Face-to-Face and Synchronous Interactive Videoconferencing Instruction: Learning
Experiences of Educators Enrolled in an Autism Certificate Program
By

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Face-to-Face and Synchronous Interactive Videoconferencing Instruction: Learning

Experiences of Educators Enrolled in an Autism Certificate Program

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Abstract

Autism spectrum disorder (ASD) was once considered a rare and severe disability (low incidence), but today individuals with ASD are educated in *every* academic environment, with 89% spending a portion of their day in the general education setting. Therefore, it is critical that all highly qualified teachers be prepared to provide appropriate education and support for these students. And to ensure that happens, quality personnel preparation programs in ASD are needed.

One such program, the Autism Certificate Program, utilizes a distance education model that combines site-based synchronous face-to-face (host site) or interactive video conferencing (IVC) instruction (remote site) with asynchronous E-learning in a yearlong post-bachelor's level program. This innovative approach provides quality professional development to ensure that educators acquire specific knowledge and skills to meet the requirements of the Individuals with Disabilities Education Act (IDEA, 2004), the Elementary and Secondary Education Act (ESEA, 2001), as well as specific outcomes or standards identified for teaching students with ASD (Council for Exceptional Children, 2009).

This study examined educators' knowledge and skill acquisition based on their enrollment at (a) remote sites or (b) the host site. In addition, the study compared the perceived knowledge and skill acquisition of participants at the two sites and effectiveness of the instructional delivery methods (i.e., face-to-face vs interactive video) relative to course outcomes and student learning experiences on the *Perceived Knowledge and Skills – Autism Survey* (Swanson, 2012). Data were collected from 91 educators and related service professionals (referred to as educators throughout paper)

who were enrolled in the course: *Characteristics of Students With Autism Spectrum Disorders.* Thirty-one participants attended the course from the host site and 60 attended the course from a remote site.

Results include descriptive statistics from the *Perceived Knowledge and Skills – Autism Survey*, course grades, E-learning activities, evidence-based practice examinations, and a culminating assignment. A Mann-Whitney *U* and chi-square analysis of the (a) achieved knowledge and skill and (b) perceived knowledge, skill, and learning experiences of participants at the host site and remote sites was conducted. Findings are discussed relative to the literature along with implications for professional development and future research.

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blood. You are amazing parents and role models. I hope that when I grow up I can be like you!

To my best friend and husband, Nolan –we were married shortly before I started the doctoral program, and you uprooted, leaving your dream job and moving away from your family and friends. I know that it has not been easy for you, and we both have struggled with being so far away from our families. Thank you for the sacrifices you have made so I could follow my dream. I love you and can't wait for the fabulous adventures we will have now that I will have a little more free time!

Dedication

To W. L.

You did not speak, but your eyes and your actions spoke volumes. You astounded me with the "conversations" we shared through improvisation, and every time we played music together I wanted to "get into your head" so I could truly understand and get to know you.

You intrigued and inspired me to want to learn more as you were nothing like what I had read in books or learned in class. You taught me so much, but I knew that I needed to learn more. My desire to understand you better led me on this journey. Although I will achieve a terminal degree, I will never stop wanting to learn more.

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CHAPTER I

Introduction

According to reports from the Centers for Disease Control (CDC, 2012a), the incidence of autism spectrum disorder (ASD) has increased dramatically over the past three decades – from approximately 15 in 10,000 in 1987 to 1 in every 88 children today. Further, the CDC estimates that approximately 1% of the U.S. population is affected by ASD. Once considered a rare and severe disability, ASD is now found in students being educated in every school environment, with over 80% of students with ASD spending at least 40% of their school day in the general education setting (U.S. Department of Education [USDE], 2011a).

Given the increasing prevalence and the variety of educational settings in which students with ASD are served, it is highly probable that most teachers and related service professionals will educate students with ASD (Barnhill, Polloway, & Sumutka, 2011; McGee & Morrier, 2005). Unfortunately, according to Schopler and Olley (1980) and Simpson (1995, 2003, 2004), most educators are not adequately prepared to effectively teach students with ASD. Therefore, personnel preparation programs in ASD are sorely needed.

Background of the Study

Several areas related to personnel preparation affect schools attempting to employ "highly qualified teachers" in ASD. Currently, many states use a noncategorical and crosscategorical special education teaching license (Simpson, 2003, 2004), and institutions of higher education (IHE) can only offer certification/endorsements allowed by their state's licensing agency. Furthermore, district administrators report that special

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education positions are left unfilled by highly qualified teachers and that they are having to hire substitutes who are unlicensed or on waivers (Study of Personnel Needs in Special Education [SPeNSE], 2002).

Another issue affecting schools wanting to hire "highly qualified teachers" in ASD is the national special education teacher shortage (American Association for Employment in Education, 2008; Billingsley, 2003; USDE, 2011b). Thus, data suggest there has been a significant and persistent shortage of highly qualified special education teachers for over two decades (Boe & Cook, 2006; McLesky, Tyler, & Flippin, 2004).

This shortage of teachers qualified to teaching students with ASD is even more acute in rural and remote communities (Brownell, Bishop, & Sindelar, 2005; Ludlow, Conner, & Schechter, 2005). Further, research indicates that rural school districts experience especially significant challenges in recruiting recent graduates from IHE located in urban or suburban communities (Hammer, Hughes, McClure, Reeves, & Salgado, 2005; Rosenkoetter, Irwib, & Saceda, 2004) and retaining highly qualified special educators (Westling & Whitten, 1996). The literature surrounding personnel preparation of rural school districts emphasizes that the most effective programs are designed to identify, recruit, train, and support teacher candidates from the local area (Ludlow et al.).

However, at this time, most states do not offer a teaching license in ASD, IHE are left to determine whether a personnel preparation program in ASD is needed and to develop the program objectives on their own (Barnhill et al., 2011). In states that do not offer a teaching license in ASD, IHE are left to determine whether a personnel preparation program in ASD is needed and to develop the program objectives on their

own (Barnhill et al., 2011). Scheuerman, Webber, Boutout, and Goodwin (2003) noted in their discussion of personnel preparation problems in ASD that there is a need for professional development in ASD to be distinct from other low-incidence disabilities in recognition of the unique learning and behavioral characteristics of individuals with ASD.

To better meet the need for highly qualified personnel in rural communities, IHE need to develop personnel preparation programs that utilize synchronous or asynchronous distance learning technologies. By using distance learning technologies, IHE can deliver quality professional development to educators who live and work far away from college or university campuses.

Distance learning using interactive video conferencing (IVC) is an emerging research area in special education personnel preparation programs. Over the past decade, a number of graduate-level personnel preparation programs in low-incidence disabilities utilizing site-based Internet videoconferencing (IVC) to provide preparation programs in rural communities have emerged (Jameson & McDonnel, 2007; Knapczyk, Chapman, Rodes, & Chung, 2001; Ludlow & Duff, 2002; Spooner, Agran, Spooner, & Kiefer-O'Donnell, 2000; Spooner, Knight, Lo, & Wood, 2007). Such programs are offered through a combination of campus and off-campus sites that provide synchronous instruction using IVC. Results show that distance education is effective in preparing special educators to meet the needs to students with low-incidence disabilities. Nevertheless, published research comparing traditional campus-based special educator preparation programs to off-campus or site-based programs using IVC is limited (Beattie, Spooner, Jordan, Algozzine, & Spooner, 2002; McDonnel et al., 2011). Further research

is needed to compare the effectiveness of distance and on-campus programs related to the complex knowledge and skills educators are expected to acquire.

Hess, Morrier, Heflin, and Ivey (2008) investigated the use of evidence-based practices (EBP) of educators working with students with ASD. Results indicated that fewer than 33% used EBP and approximately 33% of the teachers used strategies not identified as EBP. These findings further support the need for educators to receive specific professional development on a variety of EBP in order to develop and implement efficacious programs that are individualized for learners with ASD (National Research Council, 2001; Scheuermann, Webber, Boutat, & Goodwin, 2003; Schwartz, Sandall, McBride, & Boulware, 2004).

The development of high-quality personnel preparation programs in ASD will ensure that educators acquire the knowledge and skills they need in order to meet the requirements of IDEA (2004), ESEA (2001), as well as specific outcomes (National Research Council, 2001) or standards (Council for Exceptional Children, 2009) identified for teaching students with ASD. Further, the use of distance learning technologies increases convenient access to professional development in ASD and will allow educators to participate in personnel preparation programs and attend from their communities.

Quality Autism Spectrum Disorders Teacher Preparation in One Midwestern State: Needs, Challenges, and Distance Education Opportunities

The Midwestern state that the research study takes place in has experienced special education teacher shortages for more than 20 years (USDE, 2011b). Specifically, from 2004-2005 to the 2009-2010 school year, the average fully certified special

education teacher shortage was 22.13%. Further, annual special education personnel attrition rates from the 2005-2006 to 2010-2011 school years indicate a 10.64% attrition for non-urban school districts, which is slightly greater than the 10.18% average attrition for urban districts (McKnab, 2007, 2008, 2009, 2010, 2011). While these attrition rates indicate a shortage of special educators across the state, they do not adequately illustrate the challenges of hiring qualified special education personnel in rural areas and the extreme difficulty for education agencies to attract qualified professionals from outside of the community.

Similar to other rural states, IHE are located in urban or suburban communities, far away from many potential rural educators' homes or places of employment. Thus, to attend a traditional teacher preparation program full- or part-time would require rural educators to spend a significant portion of their day driving to and from the IHE, making it difficult to maintain a full-time teaching position difficult. Thus, onsite teacher preparation programs are inconvenient or financially unfeasible for many potential ASD teachers. Face-to-face courses are not an option for many educators who work full-time and want to learn more about ASD. Some are general educators who have students with ASD in their classrooms, others are provisional special educators responsible for direct instruction and general education classroom support. To ensure an adequate supply of educators prepared to serve the growing number of students with ASD in rural areas of the state, several IHEs in the state have developed alternative preparation models.

A regional Midwestern university has been a state leader in the development of an Autism Certificate Program that utilizes a distance education model. The 15-credit hour program uses a hybrid model combining synchronous face-to-face or IVC instruction

with asynchronous E-learning in a yearlong post-bachelor's-level program. The multisite based program allows for real-time instruction, guided practice, and feedback. All sessions are recorded and posted online for later student use and repeated viewing. In addition, by having multiple sites, the program offers educators opportunities to network with others in their region. This is particularly valuable for many rural educators, who may be the only person in their school building or even school district who works with students with ASD.

Through this arrangement, the Autism Certificate Program partners with local education agencies (LEA; school districts, interlocal and cooperative service programs) to deliver courses at remote sites each academic year. Sites change annually based on identified LEA needs and student interest. As a result, students living more than 100 miles from campuses (the main and satellite campus) can enroll in the program, saving travel time and cost. This innovative approach provides quality professional development to practicing educators that is aligned with the Council for Exceptional Children's (CEC, 2009) professional knowledge and skill competencies of *Initial Special Education Teachers of Individuals With Exceptional Learning Needs with Developmental Disabilities and/or Autism.* (See Appendix A for the CEC professional knowledge and skill competencies targeted in the course.)

The knowledge competencies of the CEC Standards are assessed through E-learning modules, tests, and projects, whereas the skill competencies are assessed through demonstration of skills during fieldwork embedded in the coursework. Students plan and implement interventions and submit them for instructors' feedback and evaluation. The university awards a post-bachelor's-level certificate; this is not a degree or licensure

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program. At the present time, the Midwestern state where this research study takes place does not grant specific ASD teaching licenses or endorsements. Since its inception in 2008, more than 100 teachers and related service professionals (called educators throughout the remainder of the paper) have completed the Autism Certificate Program.

Need for Research

While advances are being made in terms of understanding and addressing the learning needs of students with ASD, "personnel preparation remains one of the weakest elements of effective programming for children with autism spectrum disorders" (National Research Council, 2001, p. 225). Educators need specific professional development regarding students with ASD and the use of appropriate EBP to ensure effective programs are designed and implemented with fidelity.

Proper preparation will help ensure educators master specific CEC knowledge and skills in order to meet mandated requirements of IDEA (2004) and ESEA (2002) and specific professional standards for teaching students with ASD (CEC, 2009). Meeting these professional development needs of teachers in rural and remote communities requires innovative and alternative preparation programs that incorporate effective technology to facilitate instruction, communication, problem-solving, and student knowledge and skill development (Bargerhuffe, Dunne, & Renick, 2007; Williams, Martin, & Hess, 2002).

Statement of Purpose

The purpose of this research study was to compare the (a) acquired knowledge and skill and (b) learning experiences of educators enrolled at remote sites to those enrolled at the host site in a post-bachelor's-level course: *Characteristics of Students*

With Autism Spectrum Disorders. During the course, the instructor provided face-to-face instruction at the host site for the enrolled students who lived near the satellite campus in an urban metro area and synchronous IVC instruction to the students attending the course at remote sites. All students also participated in asynchronous E-learning activities.

Distance education is not without controversy. Much debate has surrounded the quality of instruction provided at a distance versus face-to-face (Bullock, Gable, & Mohr, 2008; Lockee et al., 2011) and questions have been raised about the level of knowledge and skills obtained when the instructor does not have direct contact with the learner (Abrami, Bernard, Bures, Borokhovski, & Tamin, 2011).

Research Questions

Two research questions guided the investigation. These questions examined whether individuals at the remote sites, who received IVC instruction, achieved the same level of "knowledge" or "understanding" as those at the host site where face-to-face instruction was delivered. Further, the research examined similarities and differences between the perceived learning experiences of the educators in the course. The learning experiences were categorized into three areas: perceived knowledge and skill, achievement of course outcomes, and learning experiences during the course. The specific research questions were as follows:

    1. Are educators who participate in synchronous IVC instruction from remote sites able to achieve the same level of knowledge and skills as educators who participate in synchronous face-to-face instruction at the host site?

2. Are the perceptions of the learning experiences by participants similar at both the host and remote sites?

Student data were collected, including (a) course grades, (b) exam average scores, (c) E-learning activity average scores, (d) culminating assignment grades, and (e) *Perceived Knowledge and Skills – Autism Survey* (demographics, prior distance learning experience, and student perceptions of gained knowledge and skills, achievement of course objectives, and learning experiences) (Swanson, 2011).

Assumptions and Limitations

This study is subject to several assumptions and limitations. A basic assumption is that participants were willing to honestly report their perceptions of the perceived outcomes of the course, their evaluation of the instructor/course, and their course experiences.

Limitations are as follows: the study participants were not randomly selected or randomly assigned to groups, groups were unequivalent in size, demographic characteristics were not controlled, and there are only two groups to compare. Further, no observations were conducted of participants working with students with ASD in their classrooms. To evaluate participants' development of skills related to teaching students with ASD, EBPs were taught during in class lecture and then followed up with in classwide guided practice. Participants then completed an assignment that required them to use a given EBP in their classroom and provided examples and written reflection on what occurred. Finally, the instructor provided verbal feedback for guided practice and written feedback and a grade for assignments.

Definition of Terms

        The following list provides definitions of terminology used throughout the dissertation.

        Asynchronous instruction/learning: Instruction/learning that occurs in real time in the same (i.e., face-to-face) or different locations (i.e., via TV, radio, webcast, podcast, videoconference, telephone, live text, or chat rooms) (Er, Ozden, & Arifoglu, 2009).

        Autism spectrum disorder (ASD): A group of five neurological disorders that share a common core of characteristics; namely, challenges in communication, social skills and restricted patterns of behavior, interests, and activities (American Psychiatric Association [APA], 1994). These disorders include autistic disorder, Asperger disorder, pervasive developmental disorder-not otherwise specified (PDD), childhood disintegrative disorder, and Rett syndrome.

        Distance learning or *distance education:* In higher education, distance learning or distance education is defined by Baker (2003) as institution-based formal education in which learners are separated from each other in terms of space, time, or both. Distance education typically takes place online and may be delivered synchronously or asynchronously.

        Educators: Individuals who have completed specified training at the undergraduate and/or graduate level that leads to certification or licensure as a general or special educator.

        E-learning: Defined by Zhang, Zhao, Zhou, and Nunamaker (2004) as learning and teaching online through network technologies. Meyen, Aust, Gauch, and Hinton (2002) further defined E-learning as the acquisition and use of knowledge that is

distributed and facilitated primarily by electronic means and can be carried out synchronously or asynchronously.

Face-to-face instruction: Instruction that takes place in the same space (i.e., in person).

Host site: In distance education, is the location where the instructor provides instruction and broadcasts to other locations such as learners' computers or remote sites.

Hybrid instruction or *hybrid learning:* According to Buzzetto-More and Sweat-Guy (2005), hybrid courses blend more than one type of instruction such as face-to-face instruction with online learning. In *Characteristics of Students with ASD* students participate in synchronous face-to-face or IVC instruction and asynchronous E-learning.

Interactive videoconferencing (IVC): Another type of online distance learning technology, IVC uses two-way video and audio to provide synchronous instruction (Bullock et al., 2008). Using IVC for professional development allows learners to attend class sessions from their homes or from satellite locations and receive instruction similar to the traditional face-to-face classroom. In *Characteristics of Students with ASD*, IVC delivers instruction to multiple satellite locations.

Professional development: According to the ESEA (2001), professional development is "high quality, sustained, and classroom focused" training opportunities that keep the learner up-to-date on the knowledge and skills needed to provide effective instruction and specialized services. These activities "support the recruiting, hiring and training of highly qualified teachers, including teachers who became highly qualified through State and local alternative routes to certification."

Related service professional: Individual who has completed advanced training at the graduate level leading to certification or licensure and provides specialized services described under the Individuals with Disabilities Education Act (IDEA, 1997). Related service professionals include, but are not limited to, speech-language pathologists, occupational therapists, social workers, and school counselors.

Remote site: In distance education programs delivering synchronous instruction, the sites receiving the broadcasted internet videoconferencing instruction are referred to as the remote site. Participants learning at the remote sites see and hear the instructor and shared content on a video screen (i.e., television, projector screen) and through speakers. Participants at the remote site communicate with the instructor and participate at the host or remote sites using a microphone.

Synchronous instruction: Defined by Er et al. (2009) as real-time learning, it may be delivered via TV, radio, webcast, podcast, videoconference, telephone, live text, or chat rooms. Synchronous learning may occur in the same or difference spaces. Asynchronous learning refers to learning formats that can occur at any time in difference spaces, and can be delivered through e-mail, interactive or static web pages, DVD, textbooks, CD, handouts, audiotape, or fax.

Summary

There is a severe need for professional development to provide rural teachers with ASD specific knowledge and skills in an effective and efficient manner given distance from campus, time, travel costs, and other personal/professional responsibilities that preclude participation in an on-campus learning program. Better understanding of effective distance learning technology for professional development is needed. This study

provides information about professional development delivered through a distance learning model that will be useful in future course and program development and in evaluation of student performance.

CHAPTER II

Review of the Literature

The IDEA (2004) and the Elementary and Secondary Education Act, also known as the No Child Left Behind Act of 2001, require that school systems employ "highly qualified teachers" who use scientifically based research as the foundation for curriculum and classroom instruction. Given the increased prevalence of autism spectrum disorders (ASD), both general and special educators are likely to have students on the autism spectrum in their classrooms (Barnhill et al., 2011; McGee & Morrier, 2005). Thus, there is a growing need for educators and other professionals to be prepared to work with this unique population (Aspy & Grossman, 2008).

