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AN INVESTIGATION OF POSTSECONDARY TEACHING RECOMMENDATIONS AND ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES IN SYNCHRONOUS DISTANCE EDUCATION

by

L. Joy Dunnigan

A DISSERTATION

Presented to the Faculty of

Graduate College at the University of Nebraska

In Partial Fulfillment of Requirements

For the Degree of Doctor of Philosophy

Major: Interdepartmental Area of Psychological and Cultural Studies (Special Education)

Under the Supervision of Professor Rose Allinder

Lincoln, Nebraska

May, 2000

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DISSERTATION TITLE

An Investigation of Postsecondary Teaching Recommendations and Accommodations for Students with Disabilities In Synchronous Distance Education

BY

Linda Joy Thomson Dunnigan

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GRADUATE COLLEGE
UNIVERSITY OF NEBRASKA

AN INVESTIGATION OF POSTSECONDARY TEACHING RECOMMENDATIONS AND ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES IN SYNCHRONOUS DISTANCE EDUCATION

L. Joy Dunnigan, Ph.D.

University of Nebraska, 2000

Advisor: Rose Allinder

This study was conducted to investigate what recommended teaching practices and what additional accommodations for students with disabilities are being employed at the postsecondary level within synchronous distance education classrooms. The survey instrument was designed to investigate the degree to which level of teaching experience contributed to the rating of importance of recommended teaching practices and the degree of use of those recommended teaching practices within the synchronous distance education classroom. In addition, the survey instrument was designed to investigate the degree to which the respondents who answered yes to having students with disabilities used accommodations for students with disabilities within the synchronous distance education classroom.

A random sample was used to select 870 Teacher Education Division (TED) members of the Council for Exceptional Children (CEC) organization. A total of 254 surveys were returned, for a return rate of 29 percent.

Of the 254 TED members who responded to the survey, 53 (21%) respondents identified having taught within synchronous distance education classrooms. The results of a series of Mann-Whitney U tests revealed no

statistically significant differences between the two groups of respondents teaching within synchronous distance education classrooms for the importance of the 16 recommended teaching practices. No statistically significant difference was found between the two groups on the degree to which they used the recommended teaching practices.

Mann-Whitney U tests were used to examine the ratings of experienced (13) and inexperienced (6) respondents on their use of disability accommodations. The Mann-Whitney U tests revealed no significant differences in the 18 accommodations items for those respondents, inexperienced (5) and experienced (8), who taught students with learning disabilities. No significant differences in the twelve accommodation items for students with hearing disabilities were found between inexperienced and experienced respondents. Results are discussed in terms of means and standard deviations of respondents rankings for importance and degree of use of recommended teaching practice and use of accommodations for students with disabilities.

DEDICATION

I would like to dedicate this work to the people who mean everything to me . . . my family.

My parents who have given me unconditional love and encouragement throughout my life. Daddy, you showed me how one can follow their dreams. Your demand for excellence was always a high standard to follow. Mom, who always encouraged me to "get your education, no one can ever take it away from you" and inspired me with her strength and courage. The support of my children and children-in-law for whom I have tried to lead the way . . . I have been and will always be so very proud of each of you . . . for you are my hero's. To Jacob, Spencer, Jackson, and Cooper you inspired me to get done and open gram's summer camp at last. I am also grateful for the unfailing support of my sisters Debbie and De Jo. Everyone who had faith in me and shared his or her joy in my success . . . each of you will never be forgotten. I love you all.

Most especially I am grateful to my husband, David. He has made completing this project a family priority. He not only supports me in my goal but he shared my goal each day.

My love and deep appreciation to each of you for your faith in me and for helping me have faith in myself. Thank-you.

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CHAPTER I

Introduction

Theories of distance education have concentrated on the notion of education in which teacher and learners are separate during a majority of the instruction (Verduin & Clark, 1991, chap. 1). Traditionally, distance education was synonymous with correspondence courses, home study, independent study, or external studies (Ahern & Repman, 1994; Sherow & Wedemeyer, 1990, chap. 2; Spooner, Spooner, Algozzine, & Jordan, 1998).

Although the concept of distance education has come to represent an all-encompassing constellation of asynchronous and synchronous characteristics, Keegan (1980) suggests six defining characteristics of distance education. First, student and teacher are separated as opposed to face-to-face same room lecturing. Second, a department or college influences planning and preparation of delivery of material versus stand-alone professor responsible for content and delivery of course information. Third, the uses of technical media, traditionally print media and now electronic media, are greater. Fourth, provision for two-way communication is made between professor and student such as the use of telephone conferencing. Fifth, a seminar format is used to bring all students together with the professor on occasion. Sixth, a team of individuals involved in the preparation and delivery of the course content is present.

Lombardi and Ludlow (1997) contended that distance education is perhaps the greatest current technological trend and will become common place. Research indicates that increasingly institutions of higher education are using

telecommunication's technologies in delivering off-campus instruction (Anagal et al., 1996; Thurston & Sebastian, 1996; Wood, Miller, & Test, 1998). Current practice in institutions of higher education revolves around two basic approaches: (a) asynchronous communication and (b) synchronous communication (Spooner et al., 1998).

In considering synchronous communication, two-way interaction (Spooner et al., 1998), there are several options which are available such as (a) two-way audio/two-way video in real time (Anagal et al., 1996; Collins, Hemmeter, Schuster, & Stevens, 1996; Spooner et al., 1998), (b) two-way audio/one-way video in real-time (Lombardi, Bauer, Peters, & O'Keefe, 1991; Spooner et al., 1998), (c) CU-SeeME (Spooner et al., 1998), (d) Internet Phone (Spooner et al., 1998), and (e) two-way audio/video plus groupware technology (Foegen, Howe, Deno, & Robinson, 1998).

Synchronous communication will be reviewed for purposes of this study. Synchronous distance education courses use technology which allows course instructors, as well as students, in distance sites to hear and see each other during instruction (Egan, 1988; Spooner et al., 1998). Today, institutions of higher education are using synchronous communication to expand the range of programs offered to students (Collins et al., 1996; Egan, 1988; Lombardi et al., 1991).

Meyen and Lian (1997) reported the response to online delivery by educational agencies at all levels has been tremendous. Postsecondary institutions have moved beyond course resources and courses via the internet to offering degrees on the internet. Thurston and Sebastian (1996) stated that

educational interactive multimedia technology has been proven to be an effective teaching tool, and the use of technology in distance education and teacher preparation has been demonstrated to be cost-effective. In addition, the delivery of information and training via distance education, whether by live interactive programming or multimedia programs at local sites, has proven to be an effective and efficient method of educating personnel in rural areas (Thurston & Sebastian, 1996).

A great amount of research in distance education has focused on recommended teaching practices for teaching within synchronous distance education classrooms (Anagal et al., 1996; Gallagher & McCormick, 1999; Thach, 1995; Thurston & Sebastian, 1996). Gallagher and McCormick (1999) reported that research into the effectiveness of distance education has traditionally focused on four specific domains: (a) student attitude and satisfaction in regards to delivery of the coursework, (b) the interaction of instructor with students during delivery of coursework, (c) student success and, (d) instructors' satisfaction within this domain.

The quality and amount of instructional interaction is an important factor that has a significant influence on student success (Thurston & Sebastian, 1996). In addition, effective instructional design and delivery are core components of successful distance learning (Thach, 1995). Therefore, it is important for instructors to develop strategies and techniques that enable them to alter the type of instruction to meet the needs of students within distance education settings (Thach, 1995).

Context of the Problem

The results of a national survey revealed that approximately 56% of all high school graduates attended a postsecondary institution (Beilke & Yssel, 1998). Among graduates with disabilities, however, only 15% of high school graduates and dropouts enrolled in a vocational program or 2-year or 4-year college or university (Beilke & Yssel, 1998). Of that number, Beilke and Yssel reported the majority (10.4%) was enrolled in vocational schools and fewer (1.6%) were enrolled in 4-year colleges.

In the past two decades, reports and research concerning postsecondary education of students with disabilities have been accumulating. For example, published research on postsecondary students with disabilities has come from many sources, including the Council for Exceptional Children (CEC), the Association on Higher Education and Disability (AHEAD), the United States Department of Education, the Office of Higher Education, Division of Student Services, and the American Association of State Colleges and Universities (DeSouza, 1998). Researchers have indicated that students with disabilities have sought and successfully completed postsecondary education as opportunities at the postsecondary level and in employment have become available in almost all sectors in society (DeSouza, 1998). Two important pieces of legislation have had an impact on the postsecondary careers of students with disabilities: the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA).

In addition to Section 504: Subpart E of the Rehabilitation Act, ADA gave individuals with disabilities the opportunities to pursue employment, educational, and recreational goals that are developed without discrimination.

Recognizing the range and variety of disabilities and circumstances in the interchange of information, the ADA specifies an individual with a disability must be provided a communication format that meets their needs (Senge & Dote-Kwan, 1995).

Despite the fact that postsecondary students with disabilities are now attending colleges and universities in increasing numbers (Skinner, 1999), there is little evidence that research has been conducted that has focused on accommodations required by students with disabilities in distance education classrooms (Wallace & Weatherman, 1995). Computerized searches of Educational Resources Information Center (ERIC) documents were conducted to verify the availability of published research on students with disabilities in distance learning classrooms. Descriptors used in the searches were: "distance near1 learning," "explode disabilities", and "higher-education" or colleges or adults in DE." The literature search revealed six articles on students with disabilities in the distance education classroom at the postsecondary level.

The main purpose of this study was to survey faculty involved in synchronous distance education to examine recommended teaching practices with students with and without disabilities. This information may be used to generate discourse among postsecondary institution instructors in distance education classes concerning programs and needs of students with disabilities.

Purpose of the Study

The purpose for conducting this study is to investigate what recommended teaching practices and what additional accommodations for students with disabilities are being employed at the postsecondary level, within

synchronous distance education classrooms. Both current recommended teaching practice and additional accommodations for students with disabilities within synchronous distance education classrooms are examined through a survey instrument.

Research Questions

This study was conducted in an attempt to answer the following questions:

1. Are there significant differences between instructors who are experienced (quarters or semesters ≥ 2) and inexperienced (quarters or semesters = 1) within distant education classrooms on the degree to which they rate the importance of recommended teaching practices?
2. Are there significant differences between instructors who are experienced and inexperienced within distant education classrooms on the degree to which they rate degree of use of recommended teaching practices?
3. To what extent did faculty receive support for teaching within synchronous distance education?
4. To what extent are instructors within distance education classrooms using accommodations for students with disabilities?
5. Are there significant differences between instructors who are experienced and inexperienced within distant education classrooms on the degree to which they use accommodations for students with disabilities?

6. To what extent did faculty receive support, specific to working with students with disabilities, in synchronous distance education classroom?

Limitations of the Study

1. This study was limited to a survey of Council for Exceptional Children, Teacher Education Division (TED), members. TED members were selected because of the following characteristics: they teach in postsecondary education and live within all 50 states, allowing for a broad sampling.
2. This study was limited to the use of a survey instrument as the primary method of gathering data. Nevertheless the use of the survey instrument was still employed for the following reasons: (a) surveys are relatively inexpensive, (b) the research can be conducted by a single individual, and (c) they allow respondents sufficient time to think about the questions being posed (Fraenkel &Waller, 1993).

Definition of Terms

Several terms will be used repeatedly throughout the study. For uniformity and clarity, specific terms are defined.

Accommodation:

> Any change to a classroom environment or task that permits a qualified student with a disability to participate in the classroom process, to perform the essential tasks of the class, or to enjoy benefits and privileges of classroom participation equal to those enjoyed by adult learners without disabilities. An accommodation is a legally mandated change that creates an equitable opportunity for task completion or environmental access. Further, an accommodation is an individually determined adjustment to a functional need. Specific accommodations can range from

low-tech rubber pencil grips to high-tech recognition software for a computer. (Horton & Hall, 1998)

Auxiliary Aids and Services:

Devices or services that accommodate a functional limitation of a person with a communication disability. The term includes qualified interpreters and communication devices for persons who are deaf or persons who are hard of hearing; qualified readers, taped texts, Braille or other devices for persons with visual impairments; adaptive equipment or similar services and actions for persons with other communication disabilities. (Association on Higher Education and Disability, 1998)

Student with a Disability:

A qualified individual with a disability as defined in Section 35.104 of the American's with Disabilities Act ". . . an individual with a disability who, with or without reasonable modifications to rules, policies, or practices, the removal of architectural, communication, or transportation barriers, or the provision of auxiliary aids and services, meets the essential eligibility requirements for the receipt of services or the participation in programs or activities provided by a public entity." (Equal Employment Opportunity Commission and U.S. Department of Justice, 1991)

Synchronous Distance Education:

Distance education entails delivery of instruction where a majority of the content expertise and management is at one location and a majority of the students at up to six locations with two-way interaction. (Egan, 1988; Spooner et al., 1998)

Significance of the Study

Survey research usually is conducted to produce sound data that can be translated into valuable information for its intended users. It is a powerful, scientific tool for gathering accurate and useful information. Its value comes from the idea of gathering information from a sample of a larger population to describe some characteristics, such as abilities, opinions, attitudes, or knowledge of the larger population (Salant & Dillman, 1994).

This study was designed to examine recommended teaching practice (Fellenz, Blackwood, & Seamons, 1988; Hassenplug & Harnish, 1998; Klesius & Homan, 1997; Lombardi et al., 1991) and additional accommodations (Association on Higher Education and Disability, the Disability Accommodation Handbook, Flick-Hruska & Blythe, 1992; and the University of Kansas Institute for Adult Studies Accommodation Handbook) being made for students with disabilities in synchronous distance education classrooms using survey research methodology. Information from this study may result in policy makers in higher education examining their programs and inservice training policies in an effort to better meet the needs of all students in distance education classrooms. Due to the lack of research about students with disabilities in distance education classrooms, this study may provide information about the current situation of faculty's practices and knowledge regarding teaching students with disabilities in the distance education environment.

Organization of the Study

This study is organized into the following five chapters: The basis of the study is provided in Chapter 1. The introduction, context of the problem, purpose of the study, research questions, definitions, limitations, significance of the study, and organization of the study are included in this chapter. A review of related literature is presented in Chapter II. The methods and the procedures used in obtaining and analyzing the data in this study, are discussed in Chapter III. The analyses of the data collected in this study was presented in Chapter IV. The discussion of the results, conclusions, and recommendations made based upon the results presented in Chapter IV are included in Chapter V.

CHAPTER II

Literature Review

The intent of this study was to investigate what recommended teaching practices and what additional accommodations for students with disabilities are being employed at the postsecondary level, within synchronous distance education classrooms. The literature reviewed in this chapter is designed to address three areas: (a) the rationale for and importance of focusing on synchronous distance education, (b) existing research on recommended teaching practices for teaching students within this setting, and (c) research on adults with disabilities at the postsecondary level as they relate to accommodations within the classroom. Three topics are included in this chapter: (a) a rationale for focusing on postsecondary synchronous distance education, (b) recommended teaching practices within synchronous distance education, and (c) accommodations for students with disabilities.

A Rationale for Focusing on Postsecondary Synchronous Distance Education

Knapxzyk, Rodes, Marche', and Chapman (1994) suggested the key to preparing K-12 teachers to carry out their professional responsibilities is not necessarily found in high-priced technologies, but rather in developing a new level of cooperation between universities and public schools and exploring new ways to offer coursework. One such delivery system, synchronous distance education, first developed for use in rural sites, is finding its way into large urban settings (Duke, 1998; Smith, Drew, Healey, McCarthy, & Hughes, 1990).

Smith et al. (1990) stated the need for special education teacher educators to be prepared to assume leadership in this emerging area. Further, Smith et al. stated the necessity for a variety of delivery approaches for instruction in remote and rural areas.

A survey of literature indicated that high quality and effective delivery of instruction via distance education will require specific personnel preparation (Middleton, 1997; Smith et al., 1990). Furthermore, Jeanquart-Barone (1995) and Smith et al. (1990) suggested special education leadership may need to possess basic competencies in distance-delivery technology in the near future. In addition, implementation of ADA requires personnel to be capable of developing "environment-ability" compromises (i.e., any physical environment altered to accommodate any particular disability) (Smith et al., 1990). Finally, postsecondary institutions subject to Section 504, as well as ADA, are prohibited from discriminatory practice on the basis of disability and must provide program modifications and/or auxiliary aids to students to the extent required by law (U.S. Department of Education, 1999).

Controversial Issues

Although the importance of providing quality instruction for students within synchronous distance education classrooms is apparent, deciding how to provide quality instruction is a controversial issue. Today, some educators have become extremely critical about how instructional practices in distance education were used in the past. These educators are especially critical of how communication between teacher and student was facilitated, arguing instead for instruction in which understanding the nature of the interaction is emphasized

(Ahern & Repman, 1994). The lack of traditional pedagogical method, which is seen as emphasizing student-faculty interaction, is viewed as a primary cause of learner dissatisfaction within synchronous distance education classrooms (Ahern & Repman, 1994; Farber, 1998). More specifically, student-faculty interaction is defined by a number of elements that include faculty interest in students' problems, both academic and personal, faculty sensitivity to issues of minorities, faculty accessibility outside of office hours, and the existence of abundant opportunities for student-faculty interaction (Farber, 1998).