To better meet the educational needs of this growing population of students, educators need specific professional development about the characteristics of ASD and the use of evidence-based practices (EBP) to ensure appropriate and efficacious programs designed and implemented with fidelity for learners with ASD. Effective ASD teacher preparation will help ensure that educators have the specific knowledge and skills needed to meet mandated requirements (e.g., IDEA, 2004; ESEA, 2001), professional practice guidelines (National Research Council, 2001), and professional standards (Council for Exceptional Children, 2009).

Alternative preparation models such as distance education are being used to ensure an adequate supply of educators are being prepared to serve the growing number of students with ASD (Barnill et al., 2011). In the Midwestern state where the research study is being conducted, one such program is the Autism Certificate Program, which was developed by a regional state university. This innovative program uses a hybrid

learning model combining face-to-face or interactive video conferencing (IVC) and E-learning to provide professional development in ASD across the state. The program was developed to meet the CEC's standards for *Teachers of Individuals With Developmental Disabilities/Autism* and the *Professional Standards Common Core* in teacher preparation programs (2009).

This chapter summarizes the relevant literature. The review begins with a discussion of the challenges inherent in providing "highly qualified" educators nationally and then discusses these needs specific to the state where the research study was conducted. Then the review of literature discusses the need for teacher preparation specific to ASD. This is followed by a discussion of the increasing numbers of students with ASD in the state. Next, the development of educational competencies and EBP in ASD are discussed. This is followed by a discussion of the unique needs and challenges for highly qualified teachers in special education. This is followed by a description of instructional options for professional development and a discussion of research surrounding the use of IVC in professional development for educators, specifically highlighting low-incidence programs. Finally, the literature review concludes with a discussion of current research surrounding personnel preparation in ASD, including a description of the Autism Certificate Program, the focus of this study.

Definition of "Highly Qualified" Educators

The ESEA (2001) required that, by the end of the 2005-2006 school year, all teachers employed in public schools be "highly qualified." Today, all highly qualified teachers must have (a) a bachelor's degree, (b) full state licensure in their content area(s), and must be able to demonstrate (c) that they know each subject they teach according to

state-designated procedures (e.g., coursework, written test scores). Special education teachers must meet the same standards as general education teachers, including competency in core academic subjects if they are designated as academic teacher of record in specific subject areas. Subject matter competency is demonstrated by either passing a state-approved academic subject test or meeting the state-approved high, objective, uniform state standard of high evaluation (HOUSSE) (Kansas State Department of Education [KSDE], 2008)

The same requirements hold true for related service professionals. Like general educators, they take one undergraduate course that overviews typical human growth and development and complete fieldwork and clinical training experiences in settings such as schools, hospitals, and outpatient clinics prior to earning professional licensure. To become licensed or certified, related service professionals must complete a graduate degree program and pass a licensing exam. Teachers and related service professionals gain knowledge and skills to work with students with specific disabilities while working on the job or through structured professional development experiences.

National Shortages of Highly Qualified Special Educators

Each year district administrators report that special education positions are left unfilled by highly qualified teachers and that, consequently, they are forced to hire substitutes who are unlicensed or on waivers (SPeNSE, 2002). Sadly, this is nothing new. Data suggest that there has been a significant and persistent shortage of highly qualified special teachers for more than two decades (Boe & Cook, 2006; McLesky et al., 2004). Further, reports from the United States Department of Education (2011) indicate that

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from the 1989-1990 to the 2009-2010 school year, there has been an 9.57% average

shortage of full-time fully certified teachers for students with disabilities ages 6 to 21.

The shortage of highly qualified special educators is even more critical in rural

areas. For example, recent research indicates that rural schools districts experience

significant challenges recruiting recent graduates (Hammer et al., 2005; Rosenkoetter et

al., 2004) and retaining highly qualified special educators (Billingsley, 2004; Provasnik et

al., 2007).

Special education teachers also have the highest turnover rate in the teaching

profession. Of those who leave, 75% report that their primary role of teaching and their

workload is unmanageable (Pasternack, 2002). Rosenberg and Sindelar (2001) found that

the average length of employment for teachers is five years or less. Westling and Whitten

(1996) arrived at similar findings in rural special educators, with only 57% planning on

remaining in the rural community after five years. Other factors affecting rural special

educator retention include lack of resources (i.e., lower salaries, fewer materials, and

fewer qualified teachers), teaching students of varied levels in the same room, and social

and geographic isolation.

Additional dilemmas in personnel preparation include the status of licensure and

comprehensive preparation programs. Many states use a noncategorical and

crosscategorical special education teaching license instead of licensing in specific

disability categories, such as autism (Simpson, 2003, 2004). In addition, IHE can only

offer certification/endorsements allowed by their state's licensing agency. If the state

does not have a license in ASD, IHE are left to determine whether a personnel

preparation program in ASD is needed and to develop the program objectives on their

own (Barnhill et al., 2011). Thus, educators may not receive adequate personnel preparation to prepare them to teach students with ASD.

Shortages of Highly Qualified Special Educators in One Midwestern State

According to the USDE (2011b, 2012), the state where the research study was conducted has experienced special education teacher shortages from 1992-2012. Current data indicate that from 2004-2005 to the 2009-2010 school years, the average fully certified special education teacher shortage was 22.13%. During the 2004-2005 academic year, the shortage was 5.15%, followed by a slight increase to 6.29% during the 2005-2006 school year. Over the next three school years, the special education teacher shortage drastically increased to 38% during 2009-2010, with 1,581 of the 4,138 special education teachers being unlicensed.

However grim, these data do not adequately show the number of positions that go unfilled or the challenges that rural districts face in recruiting teachers. With the special education teacher shortages and the mandate for "highly qualified" teachers (Billingsley, 2003; ESEA, 2001), educators need easier access to professional development opportunities. Hence an overall need for the creation of innovative professional development programs. In addition, such programs must also be available in rural communities so that teachers can develop the knowledge and skills necessary to adequately provide special education services and rural schools school districts can build capacity through professional development.

Autism Spectrum Disorders and Teacher Preparation

Autism spectrum disorders is a term used to describe a group of five neurological disorders that share a common core of characteristics. The salient characteristics, which

are part of the diagnostic criteria, include challenges in communication, social skills and restricted patterns of behavior, interests, and activities (APA, 1994). Related characteristics used to describe individuals with ASD, but not part of the diagnostic criteria, include differences in sensory processing, motor skills, emotional vulnerability, cognitive differences, and medical and biological needs (Aspy & Grossman, 2008).

The *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR) (APA, 2000) defines ASD as one of five pervasive developmental disorders (i.e., autistic disorder, Asperger disorder, pervasive developmental disorder-not otherwise specified (PDD-NOS), Rett disorder, and childhood disintegrative disorder). While the medical community relies on the DSM-IV-TR for diagnosis, school districts use IDEA criteria to determine students' eligibility for special education services and supports.

Since 1990 (IDEA; P.L. 101-476), autism has been recognized as one of 13 broadly defined disability categories; however, there are no specific categories for ASD and the other pervasive developmental disorders. As a result, students with these characteristics must meet the eligibility requirements under autism or a different disability category (e.g., mental retardation, speech-language disorder, other health impairment).

According to the CDC's Autism and Developmental Disabilities Monitoring Network (2012a), autism is growing at a startling rate of 10-17% per year. Further USDE (2011a) data indicate that 32.3% of school-age (ages 6-21 years) students identified with autism are served in general education at least 80% of the time; 18.4% spend 40-79% of their time in these elementary and secondary classrooms; and 38.78% spend less than 40% of their day in the general education classroom. By comparison, today,

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approximately 10.5% of students with autism are educated in special schools or residential programs. Given the increasing prevalence and the variety of educational settings students with ASD are served, it is highly probable that most educators at one time or another will teach students with ASD (Barnhill et al., 2011; McGee & Morrier, 2005).

Students With ASD in the One Midwestern State

According to the USDE, in 2000, 710 or 1.16% of children ages 3-21 who received special education services in the Midwestern state had an ASD. By 2011, this number had risen to 2,834 or 4.3% of children with disabilities ages 3-21 who received special education services having an ASD.

As the number of children diagnosed with ASD increases, so does the number of school districts providing educational services. Thus, in 2008, 68% (206 of 305) of all school districts in the state served at least one student with ASD (KSDE, 2009b). Two years later, this percentage had increased to 80% (241 of 305) of all school districts serving at least one student with ASD, with 47.6 % living in suburban areas and approximately 52% living in rural areas (KSDE, 2011). Schools need to meet these growing numbers by hiring teachers and related service professionals who have adequate professional development in ASD.

Not surprisingly, Midwestern families and professionals, like those in other parts of the country, often find the differences between diagnosis and eligibility for special education services confusing because a medical diagnosis does not necessarily guarantee a student with ASD eligibility for special education under IDEA. Therefore, it is critical that all highly qualified teachers be prepared to provide appropriate education and

support for all students, including students with ASD (Feinberg & Vacca, 2000; Simpson, 2004).

In a recent investigation of personnel preparation in low-incidence disabilities for rural areas, the authors noted that there is a recognized need for the development of programs focused on ASD that are distinct from crosscategorical low-incidence programs, in recognition of this group's unique learning and behavioral needs (Scheuermann et al., 2003).

According to Simpson (2005), the unique learning needs of the population of students with ASD differ greatly from those of other learners, requiring educators to possess specialized skills to adequately meet their needs. These learning differences are made up of both strengths and needs (Simpson, Myles, & LaCava, 2008). Strengths include visual-spatial abilities and skills, physical development, rote memory, unique perspectives, systemizing abilities and rule/routine based understanding. Areas of need include challenges with executive functioning, theory of mind, and central coherence. These strengths and weaknesses manifest themselves as the unique behaviors of this population. However, despite the unique and sometimes challenging behaviors, students with ASD "can achieve academically, have rich social interactions with communicative partners, and attain careers" (p. 2, KSDE, 2009a).

To achieve these outcomes, educators must be adequately prepared to teach students with ASD. In particular, educators need the professional knowledge and skills to understand how unique ASD traits can impact student learning and which EBPs support a student's needs. In 2009, CEC approved teacher standards for Autism Spectrum Disorders/Developmental Disabilities. The standards are divided into two sets, one for

beginning teachers, *Initial Special Education Teachers of Individuals With Exceptional Learning Needs With Developmental Disabilities/Autism,* and one for advanced teachers, *Advanced Knowledge and Skill Set: Developmental Disabilities/Autism Specialist.* These teaching standards are recommended to be used in conjunction with the *CEC Professional Standards Common Core* in teacher preparation programs (2009).

Evidence-Based Practices in Autism Spectrum Disorders

The ESEA requires that school systems employ scientifically based research as the foundation for general educational programs and classroom instruction (2001). Simpson, LaCava, and Graner (2004) described scientifically based research "as methods that have met rigorous standards and have been shown, when correctly applied, to reliably achieve positive results" (p. 69).

Many scientifically based educational programs and instructional methods also meet the criterion to be "evidence-based practices (EBP)" because they are based on typical child development theories or clinical research rather than classroom research findings (e.g., neuroscience studies) (Odom, Brantlinger, Gersten, Horner et al., 2004). However, many of these instructional practices would not be considered EBP for children and youth with ASD because this population was not included in the original research. According to Odom and colleagues, an intervention or strategy may be an EBP for individuals with ASD when "the practice has been specifically tested in an experimental research study, with learners who resemble the target students in critical ways (age, diagnosis, intellectual level, language level, etc.)" (p. 7).

In the last decade, several efforts have been made to determine which strategies and interventions should be considered EBP for students with ASD (e.g., National

Research Center, 2001; Odom et al., 2003; Simpson al., 2005). More recently, two large-scale projects by the National Professional Development Center for Autism Spectrum Disorders and the National Autism Center have undertaken defining what are EBP for ASD and which practices qualify.

In 2007 the National Professional Development Center for Autism Spectrum Disorders (NPDC) conducted a similar project using their own standards for determining EBP for children and youth with ASD on focused intervention practices (e.g., prompting, antecedent-based intervention, time delay, reinforcements) (Odom, Collet-Klingenberg, Rogers, & Hatton, 2010). According to the NPDC, efficacy must be established through peer-reviewed research in scientific journals using three criteria. First, for efficacy to be established through randomized or quasi-experimental design studies there must be two high-quality experimental or quasi-experimental group design studies. Second, for efficacy to be established through single-subject design studies, there must be three different investigators or research groups, and each study must have conducted five high-quality single-subject design studies. Third, to establish efficacy through a combination of evidence, there must be one high-quality randomized or quasi-experimental group design study and three high-quality single-subject design studies conducted by at least three different investigators or research groups (across the group and single-subject design studies).

Using the above criteria, 24 practices were identified by the NPDC as having sufficient evidence to be considered EBP for children and youth with ASD. These are strategies that can be implemented individually or in combination and are to be selected based upon individual need.

The National Autism Center's project *The National Standards Project* (2009) developed a model of evaluation of research based upon EBP guidelines from other health and psychology fields as well as input from experts participating in planning sessions. A *Strength of Evidence Classification System* was created as a means to determine a level of confidence that a given comprehensive treatment model was effective (e.g., antecedent package, behavioral package, story-based intervention package).

Based upon the confidence level assigned, the treatment was awarded one of four ratings, (a) *established:* sufficient evidence is available to confidently determine that a treatment produces favorable outcomes for individuals on the autism spectrum; (b) *emerging:* although one or more studies suggest that a treatment produces favorable outcomes for individuals with ASD, additional high-quality studies must consistently show this outcome before we can draw firm conclusions about treatment effectiveness; (c) *unestablished:* there is little or no evidence to allow us to draw firm conclusions about treatment effectiveness with individuals with ASD; and (d) *ineffective/harmful:* sufficient evidence is available to determine that a treatment is ineffective or harmful for individuals on the autism spectrum (p. 9). The project ended up classifying 11 treatments as established, 22 as emerging, 5 as unestablished, and 0 as ineffective/harmful.

For the full list and a comparison of the evidence-based findings of the National Professional Development Center on ASD and the National Autism Center, see Appendix B. The identified EBP from NAS and NPDC are incorporated across the Autism Certificate curriculum coursework.

Despite the focus on highly effective teachers using "scientifically based instruction" (ESEA, 2001) and the developing body of research identifying EBP in the field of ASD (National Autism Center, 2009; Odom et al., 2010; Simpson et al., 2005), few studies have been published on teacher effectiveness. Among existing studies, Boardman, Arguelles, Vaughn, Hughes, and Klinger (2005) found that special educators who taught students with learning disabilities and emotional/behavior disorders used practices they thought were feasible rather than focusing on strategies that were considered EBP.

In a study evaluating the use of EBP with students with ASD, Hess and colleagues (2008) found that fewer than one third of teachers were using EBP and approximately one third were using strategies that were not identified as EBP. Additionally, Iovannone, Dunlap, Huber, Kincaid (2003) noted that minimal efforts have been made to incorporate current EBP findings into a school system curriculum for ASD.

These findings indicate a need for that state departments and LEA to work with IHE to develop comprehensive personnel preparation programs (Barnhill et al., 2011; Williams et al., 2002. This would include collectively identifying personnel preparation needs related to ASD, developing statewide goals or objectives related to providing special education services to students with ASD, and providing opportunities for general and special educators to work together. Williams et al. also suggested that IHE should consider designing programs to include both general and special educators since students with ASD are educated in all learning environments and these types of learning opportunities should also be available at the preservice level.

Unique Needs and Challenges for Highly Qualified Special Educators in One Midwestern State

The Midwestern state where the research study was conducted is the 15th largest state in the nation by landmass, with over 82,000 square miles within its borders (U.S. Census Bureau, 2012). Sixty-five percent of all counties and 89% of western counties are considered rural (6-19.9 people per square mile) or frontier (fewer than 6 people per square mile), making it one of the most rural states in the country (Kansas Department of Health and Environment [KDHE], 2011). In the following section, we will discuss the types of educational programs available across the state, current special education licensing practices, and attrition rates.

In most rural counties (68 of 105) special education services are provided through interlocal or cooperative service programs that serve multiple school districts rather than by one individual community school district (KSDE, 2011). These cooperative service programs vary greatly in size based on the number of school districts receiving support, the number of counties included, and the number of square miles within their border. These geographic factors also determine how special education services are provided. Two extreme examples of cooperative service programs are represented by the following descriptions of two cooperatives from the Midwestern state where the research study was conducted. In the paragraph below, they will be referred to as Cooperative A and Cooperative B.

Cooperative A provides special education services to six school districts in the county. All special education services are provided within one county (468 square miles). By comparison, the largest and most remote cooperative in the state, Cooperative B,

serves 19 unified school districts, covering 13 countries in the northwest section of the state (over 12,000 square miles). Students who receive special education services may be bused several counties away to be educated. Likewise, special educators providing cooperative services may be required to travel throughout the entire service center area. These educators drive or fly to specific schools as needed to provide services and oversee students' individualized education plans (IEPs).

In this Midwestern state, one must have a general education teaching license in order to become certified in special education (KSDE, 2008). Teachers earn their license in functional (low incidence) or adaptive (high incidence) disabilities, rather than a categorical area such as ASD. This licensure practice makes it challenging for colleges and universities to adequately prepare educators to work with all students, especially those with unique characteristics and learning traits such as ASD.

This Midwestern state has documented general education teacher shortages for more 20 years and a shortage of special education teachers since 1992 (USDE, 2011b). Annual special education personnel attrition rates from the 2005-2006 to 2010-2011 school years indicate 10.64% attrition for nonurban school districts, which is slightly greater than the 10.18% average attrition for urban districts (McKnab, 2007, 2008, 2009, 2010, 2011). Current data from USDE indicate that from 2004-2005 to the 2009-2010 school year, the average fully certified special education teacher shortage was 22.13% (2011b). During the 2004-2005 school year the shortage was 5.15% followed by a slight increase to 6.29% during the 2005-2006 school year. Over the next three school years, the special education teacher shortage increased drastically, to 38% during 2009-2010, with 1,581 of the 4,138 special education teachers being unlicensed.

These shortage and attrition rates underscore the need for an adequate supply of special education teachers. In a study on the shortage of fully certificate general and special education teachers, Boe, Bobbit, Cook, Burkanic, and Terhanian (1998) found that for every available special education position, IHE produced .86 new teachers. By comparison, for each available general education elementary positions, two new teachers were certified. In addition, teachers licensed in special education did not always seek special education positions. In a later study comparing special education teacher shortages between 1993-1994 to 2001-2002, Boe and Cook (2006) noted that the shortage of fully certified special educators had increased by approximately 5%, the number of additionally fully certified special educators needed had doubled, and fewer first-time teachers were fully certified special educators or had received extensive training.

To ensure an adequate supply of educators who are prepared to serve the growing number of students with ASD in this rural Midwestern state, alternative preparation models are being developed that use technology to help address many preparation challenges faced by teachers living in rural communities. Some of these technologies include internet video conferencing, asynchronous E-learning, and an online course management system. The next section will discuss some of the current instructional options for professional development, including asynchronous and synchronous distance learning.

Current and Changing Instructional Options for Professional Development

With ESEA (2001) and IDEA (2004) mandates for all teachers to be highly qualified and for increased accountability and use of scientifically based practices, there

is a pressing need for educational professionals to increase their skills and knowledge.

However, traditional forms of inservice training generally provide limited meaningful

opportunities and often fail to impact classroom practice and improve the outcomes of

children with and without disabilities (Greenwood & Abbott, 2001). Similarly, traditional

professional development opportunities have lacked the capacity to change teachers'

instructional practices in meaningful ways (Clarke & Hollingsworth, 2002).

 To better meet the growing need for highly qualified educators, a variety of

professional development opportunities must be available. In addition to traditional face-

to-face instruction, professional development may be offered through a variety of

distance learning technologies or hybrid learning methods.

 With current technologies, professional development utilizing distance learning

typically takes place online and may be delivered synchronously or asynchronously.

Another type of online distance learning technology is interactive video conferencing

(IVC). Using IVC for professional development allows learners to attend class sessions

from their homes or at satellite locations (remote sites) and receive instruction similar to

that delivered in traditional face-to-face classrooms (host site). By attending class closer

to home, individuals who typically would not be able to attend colleges or university

programs full-time due to distance could participate, and being closer to home could help

to cut down on costs such as gas, wear and tear on vehicles, child care, and so on. On the

downside, this type of teaching/learning incurs substantial costs for specialized

equipment, the use of high-tech instruction, and prerequisite skills to access/manipulate

the media.

Professional development opportunities may also be offered through hybrid learning, which combines two or more learning models. Supporters of hybrid learning assert that it is an effective and efficient way to provide in-depth delivery of course content and analysis of knowledge (Young, 2002) that and increases student satisfaction (Dziudan & Moskal, 2001; Rivera, McAlister, & Rice, 2002; Wu & Hiltz, 2004). Indeed, some proponents believe that hybrid learning will lead to a paradigm shift in higher education (Allen & Seaman, 2003; Lorenzetti, 2005; Young).

Regardless of the type of learning or instructional medium, the learner's knowledge and skill must be assessed to determine whether an educator has met the competencies or standards of their profession. Thus, after completing a professional development opportunity educators should be expected to deliver the specially designed instruction or implement the specific strategies learned with fidelity (ESEA, 2001).

Internet Video Conferencing in Personnel Preparation

Interactive distance learning has been an available technology since the 1950s and was used first for entertainment purposes (i.e., interactive television). One of the earliest forms of interactive distance learning was *Winky Dink and You* (1953-1957), a children's TV series. In this simple version of interactive television (Brown, 1992), children watching the show would purchase a special plastic screen and then during the show, when prompted by Winky Dink, they would rub the plastic screen with a special cloth or color on it.

Today, interactive distance learning is far more advanced, with real-time/live interactions with two-way video and audio used in Internet video conferencing (IVC). Such advances in IVC technology allow users (e.g., school districts, cooperative service

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centers, libraries) with specialized equipment, such as Polycom cameras, to access professional development opportunities from a distance. Persons participating in professional development now have more convenient opportunities rather than traveling long distances to participate.

However, although IVC is more convenient for those with access, distance education is not without controversy. In particular, much debate has surrounded the quality of instruction (Burbles, 2000; Press, Washburn, & Broden, 2001). Nevertheless, supporters of distance education purport that technology-mediated instruction meets the needs of students and that IHE should embrace technology as a way to improve on the outcomes of the teaching and learning process (Hoffman, 2002).

A similar debate has occurred since the inception of online learning over the quality of instruction and efficacy of learning. In 2009, the U.S. Department of Education completed a large-scale meta-analysis comparing online learning with face-to-face instruction (USDE, 2010). Key findings related to adult learners include that students performed modestly better in online conditions than through face-to-face instruction, and those receiving instruction through a hybrid model combining both face-to-face and online learning had better outcomes than students participating in only face-to-face instruction and students participating only in online instruction.

These findings support equivalency theory, in that no matter where the learning takes place, distance learners should have equivalent learning experiences. These findings also provide some evidence to support the claim that hybrid learning such as combing face-to-face/IVC and online learning is a stronger instructional delivery model than only face-to-face, only IVC or only online.

Special education personnel preparation programs. With a general shortage of highly qualified special educators, and an even more critical shortage in rural and remote areas (Boe & Cook, 2006; McLesky et al., 2004; USDE, 2011b), alternative preparation models were needed. In the 1970s, low-incidence personnel preparation programs were developed using closed-circuit television to provide instruction to larger geographic areas (Ludlow et al., 2005).

Currently, many of these programs use technology-mediated instruction, such as closed circuit television, interactive television, or desk-top videoconferencing. Using current technology provides professional development opportunities to a wider audience than traditional on-campus programs and has the potential to meet teacher shortages in high-need geographic areas.

The effectiveness of distance learning using IVC is an emerging research area in special education personnel preparation programs. Over the past decade, a number of graduate-level personnel preparation programs in low-incidence disabilities utilizing site-based IVC to provide preparation programs in rural communities have been described in the literature (Jameson & McDonnel, 2007; Knapczyk et al., 2001; Ludlow & Duff, 2002; Spooner et al., 2000; Spooner et al., 2007). These programs use a combination of campus and off-campus sites that provide synchronous instruction using IVC. Through these programs, distance education has been found to be effective in preparing special educators to meet the needs to students with low incidence disabilities.

According to Ludlow and colleagues (2005), personnel preparation programs using distance learning (i.e., IVC and online) that were specific to low-incidence disabilities have had positive outcomes, including educators receiving quality

professional development in a field where there are few teachers, IHE having recruited members from rural and remote communities and provided on the job training. Despite the report of positive outcomes, however, published research comparing traditional campus-based special education preparation programs to off-campus or remote site programs using IVC in the last decade is limited (Beattie et al., 2002; McDonnell et al., 2011).

In a study evaluating instruction, Beattie et al. (2002) compared the end-of-semester course evaluations for three groups of students enrolled in a course on instructional methods for learning disablities: a traditional on-campus class ($n = 34$), a synchronous IVC (remote site) ($n = 30$) and a syncrhonous face-to-face on-campus class (host site) ($n = 29$) class. No statistically significant differences were found in the three groups' mean scores (i.e., overall rating, course items, instructor items, general evalution items). It should be noted that none of the evaluation items asked questions related to technology used in the course or communication with the instructor/peers. Course grades were also reported, although not statistically evaluated. In all groups, approximately 80% of the students earned an A for the course; and remaining 20% earned a grade of B.

Based on their findings, Beattie et al. (2002) recommended increased effort from the instrucor to (a) help students at remote sites become part of the larger class and to virtually share the same instructional environment; (b) prepare the content and materials for class; (c) compensate for the separation of the students; and (d) grade course assignments due to the potential increase in the number of students. Other variables discussed that may impact evaluation outcomes included adjusting presentation style based on class size, the number of times the instructor delivers a course from a distance,

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and the type of presentation equipment used (i.e., PowerPoint, overheads/ ELMO, whiteboards).

In a more current and comprehensive investigation, McDonnell et al. (2011) compared the effectivenss of instruction during six specialization courses in a distance and on-campus teacher special education preparation program for low-incidence disabilities. The on-campus teacher licensure program is a two-year, 58-credit hour program that is completed as part of a bachelor's, master's of science, or master's of education degree program. Seventeen teacher candidates were in the on-campus cohort, of these, 14 were earning their bachelor's and 3 were earning their master's of education. The distance program is a post-bachelor's licensure program consisting of the same coursework and field experiences as the on-campus program; it is taught through synchronous IVC instruction to four remote sites. The distance groups met separately from the on-campus classes. Fifteen candidates were in the distance cohort, with 14 having earned a bachelor's and 1 having earned a master's degree.

Five learning outcome measures assessed student acquisition of content (knowledge) and ability to apply the knowledge and skill. Measures included (a) mean gain scores on pre- and posttests in each specialization course, (b) scores on an IEP evaluation rubric, (c) scores on the instructional program evaluation rubric, (d) mean grade-point average in the severe specialization courses, (e) composite scores on the PRAXIS II-Education of Exceptional Students: Core Content Knowledge, and (f) student course and instructor evaluations. In addition, students completed end-of-semester course and instructor evaluations.

The results indicated differences in demographics, whereby the distance cohort had more gender diversity, higher degree level earned, and more experience and higher comfort level with computer technology. Learning outcome measures showed one statistically significant difference in the IEP evaluation rubric, with the distance learning group having lower scores (on-campus cohort: M = 95.8, SD = 6.6; distance cohort: M = 90.2, SD = 8.4; t = -2.2; p = .039). Despite statistically significant differences on one outcome measure, students in both cohorts averaged 90% on the grading rubric. No statistically significant differences were found across groups for course and instructor evaluations. These findings indicate that despite demographic differences, there was little meaningful difference across groups with regard to learning outcomes, ability to apply knowledge to the development of IEPs, development and implementation of instructional programs, PRAXIS II scores, or perceptions of the effectiveness of the courses and instructors.

Similarly, earlier research providing direct comparisons of traditional on-campus and site-based IVC found no significant differences between student learning outcomes, instructor evaluations, and levels of student satisfaction (Beattie et al., 2002; Paulsen, Higgins, Miller, Strawser, & Boone, 1998; Spooner et al., 1999). Spooner et al. suggested seven strategies that may be used to facilitate faculty and student interaction during distance courses so that the students at remote sites feel connected to the students and instructor at the host site. These include (a) establishing a weekly agenda that goes beyond the syllabus, (b) facilitating a weekly student share to encourage class participation, (c) establishing off-line small-group discussion with reporting, (d) tapping sites and individuals at remote sites for questions, (e) encouraging across-site questioning

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by students, (f) traveling to remote sites for broadcast, and (g) playing off the local audience.

To date, only one study has evaluated differences between groups related to acquisition of content (knowledge) and ability to apply the knowledge and skills aquired (i.e., developing and implementing an IEP) (McDonnell et al., 2011). Given the requirements for highly qualified teachers, further research is needed to compare the effectiveness of distance and on-campus programs related to the development of complex knowledge and skills educators are expected to develop.

Autism spectrum disorders personnel preparation programs. In a recent investigation of personnel preparation practices in ASD, Barnhill and colleagues (2011) surveyed 87 IHE offering special education personnel preparation programs; of these, 51 IHE offered ASD-specific coursework and 14 addressed or embedded ASD into other coursework. Further, results showed that 17 IHE offered ASD-specific coursework through distance learning, but did not specify which delivery methods were used or if instruction was synchronous or asynchronous. Through personal communication (2011), Barnhill clarified that the specific survey question asked, "Do you offer online, videoconferencing or distance learning courses? If yes, how many courses." Respondents were then instructed, "Please check the following that apply: (a) partial online instruction, (b) entirely online instruction, (c) partial online and partial campus classroom instruction, and (d) other." The type of distance education medium was not specified.

Ludlow, Keramidis, and Landers (2007) published their initial results on Project STARS (Specialist Training for Autism in Rural Areas), an online graduate-level program that is delivered through synchronous and asynchronous instruction to the

student's computer. In this special education degree program students can choose an emphasis in ASD by taking two 3-credit hour courses that focus on the characteristics of ASD (SPED 650) and educational interventions in ASD (SPED 652). The remaining 21 credit hours of coursework are geared towards high-incidence (mild) disabilities.

Initial results focused on program productivity, participant satisfaction (fall 2006-spring 2007), and identifying the advantages and disadvantages of the online delivery system. Student enrollment in the autism endorsement courses between fall 2006 and spring 2008 showed a significant increase (SPED 650: fall 2006 – 18, fall 2007 – 45; SPED 652: spring 2007 – 23, spring 2008 – 73). Five students completed the autism endorsement in spring 2007 and 15 were expected to complete the endorsement in the spring of 2008. Student satisfaction was measured through 6 out of 24 Likert questions on the end-of-semester course/instructor evaluation. Results were shared for SPED 650 (fall 2006) and SPED 652 (spring 2007). Both courses had high mean Likert scores (1-5 scale) (SPED 650: mean score of 4.77; SPED 652: scores ranged from 4.2-5), indicating a high level of student satisfaction. Finally, the advantages and disadvantages of online delivery were discussed. Specifically, instructors encountered few problems with the online delivery; however, students with limited experience with distance learning technologies experienced technical problems and frustration while learning the online system. Advantages reported included increased access to the program across a broader geographic area, increased enrollment, the ability to provide high-quality content presentations and highly interactive learner interactions at a lower cost, and the opportunity for broader outreach in the future. The author is unaware of any published

studies on single courses or personnel preparation programs in ASD that evaluated the effectiveness of using synchronous site-based IVC instruction.

Development of the Autism Certificate Program

The Autism Certificate Program was developed during the 2007-2008 academic year to provide comprehensive personnel preparation with the collaborative efforts of the state's Department of Education and another regional Midwestern university. The program was created to meet the CEC standards *Teachers of Individuals With Developmental Disabilities/Autism* (2009) (see Appendix A) and focuses on the EBP practices for students with ASD outlined by NAC (2009) and NPDC (Odom et al., 2010). The program reaches across the state to educators needing professional development in ASD using hybrid educational format of face-to-face or IVC and E-learning.

IVC provides synchronous class instruction through two-way audio and video, whereby students can hear and see the instructor or view other course materials (i.e., PowerPoint presentation, video clips, guest speakers) from a remote site (i.e., district office, school library, conference room). Students can verbally and visually interact with the instructor and with students at other sites. IVC allows participants to see on their viewing screen the instructor or class member who is speaking.

Synchronous face-to-face/IVC class sessions typically meet every other week, with the host/originating site transmitting to four remote locations. The Autism Certificate Program uses IVC service provided by a, a non-profit consortium organized to facilitate communication among the state's colleges, universities, and school districts (Kansas Research and Education Network, n.d.). It provides no-cost or low-cost Internet

connectivity via a statewide TCP/IP network. The TCP/IP network has the capacity to transmit synchronously both audio and video feeds to more than 150 locations.

E-learning utilizes computers/mobile devices and the Internet to provide asynchronous instruction and interaction between the instructor and students. Two examples of E-learning activities that are used to provide introductory knowledge in conjunction with assigned textbook readings or journal articles include Tegrity Campus (2011) and the Autism Internet Modules (n.d.). These online tools will be described in Chapter III.

Through this arrangement teachers and related service professionals can access professional development opportunities in ASD closer to home. Licensed teachers and related service professionals who complete the program are recognized by the state as having met specific competencies in ASD, but they are not licensed in ASD.

Summary

The United States has experienced a national special education teacher shortage for almost 20 years (American Association for Employment in Education, 2008; Billingsley, 2003; Boe & Cook, 2006; McLesky et al., 2004; USDE, 2009). In rural and remote school districts, the need for fully certified special educators has reached a critical level (Brownell et al., 2005; Ludlow et al., 2005), with schools experiencing significant difficulties in recruiting (Hammer et al., 2005; Rosenkoetter et al., 2004) and retaining highly qualified special educators (Billingsley, 2004; USDE, 2011b). This shortage has resulted in school districted hiring substitutes and others who have not participated in teacher preparation programs (noncertified staff or on waivers) or are not highly qualified in the subject matter they are teaching (Boe & Cook; SPeNSE, 2002).

The incidence of ASD has dramatically increased to 1 in 88, accounting for approximately 1% of the U.S. population (CDC, 2012a). In schools, students with an ASD diagnosis share varied learning and behavioral characteristics that make this heterogeneous group challenging to teach as one EBP may not work for everybody with the same diagnosis. Once considered a rare and severe disability (low incidence), ASD is now found among students being educated in every academic environment, with 89% spending a portion of their day in the general education setting (USDE, 2011a); it is highly probable, therefore, that most teachers and related service professionals will educate students with ASD at one time or another (Barnhill et al., 2011; McGee & Morrier, 2005).

According to Schopler and Olley (1980) and Simpson (1995, 2003, 2004), most educators are not prepared to effectively teach students with ASD. Therefore, personnel preparation programs in ASD are needed. These programs should be developed with collaboration from states and LEA to meet the needs of students with ASD in rural areas, as well as general and special education teachers, and also be available at the preservice level (Williams et al., 2002). Such collaboration will allow for common outcomes or standards for all educators working with students with ASD (Barnhill et al., 2011) and maximize the utilization of distance education technology (Williams et al.).

The availability of IVC in the Midwestern state where the study was conducted has the potential to provide quality professional development in ASD that meets specific knowledge and skill competencies. Current research supports the use of hybrid distance learning models in learning (USDE, 2010), and the effectiveness of IVC in low-incidence preparation programs has been promising (Ludlow et al., 2005).

The Autism Certificate Program was developed in collaboration with the state department, IHE, and LEA to provide quality professional development to general and special educators across the state. The program uses IVC to provide instruction through a statewide system and the locations change each upon requests from LEA. The knowledge and skills competencies from the CEC (2009) are embedded into meaningful coursework. The present study was designed to identify factors that impact the level of knowledge and skill development and as such provides valuable information for guiding IHE in developing distance learning initiatives.

<center>**Chapter III**</center>

<center>**Research Methods**</center>

Purpose of the Study

The significant increase in autism spectrum disorders (ASD) (CDC, 2012b) has heightened the need for highly qualified educators to teach students on the autism spectrum. In Midwestern state where the research study was conducted, students with ASD account for 3.45% of the school population (KSDE, 2011). This group of students brings unique learning characteristics and behaviors to all academic settings (USDE, 2011a). According to Simpson (2005) and Scheuerman and colleagues (2003), the unique learning needs of students with ASD differ from those of other learners, requiring educators to possess specialized skills to adequately meet their needs.

In this Midwestern state, as is the case in many other states, no independent teacher licensure is required to teach students with ASD, and there are no undergraduate teacher preparation programs solely in special education (KSDE, 2011). According to KSDE, special education is an endorsement area, and one must have a general education teaching license prior to adding the endorsement. For most educators, adding this endorsement occurs at the master's level. The single exception is the Masters of Arts in Teaching Special Education program, which is approved under an "Innovative Program" proviso by the State's Department of Education. Students in this program earn their initial teaching licensure in special education.

Instead of requiring special educators to complete a master's degree program in ASD, the Autism Certificate Program was developed to meet the professional development need for personnel in ASD through 15 hours of graduate coursework

(Stickle, 2008; Stickle, White, & Swanson, 2008). The program's curriculum was designed to meet standards recommended by CEC's *Initial Standards for Teachers of Individuals With Developmental Disabilities/Autism* and the *Common Core Standards* (2009). This connection will be discussed in greater detail in this chapter.

The purpose of this research study was to compare the (a) acquired knowledge and skill and (b) learning experiences of educators enrolled at remote sites to those enrolled at the host site in a post-bachelor's-level course: *Characteristics of Students With Autism Spectrum Disorders.* During the course, the instructor provided face-to-face instruction at the host site for the enrolled students who lived near the satellite campus in an urban metro area and synchronous IVC instruction to the students attending the course at remote sites. All students also participated in asynchronous E-learning activities.