Student Identified Disadvantages

In the Anagal et al. (1996) study, disadvantages identified by students participating in distance education classrooms included lack of resources available in the rural areas for class work and inability to interact directly with professors. Additional disadvantages listed by students included the following: expectations were not always clearly defined (when assignments are due; how students are being evaluated) and information was not always received in a timely manner from the main campus. Anagal et al. (1996) also identified the following six areas in relation to how students in the study compared the distance education class to campus courses: (a) interactive television class is less personal due to the distance, (b) the teacher has less control of the class, (c) on-campus classes are more challenging and expectations are greater in on-campus courses, (d) students receive less guidance in the long distance relationship creating a tendency for confusion, and (e) communication problems resulted from time constraints and six classes tend to be smaller with fewer students.

Further, disadvantages discussed by Spooner et al. (1998) and Lombardi et al. (1991) included that some students would still prefer to have the instructor in the classroom, students at remote sites must identify themselves when questioned, and highly specialized facilities are required. Additional pitfalls identified by Spooner et al. (1998) involved student and instructor loss of spontaneity, social contact, speed of understanding, and loss of community of learning experience found in face-to-face, in the same room instruction. In addition, concerns of synchronous distance learning practices lead students to comment in evaluations that technology had the capacity to isolate as well as to connect people (Duke, 1998). Hassenplug and Harnish (1998) noted students had more negative experiences with various types of interactions and reoccurring technical problems made class difficult at times (Wood et al., 1998).

Student Identified Advantages

A body of literature has demonstrated some student perceptions of the advantages of receiving instruction through two-way audio/video in real time synchronous distant education. Advantages identified by students in the Anagal et al. (1996) study included video back up, high quality education in rural areas, classes were smaller and informal, residents were able to remain working and living in their communities while earning college credits, the students could see the instructor while communicating long distance and, being able to fax out and receive information during class.

Additionally, Lombardi et al. (1991) and Spooner et al. (1998) noted the following advantages in relation to distance learning practices with synchronous two-way audio/one-way video in real time: (a) ability to reach increased

numbers of students and sites, (b) ability at limited cost to add sites, (c) saving of time and travel expense, (d) students were successful in course work, (e) bandwidth supports full-motion video, and (f) transmission path avoids problems related to geography and climate.

Miller, Smith, and Tilstone (1998) postulated an advantage for synchronous distance learning practices can involve highly motivated students taking the courses. In addition, technology offers educators new ways to maintain contact with students, parents, and peers (Duke, 1998). The convenience and accessibility of classes are more important than the setting (Hassenplug & Harnish, 1998) and it affords professionals a rare opportunity to collaborate with others at a distance (Wood er al., 1998).

Preparing Rural Special Educators

Preparing rural special educators using distance education technologies appears to have found an enthusiastic and willing audience (Gamble, 1995; Thurston, Cauble, & Dinkle, 1998). If the success continues, multimedia interactive training can be made readily available to rural professionals in a variety of fields. This methodology can overcome rural service delivery's common challenges such as lack of specialists and access to professional tools and materials (Thurston et al., 1998).

The demand for teacher training in special education in rural America is increasingly being addressed using distance education (Anderson, Morgan, & Reiff, 1988; Egan, 1988; Gamble, 1995). In special education, teachers have been dealing with situations that extended beyond the school and impacted the life of the student both in and out of school. This growing demand for educational

opportunities offered outside of the established institutional situations is made by postsecondary students who cannot come to a college or university central location due to a variety of reasons such as weather conditions, family, distance, or disability (Johnson & Amundsen, 1985). If a K-12 teacher has been established in the community, feeling a connection to community provides a sense of continuity and strength to the school setting. A valued trait for educators in the rural setting has been a commitment to place (Gamble, 1995).

The Alaska Pilot Project used a developed system of telecommunications to meet the needs of special education teacher training outside of Anchorage. The program relied on several types of asynchronous and synchronous technologies such as audioconferencing, teleconferencing, direct telephoning, mailing support materials such as videotapes, audio tapes, and printed matter and instructor visitations (Johnson & Amundsen, 1985). At the completion of the three-year project, Johnson and Amundsen reported that the project was successful in developing a model that offered training not just courses and quality graduate education not just credits.

Professionally isolated graduate students, teachers and administrators in the Foster (1997) study reported their enrollment in a distance degree program expanded and deepened their understandings of the professional and personal qualities needed by successful teachers and school leaders. Sixty-eight percent indicated initiating an active involvement in school activities within the local school or school district. In addition, Ludlow (1994) found the cost of the distance education model was offset by the increase in the number of special educational teacher trainees at the graduate level enrolled in courses.

The Department of Special Education at the University of Utah has used two-way interactive television instruction to meet the needs of rural/remote students in a variety of teacher certification courses (Egan, 1988). Egan's study examined the effectiveness of three two-way interactive television courses providing special education teacher instruction. Egan reported successful utilization of identified areas of concern during each of the preceding two courses that allowed steps to be taken by addressing student concerns by altering various instructor behaviors, instructional procedures and service delivery systems. Findings indicated that only the third course, that included trained site facilitators/instructors and a manual, rated significantly better than a conventional course. Lastly, Egan postulated that corrective actions to improve instruction delivered via two-way interactive television can be taken.

The Center, at Helena College of Technology, in western and central Montana, conducted a needs assessment of rural area school personnel and found a need for graduate education in advanced pedagogy and technology. Three interactive delivery systems were utilized to deliver courses. The first system was METNET a two-way compressed interactive video system. The second system was Picture Tel, a desktop videoconferencing system that enables students and faculty to interact via audio, video, and software sharing applications. The last delivery system was ProShare, an interactive Windows-based communication network for sharing applications and documents between faculty and students (Foster, 1997). In addition, Foster stated that this study tested the efficacy of a distance graduate degree program in

education as a conduit for the foundational development of the "professional community" in schools where graduate students were situated.

The course work for this program was designed around technology planning, special education and law, program evaluation, learning and support systems, and professional conversation. Foster made three assumptions. First, the cohort nature of the distance program would provide a supportive and systematic forum for engaging students in discussions relative to educational problems, issues, and reform efforts taking place at distance school sites. Second, the proximity afforded by the distant nature of the program would serve as a catalyst for more personal communications between teachers, school administrators, and other school stakeholders. Third, more "potential leaders and professionalized teachers" would feel empowered and skilled to serve on school site committees and would engage in extramural discussions relating to innovations and reform at their school sites.

Foster reported all students in the program believed the experience had expanded their understanding of the professional and personal qualities needed by school administrators and the importance of teacher role. In addition, the distance program served as a catalyst for student involvement at the local school site.

Gamble (1995) reported the goal of project Preparing Rural Special Educators Using Distance Learning Technologies was to enhance the educational opportunities for teachers and students by offering a degree program in an outreach format to persons who are currently indigenous to and/or employed in rural Maine. Gamble stated the response to this project was overwhelming

because it met a most urgent need for non-traditional students and individuals who had a desire to move into the field of special education.

Preparing rural special educators using distance education technologies was compatible with findings that almost all special educators hired by rural school districts were trained in-state (Theobald, 1991). Therefore, if the institutions of higher education were to have special educators fully prepared to teach in rural areas, training programs will have to make educational opportunities available locally. This use of distant education to meet the needs of personal preparation in special education honors the goals and drive of the highly motivated student who is pursuing a course of study related to a particular goal (Gamble, 1995).

Importance of Quality Education Within Distance Education

Jakupcak and Fishbaugh (1998) cautioned that distance education does not make a good teacher better or a poor teacher adequate. It does call for specific strategies to make it a more viable option for the delivery of pre- and in-service training opportunities for educators and others in the field of special education.

Although the importance of providing quality instruction within the distance education classroom is apparent, deciding how to provide quality instruction has been reiterated within the current body of literature. Hassenplug and Harnish (1998) stated that faculties were more self-critical because of lack of training and inadequate preparation time. Spooner et al. (1998) suggested that instructors will need training in how to effectively bring students at remote locations into the classroom fold.

Thurston and Sebastian (1996) reiterated that educational technology such as interactive multimedia proved to be an effective teaching tool and the use of this technology in distance education and teacher preparation was demonstrated to be cost-effective and effective teaching tool. However, faculty were not being trained adequately in instructional strategies necessary to design and operate in a distance learning environment (Jay & Blackerby, 1998).

Wallace and Weatherman (1995) stated that instructors were focusing on the media rather than the message. Further, postsecondary institutions assumed that the classes and course work offered can be easily adapted to distance learning technology (Wallace & Weatherman, 1995). Additionally, Wallace and Weatherman postulated that the quality of the learning site must move past the impersonal nature of distance learning through personalization of the instruction by the instructor.

Coyle (1995) offered that distance education technologies were powerful tools that helped educators meet the demands of access to quality education for today's learners. In addition, Coyle cautioned that the extent to which this technology increased quality depended on how skillfully it was used to meet learner needs.

Recommended Teaching Practices Within Synchronous Distance Education Classrooms

Klesius and Homan (1997) found that distant education instruction, when prepared according to specific guidelines, usually resulted in a high level of learner satisfaction. Klesius and Homan (1997) recommend instructors in the distant education classroom be prepared to follow these basic guidelines:

(a) diversification of pace and activities, (b) concise and cohesive verbal presentations with practice beforehand, (c) well-defined statements of purpose, (d) use of accompanying well-designed prebound printed material, (e) implementation of detailed planning with review of content for presentation ideas, (f) study of distance education, (g) use of on-site facilitators, (h) use of 4:3 ratio, and (i) horizontally prepared visuals and graphics.

A common thread in the literature identifying recommended teaching practices in distance education was the instructor (Fellenz et al., 1988; Hassenplug & Harnish, 1998; Klesjus & Homan, 1997; Lombardi et al., 1991). Three factors were identified that effected instructor behaviors related to student satisfaction and perceptions of effective interaction: (a) interaction one to one, (b) face to face, and (c) student accessibility. One to one interactions involved calling students at distant sites frequently by name, establishing eye contact by looking into the camera when speaking, and including both remote and host site students in discussions. Face to face contacts involved having the instructors occasionally travel to a remote site to conduct class and interact directly with students. Lastly, student accessibility to the instructor before and after class also could suffer in remote sites and required extra effort by instructors, including use of telecommunications (telephone, fax, e-mail) to compensate for this problem.

Several themes concerning strategies for learner-centered distance education emerged from this review that included building rapport, decreasing isolation, and increasing interaction (Iowa Communications Network, 1998; Jeanquart-Barone, 1995; Rao, & Dietrich, 1996; Smith et al., 1990; Thach, 1995).

To build rapport, instructors were encouraged to use the following strategies: post-active, interactive, and pre-active instructional activities (Iowa Communication Network, 1998). Post-active strategies related to distributing information about the course before the first class meeting and creating student profiles. In addition, instructors were encouraged to write course objectives to define what students will do, not what the instructor will do, and to provide students with choices in objectives and collaborative activities (Iowa Communication Network, 1998). Interactive strategies related to using get-acquainted activities, learning and using students' names, and listening to students. In addition personal responsibility for learning, emphasized being approachable (e.g., smile and make "eye contact"), being a cheerleader for teaching/learning, highlight commonalties among students and between you and the students are interactive strategies (Iowa Communication Network, 1998). Pre-active instructional strategies included communicating with students outside of class, engaging in informal conversations before/after class, sharing class lists, student profiles, and/or photos of students (Iowa Communication Network, 1998).

Instructors are encouraged to use the following post-active, interactive and pre-active instructional strategies to decrease isolation (Iowa Communication Network, 1998). Post-active instructional strategies have included planning collaborative activities, varying group configurations to include students from different sites, and assigning specific activities/content to groups or individuals. Further examples have included thinking visually, visiting and/or originating from different sites, and designing activities that help

students learn how to learn (Iowa Communication Network, 1998). Interactive instructional strategies have included using shared student experiences to draw individuals into discussions, addressing each student at least once during each class session, connecting aspects of the content and students' goals and expectations, and encouraging informal and cross-group discussions (Iowa Communication Network, 1998). Pre-active instructional strategies have included facilitating access to resources, providing information about support services, encouraging study groups, and being available outside of class for student contact (Iowa Communication Network, 1998).

Instructors are encouraged again to use post-active, interactive and pre-active instructional strategies to enhance interaction within distance education classroom (Iowa Communication Network, 1998). Post-active instructional strategies have incorporated active learning techniques, plan a variety of activities, build time for questions and answers, and higher order thinking skills activities (Iowa Communication Network, 1998). Interactive instructional strategies have assumed student participation, teach students how to use the telecommunications equipment, minimize lecture, ask questions, and uses think time (Iowa Communication Network, 1998). Pre-active instructional strategies have provided timely feedback and providing air-time before and after class for questions (Iowa Communication Network, 1998).

Instruction in remote and rural areas necessitates exploring a variety of instructional strategies (Rao & Dietrich, 1996; Smith et al., 1990; Thach, 1995). The Montana Cohort Program incorporated periodic on-site visitations by the instructor to supplement the regular distance education sessions in addition to

using e-mail as a source of communication between students and faculty, and access to electronic library resources via a statewide library network linking university and state governmental resources (Jakupcak & Fishbaugh, 1998).

In the Anderson et al. (1988) study, instructional strategies were recommended for training rural teachers for rural schools. The recommendations included training of personnel to work with a variety of handicapping conditions using instructional strategies which are databased and field-tested. Additionally, the instructor stressed the importance of using available university and community resources. Finally, the strategies incorporated local community value systems and provided many opportunities for in-vivo training in rural classrooms.

An example of a program option for rural communities is Project NETWORC (Nevada Educational Television Working Out in Rural Communities). This project used unsophisticated distance education technology to provide a series of courses that enabled teachers to earn an endorsement in early childhood special education from the University of Nevada, Reno. Project NETWORC was developed to answer the need in widely scattered rural communities where access to qualified, part-time instructors was limited (Cheney & Cummings, 1994). The model used a combination of prepared videotapes, distance technology through teleconferencing, and on-sight activities. Cheney and Cummings reported that grade distributions were similar between the Reno site, where the instructor was located, and the rural sites where the students listened to the instructor via teleconferencing. Further, Cheney and Cummings suggested that the project illustrates that effective

distance education can be developed by programs without the availability of satellite or fixed video systems.

Fellenz et al. (1987) identified eight factors that had significant impact on the learning of participants in distance education: (a) setting in which the instruction took place, (b) the instructor, (c) use made of the media, (d) motivation of the learner, (e) interaction among peer learners, (f) learning style of the individual, (g) individual time commitments, and (h) personal development of the learner.

Groupware technology, which facilitates communication via computers between instructor and students, is one type of media enhancement that facilitated principles of effective instruction within the distance education classroom (Foegen et al., 1998). Foegen et al. identify the following enhancements that occur when groupware technology is added to the two-way audio/video distance learning classroom: active student involvement, feedback from the instructor, student accountability, increased attention, increased efficiency in obtaining responses from all members of the class, a perception that having one's response displayed for the group was a positive reinforcement, and enhancement of the two-way audio/video format simulated face-to-face instruction. Negative statements regarding distance education and with the groupware by students included: verbal responding is faster than typed/written responses, instructor was not physically present, initial time to adjust to the technology was needed, discomfort in asking questions was felt, and loss of classroom intimacy because of physical absence of the instructor (Foegen et al., 1998).

Foegen et al. (1998) postulated that the results from combining groupware with two-way audio/video distance education helped create a more effective and efficient distance learning model for the following reasons. First, the use of this groupware technology allowed the instructor to apply the principles identified in the effective teaching literature to the constraints often identified by students and instructors in distance education context. Student use of terminals to construct text-based responses to instructor's questions allowed for active participation in instructional activities. Second, instructor's monitoring of student responses allowed for immediate understanding of engagement and learning taking place. Third, the instructor was able to give immediate responses to the class. In addition, Foegen et al. (1998) stated that groupware technology afforded the instructor with improved means to manage class discussions and pace the activities of the class by choosing which students response to use. A final thought postulated by Foegen et al. was that student satisfaction and instructional effectiveness might broaden the appeal of this format and enhance larger numbers of teachers to access continuing education opportunities with the use of groupware enhancement in the distance education classroom.

Accommodations for Students with Disabilities Within Synchronous Distance Education Classrooms

Technology continues to grow in importance in distance education because of its ability to mediate communication and enhance the learning process of both students and teachers (Jay & Blackerby, 1998). Further, successful distance learning programs resulted from the implementation of planned strategies that were founded on sound methods. Distance education will be an

important factor in the facilitation of access as demand for education by individuals with disabilities continues to grow (Payne, 1993). Jay and Blackerby (1998) postulated that professionals in the field of education are finding technology-based solutions to plan and implement teaching strategies that enhance specific learning and knowledge processing deficiencies of students. "As a discipline, distance educators are discovering that instructional strategies and technologies, which were originally targeted for the learning disabled, now have immense application to help the at-risk and traditional students as well" (Jay & Blackerby, 1998, p. 3). Additionally, Jay and Blackerby stated that the longer faculty continue to teach, the more likely it will become that they will deal with the issue of designing courses for students who process information differently than students who have been defined as traditional. As demonstrated earlier, instructional strategies within the distance education classroom were multivariate. Therefore, instructors need to expand curricula and course offerings. Jay and Blackerby postulated that this aspect leads each instructor to ask the age-old question of "how will I meet the needs of each of my students or trainees?" (p. 3).

Increasingly larger numbers of students with disabilities are enrolling in postsecondary institutions (Weiss & Repetto, 1997). Further, Levine and Nourse (1998) stated that in 1994, students with disabilities accounted for 32% of all incoming full-time freshmen in postsecondary schools. In addition, the fastest growing group of students with disabilities in postsecondary education was those with learning disabilities (Weiss & Repetto, 1997). Day and Edwards (1996) observed that students with learning disabilities increased from 15% to 25%,

within the group of postsecondary students with disabilities, reported within a 1991 study by Fairweather and Shaver, that encompassed a 13-year period.