Participants

Potential participants for the study were 132 students who were enrolled in the Autism Certificate course: *Characteristics of Students With Autism Spectrum Disorders* during the fall semesters of 2008 to 2011. A total of 35.6% (47) were enrolled in the course during 2008, 31.1% (41) were enrolled during 2009, 14.4% (19) were enrolled during 2010, and 18.9% (25) were enrolled in the course during 2011. Over the four-year data collection period, 31.1% (41) of the students attended the course at the host site and 68.9% (91) of the students attended at one of the remote sites. The professional development sites will be discussed further in the section describing the settings. Table 1 provides an overview of potential participants by the semester they were enrolled and the professional development site they attended.

Table 1

Potential Participants' Year Enrolled and Type of Professional Development Site

*Attended (*N *=132)*

Semester & Year	Site Enrollment	Total Enrollment	Percent
Fall 2008		47	35.6%
Host	10		
Remote	37		
Fall 2009		41	31.1%
Host	18		
Remote	23		
Fall 2010		19	14.4%
Host	3		
Remote	16		
Fall 2011		25	18.9%
Host	10		
Remote	15		
Total			
Host	41		31.1%
Remote	91		68.9%

To qualify for participating in the study, students must be fully licensed teachers

(general or special education) and/or licensed related services professionals and

employed in teaching positions in either local education agencies or other educational

settings (e.g., special education cooperative) during the semester during which they completed the *Characteristics of Students with ASD* course. After the author had obtained permission to conduct the research study from the cooperating university's Committee for the Protection of Human Research Subjects and the University of Kansas Human Subjects Committee (see Appendix C), participants were informed of the research study via email.

Dillman (2000) suggested multiple contacts be made when using the Internet to conduct research in order to increase response rates. In this study, students who had completed the course were individually contacted via e-mail by the investigator on February 23, 2012. The email briefly overviewed the research study and informed them that they would be receiving a second email about one week later that would include a full description the study, a statement of consent, and a link to Survey Monkey (www.surveymonkey.com) (see Appendix D for samples of email correspondence sent by the principal investigator).

The principal investigator monitored emails received by potential participants by using the advanced features of Microsoft Outlook. Approximately nine email addresses were invalid. The principal investigator worked with the regional midwestern university and the State's Department of Education to find current email addresses for these nine students. A total of 128 out of 132 students received the initial email letter. Four students were not located because they had moved or no longer worked as educators in the state.

Approximately one week later the second email was sent through Survey Monkey (www.surveymonkey.com). Additional follow-up emails were sent to individuals who had not completed or had only partially completed the survey after two weeks, and then

again after three weeks. A final invitation to participate in the research study was sent on March 20, 2012. The survey was closed two weeks later on April 5, 2012.

Setting

Students attended the *Characteristics of Students with ASD* course at 1 of 10 professional development sites. Once accepted into the Autism Certificate Program, students could enroll in the section of the course that was offered at their preferred location/site. It was anticipated that students would attend the site closest to their work or home. The host site, where the instructor provided face-to-face instruction that was broadcast over IVC, was located in an urban area. Over the four-year data collection period, 31.1% (41) of the students attended the course at the host site and 68.9% (91) attended the course at one of the nine remote professional development sites (Table 1). The remote sites are labeled by code and the distance to the host site one-way: Remote C (189 miles), Remote G (362 miles), Remote H1(267 miles), Remote H2 (187 miles), Remote H3 (203 miles), Remote L (391 miles), Remote P (113 miles), Remote S (176 miles), and Remote T (65 miles) . Each year the host site and Remote H1, and Remote P served as professional development sites. The remaining locations varied from year to year, depending upon request and demand. Table 2 lists the frequency and percent of students attending each of the professional development sites.

Table 2

Number and Percentage of Student Attending Each Professional Development Site

Location Attended	Total Enrollment	Percent
Host	41	31.1
Remote P	36	27.3
Remote T	14	10.6
Remote C	9	6.8
Remote H3	9	6.8
Remote H2	7	5.3
Remote H1	6	4.5
Remote S	6	4.5
Remote G	2	1.5
Remote L	2	1.5

Each classroom was set up for IVC with high-speed Internet and each had the following equipment: Polycom™ or similar camera, speakers, microphones, projector, and screen. In addition, the host site had the following equipment: document camera, laptop computer with CD/DVD player, and wireless lapel microphone.

Classroom-style seating was provided at two sites (i.e., Host, Remote H1) wherein participants directly faced the viewing screen and/or instructor. The remaining sites used a conference-room style seating arrangement wherein students were required to turn their heads or their seats approximately 45-90 degrees to look at the viewing screen. Figure 1 shows an example of the classroom and conference room seating arrangements.

During the synchronous IVC instruction, all students were able to see, hear, and interact in real-time with their peers and instructor. Three of the sites (Host, Remote H1, Remote P) had the technological capacity to simultaneously see the speaker (i.e., instructor or student) and the visuals (i.e., PowerPoint, video). The seven remaining sites were able to view either the person speaking *or* the visuals that were being shown. At these seven sites, the instructor determined which content was shown, i.e., the speaker *or* visuals.

Figure 1. Classroom and conference room style setup.

*Each conference table has a minimum of one microphone and one speaker.

Conference Room Style

S S S S	
S	Conference Table
S	
S S S S	

Camera / Screen
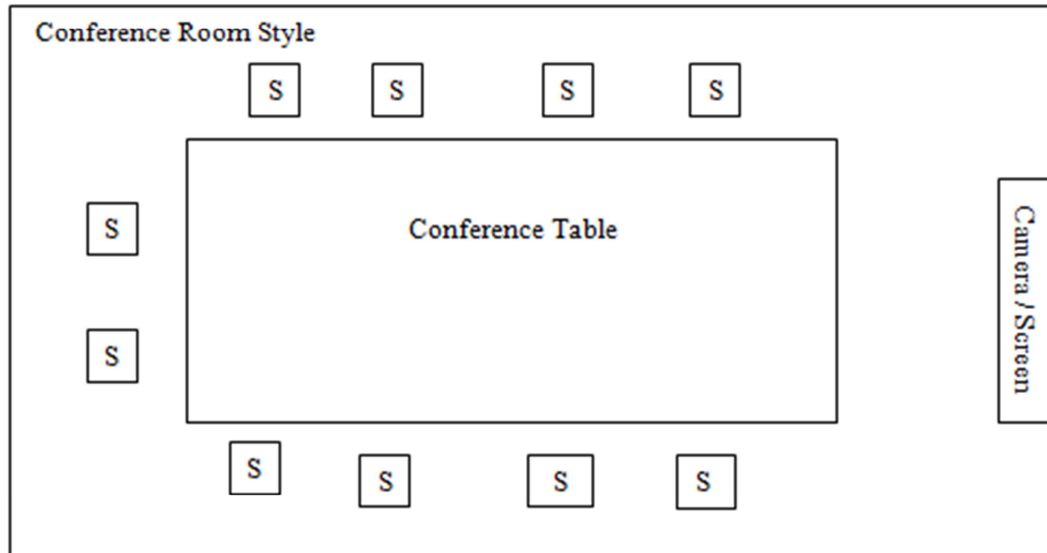
*Each table in the classroom has one microphone and an overhead speaker.

Classroom Style

S	Table	S	Table
S		S	
S	Table	S	Table
S		S	

Camera / Screen / Instructor
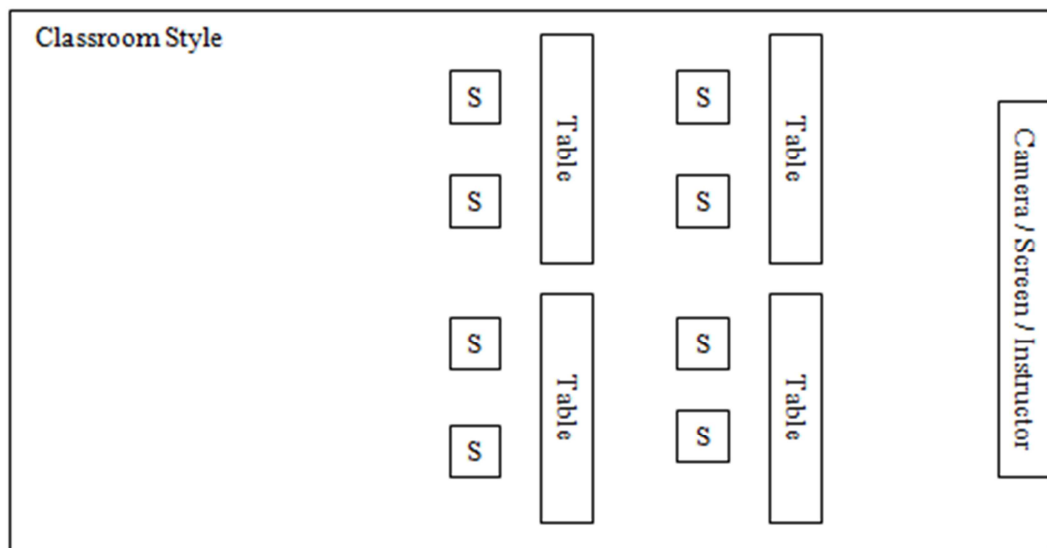
Figure 2. Key: S = Seat.

Procedures

The syllabus for the Autism Certificate course: *Characteristics of Students With Autism Spectrum Disorders,* provided online prior to the first night of the course (i.e., emailed directly to each student), outlined the expectations for completing the course, including course outcomes, the CEC Knowledge and Skills Standards (2009) targeted in the course, course policies, and brief description of assignments. The course schedule, also provided the first night of the course, consisted of a brief description of the lecture topics and a detailed list of assigned readings and videos. Copies of any readings outside of the required textbook were available to students through the university online course management system, ANGEL® Learning Management System Suite 8.0 (2011), and through the university library. At the end of each class session, the instructor reviewed the required activities (i.e., reading, E-learning, quizzes/tests) that were to be completed for the next session.

During the semester-long (16 week) course, instruction was delivered through a hybrid delivery model that utilized synchronous and asynchronous instruction. Synchronous instruction was delivered through face-to-face (host site) and IVC (remote site) class sessions. All sites received synchronous instruction for lecture content, guided practice, discussion, and feedback. Thus, the instruction received by participants at the host (face-to-face) and remote (IVC) sites was the same. Asynchronous instruction was delivered through E-learning activities that took place between the synchronous class sessions. At the end of each synchronous class session, verbal instructions were given, and written instruction were provided on ANGEL® (2011). Thus, the instruction for the asynchronous learning activities was the same for both the host and remote sites. During

the 2008 and 2009 semesters, students attended synchronous classes every week for 16 two-hour sessions. During the 2010 and 2011 semesters, students attended synchronous classes every other week for eight 4-hour sessions. During each synchronous class session, the instructor or guest speaker presented a specific lecture and guided group discussions. (See Appendix E for fall 2011 course schedule, which includes lecture topics, assigned readings and videos, and E-learning activities.) The course content remained the same over the four years, but with changes in how knowledge and skill were assessed through quizzes/tests and the culminating assignment. These changes are discussed later in this chapter.

Course materials for the synchronous and asynchronous instruction were available to students through the course web page on the ANGEL® Learning Management Suite 8.0 (ANGEL®, 2011). ANGEL® provides an integrated web-based rich media system and enables easy distribution and collection of course materials, allowing students to access the course materials and activities from any location with high-speed Internet (i.e., course syllabus, handouts, articles, videos, web links, surveys, tests, and recordings of class lectures). Handouts and other materials for synchronous instruction were posted a minimum of 24 hours prior to class so that student would have time to log into ANGEL® and download or print any of the provided materials. Students were instructed at the beginning of the semester that they were responsible for accessing and downloading/printing the class materials. It was assumed that educators would take responsibility for downloading and/or printing handout materials. Asynchronous E-learning activities were reviewed at the end of each class session, and directions and links to the activities were available in ANGEL®. Additionally, student knowledge and skill

acquisition data were collected through the ANGEL® course web page. These data collection tools are discussed further in the Evaluation section of this chapter.

Tegrity Campus (www.tegrity.com), an online tool designed to support both synchronous and asynchronous learning, also supported the study. Tegrity is a cloud-based lecture capture service. Class content, shared via the instructor's laptop, is instantly captured, then edited, and delivered in the form of podcasts or video. In the ASD Certificate Program, Tegrity Campus was used in two ways. First, all class sessions were recorded and made available to students to review after class (i.e., PowerPoint slides, visual examples, and instructor audio). Second, prior to class meetings, students were able to view lecture-based content and related media in preparation for class. This technology allowed students to access course content at any time from anywhere and permitted them to view the content on a variety of mobile devices (computer, phone, mp3 player, etc). See Appendix F for a screenshot view of an ANGEL® course web page with course content and an embedded Tegrity Campus recording. Students were able to select any of the items on the page to view (i.e., Autism Internet Modules, Tegrity Campus) or to download and/or print paper copies of the materials using their computer (e.g., handouts).

The required course textbook, *Learners on the Autism Spectrum: Preparing Highly Qualified Educators,* edited by Buron and Wolfberg (2008) provided written information related to the topics that were discussed during each class. This textbook was chosen as the foundation of the course because the editors and chapter authors are leaders in the field of ASD (educators, therapists, researchers, parents and persons on the spectrum) and because the content aligned with CEC's professional knowledge and skill

competencies for ASD (2009). (See Appendix G for the CEC professional knowledge and skill competencies targeted in the *Characteristics of Students with ASD* course.)

The textbook covers a range of important topics related to understanding the characteristics of ASD and evidence-based practices (EBP), including (a) overview of ASD, (b) brain-behavior connections, (c) early intervention, (d) structured teaching and environmental supports, (e) sensory processing characteristics and supports, (f) positive behavior supports, (g) peer play and friendships, (h) social thinking (e.g., multiple intelligences, social cognition), (i) systemizing emotions and using technology (e.g., mental-state recognition, using computers to teach emotion recognition, (j) transition, (k) interdisciplinary collaboration, and (l) personal perspectives (e.g., a parent's experience pre- and post P.L. 94-142, an individual's experience growing up with Asperger syndrome).

During synchronous instruction, fundamental elements of designing intervention plans for learners with ASD were presented, including (a) data-collection procedures, (b) functional behavior assessment, and (c) specific EBP. Students with ASD typically have difficulty learning new skills through observation or understanding the most important details or relevant details of a task (National Research Council, 2001) and, thus, require specialized direct instruction and systematic fading of prompting procedures. Therefore, the following EBP were selected to be taught in *Characteristics of Students with ASD*: (a) task analysis, (b) prompting procedures (e.g., least-to-most, simultaneous, graduated guidance), (c) visual supports, (d) individualized schedules, and (e) structured work systems and task organization. The EBP taught in the course were considered to be essential skills for teaching and working with students with ASD and, thus, were the

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foundation for instructing teachers in methods for developing comprehensive

instructional program plans (Aspy & Grossman, 2008). Further, these EBP were chosen

to be taught in the *Characteristics of Students with ASD* course because (a) each could be

taught and practiced in one synchronous class session; (b) the implementation criteria

were straightforward; and t(c) he strategies could be incorporated into a variety of

classroom environments or academic curricula (e.g., the EBP could be utilized to support

a student with ASD in any environment). During synchronous class sessions, students

received (a) lecture-based content that provided an overview of the characteristics of

ASDs and evidence-based research on methods, interventions, and supports for students

with ASD; (b) step-by-step instructions on how to implement the EBP; (c) visual and

written examples of the EBP; and (d) guided practice and discussion.

  During guided practice and discussion, students were given mock scenarios with

which to practice the EBP in class and also had opportunities to discuss and problem

solve the scenarios with peers and the instructor. For example, after learning about task

analysis, the guided practice component of the class involved students individually

completing a task analysis on tying shoelaces and writing out all of the steps. Students

also shared their task analysis with a partner to compare their task analysis steps. The

instructor then asked if any of the partners had the same number of steps or the same

descriptions for their steps (no one had the exact same steps or descriptions). The

instructor then proceeded to prompt the class with questions about why it is important to

have more than one person confirm the steps of a task analysis and to have the individual

student involved in developing the steps. After the discussion, the instructor showed an

example of a task analysis for teaching a young boy to tie his shoes that incorporated

prompting procedures, a visual support, and data collection. Appendix H presents the lesson plan for task analysis and the PowerPoint slides that were shown for this class session, thereby demonstrating the content that was discussed and presented and the learning activities that took place during the guided practice and discussion.

As a part of asynchronous instruction students participated in E-learning activities. E-learning activities rely on the Internet and devices such as a computer. During the 2008 and 2009 semesters, the students completed discussion board activities whereby they were assigned a specific activity such as viewing a video, reading an article or web page related to the topic of the week, and then answering specific questions using the online discussion board. Students were given parameters for what to include in their original post (answering the questions) and what/how to discuss and respond to peers. The parameters primarily included how to answer the specific questions, the length of responses, and the need to generate original content (i.e., students were instructed to write using their own words and to not cut and paste comments from other sources). For example, during the session on early intervention, students learned about the "red flags" of autism. At the end of class, students were assigned to view a video of an infant girl "playing" and then were to participate in a discussion board to identify and discuss the "red flags" of autism that the young girl displayed.

Based on relatively low levels of student participation and student feedback related to the above asynchronous instructional format, the discussion conditions for the course were modified during the 2010 and 2011 semesters. Specifically, the discussions were embedded into the synchronous class sessions, allowing for more meaningful and guided discussion.

As a replacement for the online discussion boards, during the 2010-2011 semesters, the instructor used the Autism Internet Modules (AIM) (www.autisminternetmodules.org) for the E-learning activities. AIM was developed by The Ohio Center for Autism and Low Incidence (OCALI) in partnership with other organizations (Arizona Department of Education, Autism Society of America, Easter Seals, Geneva Centre for Autism, Indiana Resource Center for Autism, Kansas State Department of Education, The National Professional Development Center on Autism Spectrum Disorders, Ohio Department of Developmental Disabilities, Ohio Department of Education, Ohio State University, University of Louisville/Kentucky Autism Training Center, Nebraska Autism Spectrum Disorders Network, University of Miami/Nova Southeastern University – Center for Autism and Related Disabilities) to provide professional development in the area of ASD.

These free evidence-based modules focus on a variety of topics linked to educating children and youth with ASD, including assessment and identification, characteristics of ASD, and EBP and interventions. Each module begins with a preassessment (i.e., short forced-choice quiz) and then provides an overview of the module objectives and CEC Professional Standards (i.e., what the participant will be able to do after completing each module and the specific CEC Standards that targeted). The modules discussing EBP provided step-by-step instructions for planning and implementation; and deliver the content through a combination of written text, visual examples such as photographs, and video examples. Each module ends with a postassessment (i.e., same questions as the preassessment). A resource section for each module includes discussion questions and suggested learning activities. In addition, the

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resource section for EBP includes a complete copy of the CEC Professional Standards, a copy of the step-by-step instructions for planning and implementation, and data collection forms.

Upon completion of the assigned AIM, students downloaded and submitted their pre- and postassessments results created by AIM to the course instructor. The AIM items that were included in the *Characteristics of Students with ASD* course deemed to support the development of student knowledge and skill in topical areas were identified in the class syllabus. See Appendix I for a description of the module content.

Evaluation

As noted, the purpose of this study was to compare acquired and perceived knowledge and skill development related to teaching students with ASD under two learning approaches: face-to-face instruction and IVC instruction. The coursework described above was used to teach the knowledge and skills to participating teachers that they needed to effectively teach learners with ASD. Relative to evaluating the effects of this instruction, EBP examinations measured the students' knowledge, and a culminating EBP project measured their skills. Furthermore, to determine students' perceived knowledge and skill acquisition, participants completed the *Perceived Knowledge and Skills – Autism Survey.* All course-related materials were distributed and collected through ANGEL® and the *Perceived Knowledge and Skills – Autism Survey* was delivered and data collected through Survey Monkey (www.surveymonkey.com).

EBP examinations. Participants' knowledge was measured using exam questions. Questions in the tests or quizzes were from the instructor materials from the course textbook (Buron & Wolfberg, 2008) or original questions created by the

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instructor. The questions incorporated from the textbook instructor materials assessed the following course objectives:

1.   To demonstrate knowledge of current research related to etiology of ASD and to interpret research findings in jargon-free language

2.   To articulate etiological factors

3.   To identify the core and associated characteristics of individuals with ASD

4.   To describe the distinguishing features between disorders on the autism spectrum

5.   To identify information regarding co-existing conditions connected to ASD

6.   To identify resources on ASD, including publication/journals, organizations, and website

7.   To identify legal issues that impact education and practice in the field of special education and related services for individuals with ASD

The questions created by the instructor assessed the principles and guidelines of the following EBP components that were covered in the course: (a) data collection procedures, (b) structured work systems, (c) task analysis, and (d) prompting procedures. Examination question were in the form of multiple-choice items, letter or number matching (i.e., matching terminology to the correct definition), putting the steps of task analysis in order, fill-in-the-blank, and essay questions.

The EBP examinations, which accounted for approximately 25% of the course grade, were administered online through ANGEL® outside of the synchronous class session. Students were given one week to complete these examinations. The quizzes and

tests were set up so that the students could access their exam as many times as they needed to complete it and, when ready, they submitted the exam online. Any essay or short answer-type questions were to be written in students' own words (i.e., they could not copy the answers found in the textbook).

Most of the examination questions were originally from the instructor textbook materials (i.e., publishing company developed questions) and questions on EBP were developed by the instructor when *Characteristics of Students with ASD* was first offered in 2008 and then modified at the end of each subsequent term. These amendments were based on student feedback and performance and analysis per ANGEL® item analysis (i.e., reliability analysis of individual items that was completed through ANGEL®). The instructor kept track of student feedback on items where students asked for clarification or if students said that a question was confusing or not clear. Following each examination, the instructor ran a reliability analysis through ANGEL®. Items scoring less than .75 were evaluated by the instructor and modified to ensure that they were clearly written and understood for future use.

The frequency and length of the EBP examinations changed over the four years the course was offered. During the first two years (2008-2009), quizzes were given every other week (around the topic areas discussed in class). During the third and fourth year of the program (2010-2011), the questions were combined into a midterm (Weeks 1-8) and final exam (Weeks 1-16). This change was based on feedback from students plus the fact that the instructor was spending a considerable amount of time posting and grading the quizzes. Having the EBP examinations at midterm and end of semester also allowed the students more time to process the content rather than taking an exam immediately after

the content was delivered. Examples of examination questions from the midterm and final exam are shown in Appendix J.

Culminating assignments (functional behavior assessment or task analysis). Participants' skill acquisition was measured using a culminating assignment. During the 2008 semester, students completed a functional behavior assessment, and during 2009-2011 semesters students completed a task analysis. Appendix K provides a side-by-side comparison of the culminating assignments. Appendix L includes the detailed directions, data-collection forms, and reflection questions for the FBA (a grading rubric was not used for the FBA). Appendix M includes the detailed directions, data-collection forms, reflection questions, and the grading rubric for the task analysis.

When completing the functional behavior assessment, students were first required to choose a specific student behavior to operationally define. Second, they were to practice interrater reliability with at least one other person and then collect 5-10 data points using an antecedent-behavior-consequence (ABC) data chart. Finally, they were to hypothesize the function of the behavior and propose an intervention or strategy to implement to modify the identified response.

The ABC data were cut and pasted into an instructor-created TEACCH ABC form and the students' underlying characteristics of autism were included. Based on the ABC data and the identified underlying characteristics participants were required to hypothesize the function of the behavior and propose an intervention or strategy.

Using the results from the ABC and TEACCH ABC, the students were required to compare and contrast the results from the two ABC procedures to determine which method they thought was more effective for identifying the potential cause of the

operationally defined behavior and selecting an appropriate strategy or intervention. Students submitted the two data-collection forms and answered a series of questions.

When completing the task analysis project, participants chose a specific task to teach a child. Then they completed a task analysis that broke the task down into more manageable components for teaching based upon students' needs. Participants subsequently created an individualized structured work system, determined prompting procedures, and incorporated additional EBP, as needed, to teach the task. Next, students implemented the EBP and collected data.

Students submitted a paper that described how they completed the steps of the task analysis, created the structured work system, determined prompting procedures, and set up the data-collection system. In addition, they reflected on the following questions: 1. What did you learn by completing this assignment? 2. What would you do differently next time? 3. How could you incorporate task analysis into your teaching?

An instructor-designed grading rubric was used to score the task analysis assignment. The rubric, shown in Appendix M, was based on the Implementation Checklist for Structured Work System (Hume & Carnahan, 2008), Implementation Checklist for graduated Guidance (Neitzel & Wolery, 2010a), Implementation Checklist for Least-to-Most Prompting (Neitzel & Wolery, 2010b), Implementation Checklist for Simultaneous Prompting (Neitzel & Wolery, 2010c), Implementation Checklist Task Analysis (Franzone, 2009), as well as data-collection procedures (Babkie, 2007; Babkie & Provost, 2004; Utah State Office of Education, n.d.).

Perceived Knowledge and Skills – Autism Survey. The *Perceived Knowledge and Skills – Autism Survey* (Swanson, 2012) was designed to measure student perceived

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knowledge, skill, and learning experiences. The survey collected the following

information: (a) approval for participation, (b) demographic information, (c) previous

distance learning experience, (d) employment information, (e) perceived knowledge and

skills, (f) perceived achievement of course objectives, and (g) learning experiences. The

survey was based upon the course objectives and adapted from two other surveys,

General Competencies in Autism Spectrum Disorders (Robbins, 2010) and *Modified*

Online Learning Survey (Dove, 2006). Thirty-nine of the survey questions were forced

choice and four questions were open-ended.

The following two open-ended questions were coded for common responses and

then analyzed: 1. At the time you took the course, what county/counties) were you

employed? 2. Name three ways you have implemented what you learned in

Characteristics of Students with ASD. The remaining two open-ended items were used

for descriptive and qualitative feedback: 1. Do you have any suggestions on how to

improve the course? 2. Do you have any other comments or feedback you would like to

share about the course. The survey was administered through Survey Monkey

(www.surveymonkey.com). A copy of the survey as it appeared in Survey Monkey is

shown in Appendix N.

Data Analysis

All course data were downloaded from ANGEL®, and the Survey Monkey data

were downloaded and organized into two separate *Excel* files. All data were reviewed for

accuracy and completion by the researcher and verified by a colleague/faculty member.

This included making sure that all data were transferred from the online systems to the

correct line in the *Excel* file (e.g., the online data for Student A and was correctly

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transferred the row in the *Excel* file for Student A). Cases where data were missing were highlighted, and the researcher/instructor searched for the missing information (e.g., double-checked ANGEL®, looked through saved files on the instructor's computer, collected course grades from student transcripts; for missing Survey Monkey data, students were contacted and asked to complete incomplete sections). When the researcher deemed that all possible data were collected and accurately displayed in the two *Excel* files, they were then combined into one *Excel* spreadsheet.

Data were then uploaded into the *Statistical Package for the Social Sciences 20.0* (SPSS) (2011) with assistance from the University of Kansas Center for Research and Data Collection Methods. Course data included the overall course grade (aggregate letter grade based on the quiz/exams, culminating assignment, and E-learning activities), quiz/exam percentage (i.e., semester average), and culminating assignment percentage score. Survey responses included (a) approval for participation, (b) demographic information, (c) distance learning experience, (d) employment information, (e) knowledge and skills, (f) obtainment of course objectives, and (g) learning experiences. Demographic, distance learning experience, and employment questions were primarily forced questions, with one open-ended question coded for analysis (i.e., "At the time you took the course, what county/counties were you employed?"). Perceived knowledge and skills, achievement of course objectives, and learning experiences were Likert-scale responses and three open-ended questions. The open-ended "Name three ways you have implemented what you learned in *Characteristics of Student with ASD*" was coded for common responses (i.e., implementing EBP interventions, understanding the characteristics of ASD, teacher/paraeducator training, etc.). Two other open-ended

questions related to student learning experiences (i.e.,"Do you have any suggestions on how to improve the course?" and "Do you have any other comments or feedback you would like to share about the course") were descriptively and qualitatively evaluated.

Basic statistical frequency data were used to organize the first four sections of the survey: (a) approval to participate in the research survey, (c) demographic information, (c) distance learning experience, and (d) employment information. Results of these four sections determined whether a teacher was qualified to participate in the study. Of the 132 teachers who were enrolled in *Characteristics of Students with ASD*, 101 (76.5% of the total number) responded to the survey and 83 (62.8% the class, 82.1% of the survey respondents) were qualified to participate. Twenty-six (31.3%) participated in the course from the host site and 57 (68.7%) participated in the course from a remote site.

A reliability analysis was conducted on the results of Likert-scale question sections of the *Perceived Knowledge and Skills – Autism Survey* by calculating the Cronbach's alpha coefficient for each Likert-scale item. A reliability analysis is conducted to determine if there is consistent scoring. Establishing internal consistency is the easiest way to demonstrate reliability of survey items. Cronbach's (1951) alpha coefficient determines the internal consistency or average correlation of scale items to gauge internal consistency reliability.

The internal consistency was evaluated for each of the Likert-scale question sections developed for this study by determining the coefficient scores from the student perceived level of knowledge and skill, course objectives, and learning experiences of the *Perceived Knowledge and Skills – Autism Survey*. The closer Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items in the scale. For this

type of measure, a coefficient greater than 0.7 is generally considered an acceptable reliability coefficient (Nunnally & Bernstein, 1994).

A chi-square test was subsequently conducted to determine whether students who participated through face-to-face or distance learning (IVC) had the same employment experiences and previous distance learning experience. Independent *t*-tests (Green & Salkind, 2003) were conducted on the continuous variables to evaluate the difference between the means of the face-to face and IVC groups. The continuous variables included examination scores and culminating assignment scores, as well as perceived knowledge and skills, achievement of course objectives, and learning experiences on the *Perceived Knowledge and Skills – Autism Survey*.

Initial results indicated that measures were not normally distributed (negatively skewed). Therefore, the Mann-Whitney *U* test was conducted to compare medians (Mann & Whitney, 1947). The test compared the face-to-face and IVC groups for knowledge (examination scores), skill (culminating assignment score), as well as perceived knowledge and skills, achievement of course objectives, and learning experiences on the *Perceived Knowledge and Skills – Autism Survey*. *Excel* was used for a more accurate analysis and comparison of medians for all Likert items included in the Mann-Whitney *U* test.

Research Questions

Two basic research questions guided this investigation. These questions focused on whether individuals who received IVC instruction achieved the same level of "knowledge" or "understanding" (i.e., skills) as those at a host site where face-to-face instruction was delivered. Questions were as follows:

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1. Are educators who participate in synchronous IVC instruction from remote sites able to achieve the same level of knowledge and skills as educators who participate in synchronous face-to-face instruction at the host site?

2. Are educators' perceived learning experiences similar at both the host and remote sites?

Summary

This chapter presented the research methods for the study, including a description of course instruction and course delivery methods (e.g., E-learning, face-to-face, IVC), and data collection and analysis methods. To ensure research integrity, the research was conducted following internal review board approval per protocol of the University of Kansas and the regional Midwestern university where the research study took place.

CHAPTER IV

Results

This study was organized around two major research questions: 1. Are educators who participate in synchronous IVC instruction from remote sites able to achieve the same level of knowledge and skills as educators who participate in synchronous face-to-face instruction at the host site? And 2. Are educators' perceived learning experiences similar at both the host and remote sites?

This chapter presents data and information related to addressing these two major topics as well as other results-linked information and data. Prior to discussing the two major research questions, preliminary matters will be addressed. First, the assessed knowledge and skill of the potential pool of participants are described. Second, the results of the invitation to participate in the research study are discussed. This is followed by the internal consistency analysis regarding the reliability of the Likert-scale items from the *Perceived Knowledge and Skills – Autism Survey*. Next, the summary of the survey responses by both groups is discussed, including (a) a description of respondent characteristics (demographic statistical information, prior distance learning experience, employment information); and (b) item means, standard deviations, frequencies, and percentages for perceived knowledge and skills, course objectives, and student learning experiences. Then the evaluation results of student knowledge and skill are reported by group (i.e., host/face-to-face or remote/IVC). The results include the EBP exam averages, the culminating assignment scores, E-learning activity averages, and the overall course grades. Next, results of the statistical analysis of the research questions are discussed. The chapter ends with a summary of the results.

Participants

One-hundred and thirty-two (132) students completed the Autism Certificate course: *Characteristics of Students with ASD*, during the following fall semesters, 2008 ($N_1 = 10$, $N_2 = 37$), 2009 ($N_1 = 18$, $N_2 = 23$), Fall 2010 ($N_1 = 3$, $N_2 = 16$), and Fall 2011 ($N_1 = 10$, $N_2 = 15$). Of these, 29.5% (39) of the students attended the course at the host site and 70.5% (93) attended at a remote site. Table 3 provides course grade frequency and percentages for all students who completed the course. Course letter grades earned by participants at the host site were as follows: 90.24% (37) earned an A, 4.87% (2) earned a B, 0% (0) earned a C, 2.43% (1) earned a D, and 2.43% (1) earned an F. By comparison, course letter grades earned by participants at the remote sites included: 85.72% (78) earned an A, 10.98% (10) earned a B, 2.19% (2) earned a C, 0% (0) earned a D, and 1.09% (1) earned an F. These scores reveal that the face-to-face (host) and IVC groups (remote) were similar in level of grade-connected assessed knowledge and skill prior to the participant selection and approval process.

Table 3

Potential Participant Course Grade Frequency and Percentages (N =132)

Descriptive Variables	Host (n = 41)		Remote (n = 91)	
	Frequency	%	Frequency	%
A	37	90.24%	78	85.71%
B	2	4.87%	10	10.98%
C	0	0%	2	2.19%
D	1	2.43%	0	0%
F	1	2.43%	1	1.09%

Invitation to Participate in the Study

One hundred thirty-two (132) students who had enrolled in the course:

Characteristics of Students with ASD course were emailed an invitation to participate in

the research study on February 23, 2012. The final e-mailed invitation was sent on March

20, 2012, and the survey was closed on April 5, 2012. Thus, active participant

recruitment occurred for six weeks.

One hundred and two (77.2%) students attempted to respond to the survey. Two

did not complete enough of the survey for the results to be included, and eight were not

working in education settings as certified/licensed teachers or related service

professional. Ninety-one (68.93%) of the surveys had enough data to be considered valid

(completed at least one or more Likert-item section) or were complete.

Internal Consistency of the *Perceived Knowledge and Skills – Autism Survey*

The *Perceived Knowledge and Skills – Autism Survey* was developed by the course instructor based upon the course objectives and adapted from two other surveys, *General Competencies in Autism Spectrum Disorders* (Robbins, 2010) and *Modified Online Learning Survey* (Dove, 2006). The survey included 39 forced-choice (multiple choice and Likert) and four open-ended questions. The survey had not previously been administered; therefore, it was necessary to determine the reliability of the Likert items that were comparing student perceived knowledge, achievement of course outcomes, and learning experiences. Reliability was assessed by completing an internal consistency analysis.

An internal consistency analysis measures how well the instrument delivers reliable scores. A reliability coefficient can be estimated using internal consistency (Green & Salkind, 2003). Cronbach's alpha is used to assess consistency in scores among equivalent items. Cronbach's alpha reliability coefficient normally ranges between 0 and 1. The closer Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale. It is generally accepted that a coefficient score that is greater than 0.7 is an acceptable reliability coefficient (Nunnally & Bernstein, 1994).

An analysis of consistency was conducted with the Likert scale items on the *Perceived Knowledge and Skills – Autism Survey.* The data analysis using Cronbach's alpha for reliability testing yielded a result of .92 for all Likert items. Further analysis of each subdomain of the survey led the following results related to student perceived: (a) knowledge and skills: .93; (b) achievement of course objectives: .96; and (c) learning

experiences: .75. Since all scores were above .7, no items were eliminated to increase reliability.

Perceived Knowledge and Skills – Autism Survey **Results**

This section describes the results of the *Perceived Knowledge and Skills – Autism Survey,* starting with respondent characteristics, including descriptive frequencies of demographics, distance learning experience, and employment data. These results are shown in Tables 4, 5, and 6, respectively. Next, the students' perceived knowledge and skills, achievement of course objectives, and learning experiences are discussed. Descriptions include means and standard deviations for Likert-scale and ranked items as well as frequencies and percentages for all remaining data. The results for student perceived knowledge and skills are shown in Tables 7 and 8, course objectives are listed in Table 9, and student learning experiences may be found in Tables 10,11, and 12.

Independent variables: Synchronous face-to-face (host site) or synchronous IVC instruction (distance/remote sites). Participants were asked to indicate which location they attended during the course given 10 options broken down into: (a) host site (face-to-face instruction – 1 option) or (b) remote sites (IVC instruction – 9 options). Table 4 provides total frequency for host and remote sites participants completing the survey. As illustrated, 34.06% (31) of educators who took the survey attended the host site and 65.93% (60) attended a remote site.

Year respondent enrolled in the course. Participants were asked to indicate which year they enrolled in the course. Respondents were given four options: (a) 2008, (b) 2009, (c) 2010, and (d) 2011. Frequency and percentages varied across all four years. Table 4 provides course enrollment frequency and percentages.

Number of miles participants drove one way to attend class. Participants

estimated the number of miles from their home to the site they attended (one way), given

the following 11 options: (a) less than 5 miles, (b) 5-15, (c) 16-25, (d) 26-35, (e) 36-45,

(f) 46-55, (g) 56-65, (h) 66-75, (i) 76-85, (j) 86-95, and (k) more than 95 miles. Most

students for the host and remote sites drove fewer than 35 miles one way to class. Table 4

provides frequency and percentages for number of miles driven one way.

Highest degree earned prior to taking this course. Participants were asked to

indicate the highest degree earned prior to taking the *Characteristics of Students with*

ASD course, given three options: (a) bachelor's, (b) master's, and (c) doctorate. For both

the host and remote sites, more than 60% of the participants had completed a master's

degree. Table 4 lists frequency and percentages for highest degree earned.