Factors Influencing Students with Disabilities in Postsecondary Education

A number of researchers have identified factors that have resulted in the increased numbers of students with disabilities taking advantage of postsecondary education (Adrian, 1997; Day & Edwards, 1996; Hodges & Keller, 1999; Jay & Blackerby, 1998; Payne, 1992; Simmons, 1998; Weiss & Repetto, 1997). Replete within this body of literature are the following factors:

1. Section 504 "E" of the Rehabilitation Act of 1973 mandated students with disabilities have access to postsecondary education and required postsecondary institutions to provide "auxiliary aids," such as taped texts, to students with disabilities (Day & Edwards, 1996).

2. P.L. 94-142 and P.L. 101-406 mandated special education programs and services of students with disabilities within the elementary and secondary school system. Individuals with diverse disabilities have become increasingly empowered to enter postsecondary educational systems (Levine & Nourse, 1998) with the assistance of support services (Day & Edwards, 1996).

3. Congress put even greater weight on the expectation that schools would be held accountable for standards-based outcomes for students with disabilities with the reauthorization of IDEA in 1997 (P.L. 105-17) (Turnbull, Turnbull, Shank, & Leal, 1999). Inherent within P.L. 105-17 was the theme of inclusion (Turnbull et al., 1999) or least restrictive environment that allowed many students with disabilities to follow a college bound track while attending high school (Day & Edwards, 1996).

The American economy has added 1.5 million new jobs in 2000. Of these, approximately 80% have required some postsecondary education. The job opportunities afforded students with disabilities have not been exempt from this demand (Weiss & Repetto, 1997). This demand makes students with disabilities increasingly attractive to college admissions recruiters as a viable segment of the student market (Day & Edwards, 1996; Simmons, 1998).

Student Support Services

Postsecondary institutions have tried to respond to the needs of students with disabilities by establishing student support services. Services have been in response to improved collaboration between secondary and postsecondary institutions (Simmons, 1998; Weiss & Repetto, 1997). Support service personnel have relied on assistive technology to meet the needs of students with disabilities (Day & Edwards, 1996; Jay & Blackerby, 1998; Payne, 1993).

Broad varieties of specialized equipment and materials have been developed that assist student with disabilities (Jay & Blackerby, 1998; Payne, 1993). In addition, the availability of computers and other compensatory technology has resulted in greater student independence and access in the college setting. Jay and Blackerby (1998) suggested that postsecondary instructors must systematically and carefully plan the integration of instructional strategies and technologies to enhance the educational needs of students with special requirements.

Students with disabilities may have participated in distance education courses for varied reasons including an inability to leave home because they are "place bound" (Haugen & King, 1995), to increase flexibility regarding

scheduling, or to increase control over learning environment. Payne (1993) postulated that students with disabilities, after discussion with campus disability support staff, may find it impossible to enroll in regular programs choosing distance education as the optional educational alternative. It is imperative for program faculty to provide quality courses to students with disabilities when engaging in these postsecondary courses (Dilka & Haydon, 1997).

Technology

Many institutions have reached out to assist and retain students with disabilities (Simmons, 1998) by providing assistive technologies appropriate for postsecondary students that has enhanced an individual's learning abilities by circumventing deficits (Day & Edwards, 1996). Further, circumventing deficits has been a major purpose of assistive devices that falls under the rubric of a compensatory approach (Day & Edwards, 1996). A growing body of research has supported assistive technologies for students with disabilities at the postsecondary level (Day & Edwards, 1998; Dilka & Haydon, 1997; Haugen & King, 1995; Newell & Walker, 1992; Payne, 1993; U.S. Dept. of Education National Center for Education Statistics, 1999) found that of institutions that enrolled students with disabilities, about half (54%) have an institution-wide formal planning process for the purchase and implementation of new technologies. Further, of the institutions with an institution-wide formal planning process, about half (50%) explicitly considered needs of students with disabilities.

Assistive Technologies and Accommodations

Jay and Blackerby (1998) suggested that as institutions offer more distance education classes, instructors are likely to find situations more frequently that require the use of adaptive technologies and strategies. Additionally, they postulated that the need to design instructional programs take advantage of capabilities of technology from the beginning, to have a significant and long-lasting impact on student learning. Further, institutions must educate faculty in how technology can be used to help students compensate for poor learning or processing skills (Jay & Blackerby, 1998).

Day and Edwards (1996) reported recent legislation addressing assistive technology described in P.L. 100-407 which is the Technology-Related Assistance for Individuals with Disabilities Act of 1988 reauthorized in 1994. This law influenced the availability and utilization of specially designed devices and accommodations meant to empower persons with disabilities (Day & Edwards, 1996). An assistive technology device reported by Day and Edwards is "any item, piece of furniture, or system used to increase, maintain, or improve the functional capabilities of individuals with disabilities" (p. 489). In addition, "assistive technological devices can be considered low-tech (mechanical) or high-tech (electro-mechanical or computerized)."

A major part of the selection process for identifying accommodations has been determining how multimedia (Jay & Backerby, 1998) and assistive technology has been used to address specific student needs. In order to help the learner choose an accommodation (Mellard, Gilbert, & Parker, 1998), college students should not be limited to only academic weaknesses (Skinner, 1999).

Specific processing problems that often lead to justification for needed accommodations and academic alternatives when choosing an accommodation should be included (Skinner, 1999). Flick-Hruska and Blythe (1992) recommended that instructors, when increasing their awareness concerning accommodating students with disabilities, remember they are not expected to lower their standards of excellence or remediate or diagnose or prescribe. Each student functions differently and is the best source of information about his or her disability and the impact it has on his or her classroom performance. It becomes the instructors' responsibility, with support from staff specialist and the student, to determine how to best use a given multimedia application. Jay and Backerby (1998) stated that within the instructional design process, multimedia should become an integral part that is planned so its application has the greatest impact on students. In addition, instructors should make use of multimedia to address multiple modalities. Further, this approach allows instructors to present their content message in different ways and formats.

The Association on Higher Education and Disability, the Disability Accommodation Handbook (Flick-Hruska & Blythe, 1992), and the University of Kansas Institute for Adult Studies Accommodation Handbook offered the following general accommodation suggestions for individuals with disabilities within postsecondary classrooms.

Accommodations for students who are deaf or hand of hearing include: (a) assistive listening devices, (b) use signing, lip reading, or an interpreter, (c) notetakers, (d) tape recorders, (c) captioning, (d) telecommunications for the deaf, (e) FM systems, (f) infrared systems, and (g) amplified phones.

Accommodations for students with learning disabilities include: (a) computer -assisted instruction, (b) notetakers, (c) modified format exams, (d) extended time on exams or assignments, (e) taped texts and lectures, (f) readers/scribes, (g) support groups or person, and (h) extended time for completion of course requirements.

Accommodations for students with visual impairments include: (a) provide speech synthesis for reading on the computer screen, (b) provide visual cues (such as flashing lights for timed tasks), (c) require less writing, (d) use a computer with a larger display, (e) use a computer with speech recognition capabilities, (f) use large, bolded print texts and materials, (g) use braille texts, (h) provide slate and stylus or brailler for Braille writing, and (i) have audio-taped presentation of items or for recording responses.

Additional accommodations for students with disabilities have been numerous and should be student and classroom specific. Further, general accommodation suggestions have included: (a) use of a computer to track materials and assignments, (b) use a microphone/amplifier combination, (c) use of a communication board, (d) post daily routine, (e) discuss changes as soon as possible, (f) help learner know what to expect, outline day's plan, (g) allow learner to decide what task to do first, second, and third, (h) allow learner to bring support person to class when difficult changes are anticipated, and (i) allow student to stand up or lie down whenever necessary.

Jay and Backerby (1998) postulated that having multimedia available makes it easier to use, but to use it effectively and efficiently as an instructional tool requires an evaluation plan that includes feedback about how effective the

application of multimedia is in helping students overcome learning barriers. Fifield (1995) stated that the best preparation for the future of distance education is effective utilization of current teaching technology. Postsecondary instructors must learn well-known principles of instruction and enhance education with efficacious use of technology. Payne (1993) suggested that increased success for students with disabilities in distance education programs require faculty to be creative when providing instruction. Further, as demand for education by individuals with disabilities increases, distance education will be an important factor in facilitating its access (Payne, 1993).

Although there is an increasing number of students with disabilities in postsecondary distance education classrooms (Jay & Blackerby, 1998; Payne, 1993), there is little information available regarding effective instruction and support for these students. The extent to which colleges and universities accommodate the needs of students with disabilities in distance education classrooms is a topic that has received little interest. Special education faculty conducting distant learning special education classes should not only be leaders in providing recommended teaching practice but also be leaders in modeling responsive accommodations. Moreover, special education researchers should assist instructors in their evaluation of how effective accommodations recommended for traditional classrooms are when provided within the distance education classroom.

Summary

A literature review concerning strategies for teaching within postsecondary synchronous distance education classrooms and what additional

accommodations for students with disabilities are being employed was presented in this chapter. Although there is much more to be learned about instructional accommodations for students both with and without disabilities during distance education classes, the review of literature in this chapter may provide guidance to educators recommending teaching practices and techniques for accommodating the learning needs for all students within the synchronous distance education environment. Very little is known at this time (Payne, 1993) about which accommodations are actually implemented by instructors.

CHAPTER III

Methodology

This study was conducted to investigate what current teaching practices and additional accommodations for students with disabilities are being employed at the postsecondary level in synchronous distance education classrooms. A description of the population of the study, the development and administration of the study instrument, methods of data collection, and data analysis are discussed in this chapter.

Participants

The population of this study was obtained from the Council for Exceptional Children (CEC) international organization. The total population of the CEC membership is 50,000. A random sample was selected to obtain 870 Teacher Education Division (TED) members of the CEC organization. Total membership in the TED division is 2,673 and is voluntary and self-selected. Selection of the 870 participants was conducted at the CEC's national headquarters by providing every third name on the membership list. From this list all TED members living within the United States (870) were offered the survey.

Instrumentation

A survey research design was employed for this study. One purpose of survey research is to produce sound data that can be translated into valuable information for its intended users (Salant & Dillman, 1994). Its value resides in the idea that gathering information about a sample of a larger population can

describe their characteristics, such as opinions, abilities, knowledge, and attitudes (Salant & Dillman, 1994). Additionally, the following advantages of survey research were identified by Fraenkel and Waller (1993): (a) surveys are relatively inexpensive, (b) the research can be conducted by a single individual, and (c) they allow respondents sufficient time to think about the questions being posed. The purpose of the survey in the present study was to first examine a sample of TED members' knowledge of recommended teaching practice within synchronous distance education classrooms and second, to examine TED members' accommodations when teaching students with disabilities in this setting.

The survey (see Appendix B) was researcher-designed with information acquired from the literature review (the selection of survey items was based upon the findings from research based literature identified in Chapter II). To aid in clarity, the survey instrument was divided into four sections. Section I included five questions which were designed to determine the percentage of participants who have taught at the postsecondary level during the past five years and the participants' level of teaching experience at the postsecondary level.

In Section II, participants indicated the number and type of synchronous distance education classrooms in which they had taught within the past five years. Next, participants indicated the types of professional support they had received relevant to teaching within distance education classrooms. Also, for this survey item, participants were asked to rate, on a Likert Scale, their level of agreement regarding degree of importance and degree of use of the

16 recommended teaching practices (Fellenz, Blackwood, & Seamons, 1988; Hassenplug & Harnish, 1998; Klesius & Homan, 1997; Lombardi et al., 1991) within synchronous distance education classes. Ratings for degree of importance were as follows: 1 = indicated no importance, 2 = little importance, 3 = some importance, 4 = great importance, and 5 = not applicable. The "5" point on this scale was excluded from the analysis. Participants' degree of use a rating 1 = never used, 2 = seldom used, 3 = often used, 4 = they usually used the recommendation, and 5 = not applicable. The "5" point on this scale was excluded from the analysis.

Section III of the survey was designed to determine if participants had taught students with disabilities within synchronous distance education classrooms. Participants answered Yes/No questions regarding teaching students with disabilities in distance education classrooms and participants identified the number and type of student disability. Following these two questions, participants rated the degree to which they had used the 29 accommodations (Association on Higher Education and Disability, the Disability Accommodation Handbook, Flick-Hruska & Blythe, 1992; and the University of Kansas Institute for Adult Studies Accommodation Handbook) for students with disabilities. Participants rated their level of accommodation using the following scale: 1 = never used, 2 = seldom used, 3 = often used, 4 = usually used, and 5 = not applicable. The "5" point on this scale was excluded from the analysis. The final section, Section 4, was designed to collect demographic information about the participants' primary employer.

Field Test Procedure

The survey instrument was field tested to refine the instrument once during the summer of 1999. Participants (n = 6) were instructors from a small Midwestern state college. All participants were selected who were available during the summer session and who had professional knowledge and experience teaching within postsecondary synchronous distance education classrooms. Experienced instructors (n = 4) had taught two or more quarters or semesters and inexperienced instructors (n = 2) had taught one semester in distance education classrooms. Participants were asked (a) to examine the content of the survey, (b) to identify any ambiguities (those items capable of being understood in two or more possible senses) which existed in the survey instrument, and (c) to determine the average amount of time that was necessary to complete the survey. Modifications to the survey instrument were minor changes related to vocabulary (use of ambiguous term) with no survey items added or deleted (based on review by pilot respondents and literature review).

Reliability Testing

Internal Consistency

Cronbach's coefficient alpha was calculated in order to measure the internal consistency of the instrument used in this study. The computed Cronbach's alpha for this study was classified based on Kirk's (1984) classification of index of reliability: "Very high": alpha $\geq$ 0.90; "High": alpha = 0.70-0.89; "Medium": alpha = 0.30-0.69; "Low": alpha < 0.30. The alpha coefficient was computed for Section II and Section III of this study. The resulting classification of the reliability analysis is reported in Table 1.

Table 1

Measurement of Internal Consistency of Sections II and III of the Survey Instrument Utilizing Cronbach's Coefficient Alpha

Category	Alpha Coefficients
Section II	
Importance of Practice	0.45
Degree of Use of Practice	0.78
Section III	
Student Accommodations	0.97

The data in Table 1 reveal that Cronbach's coefficient alpha for Section II, Importance of Practice, indicated "Medium" reliability and Degree of Use indicated "High" reliability based on Kirk's (1984) classification. Using the same classification, Section III, Student Accommodations, had a "very high" coefficient alpha value.

Evidence of Validity

According to Schumacher and McMillan (1993),

> Test validity is the extent to which inferences made on the basis of scores from an instrument are appropriate, meaningful, and useful. Validity is a judgment of the appropriateness of a measure for specific inferences or decisions that result from the scores that are generated. (p.167)

Validity can exist in one situation but may not exist in another. Validity depends on the measurement purpose, population, and situational factors.

Content-Related Evidence

Validity of the instrument was determined in the present study by making use of content-related evidence in the way Schumacher and McMillan (1993) discussed. The study survey's conceptual basis was founded upon a review of the pertinent literature. A computerized search for ERIC documents was conducted to verify the availability of published research on synchronous distance education and students with disabilities in postsecondary education "Salient" factors were extracted from the literature based on multiple identification by researchers. Survey questions were developed from the literature based on findings and recommendations from previous studies. Additionally, a pilot study was conducted that provided information that (a) a particular trait (teaching strategies existing within distance education classrooms for students with and without disabilities) and (b) the survey instrument appeared to be sensitive to this trait based on participants responses and findings from prior research. Therefore, there is a conceptual justification for the assumption that the survey instrument is valid.

Survey Administration Procedures

An Institutional Review Board (IRB) approval was processed and obtained from the University of Nebraska-Lincoln (Appendix A).

The survey and return postage paid envelope was mailed to participants selected randomly from the Teacher Education Division of the Council for Exceptional Children. Participants were invited to complete the survey. Participants were given two weeks to complete the survey. After the two-week time, a follow-up survey and an envelope in which each survey could be

returned was mailed to the original participants who had not responded eliciting additional responses.

Data Analysis

Data in this study were analyzed and reported using descriptive and inferential statistics and in narrative form. Using the Statistical Package for the Social Sciences (SPSS), the following statistical measures were used to analyze the research questions.

Question 1

Are there significant differences between instructors who are experienced (quarters or semesters ≥ 2) and inexperienced (quarters or semesters = 1) within distant education classrooms on the degree to which they rate the importance of recommended teaching practices?

Prior to selecting a statistical method of analysis, tests for skewness and kurtosis were run to gauge whether the data were normally distributed (Gravetter & Wallnau, 1992). The results indicated the data were negatively skewed. Therefore, the ordinary assumptions attendant to parametric methods, equal statistical variances and distributions, were not satisfied (Stonehouse & Forrester, 1998).

A nonparametric statistical test uses a model that does not specify conditions about the parameters of the population from which the sample was drawn (Kerlinger, 1964). The Mann-Whitney U test, a nonparametric statistical test, was selected because the current analysis required a comparison of two independent groups with interaction between unequal variance and unequal distributions, and small sample size (Stonehouse & Forrester, 1998).