Table 4

*Respondent Demographic Characteristics (*N = *91)*

Descriptive Variables	Host (n = 31)		Remote (n = 60)	
	Frequency	%	Frequency	%
Semester Enrolled				
2008	5	16.12%	23	38.33%
2009	14	45.16%	12	20.0%
2010	4	12.9%	13	21.67%
2011	8	25.8	12	20.0%
Miles to Site				
Less than 5	2	6.5%	13	21.7%
5-15	6	19.4%	12	20.0%
16-25	10	32.3%	4	6.7
26-35	4	12.9%	8	13.3%
36-45	2	6.5%	7	11.7
46-55	2	6.5%	4	6.7%
56-65	2	6.5%	4	6.7%
66-75	1	3.2%	3	5.0%
76-85	1	3.2%	3	5.0%
86-95	1	3.2%	1	1.7%
More than 95 miles	0	0%	1	1.7%

Degree Level

Bachelor's	11	35.5	19	31.7
Master's	19	61.3%	40	66.7
Doctorate	1	3.2%	1	1.7%

Number of previously completed online courses. Participants were asked to indicate the number of online courses they had previously completed, given three options: (a) 0, (b) 1-2, and (c) 3 or more. Approximately 70% of respondents from both the host and remote groups had previously participated in one or more online course. Table 5 provides frequency and percentages for the number of previously completed online courses.

Number of previously completed hybrid courses. Participants were asked to indicate the number of previously completed hybrid courses. Hybrid courses combine two or more learning media, such as face-to-face and online instruction. Respondents were given three options: (a) 0, (b) 1-2, and (c) 3 or more. Approximately 60% of respondents from both the host and remote groups had not previously taken a hybrid course. Table 5 provides frequency and percentages for number of previously completed hybrid courses.

Number of previously completed interactive videoconferencing courses. Participants were asked to indicate the number of IVC courses they had previously completed, given three options: (a) 0, (b) 1-2, and (c) 3 or more. Approximately 50% of respondents from both the host and remote groups had not previously enrolled in an IVC

course. Table 5 provides frequency and percentages for number of previously completed IVC courses.

Type of site(s) attended for interactive videoconferencing courses. Participants were asked to indicate the type of site(s) they had attended for IVC courses prior to taking the present course, given three options: (a) host, (b) remote, and (c) N/A (had not previously participated in an IVC course); they could select all options that applied. Results indicated that host site participants were more likely to have previously participated in an IVC course from the host site, whereas remote site participants were more likely to have previously participated in an IVC course from the remote site. Table 5 provides frequency and percentages for type of site attended for previous IVC courses.

Degree level at which distance learning course occurred. Participants were asked to indicate what degree they were working on when they participated in previous distance learning courses, given three options: (a) bachelor's, (b) postbachelor's, and (c) N/A. Approximately 70% of both the host and remote site respondents participated in distance learning courses at the postbachelor's level. Table 5 provides frequency and percentages for the degree level at which previous distance learning courses occurred.

Table 5

Previous Distance Learning Experience (N = 91)

Descriptive Variables	Host (Face-to-Face) (n = 31)		Remote (IVC) (n = 60)	
	Frequency	%	Frequency	%
Previous Online Courses				
0	9	29.0%	18	30.0%
1-2	14	45.2%	18	30.0%
3 or more	8	25.8%	24	40.0%
Previous Hybrid Courses				
0	19	61.3%	39	65.0%
1-2	11	35.5%	14	23.3%
3 or more	1	3.2%	7	11.7%
Previous IVC Courses				
0	17	54.8%	31	51.7
1-2	13	41.9%	22	36.7%
3 or more	1	3.2%	7	11.7%
Type of IVC Site Attended				
Host	6	19.4%	1	1.7%
Remote	5	16.1%	24	40.0%
N/A	17	54.8%	31	51.7%

*Both Host & Remote	3	9.7%	4	6.7%

When Distance Learning

Occurred

Bachelor's	4	12.9%	5	8.3%
Postbachelor's	22	71.0%	42	70.0%
N/A	5	16.1%	13	21.7%

*Both Host & Remote for Type of IVC Site Attended was not a selection option for participants, and results do not impact the overall frequency and percentage for the variable category.

Employment during Characteristics of Students with ASD. Participants were asked to indicate their position in an educational setting at the time they took the course. Respondents were permitted to select more than one position if applicable to their employment. Respondents were given nine options: (a) administrator, (b) general educator, (c) occupational therapist, (d) physical therapist, (e) psychologist, (f) social worker, (g) special educator, (h) speech-language therapist, and (i) other. For "other," a space was provided for writing a response. Approximately 70% of both the host and remote site respondents were special educators. Table 6 provides frequency and percentages for employment positions during *Characteristics of Students with ASD*.

Years working in the field of education. Participants were asked to indicate the number of years they had worked in the field of education, given seven options: (a) less than one year, (b) 2-3, (c) 4-5, (d) 6-10, (e) 11-15, (f) 16-20, and (g) greater than 20 years. Over 60% of both the host and remote site respondents reported having worked in the field of education for six years or more. Table 6 provides frequency and percentages for years working in the field of education.

Years working with students with ASD. Participants were asked to indicate the number of years they had worked with students with ASD, given seven options: (a) less than one year, (b) 2-3, (c) 4-5, (d) 6-10, (e) 11-15, (f) 16-20, and (g) greater than 20 years. Approximately 50% of both the host and remote site respondents reported having worked for five years or less with students with ASD. Table 6 provides frequency and percentages for number of years working with students with ASD.

County/counties working in: Frontier to urban continuum. Participants were asked to indicate the county/counties they worked in. Answers were coded into five response options: (a) frontier (fewer than six persons per square mile), (b) rural (six to 19.9 persons per square mile), (c) densely settled rural (20 to 39.9 persons per square mile), (d) suburban (40 to 149.9 persons per square mile), and (e) urban (150 or more persons per square mile). Seventy-seven percent of the host site respondents reported they worked in an urban county, whereas more remote site respondents reported they worked in suburban, densely settled rural, rural or frontier counties. Table 6 provides frequency and percentages for counties working in.

Educational setting employed in during Characteristics of Students with ASD. Participants were asked to indicate the type of educational setting they were employed in at the time they took the course, given four options: (a) school district, (b) private school, (c) cooperative/ interlocal, and (d) other. Seventy-four percent of the host respondents reported they worked for a school district, whereas approximately half of remote site respondents reported working for a school district and the other half working for a cooperative or interlocal. Table 6 provides frequency and percentages for educational setting employed in.

Table 6

Respondent Employment Characteristics During Characteristics of Students with ASD (N

= 91)

Descriptive Variables	Host (Face-to-Face) (n = 31)		Remote (IVC) (n = 60)	
	Frequency	%	Frequency	%
Position				
Administrator	0	0.0%	3	5.0%
General educator	0	0.0%	6	10.0%
Occupational therapist	0	0.0%	0	0.0%
Physical therapist	0	0.0%	0	0.0%
Psychologist	1	3.22%	2	3.33%
Social worker	1	3.22%	0	0.0%
Special educator	23	74.19%	39	65.0%
Speech language therapist	4	12.9%	7	11.67%
Other	6	19.35	8	13.33%
Years in Education				
Less than 1 year	0	0.0%	1	1.7%
2-3	7	22.6%	7	11.7%
4-5	5	16.1%	11	18.3%
6-10	10	32.3%	15	25.0%

11-15	4	12.9%	10	16.7%
16-20	3	9.7%	5	8.3%
Greater than 20 years	2	6.5%	11	18.3%
Years Working With ASD				
Less than 1 year	3	9.7%	10	16.7%
2-3	7	2.6%	14	23.33%
4-5	6	19.4%	11	18.3%
6-10	9	29.0%	14	23.33%
11-15	3	9.7%	6	10.0%
16-20	3	9.7%	1	1.7%
Greater than 20 years	0	0.0%	4	6.7%
Geographic Area				
Frontier	1	3.22%	4	6.67%
Rural	4	12.9%	15	25.0%
Densely settled rural	3	9.67%	18	30.0%
Suburban	6	19.35%	23	38.33%
Urban	24	77.42%	11	18.33%
Educational Setting				
School district	23	74.2%	29	48.3%
Private school	0	0.0%	1	1.7%
Cooperative/interlocal	8	25.8%	28	46.7%
Other	0	0.0%	2	3.3%

Note. Employment position and geographic location: respondents could select all options that applied.

In the next section of the survey, participants responded to six Likert questions that asked about how well the course objectives were met.

Perceived knowledge and skill. In this section of the survey, participants responded to seven questions that asked about the level of knowledge and skill they had achieved at the completion of the course. Six questions were Likert-scale items and one was designed to solicit open responses. The six Likert items used a 1-7 rating scale with the extreme variables described. A response of "1" meant "no – not at all" and a "7" meant "yes-very much." The means and standard deviations for these items are presented in Table 7.

Table 7

Mean Scores for Student Perceived Knowledge and Skill

		Host		Remote	
Questions		*M*	*SD*	*M*	*SD*
Item 19:	Has your work-related knowledge increased?	5.94	1.26	5.87	1.2
Item 20:	Has your work-related skills increased?	5.87	1.09	5.70	1.21
Item 21:	Did this course help you identify characteristics of learners with ASD?	5.94	1.29	6.03	1.07
Item 22:	Did this course help you identify evidence-based practices for students with ASD?	6.19	1.20	5.8	1.13
Item 23:	Did this course provide information about how to implement evidence-based practices with fidelity?	6.00	1.07	5.72	1.06
Item 24:	Did your practice with students with ASD change as a result of this course?	5.90	1.19	5.43	1.44

The open-ended-question, Item 25, asked participants to name three ways they implemented what they learned in the course. Open responses were coded for common themes. Frequencies and percentages are presented in Table 8.

Table 8

Frequencies and Percentages for Item 25: Name Three Ways You Have Implemented What You Learned in the Course (N =89)

| | Host | | Remote | |
| | (n = 31) | | (n = 58) | |
Descriptive Variables	Frequency	%	Frequency	%
Identification of characteristics	19	61.13%	45	77.59%
Evidence-based practices	25	80.64%	41	70.69%
Strategies (non-EBP)	17	54.84%	27	46.55%
Curriculum/instruction	7	22.58%	16	27.59%
Professional development/consultation	8	25.81%	10	17.24%
Sharing resources	9	29.03%	9	15.55%
Parent training	2	6.45%	2	3.49%
Assessment for daily programming	6	19.35%	7	12.07%
IEP/parent relationships	5	16.13%	5	8.62%
Collaboration	2	6.45%	4	6.9%
Autism team	5	25.81%	10	17.24%
Student awareness	1	3.22%	1	1.72%

Perceived achievement of course objectives. In this section of the survey,

participants responded to six Likert questions that asked about how well the course

objectives were met. The items used a 1-7 rating scale with only the extreme variables

described. A response of "1" meant "completely disagree" and "7" meant "completely

agree." The means and standard deviations for responses to these items are presented in

Table 9.

Table 9

Mean Scores of Student Perceived Achievement of Course Objectives

Questions		Host (*n* = 31)		Remote (*n* = 60)	
		M	*SD*	*M*	*SD*
Item 26:	Describe the core characteristics of ASD.	6.35	.79	6.33	.95
Item 27:	Describe the associated characteristics of individuals with ASD.	6.39	.80	6.27	.95
Item 28:	Describe the distinguishing features between disorders of the ASD.	6.26	.82	6.12	1.10
Item 29:	Plan ASD strategies or interventions discussed in this course.	6.35	.66	6.05	1.17
Item 30:	Implement ASD strategies or interventions discussed in this course.	6.42	.62	6.10	1.2
Item 31:	Evaluation the effectives of strategies or interventions discussed in this course.	6.26	.82	5.97	1.09

Learning experiences. The final section of the survey asked participants to respond to 17 questions about their learning experiences during *Characteristics of Students with ASD*. Twelve were Likert-scale items, two were forced answer, ranked items, and two were open response. Participants used the following rating scale to respond to the Likert-type questions with the extreme variables described. A response of "1" meant "completely disagree" and "7" meant "completely agree." The means and standard deviations for these items are presented in Table 10.

Table 10

Mean Scores of Student Learning Experiences

Questions		Host			Remote		
		N	*M*	*SD*	*N*	*M*	*SD*
Item 32:	I received all of the instruction I needed to feel comfortable accessing the course materials online.	31	6.29	1.04	59	5.4	1.62
Item 33:	I received all of the instruction I needed to feel comfortable participating in the live class sessions.	31	6.48	.77	60	5.60	1.61
Item 34:	I participated more in the live class sessions that I usually do in a traditional face-to-face	27	4.11	1.87	60	2.93	1.86

class.

Item 35:	This course provided the opportunity for me to network with my peers.	31	5.26	1.53	60	5.30	1.60
Item 36:	This course provided me the opportunity to develop rapport with my professor.	31	5.97	1.62	60	4.28	1.72
Item 37:	A valuable part of this course was the lecture provided by the professor or guest speakers.	31	6.32	.95	59	5.7	1.21
Item 38:	A valuable part of this course was the interaction with the professor.	31	6.10	1.42	59	4.95	1.56
Item 39:	The amount of instructor/student interaction time during this course was adequate.	31	6.10	1.27	58	5.21	1.66
Item 40:	I was exposed to an appropriate range of experiences/techniques in this course.	31	6.29	1.19	60	5.68	1.36
Item 41:	The visuals displayed during the live class sessions were	31	6.52	.77	60	5.97	1.21

	beneficial.						
Item 42:	I enjoyed taking this course.	31	6.52	.68	60	5.97	1.25
Item 43:	I would recommend this course to others.	31	6.55	.77	60	6.17	1.14

For the two forced-answer questions, participants were asked:

44. Since taking this course I have stayed in touch with the instructor (answer

    choices: ongoing, infrequently, not at all)

45. Since taking this course I have stayed in touch with peers (select all that

    apply) (answer options: not at all, stayed in touch with peers from my site,

    stayed in touch with peers from other sites).

The frequencies and percentages for these items are presented in Table 11.

Table 11

Frequencies and Percentages for Student Learning Experiences

		Host (*n* = 31)		Remote (*n* = 60)	
Questions		Frequency	%	Frequency	%
Item 44:	Stayed in touch with the instructor				
	Ongoing	14	45.2%	13	21.7%
	Infrequently	15	48.4%	27	45.0%
	Not at all	2	6.5%	20	33.3%
Item 45:	Stayed in touch with peers				
	Not at all	12	38.7%	14	23.3%
	From my site	19	61.3%	43	71.7%
	From other sites	0	0%	2	3.3%
	From my/other sites	0	0%	1	1.7%

Item 46 asked respondents to: Rank the following parts of the course from most to least

beneficial (1 = most beneficial and 7 = least beneficial). The means and standard

deviations for the ranked item responses are presented in Table 12.

Table 12

Mean and Standard Deviations for Ranked Student Learning Experience Items

| | Host | | | Remote | | |
| | ($n = 31$) | | | ($n = 59$) | | |
Variables	*Mean*	*SD*	Rank	*Mean*	*SD*	Rank
Assigned readings	2.90	1.66	6	4.17	2.11	4
Online activities	4.10	2.1	4	4.59	1.82	3
Quizzes/tests	2.13	1.28	7	2.12	1.62	7
Projects/assignments	5.0	1.69	3	4.71	1.69	2
In class activities	5.19	1.62	1*	4.90	1.69	1
Communication with peers	3.48	1.67	5	3.83	1.96	5
Communication with instructor	5.19	1.64	1*	3.68	1.76	6

* In-class activities and communication with instructor had the same group means.

Finally, the two open response questions were as follows:

47. Do you have any suggestions on how to improve this course?

48. Do you have any other comments or feedback that you would like to share about the course?

These last two questions were optional. Most participants left them blank or provided a brief "no" or "none."

Question 47 generated responses from 47.15% (42) of the participants – 26.83% (11) of the responses from the host site and 73.81% (31) of the responses from the distance sites. Comments from both the host and distance sites were primarily positive, about enjoying the course. Constructive feedback from the host site included comments regarding the effectiveness of the discussion boards, as well as recommendations for increasing instruction prior to accessing ANGEL® and for topics outside of the assigned readings, keeping the class live so it could be interactive, having students sit closer to cameras and better lighting so students could see each other better. Constructive feedback from the distance sites included difficulty paying attention (length of class, others talking), lower comfort level with technology, distance to remote site, continuing to bring in guest speakers and encouraging students to network with each other, suggestions for the instructor to develop a better rapport with students from the distance sites (instructor traveling to distance sites, encouraging more communication during class), offering the course online, and using more interactive activities and videos demonstrating characteristics/strategies.

Question 48 generated responses from 40.66% (37) of the participants, 24.32% (9) from the host site and 75.68% (28) from the distance sites. Comments from both the

91

host and distance sites were primarily positive, about enjoying the course and the vast knowledge of the instructor. Constructive feedback from the host site included comments regarding the balance between lecture guest speakers and assignments, the increase of ASD specific knowledge, and the importance of keeping the class live. Constructive feedback from the distance sites included the time the class was scheduled was convenient, the availability and response of the instructor, the interactivity of the class, adding additional articles to support learning, the distance to the remote site, adding observations related to specific strategies, and IVC as a good way to have the program available throughout the state. Appendix O provides the complete list of responses for the two open-response questions.

Student Achieved Knowledge and Skill

This section discusses the assessment of student-achieved knowledge and skill at the completion of the course. This included the overall grade for the course, mean examination score, and culminating assignment scores for all students who completed the course. Examinations (quizzes, midterm, and final exams) developed by the textbook publishing company (Buron & Wolfberg, 2008) and the course instructor assessed students' knowledge. Questions were presented in a true/false, multiple-choice, short-answer, and essay format and were completed by students online through ANGEL®. Skills were assessed through a culminating application assignment. During the first years of the course (2008), students completed a functional behavior assessment but during the last three years (2009-2011) students completed a task analysis assignment.

Relative to assessment of knowledge, 91 students qualified to participate in the research study: 34.1% (31) attended the class at the host site and 65.9% (60) at the remote

sites. Table 13 displays course grade frequency and percentages by semester and for the groups. Semester grades are displayed by year and site as instruction and course assignments varied across the four years. Totals for each group are displayed to show that the groups of qualified participants were similar.

Course letter grades earned by participants at both the host and remote groups were primarily A and B. Student course letter grade earned for the semester was used for comparison instead of an overall course percentage or numerical grade due to the partial loss of the fall 2009 grade book data (i.e. semester grade, E-learning activities). Letter grades were retrieved from a university database, and the culminating assignments had been saved by the instructor.

Table 13

Course Grade Frequency and Percentages by Year and Total for each Group (N=91)

| | Host | | Remote | |
| | ($n = 31$) | | ($n = 60$) | |
Descriptive Variables	Frequency	%	Frequency	%
2008				
A	3	9.67%	22	33.67%
B	2	6.45%	1	1.67%
C	0	0%	0	0%
D	0	0%	0	0%
F	0	0%	0	0%
2009				
A	14	45.2%	12	20.0%
B	0	0%	0	0%
C	0	0%	0	0%
D	0	0%	0	0%
F	0	0%	0	0%
2010				
A	4	12.9%	9	15.0%
B	0	0%	4	6.67%
C	0	0%	0	0%
D	0	0%	0	0%

F	0	0%	0	0%
2011				
A	6	19.35%	7	11.67%
B	2	6.45%	2	3.33%
C	0	0%	2	3.33%
D	0	0%	0	0%
F	0	0%	1	1.67%
Total				
A	27	87.1%	50	83.33%
B	4	12.9%	7	11.671$
C	0	0%	2	3.33%
D	0	0%	0	0%
F	0	0%	1	1.67%

For participant scores that were retrievable, Table 14 provides the means and
standard deviations for student assessed knowledge and skill, which included their overall
grade, examination average, and culminating assignment score.

Table 14

Assessment of Student Achieved Knowledge and Skill

	Host			Remote		
Variable	*N*	*M*	*SD*	*N*	*M*	*SD*
Course grade	16	94.13	3.57	47	92.32	8.30
E-learning activities	16	96.63	8.58	47	95.34	8.38
Culminating assignment	13	95.85	5.89	43	89.51	18.93
Exam average	16	86.38	9.68	47	88.47	10.9

Statistical Analysis of Research Questions

The following section describes the statistical analysis used to evaluate the results of the study. First, the distribution of responses for previous distance learning experience and employment will be discussed. Then the results of the following research questions are discussed:

1. Are educators who participated in synchronous IVC instruction from remote sites able to achieve the same level of knowledge and skills as educators who participate in synchronous face-to-face instruction at the host site?

2. Are educators perceived learning experiences similar at both the host and remote sites?

The independent variable (students who received the IVC instruction or the face-to-face instruction group) was evaluated on the basis of students' knowledge and skill acquisition, specifically students' course grades, culminating assignment scores, E-learning activity average, EBP exam average, and rated utilizing the scale items from the *Perceived Knowledge and Skills – Autism Survey*. Survey items were divided into three sections: (a) student knowledge and skills, (b) course outcomes, and (c) student learning experiences.

Independent *t*-tests (Green & Salkind, 2003) were conducted to compare the host and distance group. The independent *t*-test is used to evaluate the difference in the continuous variable means between two independent groups. The continuous variables in this study included the course grades, examination average scores, culminating assignment scores, and the Likert-scale items on the *Perceived Knowledge and Skills – Autism Survey.*

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An assumption when using independent *t*-tests is that the shape of the distribution is normal. Initial results for this study indicated that measures were not normally distributed; data were negatively skewed. Independent *t*-tests yield relatively accurate *p* values under some conditions when measures are not normally distributed, but may not be as powerful as the Mann-Whitney *U* test for nonnormal distributions (Green & Salkind, 2003). Data analysis for both research questions used Mann-Whitney *U*. The second question was also evaluated using Pearson's chi-square test. Both analyses required a *p* value of at least .05 for statistical significance.

The Mann-Whitney *U* was conducted to compare the face-to-face and IVC/remote instruction groups for knowledge (exam scores), skill (culminating assignment score), and perceived knowledge and skills, as well as achievement of course objectives and learning experiences on the *Perceived Knowledge and Skills – Autism Survey*. The Mann-Whitney *U,* a nonparametric test, makes no assumptions about the distribution of data and evaluates whether the medians on a test variable differ significantly between two groups (Siegel, 1956). Scores on the test variable are converted to ranks, ignoring group membership (Green & Salkind, 2003). The Mann-Whitney *U* test evaluates whether the mean ranks for the two groups differ significantly from each other. Because analyses for the Mann-Whitney *U* test are conducted on ranked scores, the distribution of data does not have to be of any particular form; however, the distributions should be continuous and have identical forms. Medians were also analyzed using *Excel*.

A chi-square test was conducted to determine whether students who participated in the face-to-face and distance group had similar distance learning experiences prior to beginning this course. A chi-square test evaluates whether the proportions of individuals

who fall into categories of a variable are equal to hypothesized values or status (Green & Salkind, 2003). The test does not recognize any quantitative distinction among categories but simply assesses whether the proportions associated with the categories are significantly different from hypothesized proportions. The coefficient can range in value from 0 to 1. A value of 0 indicates that the sample proportions are exactly equal to the hypothesized proportions; a value of 1 indicates that the sample proportions are as different as possible from the hypothesized proportions.

Demographic variables that may impact the research hypothesis. The *Perceived Knowledge and Skills – Autism Survey* asked two questions related to prior distance learning experience and employment experience. The distribution of responses was evaluated with chi-squared tests to determine if these demographic variables impacted the outcome of the course (assessed knowledge and skill) and student perceptions (perceived knowledge and skill, achievement of course outcomes, learning experiences). A p value of .05 was used as the threshold for statistical significance.

Previous distance learning experience. The distribution of responses relative to prior distance learning experience was analyzed. These experiences were related to the number of previous online, hybrid, and IVC courses previously enrolled in and the type of site attended for the IVC course(s). Statistically significant differences were found for type of distance learning site attended for IVC classes. In the face-to-face learning group, more people responded host site, $z = 2.3$, $p < .05$, and fewer responded remote site, $z = -1.6$, $p < .05$. In the distance learning group, fewer people responded host site, $z = -1.7$, $p < .05$, and more responded remote site, $z = 1.1$, $p < .05$. Table 15 displays the results of the chi-squared test for previous distance learning experience.

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Table 15

Results of Previous Distance Learning Experience Chi-Square Analysis

Variable	Value	*df*	Asymp Sig. (2-sided)
Online courses	2.53	2	.29
Hybrid courses	3.06	2	.25
IVC courses	2.14	2	.40
IVC sites attended	12.39	3	.01

p< 0.05 level (2-tailed).

Employment during Characteristics of Students with ASD enrollment. The distribution of responses relative to employment during course enrollment was analyzed. Nonstatistically significant differences were found for all items. Table 16 displays the results of the chi-squared test for employment during *Characteristics of Students with ASD* enrollment.

Table 16

Results of Employment During Characteristics of Students with Autism Spectrum Disorders Enrollment Chi-Square Analysis

Variable	Value	*df*	Asymp Sig. (2-sided)
Employment position	10.0	6	.33
Years in the field of education	5.32	6	.57
Years working with students with ASD	7.15	6	.42
Type of educational setting employed	7.22	3	.10

p< 0.05 level (2-tailed).

Research Question 1: After receiving synchronous face-to-face or IVC instruction at the host and remote sites, are students' knowledge and skills equivalent?

To analyze the achieved knowledge and skills of participants, the independent variable of instruction (IVC instruction vs face-to-face instruction) was compared utilizing the Mann-Whitney U test relative to the dependent variables course grade, E-learning activities average score, culminating assignment score, and exam average. A p value of.05 was used as the threshold for statistical significance. No statistically significant differences were found across the four dependent variables. Students' achieved knowledge and skill results are presented in Table 17.

Table 17

Results of Student-Achieved Knowledge and Skill Mann-Whitney U Test

Variables	Sig.	Host	Distance
		Median	
Course grade	.83	95.0	95.0
E-learning activity average	.55	100.0	100.0
Culminating assignment score	.26	98.0	95.0
Exam average	.32	89.0	91.0

$p< 0.05$ level (2-tailed).

Research Question 2: Are educators' perceived learning experiences similar at both the host and remote sites?

To analyze the similarities and differences in students' perceived learning experiences, the independent variable of IVC instruction (distance) and face-to-face instruction (host) were compared utilizing the Mann-Whitney U test and chi-square analysis on the dependent variables. Results were analyzed for student perceived knowledge and skill, achievement of course objectives, and learning experiences.

Student perceived knowledge and skill. A Mann-Whitney U test was conducted on six Likert items that compared host and distance groups' perceived knowledge and skill after completing the *Characteristics of Students with ASD* course. A p value of .05 was used as the threshold for statistical significance. The Mann-Whitney U test revealed statistically significant differences in identification of EBP for students with ASD, $p =$ .05. These differences were between medians of face-to-face learning (median = 6) and distance learning (median = 6). No other statistically significant findings related to perceived knowledge and skills. Table 18 provides the results for the student perceived knowledge and skill Mann-Whitney U test analyses.

Table 18

Results of Student-Perceived Knowledge and Skill Mann-Whitney U Test

Variables		Sig.	Host	Distance
			Median	
Perceived Knowledge				
Item 19:	Has your work-related knowledge increased?	.75	6.0	6.0
Item 21:	Did this course help you identify characteristics of learners with ASD?	.80	6.0	6.0
Item 22:	Did this course help you identify evidence-based practices for students with ASD?	.05	6.0	6.0
Item 23:	Did this course provide information about how to implement evidence-based practices with fidelity?	.16	6.0	6.0
Perceived Skill				
Item 20:	Has your work-related skills increased?	.52	6.0	6.0
Item 24:	Did your practice with students with ASD change as a result of this course?	.11	6.0	6.0

$p < 0.05$ level (2-tailed).

Student-perceived achievement of course outcomes. A Mann-Whitney *U* test
was conducted on six Likert items that compared host and distance groups' perceived
achievement of course outcomes for the *Characteristics of Students with ASD* course. A *p*
value of .05 was used as the threshold for statistical significance. Statistically
nonsignificant differences were found for all course outcome items. Table 19 provides
the Mann-Whitney *U* test results for the achievement of course outcomes comparison.

Table 19

Results of Course Outcomes Mann-Whitney U Test

			Host	Distance
Variables		Sig.	Median	
Item 25:	Describe the core characteristics of ASD.	.83	7.0	7.0
Item 26:	Describe the associated characteristics of individuals with ASD.	.64	7.0	6.5
Item 27:	Describe the distinguishing features between disorders of the ASD.	.82	6.0	6.0
Item 28:	Plan ASD strategies or interventions discussed in this course.	.41	6.0	6.0
Item 29:	Implement ASD strategies or interventions discussed in this course.	.44	6.0	6.0
Item 30:	Evaluation the effectives of strategies or interventions discussed in this course.	.28	6.0	6.0

p< 0.05 level (2-tailed).

Student-perceived learning experiences. Fifteen items were analyzed to compare the host and distance groups' perceived learning experiences during *Characteristics of Students with ASD* using a Mann-Whitney *U* test and chi-square analysis. A *p* value of.05 was used as the threshold for statistical significance for both analyses.

Twelve of the 15 items were Likert-scale items. These items were recoded from a 1-8 scale to a 0-7 scale, with 0 meaning "I don't recall," 1 meaning "completely disagree," and 7 meaning "completely agree." Respondents who responded "I don't recall" were not included in the statistical analysis for the specific item. Statistically significant results were found on 10 of the 12 Likert items, with the remote site having lower mean ranked scores on all 10 items. Table 20 provides the results for the student perceived learning experiences Mann-Whitney *U* test.

Table 20

Results of Student Learning Experiences Mann-Whitney U *Test*

Variables		Sig.	Host	Distance
			Median	
Item 31:	At the beginning of the course I received all of the instruction I needed to feel comfortable accessing the course materials online.	.01	7.0	6.0
Item 32:	At the beginning of the course I received all of the instruction I needed to feel comfortable participating in the live class sessions.	.01	7.0	6.0
Item 33:	I participated more in the live class sessions that I usually do in a traditional face-to-face class.	.01	4.0	2.0
Item 34:	This course provided the opportunity for me to network with my peers.	.80	5.0	6.0
Item 35:	This course provided me the opportunity to develop rapport with my professor.	.00	7.0	5.0
Item 36:	A valuable part of this course was the lecture provided by the professor or guest speakers.	.01	7.0	6.0
Item 37:	A valuable part of this course was the interaction with the professor.	.00	7.0	5.0

Item 38:	The amount of instructor/student interaction time during this course was adequate.	.01	7.0	5.5
Item 39:	I was exposed to an appropriate range of experiences/techniques in this course.	.01	7.0	6.0
Item 40:	The visuals displayed during the live class sessions were beneficial.	.01	7.0	6.0
Item 41:	I enjoyed taking this course.	.03	7.0	6.0
Item 42:	I would recommend this course to others.	.09	7.0	6.5

$p< 0.05$ level (2-tailed).

The next two items were forced-choice and asked about staying in touch the instructor and peers after the course ended. The results of the chi-square analysis indicated that there were statistically significant differences for Item 43 (Since taking this course, I have stayed in touch with the instructor), with more host site participants reporting that they had stayed in touch with the instructor. Table 21 provides the results of the chi-square analysis.

Table 21

Results of Student Learning Experiences Chi-Square Analysis

Variable		Value	df	Asymp Sig. (2-sided)
Item 43:	Since taking this course I have stayed in touch with the instructor.	9.96	2	.01
Item 44:	Since taking this course I have stayed in touch with peers.	3.6	3	.31

$p < 0.05$ level (2-tailed).

The final question related to student learning experiences asked participants to rank parts of the course, with 1 meaning "most beneficial" and 7 meaning "least beneficial." One of the ranked items, communication with instructor, resulted in statistically significant differences, with the host group giving it a higher rank. Table 22 provides the results for the chi-square analysis.

Table 22

Results of Ranked Items of Student Learning Experiences Chi-Square Analysis

Variable	Value	*df*	Asymp Sig. (2-sided)
Assigned Reading	9.1	6	.17
Online Activities	5.4	6	.49
Quizzes/Tests	5.5	6	.48
Projects/Assignments	10.07	6	.12
In class activities	3.32	6	.77
Communication with class members	6.22	6	.40
Communication with instructor	16.47	6	.01

p< 0.05 level (2-tailed).

Summary

The study was organized around two major research questions: 1. Are educators who participate in synchronous IVC instruction from remote sites able to achieve the same level of knowledge and skills as educators who participate in synchronous face-to-face instruction at the host site? And 2. Are educators' perceived learning experiences similar at both the host and remote sites?

The findings of the study included a comparison of two independent groups (host/face-to-face and remote/IVC) of educators who were enrolled in the *Characteristics of Students with ASD* course and had completed the *Perceived Knowledge and Skills – Autism Survey.* The internal consistency analysis of the Likert-scale items resulted in a Cronbach's alpha of .92 for all items. Thus, the reliability of the survey was good.

Mann-Whitney U tests were conducted to compare the host and remote group on knowledge and skills. Group comparisons of student-achieved knowledge indicated that there were no statistically significant differences in the level of student-achieved knowledge and student-achieved skill across groups.

Further, Mann-Whitney U and chi-square tests were conducted to compare the host and remote group for perceived knowledge and skills, achievement of course outcomes, and learning experiences. Group comparisons for student perceptions revealed significant differences in perceived knowledge and skill as well as learning experiences. No significant differences were found in learning outcomes, however. Differences in student perceived knowledge and skill included the face-to-face group feeling more confident in their ability to identify EBP. Differences in student learning experiences included the face-to-face group feeling more comfortable accessing the online portion of

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the course and participating in the live class sessions, having opportunities to network with peers, finding the lecture and interaction with the instructor valuable parts of the course, exposure to an appropriate range of learning experiences, finding the visuals displayed during class beneficial and overall better enjoyment of the course.

Overall, the differences noted favored the host group, who received face-to-face instruction. In summary, although no statistically significant differences were found in achieved knowledge and skill, the distance group perceived that they did not have the same level of knowledge or the same learning experiences as did the host group.

CHAPTER V

Summary, Discussion, and Conclusions

Once considered a rare and severe disability, autism spectrum disorders (ASD) are now widespread and students with ASD are being identified and educated in *every* academic environment. To meet the educational and behavioral needs of this population of learners, high-quality professional development is needed to ensure that educators are prepared to address their unique needs. Traditional professional development opportunities lack the capacity to meet the growing need for highly qualified educators, especially in rural and remote communities. Therefore, personnel preparation programs are needed that utilize alternative models.

One such alternative personnel preparation program, the Autism Certificate Program, was developed by a regional Midwestern university to provide comprehensive personnel preparation in ASD for already certified educators. The program provides quality professional development in ASD throughout the state in which it is located using a hybrid educational format of synchronous face-to-face, or Internet video conferencing (IVC), and asynchronous E-learning. Since the inception of the program in the fall of 2008, more than 130 post-bachelor's-level students have been involved in the program. To date, 98 students have completed the program.

The purpose of this study was to evaluate the effectiveness of synchronous IVC instruction for preparing educators to teach students with ASD. Many colleges and universities offer courses, and even entire professional development programs, through distance learning. However, several researchers, (e.g., Barnhill et al., 2011; Scheuerman et al., 2003) have recommended that ASD teacher preparation programs be developed

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that are distinct from existing low-incidence disability programs in recognition of the unique learning and behavior of individuals with ASD. Such recommendations include distance learning, such as interactive TV (called IVC throughout this paper) and online instruction. Further, they recommend a strong focus on educators' ability to implement evidence-based practices (EBP) (Hess et al., 2008).

The 15-hour Autism Certificate Program was designed to be delivered at the post-bachelor's level as special educators and related service professionals in the state in which the study was conducted are required to have completed a master's degree in their specialization area. Completion of this course of study certifies that the individual learn has met specific standards from the CEC (2009).

To date, the researcher has been unable to identify any published studies specifically evaluating the effectives of IVC in preparing educators to teach students with ASD. A few low-incidence teacher preparation programs utilizing IVC have been described in the research literature (Jameson & McDonnel, 2007; Knapczyk et al., 2001; Ludlow & Duff, 2002; Spooner et al., 2000; Spooner et al., 2007). Fewer studies have been published focusing on the development of specific knowledge and skills of special educators participating in professional development utilizing IVC for instruction and learning (McDonnell et al., 2011).

In an attempt to begin filling this void in the literature, the present study compared the acquired knowledge and skill and perceived learning experiences of educators receiving (a) IVC instruction at remote sites and (b) face-to-face instruction at a host site. The post-bachelor's-level course used for the comparison was *Characteristics of Students with ASD.*

Acquired knowledge and skill was assessed through course performance (i.e., course grade, average on E-learning activities, average test/quiz scores, and culminating assignment score). Student learning experiences, in turn, were assessed through the results of three sections of the *Perceived Knowledge and Skills – Autism Survey* (Swanson, 2012). The survey collected information related to student demographic information while enrolled in the *Characteristics of Students with ASD* course and their perceived experiences during the course related to (a) knowledge and skill, (b) achievement of course outcomes, and (c) learning experiences.

The instructor provided face-to-face instruction at the host site for the students who lived near the university metro campus. Synchronous IVC instruction was offered to students who attended the course at remote sites. All students also participated in asynchronous E-learning activities. Between the fall of 2008 and fall of 2011, the class was offered four times with a total of 132 students enrolled. Of these, 31% (41) attended the course at the host site and 68.9% (91) attended at a remote site.

Statistical analysis utilizing Mann-Whitney *U* and chi-square tests revealed several similarities and differences for the face-to-face and IVC instruction groups. Similarities included statistically nonsignificant differences between groups on student achieved knowledge and skill and student perceived achievement of course outcomes. Statistically significant differences were found on demographic variables, items assessing student perceived knowledge and skill, and learning experiences.

Discussion

In this section, the research findings are discussed and interpreted relative to the related extant literature. Findings to be discussed include the demographic variables of

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the participants, the acquired knowledge and skills, and the statistically significant differences found by comparing the results of the *Perceived Knowledge and Skills – Autism Survey* (i.e., demographic variables, student perceived level of knowledge and skill, and learning experiences) across the host and distance learning groups.