The Mann-Whitney U test is a test of rank orders of samples (Stonehouse & Forrester, 1998). It is sometimes thought of as the nonparametric equivalent of an independent group's t test, but it is not a test of differences between means, rather it is a test of differences of rank orders of samples (Stonehouse & Forrester, 1998). The Mann-Whitney U Test measures the likelihood of a significant difference between two groups based on a sum of their ranks (Jaccard & Becker, 1997). The Mann-Whitney U test for significance factor at 0.05 is reported. An alpha level of 0.05 was selected to decrease the likelihood of a Type II error (Rowntree, 1981; Schumacher & McMillan, 1993; Wiersma, 1991). The probability of finding a significant difference by chance alone increases with multiple tests, therefore a Bonferroni correction was used to set the probability ($\alpha = 0.003$) (Gravetter & Wallnau, 1992). Given a null hypothesis of no real systematic difference between experience and level of importance of recommended teaching practice within synchronous distance education, the two samples are similar and the U value is relatively large (Gravetter & Wallnau, 1992).

Respondents rated the importance of recommended teaching practices using a five-point scale with 1 being of no importance and 4 being of great importance. A rating of 5 indicated the teaching practice was non-applicable. Means were calculated and reported in Chapter IV. For the purposes of this evaluation, ratings of 5, or nonapplicable, were treated as missing data because such an answer was the functional equivalent of no response.

Question 2

Are there significant differences between instructors who are experienced and inexperienced within distance education classrooms on the degree to which

they rate degree of use of recommended teaching practices? Tests for skewness and kurtosis showed the data were negatively skewed, therefore, a nonparametric statistical analysis was applied. The data were analyzed using the Mann-Whitney U test because parametric assumptions were not met and because the sample size was small (Gravetter & Wallnau, 1992; Jaccard & Becker, 1997; Stonehouse & Forrester, 1998). An alpha level of 0.05 was reported and selected to avoid a Type II error (Rowntree, 1981; Schumacher & McMillan, 1993; Wiersma, 1991). The probability of finding a significant difference by chance alone increases with multiple tests, therefore a Bonferroni correction to the set probability (0.003) was used (Gravetter & Wallnau, 1992). Given a null hypothesis of no relationship between experience and degree of use of recommended teaching practice within synchronous distance education, the two samples are similar and the U value is relatively large (Gravetter & Wallnau, 1992). Means were calculated and are reported in Chapter IV.

Question 3

To what extent did faculty receive support for teaching within distance education classrooms? Frequencies and percentages were calculated for this question. Numbers and percentages of respondents who indicated support for teaching within the synchronous distance education classroom and the type of support received were reported in Chapter IV.

Question 4

To what extent are instructors within distance education classrooms using accommodations for students with disabilities? To answer this question, respondents rated the degree to which they used accommodations for students

with disabilities within synchronous distance education classrooms. Means and standard deviations were calculated and are reported in Chapter IV.

Question 5

Are there significant differences between instructors who are experienced and who are inexperienced within distant education classrooms on the degree to which they use accommodations for students with disabilities? A nonparametric statistical analysis was applied, because tests for skewness and kurtosis showed the data were negatively skewed. Data were analyzed using the Mann-Whitney U test because parametric assumptions were not met and because the sample size was small (Stonehouse & Forrester, 1998). The Mann-Whitney U test for significance factor at 0.05 was reported. The probability of finding a significant difference by chance alone increases with multiple tests, therefore a Bonferroni correction to the set probability (0.004) was used (Gravetter & Wallnau, 1992). Given a null hypothesis of no relationship between experience and use of accommodations within synchronous distance education, the two samples are similar and the U value is relatively large (Gravetter & Wallnau, 1992). Means were calculated and are reported in Chapter IV.

Question 6

To what extent did faculty receive support, specific to working with students with disabilities, within distance education classrooms? This question was analyzed using frequencies and percentages. Respondents indicated the type of support received. Frequencies and percentages of respondents who indicated each type of support were calculated and reported in Chapter IV.

Summary

In this chapter, the study design was discussed. A description of the sampling procedures, a description of the detailed design of the research instrument, and the methods used to administer the instrument were explained. A list of the research questions along with the statistical methods used to analyze the collected data were given. Chapter IV contains the analysis of data obtained from the survey instrument and analyses of the data are presented.

CHAPTER IV

Findings of the Study

A restatement of the purpose of the study, a brief summary of the design of the study, and the presentation of the findings are included in this chapter. The research questions are answered by the presentation of statistical analysis.

Summary of the Study

The purpose for conducting this study was to investigate what recommended teaching practices and what additional accommodations for students with disabilities are used at the postsecondary level, within the synchronous distance education classroom. The population identified for this study was Teacher Education Division (TED) members of the Council for Exceptional Children (CEC) organization. To identify the population, a phone call was made to the CEC office of Membership Services to request a random sample of TED members. Following a review of literature, the collection of data was achieved using a researcher-designed survey instrument. SPSS was used to analyze data. The data gathered in the research investigation and a summary analysis of the data are presented in this chapter.

Sampled Surveyed

The survey was distributed to a random sample of 870 TED members of the CEC organization living in the United States. After two weeks, the researcher had received 142 (16.3%) completed surveys. A follow-up mailing yielded an additional 112 responses (12.8%). Two hundred fifty-four (254) responses were

received representing a 29.1% survey return rate. Table 2 displays the survey return rates for each mailing.

Table 2

Survey Return Data

Mailing	Sent N	Returned N	Percent
Initial	870	142	16.3
Follow-up	731	112	12.8
Total		254	29.1

Two of the surveys were returned as non-deliverable. An additional survey was dropped due to a participant's request. An adjusted sample of 867 TED members was yielded. Table 3 contains the adjustments made to the original sample.

Table 3

Adjusted Population for Mailing Rate

Surveys	N
Total originally mailed	870
Returned non-deliverable	2
Returned removed from list	1
Adjusted population	867

Of the 867 TED members in the adjusted population, 254 surveys were returned. These responses represented an adjusted overall return rate of 29%. Data from 251 surveys (29%) were analyzed.

Data from Section I of the survey instrument, teaching information, were analyzed through the use of descriptive statistical techniques. Variables examined under demographic and institutional information included post-secondary classes taught and quarters or semesters of experience. Frequencies and percentages were used to report these variables. Teachers responded in the following way: 131 (52%) reported teaching undergraduate special education classes, 141 (56%) reported teaching graduate special education classes, 18 (7%) reported teaching undergraduate special education synchronous distance education classes, 40 (16%) reported teaching graduate special education synchronous distance education classes, and 15 (6%) reported teaching any postsecondary synchronous distance education classes. Table 4 displays the frequencies and percentages of responses by type of classes taught.

Respondents were asked to identify the number of quarters or semesters taught in a synchronous distance education classroom in the past five years. The level of respondents' teaching experience was defined as inexperienced = 1 quarter or semester and experienced $\geq$ 2 quarters or semesters within the synchronous distance education classroom.

Of the total number of respondents (53) who identified classes taught within synchronous distanced education classrooms, 18 (34%) reported that they taught special education courses at the undergraduate level, 40 (75%) reported that they taught graduate special education, and 15 (28%) reported that

Table 4

Frequencies and Percentages of Respondents' Teaching Experience

Characteristic	Frequency	Percentage of Total Returned Surveys
Post Secondary Classes Taught		
Undergraduate SPED Class	131	52
Graduate SPED Class	141	56
Total Respondents Reporting DE Classes	53	21
Undergraduate SPED DE	18	7
Graduate SPED DE	40	16
Any Postsecondary DE	15	6

Note. N = 251; total exceeds 251 because respondents were instructed to check all classes taught at the postsecondary level. Acronyms are Special Education (SPED) and Distance Education (DE).

they taught non-special education courses at the post secondary level. Of the 18 (34%) who taught at the undergraduate level, 8 (15%) out of the 18 reported that they were inexperienced in teaching synchronous distance classes and 10 (19%) out of the 18 reported that they were experienced teaching within synchronous distance education. Of the 40 (75%) who taught graduate level special education courses, in synchronous distance education, 14 (26%) out of the 40, reported that they were inexperienced and 26 (49%) out of the 40 reported that they were experienced. Of the 15 (28%) who taught non-special education courses, within synchronous distance education 8 (15%) out of the 15 reported being inexperienced and 7 (13%) out of the 15 reported that they were

experienced. Table 5 displays frequencies and percentages of types of classes taught and respondents experience level teaching.

Table 5

Frequencies and Percentages of Types of Synchronous Distance Classes Taught by Respondents' Experience Level Teaching

Type of Classroom	N	Percent
Total Respondents Teaching in Synchronous Distance Education Classrooms	53	100
Undergraduate Special Education	18	34
Inexperienced	8	15
Experienced	10	19
Graduate Special Education	40	75
Inexperienced	14	26
Experienced	26	49
Post Secondary Any Class	15	28
Inexperienced	8	15
Experienced	7	13

Note. N = 53; total exceeds 53 respondents teaching distance education because respondents were instructed to indicate all that apply.

Data from Section IV, primary employer, were analyzed through the use of frequencies and percentages. Responses to primary employer were reported as

follows: 174 (69%) college or university, 42 (17%) P K-12, two (0.8%) as a federal agency as the primary employer, 11 (4%) as a local agency, 4 (2%) as a self-employed, and 11 (4%) as other types of employment. Of the 11 reporting other types of primary employer, 3 reported retired, 1 reported unemployed, 4 reported student and 3 reported national not-for-profit organization, National Catholic Educational Association, and American Sign Language Interpreter, respectively. Table 6 displays the frequencies and percentages of responses.

Table 6

Reported Employment Demographics for the Participant Sample Number and Percentages

Characteristic	Number	Percentage
Primary Employer		
College/university	174.0	69.0
School (Pre K-12)	42.0	17.0
Federal Agency	2.0	0.8
State Agency	11.4	4.4
Self-employed	4.0	1.6
Other	11.0	4.4

Presentation and Analysis of the Data

The analysis of the data according to the order of research questions is presented in this section. Descriptive and inferential statistics will be presented to determine the answer to the research questions.

Question One

"Are there significant differences between instructors who are experienced and who are inexperienced within the distant education classroom on the degree to which they rate the importance of recommended teaching practices?" This question was designed to investigate the degree to which level of teaching experience contributed to the rating of "importance of recommended teaching practices" in the synchronous distance education classroom, based on responses to Section II of the survey instrument. Respondents were asked to indicate the degree of (importance of recommended teaching practices) within synchronous distance education.

Respondents rated "importance of recommended teaching practices" using a five-point Likert scale with 1 being of "no importance" and 4 being of "great importance." A rating of 5 indicated the teaching practice was "non-applicable," and was treated as missing data because this answer was the functional equivalent of no response. For this question, the total population of respondents reporting (importance of recommended teaching practices) were divided into two groups: (a) inexperienced respondents (quarters or semesters = 1), and (b) experienced respondents (quarters or semesters $\geq$ 2). Fourteen respondents indicated they were inexperienced and 39 respondents reported they were experienced instructors. The responses of the two samples for each item were analyzed using 16 Mann-Whitney U tests. An alpha level of 0.003 (Bonferroni correction) was used for statistical tests.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 1 (you teach students

how to use system) for respondents with no experience and respondents with experience teaching within the synchronous distance education classroom. No significant difference of the level of experienced was found ($\underline{U}$ = 203.000; $\underline{p}$ > 0.003). Respondents with no experience averaged a mean rank of 23.00. Respondents with experienced averaged a mean rank of 22.27.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 2 (encourage interactivity) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experience was found ($\underline{U}$ = 247.500; $\underline{p}$ > 0.003). Respondents with no experience averaged a mean rank of 23.97. Respondents with experience averaged a mean rank of 25.50.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 3 (distribution network with 2-day lag for materials) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experienced was found ($\underline{U}$ = 172.500; $\underline{p}$ > 0.003). Respondents with no experience averaged a mean rank of 21.13. Respondents with experience averaged a mean rank of 20.95.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 4 (use system to let student's present work) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experience was found ($\underline{U}$ = 196.00; $\underline{p}$ > 0.003). Respondents with no experience averaged a mean rank of 20.75. Respondents with experience averaged a mean rank of 26.38.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 5 (look directly into camera frequently) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experience was found ($\underline{U} = 194.00$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 25.36. Respondents with experience averaged a mean rank of 21.94.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 6 (use class videotapes to self-evaluate) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experience was found ($\underline{U} = 194.00$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 27.38. Respondents with experience averaged a mean rank of 22.26.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 7 (utilization of guest remote instructors) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experience was found ($\underline{U} = 188.500$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 25.43. Respondents with experience averaged a mean rank of 21.78.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 8 (restate student's comments/questions) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experience was found ($\underline{U} = 215.000$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 25.14. Respondents with experience averaged a mean rank of 23.52.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 9 (address presentations to all sights) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experience was found ($\underline{U} = 232.000$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 23.47. Respondents with experience averaged a mean rank of 24.25.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 10 (refer to student by name not site) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experience was found ($\underline{U} = 180.000$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 20.03. Respondents with experience averaged a mean rank of 26.53.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 11 (only hand out materials if all sites have) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experience was found ($\underline{U} = 196.500$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 22.88. Respondents with experience averaged a mean rank of 22.34.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 12 (pace camera switching) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experience was found ($\underline{U} = 181.000$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 20.43. Respondents with experience averaged a mean rank of 20.54.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 13 (dress for teaching via this mode) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experience was found ($\underline{U} = 161.500$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 22.58. Respondents with experience averaged a mean rank of 20.27.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 14 (use text print for elmo of font size 20-30 points) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experience was found ($\underline{U} = 118.500$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 21.65. Respondents with experience averaged a mean rank of 18.73.

A Mann-Whitney U test was used to examine the difference in the level of importance of the recommended teaching practice of item 15 (hold office hours over system) for respondents with no experience and respondents with experience teaching. No significant difference of the level of experience was found ($\underline{U} = 170.000$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 25.36. Respondents with experience averaged a mean rank of 21.17 (see Table 7).

Means were calculated for each recommended teaching practice item for each group after the responses were tabulated. The mean scores of both groups appear in Table 8 and are organized in descending order based on the responses of the inexperienced instructors.

Table 7

Mann-Whitney U Test of the Importance of the Recommended Teaching Practices by Inexperienced and Experienced Synchronous Distance Education Teachers

Recommended Teaching Practices		N	U	p
1.	You teach students how to use system.	44	203.000	0.853
2.	Encourage interactivity.	49	247.500	0.151
3.	Distribution network with 2-day lag for materials.	41	172.500	0.956
4.	Use system to let student's present work.	48	196.000	0.091
5.	Look directly into camera frequently.	45	184.000	0.341
6.	Use class videotapes to self-evaluate.	47	194.000	0.196
7.	Utilization of guest "remote' instructors.	45	188.500	0.346
8.	Restate student's comments/questions.	47	215.000	0.664
9.	Address presentations to all sights.	47	232.000	0.706
10.	Refer to student by name not site.	48	180.000	0.054
11.	Only hand out materials if all sites have.	44	196.500	0.829
12.	Pace "camera switching."	40	181.000	0.975
13.	Dress for teaching via this mode.	41	161.500	0.533
14.	Use text print for elmo of font size 20-30 points.	38	118.500	0.314
15.	Instructor originates course from all sites early in term.	37	115.500	0.292
16.	Hold office hours over system.	44	170.000	0.292

Note. N = 53; total of each item differs from 53 because respondents were instructed to indicate all that apply. No significance was found at a = 0.003.

Table 8

Mean Ratings of Responses to Importance of Recommended Teaching Practices by Inexperienced and Experienced Teachers

Teaching Practice	Inexperienced			Experienced		
	N	Mean	SD	N	Mean	SD
1. Encourage interactivity.	16	3.92	0.26	34	4.00	0.00
2. Address presentations to all sights.	16	3.57	1.15	35	3.54	1.19
3. Use system to let student's present work.	15	3.50	0.65	35	3.50	1.05
4. Refer to student by name not site.	16	3.35	1.08	36	3.54	1.01
5. Look directly into camera frequently.	16	3.21	1.42	34	3.30	1.10
6. Use class videotapes to self-evaluate.	16	3.14	0.86	34	2.75	1.14
7. Restate student's comments/questions.	16	3.07	1.38	35	3.50	0.86
8. Only hand out materials if all sites have.	16	3.07	1.68	35	3.37	1.35
9. Pace "camera switching."	16	3.00	1.35	33	2.63	1.49
10. Utilization of guest "remote' instructors.	16	2.92	1.07	35	2.58	1.23
11. Establish network with 2-day lag for materials.	16	2.69	1.79	35	3.12	1.43
12. Dress for teaching via this mode.	16	2.64	1.49	32	2.71	1.25
13. Hold office hours over system.	16	2.57	1.50	34	2.39	1.27
14. You teach students how to use system.	16	2.46	1.26	33	2.25	1.19
15. Use text print for elmo of font size 20-30 points.	14	2.46	2.02	36	3.11	1.51
16. Instructor originates course from all sites early in term.	14	2.25	1.65	33	2.75	1.63

Note. N = 53; total of each item differs from 53 because respondents were instructed to indicate all that apply.

The teaching practice described on the survey as (Encourage interactivity) received the highest mean score for both inexperienced instructors (M = 3.92; SD = 0.26) and experienced instructors (M = 4.00; SD = 0.0). The teaching practice described on the survey as (Address presentations to all sites) received the second highest mean for both groups: inexperienced respondents (M = 3.57; SD = 1.15) and experienced respondents (M = 3.54; SD = 1.19).

The lowest mean (M = 2.25; SD = 1.65) was associated with the teaching practice described on the survey as (Instructor originates course from all sites early in term) for the inexperienced respondents. "Teaching students how to use the system" resulted in the lowest mean (M = 2.25;SD = 1.19) for experienced respondents.

Question Two

"Are there significant differences between instructors who are experienced and inexperienced within distant education classrooms on the degree to which they use recommended teaching strategies?"

Question two was designed to investigate the degree to which level of teaching experience contributed to the respondents' use of recommended teaching practices within the synchronous distance education classroom, based on the teachers' responses to Section II of the survey instrument. Respondents rated a list of recommended teaching practices according to the degree to which they had used the items during the past five years within synchronous distance education.

Respondents indicated on a 5-point Likert-type scale the degree to which they "used suggested teaching practices" with a 1 being never used and a 4 being

usually used. A rating of 5 was non-applicable. Answers of "NA" were treated as missing data because such an answer was the functional equivalent of no response.

For question two, the total population of respondents reporting the importance of recommended teaching practices was divided into two groups, inexperienced respondents and experienced respondents. Fourteen respondents indicated that they were inexperienced, and 39 indicated that they were experienced instructors. The results of a series of 16 Mann-Whitney U tests, the values (U) obtained, and the significance levels for each of the 16 items are reported in Table 9. An alpha level of 0.003 (Bonferroni correction) was used for statistical tests.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 1 (you teach students how to use system) for respondents with no experience and respondents with experience teaching within the synchronous distance education classroom. No significant difference in the results of the level of experience was found ($\underline{U} = 242.500$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 23.66. Respondents with experience averaged a mean rank of 25.65.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 2 (encourage interactivity) for respondents with no experience and respondents with experience teaching. No significant difference in the results of the level of

Table 9.

Significance for the Mann-Whitney U Test of Degree of Use of the Recommended Teaching Practices by Inexperienced and Experienced Synchronous Distance Education Teachers

Recommended Teaching Practices		N	U	p
1.	You teach students how to use system.	49	242.500	0.638
2.	Encourage interactivity.	50	230.000	0.147
3.	Distribution network with 2-day lag for materials.	49	243.000	0.778
4.	Use system to let student's present work.	50	207.00	0.201
5.	Look directly into camera frequently.	50	270.500	0.973
6.	Use class videotapes to self-evaluate.	50	225.500	0.312
7.	Utilization of guest "remote" instructors.	51	252.500	0.561
8.	Restate student's comments/questions.	51	224.500	0.215
9.	Address presentations to all sights.	51	279.500	0.989
10.	Refer to student by name not site.	52	280.000	0.853
11.	Only hand out materials if all sites have.	51	271.500	0.847
12.	Pace "camera switching."	49	227.500	0.408
13.	Dress for teaching via this mode.	48	254.500	0.972
14.	Use text print for elmo of font size 20-30 points.	50	251.500	0.990
15.	Instructor originates course for all sites early in term.	47	194.000	0.368
16.	Hold office hours over system.	50	264.500	0.871

Note. N = 53; total of each item differs from 53 because respondents were instructed to indicate all that apply. No significance was found at $\alpha = 0.003$.

experience was found (U = 230.000; p > 0.003). Respondents with no experience averaged a mean rank of 22.88. Respondents with experience averaged a mean rank of 26.74.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 3 (distribution network with 2-day lag for materials) for respondents with no experience and respondents with experience teaching. No significant difference in the results of the level of experience was found (U = 243.000; p > 0.003). Respondents with no experience averaged a mean rank of 24.20. Respondents with experience averaged a mean rank of 25.35.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 4 (use system to let student's present work) for respondents with no experience and respondents with experience teaching. No significant difference in the results of the level of experience was found (U = 207.000; p > 0.003). Respondents with no experience averaged a mean rank of 21.80. Respondents with experience averaged a mean rank of 27.09.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 5 (look directly into camera frequently) for respondents with no experience and respondents with experience teaching. No significant difference in the results of the level of experience was found (U = 270.500; p > 0.003). Respondents with no experience averaged a mean rank of 25.41. Respondents with experience averaged a mean rank of 25.54.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 6 (use class videotapes to self-evaluate) for respondents with no experience and respondents with experience teaching. No significant difference in the results of the level of experience was found ($U = 225.500$; $p > 0.003$). Respondents with no experience averaged a mean rank of 27.88. Respondents with experience averaged a mean rank of 24.38.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 7 (utilization of guest remote instructors) for respondents with no experience and respondents with experience teaching. No significant difference in the results of the level of experience was found ($U = 252.500$; $p > 0.003$). Respondents with no experience averaged a mean rank of 27.28. Respondents with experience averaged a mean rank of 24.66.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 8 (restate student's comments/questions) for respondents with no experience and respondents with experience teaching. No significant difference in the results of the level of experience was found ($U = 224.500$; $p > 0.003$). Respondents with no experience averaged a mean rank of 22.53. Respondents with experience averaged a mean rank of 27.59.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 9 (address presentations to all sights) for respondents with no experience and respondents

with experience teaching. No significant difference in the results of the level of experience was found ($U = 279.500$; $p > 0.003$). Respondents with no experience averaged a mean rank of 25.97. Respondents with experience averaged a mean rank of 26.01.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 10 (refer to student by name not site) for respondents with no experience and respondents with experience teaching. No significant difference in the results of the level of experience was found ($U = 280.000$; $p > 0.003$). Respondents with no experience averaged a mean rank of 26.00. Respondents with experience averaged a mean rank of 26.72.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 11 (only hand out materials if all sites have) for respondents with no experience and respondents with experience teaching. No significant difference in the results of the level of experience was found ($U = 271.500$; $p > 0.003$). Respondents with no experience averaged a mean rank of 26.53. Respondents with experience averaged a mean rank of 25.76.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 12 (pace camera switching) for respondents with no experience and respondents with experience teaching. No significant difference in the results of the level of experience was found ($U = 227.500$; $p > 0.003$). Respondents with no experience averaged a mean rank of 27.28. Respondents with experience averaged a mean rank of 23.89.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 13 (dress for teaching via this mode) for respondents with no experience and respondents with experience teaching. No significant difference in the results of the level of experience was found ($\underline{U} = 254.500$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 24.41. Respondents with experience averaged a mean rank of 24.55.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 14 (use text print for elmo of font size 20-30 points) for respondents with no experience and respondents with experience teaching. No significant difference in the results of the level of experience was found ($\underline{U} = 251.500$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 25.54. Respondents with experience averaged a mean rank of 25.49.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 15 (instructor originates course for all sites early in term) for respondents with no experience and respondents with experience teaching. No significant difference in the results of the level of experience was found ($\underline{U} = 194.000$; $\underline{p} > 0.003$). Respondents with no experience averaged a mean rank of 21.36. Respondents with experience averaged a mean rank of 25.12.

A Mann-Whitney U test was used to examine the difference in the level of degree of use of the recommended teaching practice of item 16 (hold office hours over system) for respondents with no experience and respondents with

experience teaching. No significant difference in the results of the level of experience was found ($U = 264.500$; $p > 0.003$). Respondents with no experience averaged a mean rank of 25.03. Respondents with experience averaged a mean rank of 25.72 (see Table 9).

Means were calculated for both the experienced and inexperienced respondents following a tabulation of the responses related to the degree of use of each of the recommended teaching practices. Two teaching practices, "Encourage interactivity" and "Address presentations to all students," resulted in the highest calculated mean for inexperienced respondents ($M = 3.71$; $SD = 0.46$ and 0.61 respectively). The highest mean ($M = 3.88$; $SD = 0.40$) for experienced respondents was computed for the teaching practice described on the survey instrument as "Encourage interactivity." For inexperienced respondents, mean scores of over 3.00 were calculated for 4 of 16 teaching practices with standard deviations ranging between 0.46 to 1.23. For experienced respondents, mean scores of over 3.00 were calculated for 7 of 16 teaching practices with standard deviations ranging between 0.40 to 1.31 (Table 10).

Question Three

"To what extent did faculty receive support for teaching within the distance education classrooms?" This question was designed to investigate the types of professional support respondents received in the past five years relevant to teaching within synchronous distance education classrooms. A list of professional supports was provided in Section II of the survey instrument. From the list of professional supports, respondents were asked to check those professional supports they received.

Table 10.

Mean Ratings and Standard Deviations for Degree of Use of Recommended Teaching Practices by Teachers

Teaching Practice		Inexperienced			Experienced		
		N	Mean	SD	N	Mean	SD
1.	Encourage interactivity.	16	3.71	0.46	34	3.88	0.40
2.	Address presentations to all sights.	16	3.71	0.61	35	3.47	1.15
3.	Refer to student by name not site.	16	3.35	1.21	36	3.33	1.04
4.	Look directly into camera frequently.	16	3.14	1.23	34	3.26	1.08
5.	Use system to let student's present work.	15	2.92	0.99	35	3.11	1.24
6.	Only hand out materials if all sites have them.	16	2.85	1.65	35	3.13	1.31
7.	Distribution network with 2-day lag for materials.	15	2.84	1.57	34	2.91	1.44
8.	Use text print for elmo of font size 20-30 points.	14	2.75	1.86	36	2.94	1.65
9.	Restate students comments or questions.	16	2.71	1.38	35	3.42	0.91
10.	Pace "camera switching."	16	2.64	1.33	33	2.29	1.36
11.	Dress for teaching via this mode.	16	2.64	1.49	32	2.93	1.19
12..	You teach students how to use system.	16	2.21	1.25	33	2.24	1.22
13.	Use class videotapes to self-evaluate.	16	2.07	1.07	34	1.94	1.20
14.	Utilization of guest "remote" instructors.	16	2.00	1.30	34	1.74	1.22
15.	Hold office hours over system.	16	1.92	1.54	34	1.91	1.23
16.	Instructor originates course from all sites early in term.	14	1.66	1.66	33	2.63	1.57

Note. N = 53; total of each item differs from 53 because respondents were instructed to indicate all that apply.

Of the 53 respondents who identified themselves as having taught within distance education, 48 (91%) identified having origination site equipment facilitator and 36 (68%) checked a remote site equipment facilitator for support. Additionally, 22 (41.5%) identified use of a troubleshooting guide, 30 (57%) had students who assisted, 26 (49%) responded some type of workshop, and 8 (15%) identified other types of support. Frequency and percentages reported for professional supports are listed in Table 11.

Table 11

Frequency Count and Percentage of Support Received Relevant to Teaching within Synchronous Distance Education

Type of Support	Frequency	Percentage
Origination site equipment facilitator	48	91
Remote site equipment facilitator	36	68
Troubleshooting guide	22	42
Students who assists	30	57
Workshop	26	49
Other	8	15

Note. N = 53; total of respondents is more than 53 because respondents were instructed to indicate all that apply.

Question Four

"To what extent are instructors within the distance education classroom using accommodations for students with disabilities?" This question was

designed to investigate the degree to which the respondents who answered yes to having students with disabilities "used accommodations" for students with disabilities within the synchronous distance education classroom, based on the respondents' responses to Section III of the survey instrument. Of the 53 respondents identified as teaching within distance education, 19 (36%) indicated that they had students with disabilities in the classroom. These respondents rated a list of 29 accommodations for students with disabilities according to the degree to which the respondent used each of the accommodations.

Respondents indicated the degree to which they used each of 29 accommodations. A rating of 4 indicated the accommodation was usually used, a rating of 3 indicated that the accommodation was often used, a rating of 2 indicated the accommodation was seldom used, and a rating of 1 indicated the accommodation was never used. Respondents were also given a choice of "NA," or non-applicable because certain practices were either disability or technologically specific. For the purposes of this evaluation, answers of "NA" were treated as missing data because such an answer was the functional equivalent of no response. A mean was calculated for each accommodation item after the responses were tabulated. The 3 highest means were achieved for the accommodations described on the survey instrument as, "Post daily routine, discuss changes as soon as possible" ($\underline{M}$ = 3.64; $\underline{SD}$ = 0.78), "Help student know what to expect, outline day's plan" ($\underline{M}$ = 3.63; $\underline{SD}$ = 0.83), and "Allow scribe or tape recorder" ($\underline{M}$ = 3.56; $\underline{SD}$ = 0.81). Means in descending order, and standard deviations are listed in Table 12.

Table 12

Mean and Standard Deviation Ratings of Responses to Accommodations Used for Students with Disabilities within Distance Education Classrooms (N = 19)

Type of Accommodation		Means	SD
1.	Post daily routine, discuss changes.	3.64	0.78
2.	Help student know what to expect.	3.63	0.83
3.	Allow scribe or tape recorder.	3.56	0.81
4.	Allow extra time to complete assignments.	3.55	0.98
5.	Provide written copy of directions/lecture.	3.52	0.87
6.	Give extra response time.	3.44	0.98
7.	Allow more time to complete tasks.	3.44	0.98
8.	Use of computer to track materials/assignments.	3.18	0.98
9.	Student stands up or lie down in class.	3.18	1.25
10.	Break work into small amounts.	3.07	1.07
11.	Have audio-taped presentation for recording.	3.05	1.08
12.	Large, bold print text.	3.00	1.17
13.	Demonstrate steps in small steps.	3.00	1.19
14.	Personal support person with student.	3.00	1.24
15.	Alternative forms of information sharing.	2.94	1.24
16.	Decrease need to read handwritten material.	2.87	1.20
17.	Assistant to read or tape items.	2.78	1.12
18.	Responses in written/demonstration format.	2.73	1.22
19.	Signing, lipreading, or an interpreter.	2.60	1.34
20.	Use computer with larger screen.	2.58	1.31
21.	Microphone/amplifier combination.	2.58	1.37
22.	Zoom text.	2.35	1.22
23.	Students decides what task to do 1st, 2nd.	2.22	1.30
24.	Students set up schedule for class attendance.	2.33	1.37
25.	Require less writing.	2.31	1.19
26.	Provide visual cues.	2.22	1.39
27.	Computer with speech recognition.	2.18	1.16
28.	Speech synthesis for reading on computer.	2.10	1.10
29.	Use communication board.	1.80	0.78

Question Five

"Are there significant differences between instructors who are experienced and inexperienced within the distant education classroom on the degree to which they use accommodations for students with disabilities?" This question was designed to investigate the degree to which level of teaching experience contributed to the respondents' "use disability-specific accommodations" for students with disabilities. Results are based on the teachers' responses to Section III of the survey instrument. The responses to 3 survey questions were analyzed to address this research question.

Respondents were asked first to indicate whether they had taught students with disabilities within distance education classrooms in the last five years. Second, respondents were given a list of areas of disability on the survey and were asked to identify the number of students with disabilities in each area they had taught in synchronous distance education classrooms. Third, respondents rated on a Likert-type scale the degree to which they used accommodations for students with disabilities within synchronous distance education. A rating of 4 indicated "usually used," 3 "often used," 2 "seldom used," and 1 "never used." Respondents could select "NA," or not applicable, in recognition that certain accommodations were either disability or technologically specific. Answers of "NA" were treated as missing data because such an answer was the functional equivalent of no response.

The total population of respondents reporting accommodation use for students with disabilities was divided into 2 groups: (a) inexperienced respondents (quarters or semesters = 1), and (b) experienced respondents

(quarters or semesters ≥ 2). Six respondents indicated they were inexperienced and 13 indicated they were experienced at teaching students with disabilities within the synchronous distance education classroom.

Of the 11 respondents who indicated they had taught students with physical disabilities, 3 were inexperienced and 8 were experienced. Of the 9 respondents who indicated they had taught students with visual disabilities, 1 was inexperienced and 8 were experienced. Of the 10 respondents who indicated they had taught students with hearing disabilities, 7 were inexperienced and 3 were experienced. Of the 13 respondents who indicated they had taught students with specific learning disabilities, 5 were inexperienced and 8 were experienced (Table 13).

Table 13.

Number of Inexperienced and Experienced Respondents Indicating Types of Students with Disabilities in the Synchronous Distance Education Classroom

Student Disability	Total Respondents	Inexperienced Respondents	Experienced Respondents
Physical Disabilities	11	3	8
Visual Disabilities	9	1	8
Hearing Disabilities	10	7	3
Learning Disabilities	13	5	8

Note: Total N exceeds 19 because respondents were told to indicate all that applied.

A series of 29 Mann-Whitney U tests was used to examine the ratings of experienced and inexperienced respondents on their use of disability accommodations by category within synchronous distance education classrooms. There were five categories of accommodations, accommodations for students with physical disabilities, accommodations for students with visual disabilities, accommodations for students with hearing disabilities, and accommodations for students with specific learning disabilities.

The 14 survey accommodation items included within the category for students with physical disabilities were 1, 3, 4, 5, 6, 7, 9, 10, 13, 15, 16, 22, 21, and 27 (Association on Higher Education and Disability, 1994; Flick-Hruska & Blythe, 1992; Mellard et al., 1998). Accommodations included within the category for students with visual disabilities were 14 survey items 3, 4, 5, 8, 11, 13, 14, 15, 16, 17, 18, 22, 23, and 24 (Association on Higher Education and Disability, 1994; Flick-Hruska & Blythe, 1992; Mellard et al., 1998). Twelve accommodation items (1, 2, 3, 4, 5, 13, 15, 19, 20, 22, 29) were listed that were specific to hearing disabilities (Association on Higher Education and Disability, 1994; Flick-Hruska & Blythe, 1992; Mellard et al., 1998). Eighteen accommodation items (1, 2, 3, 4, 5, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22) were listed on the survey that were specific to learning disabilities (Association on Higher Education and Disability, 1994; Flick-Hruska & Blythe, 1992; Mellard et al., 1998).

The fifth category was a general category that included those accommodations survey items that were not disability-specific, items 3, 4, 5, 13, 15, 16, and 22 (Association on Higher Education and Disability, 1994; Flick-Hruska & Blythe, 1992; Mellard et al., 1998). Results could not be computed for

physical disabilities and visual disabilities because of the small number of respondents who indicated non-applicable on those disability-specific accommodation items.

For question five, the total population of respondents reporting teaching students with learning disabilities, were divided into two groups: inexperienced respondents and experienced respondents. Five respondents indicated that they were inexperienced and 8 indicated that they were experienced instructors. The results of a series of 18 Mann-Whitney U tests, the values (U) obtained, and the significance levels for each of the 18 items are reported in Table 14. An alpha level of 0.002 (Bonferroni correction) was used for statistical tests. No significant differences in the 18 accommodation items were found.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 1 (alternative forms of information sharing) by respondents with no experience and respondents with a lot of experience teaching students with specific learning disabilities within the synchronous distance education classroom. No significant difference in the result of the use of the survey item was found ($\underline{U} = 7.00$, $\underline{p} > 0.002$). Respondents with no experienced averaged 8.60 mean ranking. Respondents with experience averaged 5.00 mean ranking.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 2 (responses in demonstrations/written format) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found

Table 14.

Mann-Whitney U Results for Degree of Use of Student Accommodations for Students with Learning Disabilities by Experienced and Inexperienced Respondents

Student Accommodation		N	U	p
1.	Alternative forms of information sharing.	12	7.00	0.071
2.	Responses in demonstrations/written format.	11	9.00	0.316
3.	Allow extra time to complete answers.	13	12.50	0.137
4.	Personal support person with student.	9	1.00	0.019
5.	Students decides task to do 1st, 2nd, etc.	12	8.00	0.150
7.	Expanded task completion time.	13	7.50	0.034
8.	Allow scribe or tape recorder.	11	7.50	0.077
10.	Break work into smaller amounts.	10	7.00	0.214
11.	Decrease need to read handwritten material.	11	13.50	0.921
12.	Demonstrate steps in small steps.	11	7.50	0.186
13.	Give extra response time.	13	13.50	0.269
14.	Audio-taped presentation or for recording.	12	15.50	0.723
15.	Help student know what to expect.	13	8.00	0.017
16.	Post daily route, discuss changes.	11	5.50	0.087
17.	Assistant to read or tape items.	11	11.50	0.498
20.	Written copy of directions/lecture.	12	9.00	0.153
21.	Require less writing.	11	8.50	0.448
22.	Computer to track materials/assignments.	11	11.50	0.910

Note. N = 13; N < 13 when respondents indicated non-applicable

($\underline{U}$ = 9.00, $\underline{p}$ > 0.002). Respondents with no experience averaged a mean rank of 7.25. Respondents with experience averaged a mean rank of 5.29.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 3 (allow extra time to complete answers) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($\underline{U}$ = 12.50, $\underline{p}$ > 0.002). Respondents with no experience averaged a mean rank of 8.50. Respondents with experience averaged a mean rank of 6.06.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 4 (personal support person with student) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($\underline{U}$ = 1.00, $\underline{p}$ > 0.002). Respondents with no experience averaged a mean rank of 6.80. Respondents with experience averaged a mean rank of 2.75.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 5 (students decides task to do 1st, 2nd, etc.) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($\underline{U}$ = 8.00, $\underline{p}$ > 0.002). Respondents with no experience averaged a mean rank of 8.50. Respondents with experience averaged a mean rank of 5.50.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 7 (expanded task completion time) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($\underline{U} = 7.50$, $\underline{p} > 0.002$). Respondents with no experience averaged a mean rank of 9.50. Respondents with experience averaged a mean rank of 5.44.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 8 (allow scribe or tape recorder) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($\underline{U} = 7.50$, $\underline{p} > 0.002$). Respondents with no experience averaged a mean rank of 7.50. Respondents with experience averaged a mean rank of 4.75.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 10 (break work into smaller amounts) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($\underline{U} = 7.00$, $\underline{p} > 0.002$). Respondents with no experience averaged a mean rank of 6.60. Respondents with experience averaged a mean rank of 4.40.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 11 (decrease need to read handwritten material) by respondents with no experience and

respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($\underline{U}$ = 13.50, $\underline{p}$ > 0.002). Respondents with no experience averaged a mean rank of 6.13. Respondents with experience averaged a mean rank of 5.93.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 12 (demonstrate steps in small steps) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($\underline{U}$ = 7.50, $\underline{p}$ > 0.002). Respondents with no experience averaged a mean rank of 7.63. Respondents with experience averaged a mean rank of 5.07.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 13 (give extra response time) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($\underline{U}$ = 13.50, $\underline{p}$ > 0.002). Respondents with no experience averaged a mean rank of 8.30. Respondents with experience averaged a mean rank of 6.19.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 14 (audio-taped presentation or recording) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference of the use of the survey item was found ($\underline{U}$ = 15.50,

$p > 0.002$). Respondents with no experience averaged a mean rank of 6.90. Respondents with experience averaged a mean rank of 6.21.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 15 (help student know what to expect) by respondents with no experience and respondents of experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($U = 8.00$, $p > 0.002$). Respondents with no experience averaged a mean rank of 4.60. Respondents with experience averaged a mean rank of 8.50.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 16 (post daily route, discuss changes) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($U = 5.50$, $p > 0.002$). Respondents with no experienced average a mean rank of 3.83. Respondents with experience averaged a mean rank of 6.81.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 17 (assistant to read or tape items) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($U = 11.50$, $p > 0.002$). Respondents with no experience averaged a mean rank of 6.70. Respondents with experience averaged a mean rank of 5.42.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 20 (written copy of directions/lecture) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($\underline{U} = 9.00$, $\underline{p} > 0.002$). Respondents with no experience averaged a mean rank of 4.75. Respondents with experience averaged a mean rank of 7.38.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 21 (require less writing) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($\underline{U} = 8.50$, $\underline{p} > 0.002$). Respondents with no experience averaged a mean rank of 7.17. Respondents with experience averaged a mean rank of 5.56.

A Mann-Whitney U test was used to examine the difference in the use of the specific learning disability accommodation of survey item 22 (computer to track materials/assignments) by respondents with no experience and respondents with experience teaching students with specific learning disabilities. No significant difference in the result of the use of the survey item was found ($\underline{U} = 11.50$, $\underline{p} > 0.002$). Respondents with no experience averaged a mean rank of 6.17. Respondents with experience averaged a mean rank of 5.94 (see Table 14).

Mean scores and standard deviations were calculated for each specific learning disability accommodation item for the two groups: respondents who reported being experienced in the synchronous distance education classrooms

and having students with learning disabilities, and those who reported being inexperienced after the responses were tabulated. The mean scores of both groups are listed in Table 15 and organized in descending order based on responses of the inexperienced respondents.

The specific learning disability accommodations described on the survey as (Allow extra time to complete assignments) ($\underline{M}$ = 4.00; $\underline{SD}$ = 0.0), (Allow scribe or tape recorder) ($\underline{M}$ = 4.00; $\underline{SD}$ = 0.0), and (Expanded task completion time) ($\underline{M}$ = 4.00; $\underline{SD}$ = 0.0), received the highest mean scores for the inexperienced respondents. The specific learning disability accommodations (Written copy of directions/lecture) ($\underline{M}$ = 4.00; $\underline{SD}$ = 0.0), and (Help student know what to expect) ($\underline{M}$ = 4.00; $\underline{SD}$ = 0.0) received the highest mean scores for experienced respondents. The accommodations described on the survey as (Give extra response time) ($\underline{M}$ = 3.80; $\underline{SD}$ = 0.44) and (Personal support person with student) ($\underline{M}$ = 3.80; $\underline{SD}$ = 0.44) received the second highest mean scores for inexperienced respondents. Post daily route, discuss changes ($\underline{M}$ = 3.85; $\underline{SD}$ = 0.37) received the second highest mean score for experienced respondents.

The lowest mean ($\underline{M}$ = 2.33; $\underline{SD}$ = 0.57) was associated with the specific learning disability accommodation (Require less writing) for the inexperienced respondents. Require less writing ($\underline{M}$ = 2.00; $\underline{SD}$ = 1.15) and Personal support person with student ($\underline{M}$ = 2.00; $\underline{SD}$ = 1.00) resulted in the lowest mean scores for experienced respondents.

Additionally, for question five, the total population of respondents reporting teaching students with hearing disabilities, were divided into two groups, inexperienced respondents and experienced respondents.

Table 15.

Mean Ratings of Degree of Use of Student Accommodations with Students with Learning Disabilities by Experienced and Inexperienced Respondents In Descending Order by Inexperience

Student Accommodation	Inexperienced			Experienced		
	N	Mean	SD	N	Mean	SD
1. Allow extra time to complete assignments.	5	4.00	0.00	8	3.42	1.13
2. Allow scribe or tape recorder.	5	4.00	0.00	6	3.40	0.54
3. Expanded task completion time.	5	4.00	0.00	8	3.14	1.06
4. Give extra response time.	5	3.80	0.44	8	3.28	1.11
5. Personal support person with student.	5	3.80	0.44	4	2.00	1.00
6. Alternative forms of information sharing.	5	3.60	0.89	7	2.50	1.22
7. Written copy of directions/ lecture.	4	3.50	0.57	8	4.00	0.00
8. Demonstrate steps in small steps.	4	3.50	1.00	7	2.66	1.21
9. Break work into smaller amounts.	5	3.40	0.54	5	2.75	1.25
10. Audio-taped presentation or for recording.	5	3.40	0.89	7	3.33	0.81
11. Post daily route, discuss changes.	3	3.30	1.15	8	3.42	0.78
12. Computer to track materials/assignments.	3	3.30	1.15	8	3.42	0.78
13. Responses in demonstrations/ written format.	4	3.25	0.95	7	2.50	1.22
14. Student decides task to do 1st, 2nd, etc.	5	3.25	0.95	7	2.28	1.5
15. Help student know what to expect.	5	3.20	0.83	8	4.00	0.00
16. Assistant to read or tape items.	5	3.20	1.09	6	3.00	0.70
17. Decrease need to read handwritten material.	4	3.00	0.81	7	2.66	1.21
18. Require less writing.	3	2.33	0.57	8	2.00	1.15

Note: $N = 13$; $N < 13$ when respondents indicated non-applicable.

Seven respondents indicated that they were inexperienced and 3 indicated they were experienced instructors. The results of a series of 12 Mann-Whitney U tests, the values (U) obtained, and the significance levels for each of the 12 items are reported in Table 16. An alpha level of .004 (Bonferroni correction) was used for statistical tests. No significant differences in the 18 accommodation items were found.

Table 16.

Mann-Whitney U Results for Degree of Use of Student Accommodations with Students with Hearing Disabilities by Experienced and Inexperienced Respondents

Student Accommodation	N	U	P
1. Alternative forms of information sharing.	9	5.00	0.232
2. Responses in demonstrations/written format.	7	2.00	0.316
3. Allow extra time to complete answers.	9	6.00	0.593
4. Personal support person with student.	8	2.00	0.453
5. Students decide task to do 1st, 2nd, etc.	8	1.00	0.78
13. Give extra response time.	9	5.50	0.423
15. Help student know what to expect.	10	6.00	0.456
16. Post daily route, discuss changes.	8	6.00	1.000
19. Visual cues.	6	0.50	0.095
20. Written copy of directions/lecture.	9	2.50	0.117
22. Computer to track materials/assignments	7	2.00	0.195
29. Signing, lip reading, or interpreter.	9	1.50	0.091

Note. N = 10; N < 10 when respondents indicated non-applicable

A Mann-Whitney U test was used to examine the difference in the use of the hearing disability accommodation of survey item 1 (alternative forms of information sharing) by respondents with no experience and respondents with experience teaching students with hearing disabilities. No significant difference of the use of the survey item was found ($\underline{U} = 5.00$, $\underline{p} > 0.004$). Respondents with no experience averaged a mean rank of 4.71. Respondents with experience averaged a mean rank of 6.00.

A Mann-Whitney U test was used to examine the difference in the use of the hearing disability accommodation of survey item 2 (responses in demonstrations/written format) by respondents with no experience and respondents with experience teaching students with hearing disabilities. No significant difference of the use of the survey item was found ($\underline{U} = 2.00$, $\underline{p} > 0.004$). Respondents with no experience averaged a mean rank of 3.40. Respondents with experience averaged a mean rank of 5.50.

A Mann-Whitney U test was used to examine the difference in the use of the hearing disability accommodation of survey item 3 (allow extra time to complete answers) by respondents with no experience and respondents with experience teaching students with hearing disabilities. No significant difference of the use of the survey item was found ($\underline{U} = 6.00$, $\underline{p} > 0.004$). Respondents with no experience averaged a mean rank of 4.86. Respondents with experience averaged a mean rank of 5.50.

A Mann-Whitney U test was used to examine the difference in the use of the hearing disability accommodation of survey item 4 (personal support person with student) by respondents with no experience and respondents with

experience teaching students with hearing disabilities. No significant difference of the use of the survey item was found ($\underline{U} = 2.00$, $\underline{p} > 0.004$). Respondents with no experience averaged a mean rank of 4.29. Respondents with experience averaged a mean rank of 6.00.

A Mann-Whitney U test was used to examine the difference in the use of the hearing disability accommodation of survey item 5 (students decides task to do 1st, 2nd, etc.) by respondents with no experience and respondents with experience teaching students with hearing disabilities. No significant difference of the use of the survey item was found ($\underline{U} = 1.00$, $\underline{p} > 0.004$). Respondents with no experience averaged a mean rank of 3.67. Respondents with experience averaged a mean rank of 7.00.

A Mann-Whitney U test was used to examine the difference in the use of the hearing disability accommodation of survey item 13 (give extra response time) by respondents with no experience and respondents with experience teaching students with hearing disabilities. No significant difference of the use of the survey item was found ($\underline{U} = 5.50$, $\underline{p} > 0.004$). Respondents with no experience averaged a mean rank of 4.71. Respondents with experience averaged a mean rank of 6.00.

A Mann-Whitney U test was used to examine the difference in the use of the hearing disability accommodation of survey item 15 (help student know what to expect) by respondents with no experience and respondents with experience teaching students with hearing disabilities. No significant difference of the use of the survey item was found ($\underline{U} = 6.00$, $\underline{p} > 0.004$). Respondents with

no experience averaged a mean rank of 5.25. Respondents with experience averaged a mean rank of 6.50.

A Mann-Whitney U test was used to examine the difference in the use of the hearing disability accommodation survey item 16 (post daily route, discuss changes) by respondents with no experience and respondents with experience teaching students with hearing disabilities. No significant difference of the use of the survey item was found ($\underline{U} = 6.00$, $\underline{p} > 0.004$). Respondents with no experience averaged a mean rank of 4.50. Respondents with experience averaged a mean rank of 4.50.

A Mann-Whitney U test was used to examine the difference in the use of the hearing disability accommodation of survey item 19 (visual cues) by respondents with no experience and respondents with experience teaching students with hearing disabilities. No significant difference of the use of the survey item was found ($\underline{U} = 50$, $\underline{p} > 0.004$). Respondents with no experience averaged a mean rank of 2.63. Respondents with experience averaged a mean rank of 5.25.

A Mann-Whitney U test was used to examine the difference in the use of the hearing disability accommodation of survey item 20 (written copy of directions/lecture) by respondents with no experience and respondents with experience teaching students with hearing disabilities. No significant difference of the use of the survey item was found ($\underline{U} = 2.50$, $\underline{p} > 0.004$). Respondents with no experience averaged a mean rank of 4.36. Respondents with experience averaged a mean rank of 7.25.

A Mann-Whitney U test was used to examine the difference in the use of the hearing disability accommodation of survey item 22 (computer to track materials/assignments) by respondents with no experience and respondents with experience teaching students with hearing disabilities. No significant difference of the use of the survey item was found ($\underline{U} = 2.00$, $\underline{p} > 0.004$). Respondents with no experience averaged a mean rank of 3.40. Respondents with experience averaged a mean rank of 5.50.

A Mann-Whitney U test was used to examine the difference in the use of the hearing disability accommodation of survey item 29 (signing, lip reading, or interpreter) by respondents with no experience and respondents with experience teaching students with hearing disabilities. No significant difference of the use of the survey item was found ($\underline{U} = 1.50$, $\underline{p} > 0.004$). Respondents with no experience averaged a mean rank of 4.21. Respondents with experience averaged a mean rank of 7.75 (Table 16).

Means were calculated for each specific hearing disability accommodation item for the two groups; respondents who reported being experienced in synchronous distance education classrooms and those who reported being inexperienced. The mean scores of both groups are listed in Table 17 and organized in descending order based on the responses of the inexperienced respondents.

The hearing disability specific accommodation described on the survey as (Allow extra time to complete assignments) received the highest mean score for the inexperienced respondents ($\underline{M} = 4.00$; $\underline{SD} = 0.00$). The hearing disability accommodations described on the survey as (Help student know what to expect)

Table 17.

Mean Ratings of Degree of Use of Student Accommodations with Students with Hearing Disabilities by Experienced and Inexperienced Respondents

		Inexperienced			Experienced		
	Student Accommodation	N	Mean	SD	N	Mean	SD
1.	Allow extra time to complete assignments.	7	4.00	0.00	2	3.50	1.22
2.	Give extra response time.	7	3.66	0.57	2	3.50	1.22
3.	Use computer to track materials/assignments.	5	3.50	0.70	2	3.33	1.03
4.	Help student know what to expect.	7	3.33	1.15	3	4.00	0.00
5.	Written copy of directions/ lecture.	7	3.00	1.00	2	4.00	0.00
6.	Personal support person with student.	7	3.00	1.73	1	3.40	0.89
7.	Students decide task to do 1st, 2nd, etc.	6	2.50	2.12	2	2.33	1.36
8.	Visual cues.	4	2.50	2.12	2	3.20	1.64
9.	Signing, lip reading, or interpreter.	7	2.50	2.12	2	3.33	1.03
10.	Alternative forms of information sharing.	7	2.33	1.52	2	3.16	1.16
11.	Responses in demonstrations/ written format.	5	2.33	1.52	2	3.00	1.22

Note: N = 10; N < 10 when respondents indicated non-applicable.

and (Written copy of directions/lecture) received the highest mean scores (M = 4.00; SD = 0.0) for experienced respondents. The hearing disability accommodation (Give extra response time) (M = 3.66; SD = 0.57), received the second highest mean for inexperienced respondents. For the experienced respondents (Allow extra time to complete assignments) and (Give extra

response time) received mean scores of (M = 3.50; SD = 1.22) for the second highest mean score.

The lowest mean (M = 2.33; SD = 1.52) was associated with the hearing disability accommodation described in the survey as (Responses in demonstrations/written format) for the inexperienced respondents. Students decide task to do 1st, 2nd, etc. (M = 2.33; SD = 1.36) resulted in the lowest mean for experienced respondents.

Question Six

"To what extent did faculty receive support, specific to working with students with disabilities within distance education classrooms?" This question was designed to investigate the types of professional support respondents received in the past five years related to teaching students with disabilities within synchronous distance education classrooms, based on responses to Section III of the survey instrument. Respondents were asked to check all that applied. Responses to this survey item were analyzed using frequencies and percentages. The numbers and percentages of respondents who indicated support for teaching students with disabilities within the synchronous distance education classroom are reported.

Of the 19 respondents who identified having taught students with disabilities within distance education, 9 (47%) identified they had student support service personnel for support while teaching within synchronous distance education and 5 (29%) checked student's personal assistant while teaching within synchronous distance education. Additionally, 15 (79%) identified student self-advocacy as a support while teaching within synchronous

distance education and 2 (12%) indicated that they had received other types of support for teaching students with disabilities within synchronous distance education. Frequency and percentages reported for professional supports are listed in Table 18.

Table 18.

Frequency Count and Percentage of Support Received Relevant to Teaching Students with Disabilities within Synchronous Distance Education

Type of Support	Frequency	Percentage
Student Support Service Personnel	9	47
Student's Personal Assistant	5	29
Student Self-Advocacy	15	79
Other Type of Support	2	12

Note. N = 19; total of respondents is more than 19 because respondents were instructed to indicate all that apply.

Summary

In this chapter, findings of the study were reported based on the tabulation and statistical analysis of the data collected through a survey instrument. The six research questions were addressed. Means and frequencies were presented and the results of Mann-Whitney U-tests were reported. Conclusion's which can be drawn from the data are presented in Chapter V. A discussion of the findings and recommendations for further study are also enumerated in Chapter V.

CHAPTER V

Summary, Conclusions, and Recommendations

This chapter consists of three sections. A summary of the study is presented in the first section. Conclusions based on the research findings are discussed in the second section. In the third section, recommendations are given for instruction within synchronous distance education classrooms, student accommodations within synchronous distance education classrooms, and for future research based on the findings of this study.

Summary of the Study

The purpose for conducting this study was to investigate what recommended teaching practices and what additional accommodations for students with disabilities are used at the postsecondary level in synchronous distance education classrooms. Based on a review of the literature, a survey instrument was designed to collect data from a random sample of the Teacher Education Division (TED) members of the Council for Exceptional Children (CEC) organization.

In the fall semester of 1999, the survey packet was distributed to a random sample of 870 TED members living within the United States. The packet consisted of a cover letter from the researcher, the survey, and a postage paid envelope in which each survey could be sealed and returned. Participants were given two weeks to fill out their surveys. The researcher had received 142 (16.3%) completed surveys after two weeks. A follow-up mailing consisting of an identical packet was mailed out to the non-responding participants. This mailing

resulted in an additional 112 responses (13%). Two hundred fifty-four (254) responses were received for a total return rate of 29 percent.

Descriptive and inferential statistics were used to report the results of this study, including means and the Mann-Whitney U Test. The next section contains a summary of the findings to each research question, the conclusions, and a discussion section.

Conclusions and Discussion

Research Question One

Are there significant differences between instructors who are experienced (quarters or semester ≥ 2) and inexperienced (quarters or semesters = 1) within the distant education classroom on the degree to which they rate the importance of recommended teaching practices?

Although no significant differences were found between respondents based on the amount of experience in synchronous distance education classrooms, several conclusions can be drawn from an analysis of the data related to research question 1. Experienced and inexperienced respondents placed a high degree of importance on the teaching practice (encourage interactivity). In a rank ordering of means, (encourage interactivity) ranked first for both experienced and inexperienced respondents. Standard deviations indicate a high degree of consensus among the respondents on this item.

Analysis of the responses of the inexperienced group showed that in addition to (encourage interactivity), mean scores of 3 or higher were calculated for 8 other survey items related to recommended teaching practices. Of these 8, only (use system to let student's present work) and (use class videotapes to

self-evaluate) had standard deviations that would allow the conclusion that there was consensus among the respondents regarding the importance placed on these practices.

Analysis of the responses of the experienced group showed that in addition to (encourage interactivity), mean scores of 3 or higher were calculated for 8 other survey items related to recommended teaching practices. Of these 8, only one item (restates student's comments/questions) had a standard deviation which would allow the conclusion that there was consensus among experience respondents regarding the importance of this teaching practice.

A review of the literature on synchronous distance education revealed recommended teaching practices in three categories, preactive practices, interactive practices, and postactive practices (Iowa Communication Network, 1998). In a rank ordering of means, the lowest means for both experienced and inexperienced respondents were for preactive practices. For instance, (instructor originates course from all sites earlier in term), a preactive practice (Iowa Communication Network, 1998), received the lowest calculated mean score for both groups. Standard deviations of 1.63 and 1.65 also indicated less consensus among the respondents on this item.

The findings of the current study related to research question one are consistent with researchers who have identified recommended teaching practices in synchronous distance education as being determined by instructor behaviors as fundamental to learning (Fellenz et al., 1988; Hassenplug & Harnish, 1998; Klesjus et al., 1997; Knapczyk et al.,1994). Knapczyk et al. found that teachers

bring a wealth of professional skill and experience to the class. When properly structured, Knapczyk et al. reported that distance education capitalized on these experiences, facilitated the mechanics of course delivery, and enriched the content and teaching interactions of the class sessions. Thurston and Sebastian (1996) stated that the quality and amount of instructional interaction is an important factor.

In addition to respondent's prior knowledge of teaching practice, possible reasons for the consensus by respondents on the importance of (encourage interactivity), (use system to let student's present work), and (restates student's comments/questions), is the availability of some type of support reported by all but one respondent. Included within this support were troubleshooting guides (42%) and workshops (49%) as reported available by respondents. A troubleshooting guide included recommended teaching practices that enhanced an instructor's ability to teach effectively within the synchronous distance education classroom (Iowa Communications Network, 1998).

Furthermore, prior to beginning to teach a first class, support and training (though minimal at times) included encouraging interactivity as a key to successfully teaching via distance education (Iowa Communications Network, 1998). It could be argued that prior training in classroom teaching practices would give the instructor valuable background knowledge concerning the importance of teacher-student interaction in the learning process. Successful use of interactive teaching practice in traditional teaching classrooms would add importance to the use of these recommended practices within synchronous distance education classrooms (Hassenplug & Harnish, 1998). Further,

Hassenplug and Harnish stated that experiences that enhanced and maximized various types of interaction need to be intentionally designed and used by instructors. Teaching practices such as those studied within the current research seem to be related to perceptions of effective interaction.

In support of the conclusions drawn relative to the importance of recommended teaching practices, the following comment could be offered from a respondent's survey to corroborate the importance of recommended teaching practices. "Although I haven't taught a class this way I have been a student in a distance education class. I enjoyed it very much and the professor was excellent at employing all of the items you have in Section II."

Research Question Two

Are there significant differences between instructors who are experienced and inexperienced within distance education classrooms on the degree to which they use recommended teaching strategies? Although no significant differences were found on the degree to which experienced and inexperienced respondents reported using recommended teaching practices, several conclusions can be drawn from the findings of this study.

High mean scores were obtained for degree of use of the teaching practice (encourage interactivity). It may be concluded that survey respondents used teaching practices that encouraged interactivity and that there was a relatively high degree of consensus on the usefulness of encouraging interactivity among both groups based on their standard deviations.

In addition to (encourage interactivity), inexperienced respondents used the teaching practice (address presentations to all students). Although two other

teaching practices, (address presentations to all students) and (refer to student by name not site), resulted in means of 3 or higher as well, there was a wider range of degree of use based on the standard deviations of 1.21 and 1.23, respectively, so conclusions about the degree of use of these practices among inexperienced respondents can not be drawn.

Additionally, mean scores and standard deviations related to degree of use for six recommended teaching practices by experienced respondents varied considerably indicating a wide range of degree of use. Additional conclusions about the degree of use of teaching practices by experienced respondents can not be drawn because of the wide range of standard deviations.

Two issues should be addressed in regard to these findings. In the current study it was found that both inexperienced and experienced respondents placed a high degree of importance on the teaching practice (encourage interactivity) and it had a high degree of use among both groups.

Researchers have demonstrated that well-designed and targeted instruction can be very effective methods for delivering instruction to groups of individuals (Ahern & Repman, 1994). Further, Ahern and Repman found that in real time, synchronous systems interaction is determined by the quality of the implementation of specific strategies that encourage a high level of interaction. Instructors who teach post secondary special education classes are trained to design lessons that encourage interactivity, especially in today's climate of inclusion. It could be argued that teaching practices used by instructors would naturally be interactive in nature.

Egan (1988) found presentation skills as an important variable for effective learning in synchronous distance graduate special education classes. Teaching behaviors such as those studied in this research seem to be related to perceptions by respondents of interaction. In fact the transition to teaching within synchronous distance education classrooms, in regards to student interaction is quite easy to accomplish.

A high degree of importance was also placed on (use system to let student's present work) and (use class videotapes to self-evaluate) among inexperienced respondents. However, the degree to which these practices were put into use was not correspondingly high. The reason for the discrepancy between inexperienced respondents' beliefs about teaching practices and their utilization of teaching practices can not be ascertained from this research. However, it could be speculated that these differences were possibly due to the lack of an on-site facilitator to help with transitions necessary to allow students to present work on the system. Instructors who were inexperienced may not have felt confident in arranging the environment for student presentations.

In addition to (encourage interactivity), experienced respondents also placed a high degree of importance on (restate students comments/questions) and their use of this practice reflected this belief. Cuffman and MacRae (1996) found that after faculty learned about their distance education environment, many realized that there were limitations (e.g., reduced spontaneity) and that interaction with students was important. The authors included the following recommendations: referring to student by name not site, looking directly into camera frequently, and restating students comments or questions (Hassenplug &

Harnish; Iowa Communication Network, 1998). Experiences that enhanced and maximized various types of interaction needed to be intentionally designed and used by instructors (Hassenplug & Harnish, 1998).

Research Question Three

To what extent did faculty receive support for teaching within distance education classrooms? Faculty in this study received support for teaching in the distance education classroom to a large extent. A large majority of respondents identified having an origination site equipment facilitator and a remote site equipment facilitator. Respondents also received other types of support including: troubleshooting guides, student assistants, and workshop training. Egan (1988) found that courses taught at a time when trained site facilitators were available and where a manual or troubleshooting guide was used rated significantly better than did courses where these supports were not available.

Comments from an experienced respondent and an inexperienced respondent speak to the importance of support. One experienced respondent reported having received "continuous training opportunities available through the University and Graduate School of Ed." An inexperienced respondent commented, "I used the interactive video network during the first semester of its use on our campus. It was very difficult!—and students hated it! There were numerous equipment failures. Since that time, execution of this system has improved greatly!"

Research Question Four

To what extent are instructors within the distance education classroom using accommodations for students with disabilities? Respondents were asked to

indicate the degree to which they made any of the 29 accommodations appearing on the survey. The list was comprised of five categories of accommodations: students with physical disabilities, students with visual disabilities, students with hearing disabilities, and students with specific learning disabilities. The fifth category was a general category that included those accommodations that were not disability-specific.

An analysis of the data related to general accommodations (see research question five discussion to learn about disability-specific accommodations) revealed that respondents utilized the following general accommodations: (post daily routine, discuss changes) (help student know what to expect), (allow extra time to complete assignments), and (give extra response time). It could be concluded that respondents used these accommodations with some frequency.

It may be concluded that respondents in the current study were willing to accommodate students by adapting their assignments. For instance, respondents allowed extra time to complete assignments and they posted changes. These results were consistent with the findings of previous researchers. For example, Vogel, Leyser, Wyland, and Brulle (1999) found that faculty were willing to adapt assignments. One could speculate that along with the usefulness of these accommodations, respondents rated these as used most often because they were easy to implement, did not require a great deal of time, and were the most familiar.

Research Question Five

Are there significant differences between instructors who are experienced and inexperienced within the distance education classroom on the degree to

which they use accommodations for students with disabilities? There were no significant differences found between experienced and inexperienced respondents within the distance education classroom on the degree to which they used accommodations for students with specific learning disabilities. However, an analysis of the means and standard deviations calculated for these accommodations specific to learning disabilities does allow the following conclusions.

Respondents who were inexperienced showed high levels of agreement and consensus toward survey items related to those accommodations that were student directed, allow extra time to complete assignments, allow scribe or tape recorder, and expanded task completion time. By comparison, respondents who were experienced show lower levels of agreement, and slightly less consensus, toward these three survey items.

For accommodation item 13 (give extra response time), inexperienced respondents who taught students with learning disabilities in the synchronous distance education classroom indicated a higher degree of use than respondents who identified as being inexperienced. The third note-worthy result in the area of specific learning disability accommodations was survey item 4 (personal support person with student). Respondents who taught students with disabilities within synchronous distance education and identified as inexperienced indicated a higher degree of use than respondents who were experienced.

Finally, although not significant, inexperienced respondents who were identified as teaching students with learning disabilities within synchronous distance education indicated a higher degree of use of accommodations on 14 of

the 18 items. Only items 15 (help student know what to expect), item 16 (post daily routine, discuss changes), item 18 (responses in written/demonstration format), item 20 (provide written copy of oral directions and lectures), and item 22 (computer to track materials/assignments) were indicated by experienced respondents teaching students with learning disabilities within distance education as having a higher degree of use.

Vogel et al.'s (1999) research on faculty attitude and practices with students with learning disabilities in higher education indicated factors that may influence faculty attitudes included age, academic discipline, experience-teaching students with learning disabilities, years of teaching experience, and professional rank. Faculty who had more student contact and years of teaching experience with students with disabilities had more positive attitudes and were more willing to accommodate students with learning disabilities than those who were less experienced in the area of teaching accommodations as compared to examination accommodations (Vogel et al., 1999).

Years of experience teaching in synchronous distance education and having students with learning disabilities within those settings, did not mirror Vogel et al.'s (1999) results. Those respondents who identified themselves as being inexperienced teaching in distance education indicated a higher degree of use of accommodations for students with learning disabilities in the synchronous distance education setting. An inexperienced respondent's comment is offered as further evidence, "Use even when no students with disabilities present" to five of the accommodations which included those ranked highest overall and another

inexperienced respondent who stated, "individualized," to specific accommodations. In the context of this study, inexperience related only to the synchronous distanced education classroom and did not reflect overall years of teaching experience outside this environment. It may be speculated that the use of accommodations for students with learning disabilities was due to prior teaching experience and/or training. In addition, faculty in education, in the Vogel et al. study, were found to have more positive attitudes toward individuals with disabilities than other faculty outside education.

Finally, other findings from the Vogel et al. (1999) study indicated that faculty who had experience with students with learning disabilities were significantly less willing to provide one-on-one assistance with students with learning disabilities in the area of writing. In addition, experienced faculty were less willing to provide supplementary materials such as lecture outlines or to provide assignments in an alternative format. Conversely, within experienced respondents indicated a higher degree of use of item (provide written copy of oral directions and lectures) than did the inexperienced respondents. In addition, Vogel et al. (1999) suggested factors that may influence faculty attitudes included experience teaching students with learning disabilities and years of teaching experience. In fact, an experienced respondent who indicated having taught graduate special education students in distance education with physical, visual, and learning disabilities, stated that "By the time a student is admitted to graduate school he/she has achieved most of the adaptive equipment & techniques to succeed—with perhaps some personal self-advocacy if the professor is not aware of some special ed needs."

There were no significant differences between experienced and inexperienced respondents who taught students with hearing disabilities within synchronous distance education on the degree to which they used accommodations for students with hearing disabilities. However, an analysis of the means for accommodations specific to hearing disabilities does allow for the following note-worthy consideration.

On item number 5 (provide written copy of directions/lecture), experienced respondents indicated a higher degree of use than respondents who identified as inexperienced. Those respondents who identified themselves as experienced teaching students with hearing disabilities indicated a higher degree of use in 9 out of 12 accommodations for students with hearing disabilities (Table 15). One experienced respondent teaching in distance education classroom, commented, in regard to degree of use of accommodations for students identified in the area hearing disabilities that "usually for all students, not exclusively students w/disabilities" and in response to item 21 (require less writing), the respondent commented "handwriting, usually (4); conceptual writing, seldom (2) i.e., students must use some format to demonstrate the ability to conceptualize, analyze, synthesize, organize, and express ideas/information. This can be achieved through a range of expressive modes, personalized to meet individual students' needs." Experienced respondents teaching students with hearing disabilities identified themselves as being trained special educators. Therefore, one could assume that respondents who had previous experience working with student's with disabilities and experience teaching in the

synchronous distance education classroom would be more willing to respond to the accommodation needs of the student with hearing disabilities.

The underlying assumption of this research question was that inherent to experience, a higher degree of confidence in making accommodations within a technologically-rich environment for students with disabilities could be expected. This was consistent with findings by Jay and Backerby (1998), who offered, in the instructional design process, that multimedia should become an integral part planned so that its application had the greatest impact on students. Further, it is easy to demonstrate how the value of using technologies for students with learning disabilities has a positive impact on all students. Means and standard deviation for accommodations for students, which rely on technology within the distance education classroom , such as (allow scribe or tape recorder), (use of computer to track materials/assignments), (have audio-taped presentation for recording), and (large, bold print text and materials) would indicate some consensus by respondents for the use of these items for their students with disabilities when needed. One possible explanation for the lower mean rankings of additional accommodation items, that rely on technology, may be found in comment's made by an experienced respondent who identified having students with physical, visual, hearing, and learning disabilities, "not all tech supports are available at all sites yet" and another respondent who indicated "if available" in response to technological accommodation. Payne (1993) offered that as the demand for education by students with disabilities grows, distance education will be an important factor in facilitating student access to postsecondary education.

Research Question Six

To what extent did faculty receive support, specific to working with students with disabilities, within distance education classrooms? This question was designed to investigate the types of professional support respondents received in the past five years relevant to teaching students with disabilities within synchronous distance education classrooms. A list of professional supports was provided in Section III of the survey instrument. From the list of professional supports, respondents were asked to check those professional supports they received.

Of the 19 respondents who identified themselves as having taught students within distance education, 13 identified student self-advocacy and 8 checked student support service personnel. Additionally, 5 had student's personal assistant and 2 reported other types of supports. The 2 other types of supports that were indicated by respondents were "me-I teach special ed!" and "tutor." One respondent commented "we're on our own at this university" and I would offer from another respondent, "supports I can provide (former SPED teacher)." Support for making the accommodations was not needed but was available at the institution. Not having experience working with students with disabilities, not having support, and not having training would make it difficult to accommodate students within synchronous distance education classrooms.

Summary

It appeared that no significant differences were found in question 1 and 2, in experience level in the perception of "importance of recommended teaching practices" and "degree of use" of recommended teaching practices in the

synchronous distance education classroom. The teaching practice (encourage interactivity) received the highest mean scores for both inexperienced and experienced respondents for "level of importance" and "degree of use." In addition, (use system to let student's present work) and (use class videotapes to self-evaluate) had a high degree of importance placed on these teaching practices by inexperienced respondents but the degree to which these practices were put in to use were not correspondingly high. Egan (1988) found a critical factor in distance education is timely interactivity that occurs among and between students. Those practices that involved technological manipulation of equipment were not reported as having a high degree of use by inexperienced respondents.

Experienced respondents, in addition to placing a high degree of importance on (encourage interactivity) also placed a high degree of importance on (restate students comments/questions) and their use of this practice reflected this belief. This is consistent with researchers who have identified recommended teaching practices in distance education that have a significant impact on the learning of students within the distance education classroom (Fellenz et al., 1988; Hassenpllug & Harnish, 1998; Klesjus et al., 1997; Lombardi et al., 1991) where the instructor has the greatest effect on learning (Fellenz et al., 1988).

It appears that no significant differences in experience level in the degree of use of accommodations for students with disabilities, in synchronous distance education classrooms, was found in the context of this study. This author believes that this could be a factor in respondent's willingness to accommodate students with disabilities. In the current study respondents were willing to make accommodations for students with learning disabilities by adapting their

assignments. The three accommodations (allow student to bring support person to class, allow more time to complete tasks, and help student know what to expect outline's day's plan) while not significant, resulted in note worthy discussion.

In addition, experienced respondents who taught students with hearing disabilities within synchronous distance education classroom indicated a higher degree of use of the accommodation (provide written copy of directions/lecture). Overall, experienced respondents who taught students with hearing disabilities indicated a higher degree of use of all accommodations for students with hearing disabilities within the distance education classroom. A caveat to these findings is the small sample size and the factor that prior teaching experience and knowledge working with students with disabilities was not know.

While Nelson et al. (1990) suggested that faculty are generally not amenable to modifying their instructional practices to accommodate students with learning disabilities at the postsecondary level, Vogel et al. (1999) found that faculty indicated greater willingness to provide teaching accommodations as compared to examination accommodations for students with learning disabilities. It may be concluded that respondents in the current study were willing to make accommodations for students with disabilities. How to separate the need to accommodate for a student's disability from the willingness to do so is not what this study measured. In addition, this study did not measure the number of students with disabilities that did not require accommodations.

Recommendations

Several recommendations for practice and for further research have emerged from this investigation. Recommendations for professionals are provided in the first section followed by recommendations for further study in the final section.

1. Based on the findings of this study for interactivity as a highly valued and used recommended teaching practice, instructors may want to consider adopting practices which facilitate collaboration between all class members to a greater degree.
2. Based on the findings of this study for the importance of identified recommended teaching practices postsecondary institutions are encouraged to acknowledge the importance of research-based teaching practices within synchronous distance education and to provide inservice workshops to address these practices.

Recommendations for Further Study

1. Studies should be designed to assess student perception of recommended teaching practices within synchronous distance education given the responses of instructors in this study for the importance and degree of use of recommended teaching practices.
2. Further researchers should revise the current survey instrument to assess more closely instructors degree of teaching experience with students who have disabilities at the postsecondary level, prior to teaching in synchronous distance education classrooms.

3. Future researchers should expand upon this study, using formal assessment procedures to assess the existence and effectiveness of accommodations for students with disabilities in synchronous distance education classrooms.
4. This study could be replicated with states identified as having synchronous distance education on a large scale.

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Appendix A

University of Nebraska Lincoln

Research Compliance Services
Institutional Review Board
103 Whittier Bldg.
2255 W Street
P.O. Box 830849
Lincoln, NE 68583-0849
(402) 472-6965
FAX (402) 472-9323

August 31, 1999

Ms. L. Joy Dunnigan
10884 W. Birch Road
Clatonia NE 68328

Dear Ms. Dunnigan:

IRB # 99-08-417 EX

TITLE OF PROPOSAL: **An Investigation of Postsecondary Teaching Recommendations and Accommodations for Students With Disabilities in Synchronous Distance Education**

This letter is to officially notify you of the approval of your project by the Institutional Review Board for the Protection of Human Subjects. This project has been approved by the Unit Review Committee from your college and sent to the IRB. It is the committee's opinion that you have provided adequate safeguards for the rights and welfare of the subjects in this study. Your proposal seems to be in compliance with DHHS Regulations for the Protection of Human Subjects (45 CFR 46) and has been classified as exempt.

1. Enclosed is the IRB approved Informed Consent form for this project. Please use this form when making copies to distribute to your participants. If it is necessary to create a new informed consent form, please send us your original so that we may approve and stamp it before it is distributed to participants.

This project should be conducted in full accordance with all applicable sections of the IRB Guidelines and you should notify the IRB immediately of any proposed changes that may affect the exempt status of your research project.

Sincerely,

Sharon Evans

Sharon A. Evans, Chair
for the IRB

xc: Dr. Donald Helmuth
Faculty Adviser
Unit Review Committee

Appendix B

University of Nebraska Lincoln
Department of Special Education and Communication Disorders

Special Education
202 Barkley Memorial Center
P.O. Box 830732
Lincoln, NE 68583-0732
Phone (402) 472-3955
Fax (402) 472-7697

September 1, 1999

IRBAPP#99-08-417EX

Dear TED Member,

As members of the Teacher Education Division of CEC, your assistance in this national study will be invaluable. Whatever your experience (none to extensive) with synchronous distance education, your assistance in learning more about the recommended teaching strategies and additional accommodations for students with disabilities that are being employed at the postsecondary level, within synchronous distance education is needed. Within this study, synchronous distance education is two-way interaction in which there is two-way communication in real time. Having a better understanding of the number of instructors, how instructors value and adopt recommended teaching strategies, and utilize additional accommodations for students with disabilities, may help instructors examine their programs in an effort to meet the needs of all students in synchronous distance education.

We can assure that your answers will be reported together with those of other members, and that your name will not be identified in the final report. Please keep in mind that your participation is voluntary, and you are free to omit any answers to specific questions for any reason. Your returned questionnaire will be taken as informed consent.

If you have questions about your rights as a research subject that have not been answered by the investigator, you may contact the University of Nebraska-Lincoln Institutional Review Board, telephone (402) 472-6965.

You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators or the University of Nebraska Lincoln. Your decision will not result in any loss of benefits to which you are otherwise entitled.

If you are willing to respond to the survey, please respond within the next two weeks. The questionnaire itself should take about 10 minutes to complete. If you have any questions, please feel free to contact us. A complimentary copy of a report of this project will be available on request to persons contributing information, once the project is completed.

Thank you very much in advance for your assistance. The information from the questionnaire will help to develop a better understanding of the numbers of instructors and the teaching strategies those instructors in synchronous distance education classroom use.

L. Joy Dunnigan, M.Ed.
Hastings College
800 Turner Avenue
Hastings, NE 68901-7566
(402) 461-7472

Rose Allinder, Ph.D.
318-I Barkley Memorial Center
University of Nebraska-Lincoln
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Department of Special Education and Communication Disorders

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September 15, 1999

IRBAPP#99-08-417EX

Dear TED Member:

Earlier this month you received a copy of the attached survey, which requested information on your involvement in synchronous distance education at the postsecondary level. If you have already responded to this survey — thank you! Moreover, you can throw away this letter right now.

However, if you have not already done so, within the next week, please take approximately ten minutes to respond to the following questions. Your response to questions will assist us in having a better understanding of the actual numbers of instructors, how instructors value and adopt recommended teaching strategies, and utilize additional accommodations for students with disabilities, in synchronous distance education.

You will find a stamped addressed envelope for your convenience in returning the survey instrument.

Thank you very much.

Sincerely,

L. Joy Dunnigan, M.Ed.
Hastings College
800 Turner Avenue
Hastings, NE 68901-7696
(402) 461-7472

Rose Allinder, Ph.D.
318-I Barkley Memorial Center
University of Nebraska-Lincoln
Lincoln, NE 68583-0738
(402) 472-5457

An Investigation of Postsecondary Teaching Recommendations and Accommodations for Students with Disabilities in Synchronous Distance Education

Purpose: We seek your assistance in collecting information about teaching strategies and what additional accommodations for students with disabilities are being employed in the postsecondary synchronous distance education classroom. Within this study, synchronous distance education is two-way interaction in which there is two-way communication in real time.

Section I: Teaching Information

Please indicate which of the following classes you taught at the postsecondary level during the past five years. Circle all that apply and fill in the number of quarters or semesters where indicated.

a. special education class at the undergraduate level
b. special education class at the graduate level
c. undergraduate special education class via distance education classroom
   ____# of quarters or semesters
d. graduate special education class via distance education classroom
   ____# of quarters or semesters
e. any postsecondary class via distance education classroom
   ____# of quarters or semesters

If you answered c, d, or e of the previous questions please continue survey.
If you did not answer c, d, or e of the previous questions, please continue to Section IV.

Section II: Distance Education

Please indicate the type with the number of synchronous distance education classrooms in which you have taught within the past five years. Example: 4 Internet Phone If combinations of types for one class please indicate only one type for that class.

____ Two-way Audio/Video in real time (ability to see and hear students at all sites).
____ Two-way Audio, One-way Video in real time (Students see instructor, but instructor only sees studio students).
____ Internet Phone (Connected parties hear one another, but do not see one another).
____ Internet Relay Chat (No audio and no video, straight text directed at central location).
____ Other (please specify). _____

Please check all types of professional support you have received relevant to teaching within distance education classrooms within the past five years.

____ Originating site equipment facilitator.
____ Remote site equipment facilitator.
____ Access to a troubleshooting guide.
____ Student who assists.
____ Workshop
____ Other: _____

Please indicate the degree of importance and degree you use the following suggested teaching strategies/recommendations while teaching via distance education.

In the left hand column: 1 = No importance 2 = Little importance
3 = Some importance 4 = Great importance 5 = Not applicable
In the right hand column: 1 = Never 2 = Seldom 3 = Often
4 = Usually 5 = Not Applicable (NA).

Importance					Recommendations/Strategies	Degree You Use				
No	Little	Some	Great	NA		Never	Seldom	Often	Usually	NA
1	2	3	4	5	1. You teach students how to use the equipment.	1	2	3	4	5
1	2	3	4	5	2. Encourage interactivity	1	2	3	4	5
1	2	3	4	5	3. Establish a distribution network for materials with at least a two-day lag.	1	2	3	4	5
1	2	3	4	5	4. Use system to let students present their work.	1	2	3	4	5
1	2	3	4	5	5. Look directly into the camera frequently.	1	2	3	4	5
1	2	3	4	5	6. Use class videotapes as a means for self-evaluation.	1	2	3	4	5
1	2	3	4	5	7. Utilization of guest "remote" instructors.	1	2	3	4	5
1	2	3	4	5	8. Restate student's questions or comments.	1	2	3	4	5
1	2	3	4	5	9. Address presentation to all sites. Avoid speaking to the "origination site" students "only".	1	2	3	4	5
1	2	3	4	5	10. Refer to students by name rather than site.	1	2	3	4	5
1	2	3	4	5	11. Only hand out materials if all sites have received them.	1	2	3	4	5
1	2	3	4	5	12. Pace the amount of camera "switching."	1	2	3	4	5
1	2	3	4	5	13. Dress for teaching via this mode.	1	2	3	4	5
1	2	3	4	5	14. Design specific text print for use with Elmo in font sizes 20 - 30 points.	1	2	3	4	5
1	2	3	4	5	15. Instructor originate course from all sites early in the semester.	1	2	3	4	5
1	2	3	4	5	16. Hold office hours over the system.	1	2	3	4	5
1	2	3	4	5	17. Other _____	1	2	3	4	5

Section III: Students with Disabilities

Instruction: (Please check all that apply.)

1. Within the last 5 years, have you taught students with disabilities within the distance education classroom setting?

A. ____ Yes B. ____No

If "No" to the previous question, please continue to Section IV.
If "YES" please continue with the survey questions.

2. Please respond to the following question by indicating the number of students with disabilities in each area.

Physical Disability	____1-5	____6-10	____>10
Visual Disability	____1-5	____6-10	____>10
Hearing Disability	____1-5	____6-10	____>10
Specific Learning Disability	____1-5	____6-10	____>10
Other: _____	____1-5	____6-10	____>10

3. Please indicate the degree to which the following accommodations for your students with disabilities within the distance education classrooms, have been used during the past five years.

Degree of use: 1 = Never 2 = Seldom 3 = Often
4 = Usually 5 = Not applicable.

	Degree of use				
Accommodation	Never	Seldom	Often	Usually	NA
1. Accept alternative forms of information sharing (demonstrations, taped instead of oral report, debates.)	1	2	3	4	5
2. Accept responses in demonstrations or written format.	1	2	3	4	5
3. Allow extra time to complete assignments.	1	2	3	4	5
4. Allow student to bring support person to class when difficult changes are anticipated.	1	2	3	4	5
5. Allow student to decide what task to do 1st, 2nd, 3rd, etc.	1	2	3	4	5
6. Allow student to set up own schedule for class attendance.	1	2	3	4	5
7. Allow more time to complete tasks.	1	2	3	4	5
8. Allow scribe or tape recorder.	1	2	3	4	5
9. Allow student to stand up or lie down whenever necessary.	1	2	3	4	5
10. Break work into smaller amounts.	1	2	3	4	5
11. Decrease the need to read handwritten materials, such as notes or comments.	1	2	3	4	5
12. Demonstrate steps to be completed in small steps.	1	2	3	4	5
13. Give extra response time.	1	2	3	4	5
14. Have audio-taped presentation of items or for recording responses.	1	2	3	4	5
15. Help student know what to expect, outline day's plan.	1	2	3	4	5
16. Post daily routine, discuss changes as soon as possible.	1	2	3	4	5
17. Provide an assistant to read and/or tape items.	1	2	3	4	5
18. Provide speech synthesis for reading on the computer screen.	1	2	3	4	5
19. Provide visual cues (such as flashing lights for timed tasks).	1	2	3	4	5
20. Provide written copy of oral directions and lectures.	1	2	3	4	5

Accommodation	Degree of use				
	Never	Seldom	Often	Usually	NA
21. Require less writing.	1	2	3	4	5
22. Use a computer to track materials and assignments.	1	2	3	4	5
23. Use a computer with a larger screen.	1	2	3	4	5
24. Use a computer with speech recognition capabilities.	1	2	3	4	5
25. Use a microphone/amplifier combination.	1	2	3	4	5
26. Use adapted computer capabilities, such as Zoom Text.	1	2	3	4	5
27. Use a communication board.	1	2	3	4	5
28. Use large, bolded print texts and materials.	1	2	3	4	5
29. Use signing, lip reading, or an interpreter.	1	2	3	4	5
30. Other _____.	1	2	3	4	5

Instructions: (Check all that apply.) Please indicate the type of professional support you have received, relevant to teaching students with disabilities, via distance education within the past five years.

_____ Student Support Service personnel.
_____ Student's personal assistant.
_____ Student self-advocacy.
_____ Other: _____

Section IV: Employer

Instructions: Please complete the following question by checking your primary employer.

_____ College/University
_____ School (PreK-12)
_____ Agency (_____Federal _____State _____Local)
_____ Self-employed
_____ Other _____

Instructions: If you have any further comments, please feel free to write them down.

Thank you for your participation in this study.