Perceived Knowledge and Skill – Autism Survey

The *Perceived Knowledge and Skills - Autism Survey* (Swanson, 2012) enabled students to self-report on their experiences in the face-to-face or IVC sections of the course related to perceptions of knowledge and skill, achievement of course outcomes, and student learning experiences. According to Blank (2005) and Smithson and Porter (1994), self-report is a reliable and accurate measure of educator knowledge and practices.

One-hundred and three students attempted to complete the *Perceived Knowledge and Skill – Autism Survey*. Ninety-one of the respondents qualified to be included as participants in the research study (i.e., they were certified educators or related service professionals and had completed at least one Likert section of the survey). Thirty-four percent (31) of those who completed the survey attended the course at the host site and 65.93% (60) attended at a remote site. Seventy-five percent (31 out of 41) of the host site students and 65.9% (60 out of 91) of the remote site students participated in the research study. At both types of sites, more than 60% of respondents had completed a minimum of a master's degree prior to beginning the course (host = 64.5%, remote = 68.5%). Thus, most of the study participants already had their special education teaching license or professional license (i.e., speech-language pathologist, social worker) and had come back for additional professional development specific to ASD.

Demographic variables. The results indicated that one statistically significant difference involved previous distance learning experience and the type of IVC site attended (i.e., host or remote). Specifically, students at the host site were more likely to have participated in previous IVC courses from a host site whereas students at the remote sites were more likely to have participated in previous IVC courses from a remote site. In other words, not surprisingly, participants were more likely to attend professional development closer to their home or work. Typically, IVC courses are offered from university campuses, which are far from many educators' homes in this rural state. These findings are further evidence that alternative professional development programs utilizing distance education are needed in order meet the mandate for "highly qualified" teachers (ESEA, 2001).

The distance education model evaluated here increased access to quality professional development to general and special education teachers throughout the Midwestern state the Autism Certificate is offered (Williams et al., 2002), including rural and remote communities, thereby enabling teachers to develop the knowledge and skills to provide effective special education services and rural school districts to build capacity through professional development (Billingsley, 2003). This innovative approach provides quality professional development to practicing educators that can meet the mandate for "highly qualified" teachers (ESEA, 2001) and is aligned with CEC's (2009) professional knowledge and skill competencies of *Initial Special Education Teachers of Individuals with Exceptional Learning Needs with Developmental Disabilities and/or Autism.*

Research Question 1: After receiving synchronous face-to-face or IVC instruction at the host and remote sites, are students' knowledge and skills equivalent?

The results showed nonstatistically significant difference for achieved knowledge and skill. Thus, the level of knowledge and skill achieved at the completion of the course was equivalent across groups. The results from this study are consistent with the findings reported by McDonnell, Jameson, Riesen, Polychronis, Crocket, and Brown (2011), and further support the utilization of distance education programs that deliver synchronous IVC instruction and learning.

Distance education is still surrounded by some degree of controversy related to the quality of instruction versus face-to-face face (Bullock et al., 2008; Lockee et al., 2011), including the level of knowledge and skills obtained when the instructor does not have direct contact with the learner (Abrami, Bernard, Bures, Borokhovski, & Tamin, 2011). The results of this study with regard to achieved knowledge and skill suggest that these fears are unfounded when the design of the program and the instruction are equivalent.

Research Question 2: Are educators' perceived learning experiences similar at both the host and remote sites?

Similarities and differences in student perceptions related to achieved knowledge, skills, and course outcomes, as well as learning experiences were evaluated for the host and remote sites. Several statistically significant differences were found related to knowledge, skill, and learning experiences, whereas nonstatistically significant differences emerged for perceived achievement of course outcomes. For the differences noted, they favored the host group, who received face-to-face instruction. Perhaps these perceived differences were directly related to the learner not having direct contact with the instructor (Abrami et al., 2011).

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Student perceived knowledge and Skill. Relative to participants' perceived knowledge and skill acquisition, one statistically significant difference was on Item 22: *As a result of taking Characteristics of Students with ASD2, to what extent did this course help you identify evidence-based practices for students with ASD*? Analysis of this item revealed that the distance groups had lower mean rank scores than the host group ($p <$ .05, face-to-face median = 6, IVC median = 6).

Sometimes when a statistically significant result occurs, it is possible for groups to have different rank sums and equal medians, although this does not commonly occur (UCLA Academic Technology Service, n.d.). Therefore, despite displaying the same medians for Item 22, the results indicate that participants in the IVC group had a lower perception of their ability to identify EBP for students with ASD than participants in the face-to-face group.

This statistically significant difference was unexpected, as participants in both groups were similar in level of achieved knowledge and skill and as well as responses to survey items related to planning, implementing, and evaluating EBP (Items 23, 25, 29, 30, 31). A related result that should be noted, although statistically nonsignificant, was Item 25. In this item, respondents named three ways in which they implemented what they had learned in the course. Specifically, 80.64% (25) of the host site respondents indicated that they implemented EBP compared to 70.69% (41) of the remote site respondents.

The researcher is unaware of published research related to the perception of achieved knowledge and skill. In a related study on the implementation of EBP for students with ASD, Hess and colleagues (2008) found that fewer than one third of

teachers were using EBP. Relative to better understanding the meaning of these data, it would be helpful to know what type of learning environment the educators in this study had participated in for their professional development prior to and after completing the training connected to the present study.

Student learning experiences. Twelve out of 15 survey items targeting participants' perceived learning experiences revealed statistically significant differences, with the distance group having lower ranked scores on all of the items (Items 32, 33, 35, 36, 37, 38, 39, 40, 41, 43, and 45). These differences were related to feeling comfortable using the technology required for participation and completion of the *Characteristics of Students with ASD* course (i.e., microphones during IVC instruction, computers, Internet, ANGEL® Learning Management Suite, microphones), level of participation during the live class sessions, interaction and rapport with the instructor, value of the lecture content, appropriate range of experiences/techniques, value of the visuals displayed, overall enjoyment of the course, likelihood of recommending the course to others, likelihood of staying in touch with instructor after the course ended, and importance of communication with the course instructor.

The mean and median scores for these items were generally high, indicating positive experiences for both groups, with one exception. Item 34 asked participants about their level of participation in the IVC course vs. a traditional face-to-face class. Both groups had considerably lower mean (face-to-face = 4.11, IVC – 2.93) and median scores (face-to-face = 4, IVC = 2) in relation to the other survey items, indicating that they were less likely to verbally participate in the synchronous class using the IVC technology.

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Two of the differences noted (Items 32, 33) were related to instruction and may be associated with level of comfort using the technology required for the course. These items were as follows: *I received all of the instruction I needed to feel comfortable accessing the course materials online* (Item 32) and *I received all of the instruction I needed to feel comfortable participating in the live class sessions* (Item 33). Students who are not comfortable using the technology required for participation or completion of the distance course could be expected to be at a disadvantage (i.e., using a computer or the Internet to access course materials, using microphones to communicate/interact during the IVC class). This interpretation is consistent with other online course findings (see, for example, Ludlow, Keramidis, & Landers, 2007). Specifically, a lower level of comfort could impact the student's ability to independently access the course materials and online components of the course and to naturally interact with the instructor and peers.

Even though students at all sites received synchronous instruction, those at the remote sites were physically separated from the instructor and from many of their peers. With the physical separation from the instructor and peers and a lower comfort level using technology, students at the distance sites would be expected have a different learning experience than the students at the host site. Perhaps, being in a different space and being required to use special equipment (i.e., microphone) to initiate or respond may have made interacting with the instructor and/or peers seem more challenging, thus decreasing the amount of times students verbally communicated in the live class sessions. This challenge could negatively affect the development of rapport with the instructor and staying in touch with peers after the completion of the course.

Other differences that might be attributed to being in a space separate from the instructor include Item 37: *A valuable part of this course was the lecture provided by the instructor or guest speakers,* and Item 41: *The visuals displayed during the live class were beneficial.* During the live class sessions, the instructor or guest speakers provided lecture content and the accompanying visuals. During the lecture, PowerPoint slides and other materials were displayed. The host site and two of the remote sites had the technological capabilities to simultaneously see the person who was speaking and the visuals the instructor was displaying. Participants at the remaining remote sites were only able to see the person speaking *or* the visuals displayed. The instructor determined what information was displayed. It might have been more beneficial for the remote sites to see the person speaking and the visuals less.

Further, Item 40: *I was exposed to an appropriate range of experiences/techniques,* did have lower scores for the host group as well. Differences on this item might be contributed to instruction as well as student expectations. The *Characteristics of Students with ASD* course was taught in the first semester of the Autism Certificate Program and is designed to provide the underpinnings for understanding the characteristics of ASD and the strategies that are foundational for all successful interventions for students with ASD (i.e., data collection, functional behavior assessment, prompting, reinforcement, visual supports, and task analysis). The final difference was on Item 43: *I would recommend the course to others.* It is possible that factors contributing to the differences in this item include instruction, comfort level with technology, and/or being in a separate space from the instructor.

Even with the numerous statistically significant differences, the IVC group achieved the same level of knowledge and skill as the face-to-face group. Thus, it is not clear how meaningful these statistically significant differences are as the scores are generally high for both groups, indicating a positive perceived experience (Beattie et al., 2002). This pattern of similar achievement level is consistent with outcome reports of other researchers (McDonnell et al., 2011).

Student perceived achievement of course outcomes. Nonsignificant differences were found across groups for all items related to student perceived achievement of course outcomes. Thus, one may infer that all students perceived that they achieved similar achievement-related outcomes. These results are consistent with findings of other researchers comparing host and remote site course evaluations (Beattie et al., 2002; McDonnell et al., 2011).

Implications for Practice

Given the increased prevalence of ASD and the variety of settings in which students with ASD are educated, high-quality personnel preparation and professional development programs in ASD are needed to ensure that educators acquire specific knowledge and skills to meet the requirements of IDEA (2004), ESEA (2001), and the standards identified for teaching students with ASD (CEC, 2009). Specifically, instruction must emphasize understanding and recognizing the characteristics of ASD and how to select and implement EBP that are appropriate for individual students' needs (National Autism Center, 2009; Odom et al., 2010).

The Autism Certificate Program was developed in collaboration with the State's Department of Education, another Midwestern university and LEA to provide

professional development in ASD. For already certified educators, the Autism Certificate may be completed in substitution of or in addition to the crosscategorical special education teacher licensure offered in the state (i.e., adaptive/high-incidence or functional/low-incidence). The program allows for common outcomes or standards for all educators working with students with ASD (Barnhill et al., 2011) and was developed to meet the CEC standards *Teachers of Individuals with Developmental Disabilities/Autism* (2009) and to encourage use of EBP practices for students with ASD, as outlined by National Autism Center (2009) and the National Professional Development Center on Autism Spectrum Disorders (Odom et al., 2010). The program also maximizes utilization of distance education technology (Williams et al., 2002) by using the state-wide IVC service and partners with school districts, cooperatives, interlocals, or universities that own the IVC equipment to provide the synchronous IVC instruction.

Thus, the Autism Certificate and similarly designed programs meet the professional development needs of teachers in rural and remote communities by facilitating instruction, communication, problem-solving, and student knowledge and skill development (Bargerhuffe et al., 2007; Billingsley, 2003; Williams et al., 2002). This preparation will ensure educators master specific knowledge and skills in order to meet mandated requirements of IDEA (2004) and ESEA (2001) and specific professional standards for teaching students with ASD (CEC, 2009). Further, by using online technologies the Autism Certificate reaches a larger audience, including educators in rural and remote states.

Limitations of the Study

This study provides a much-needed start on research into utilization of distance learning, namely, the use of synchronous site-based IVC, to prepare educators to effectively teach students with ASD. Several aspects of the study would benefit from future research. In the meantime, the results should be interpreted and generalized with caution. First, the study only included educators and related service professionals from one Midwestern state and covered only the first of five courses offered as part of the Autism Certificate.

Second, the technological capacity and quality of IVC equipment varied at each site. That is, the host site and two of the remote sites had the technological capacity to simultaneously view the visuals displayed by the instructor and the person speaking (i.e., instructor or classmate). Participants at the eight remaining remote sites were only able to view the visuals *or* the person speaking. The information they viewed was determined by the instructor. Additionally, the IVC equipment used by the program to broadcast the course was updated to high definition during the second year of the program. Thus, the students who were enrolled between 2010-2011 viewed a higher quality visual display.

Third, several changes were made over the four years during which the course was offered, including adjusting how the course was taught (i.e., every week for two hours, every other week for four hours), how student knowledge was assessed (i.e., changing weekly quizzes to midterm and final exams), and how skill was assessed (i.e., switching from functional behavior assessment to task analysis). In 2008, when the research study began, the Autism Certificate Program was new, and the instructor was new to higher education. As such, it should be expected that changes would be made to

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the course and the overall program. It would also be expected that new instructors would make adjustments to how they provide instruction and assessment of student knowledge and skill as they get more experience teaching the course. Over the four years of the research study, the course content areas remained the same with adjustments made to instruction and assessment procedures.

Fourth, this study evaluated one course from the Autism Certificate Program and focused primarily on the effectiveness of the IVC instruction and learning to the exclusion of evaluating the effectiveness of other aspects of the course (i.e., guided discussion, e-Learning, assignments, hybrid delivery model). The study focused on one course to keep the independent variables simplified, as the Autism Certificate Program is taught from multiple locations and elective courses may be taught online. Further, the focus was on the effectiveness of IVC instruction and learning as myriad research studies supports the use of online teaching and learning and hybrid teaching and learning (USDE, 2010) and it was, therefore, thought to be redundant to evaluate these components of the course.

Lastly, several items related to the statistical analyses pose limitations to the study, including the probability of Type I error and violations of assumptions. Type I error refers to the probability of rejecting a null hypothesis when it is true. When multiple hypotheses are tested, one or more Type I error may occur (Green & Salkind, 2003). With an alpha level at .05, there is a 5% probability that a Type I error will occur. Moreover, two assumptions of Mann-Whitney U tests were violated having to do with (a) random sample and (b) sample size. Students independently chose to apply to the Autism Certificate Program and to enroll in the course. It was assumed that students taking the

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course would attend sessions at the site closest to their work or home. In terms of sample size, the host site group had fewer than 41, which is recommended for Mann-Whitney U test (Green & Salkind, 2003). In addition, the small sample size and the variability in the enrollment numbers each year and at each site prohibited more advanced statistical analysis. As a result, the research turned into a descriptive rather than an inferential study.

Future Research

In light of the limitations identified above and the small number of published studies evaluating distance learning programs to prepare educators to teach student with ASD and other low incidence disabilities, additional research is needed. Specifically, the following is recommended: (a) evaluate entire programs rather than single courses to better determine if knowledge, skills, and learning experiences are equivalent across the host and remote sites for the entire program; (b) in addition to the course delivery method (i.e., face-to-face vs. IVC), evaluate multiple components of instruction that may contribute to the effectiveness of the course (i.e., guided discussion, e-Learning activities, assignments); (c) evaluate the educators' ability to implement EBP for ASD through observation or video to ensure fidelity; (d) evaluate which components of the program were the most effective in preparing educators to teach students with ASD by utilizing a follow-up survey for all program completers and (e) systematically evaluate the effects of distance education on the long-term retention rates of educators in the rural and remote communities.

Summary

Given the increased prevalence of ASD it is likely both general and special educators, and related services professionals will have students with ASD in their classrooms/on their caseloads, thus there is a growing need for educators and other professionals to be prepared to work with this unique population. To better meet the unique educational and behavioral needs of this growing population, specific professional development about the characteristics of ASD and the use of EBP is needed to ensure appropriate and efficacious programs designed and implemented with fidelity for learners with ASD.

Effective ASD teacher preparation will help ensure that educators have the specific knowledge and skills needed to meet mandated requirements, professional practice guidelines, and professional standards. While research supports the effectiveness of IVC instruction, there is little published research to indicate if this format of instruction is an effective way to prepare educators to work with students with ASD. The results of this research study will help begin building a basis for the effectiveness of IVC instruction for preparing educators to work with students with ASD.

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CEC Initial Special Education Teachers of Individuals with Exceptional

Learning Needs with Developmental Disabilities and/or Autism

Standard 1: Foundations	
Knowledge	
ICC1K1	Models, theories, philosophies, and research methods that form the basis for special education practice
ICC1K2	Laws, policies, and ethical principles regarding behavior management planning and implementation
ICC1K3	Relationship of special education to the organization and function of educational agencies
ICC1K4	Rights and responsibilities of individuals with exceptional learning needs, parents, teachers, and other professionals, and schools related to exceptional learning needs
ICC1K5	Issues in definition and identification of individuals with exceptional learning needs, including those from culturally and linguistically diverse backgrounds
ICC1K6	Issues, assurances and due process rights related to assessment, eligibility, and placement within a continuum of services
ICC1K7	Family systems and the role of families in the educational process
ICC1K8	Historical points of view and contribution of culturally diverse groups
ICC1K9	Impact of the dominant culture on shaping schools and the individuals who study and work with them
ICC1K10	Potential impact of differences in values, languages and customs that can exist between the home and school
DD1K1	Definitions and issues related to the identification of individuals with developmental disabilities
DD1K2	Continuum of placement and services available for individuals with developmental disabilities
DD1K3	Historical foundations and classic studies of developmental disabilities
DD1K4	Trends and practices in the field of developmental disabilities
DD1K5	Theories of behavior problems of individuals with developmental disabilities
Skills	
ICC1S1	Articulate personal philosophy of special education
Standard 2: Development and Characteristics of Learners	
Knowledge	
ICC2K1	Typical and atypical human growth and development
ICC2K2	Educational implications of characteristics of various exceptionalities
ICC2K3	Characteristics and effects of the cultural and environmental milieu of the individual with exceptional learning needs and family
ICC2K4	Family systems and the role of families in supporting development
ICC2K5	Similarities and differences of individuals with and without exceptional learning needs

ICC2K6	Similarities and differences of individuals with and without exceptional learning needs
ICC2K7	Effects of various medications on individuals with exceptional learning needs
ICC2K6	Similarities and differences of individuals with and without exceptional learning needs
ICC2K7	Effects of various medications on individuals with exceptional learning needs
Skills	
	None

Standard 3: Individual Learning Differences

Knowledge	
ICC3K1	Effects an exceptional condition(s) can have on an individual's life
ICC3K2	Impact of learner's academic and social abilities, attitudes, interests, and values on instruction and career development
ICC3K3	Variations in beliefs, traditions, and values across and within cultures and their effects on relationship among individuals with exceptional learning needs, family, and schooling
ICC3K4	Cultural perspectives influencing the relationships among families, schools, and communities as related to instruction
ICC3K5	Differing ways of learning of individuals with exceptional learning needs, including those from culturally diverse backgrounds and strategies for addressing these differences
DD3K1	Impact of multiple disabilities on behavior
Skills	
	None

Standard 4: Instructional Strategies

Knowledge	
ICC4K1	Evidence-based practices validated for specific characteristics of learners and settings
DD4K1	Specialized materials for individuals with developmental disabilities
DD4K2	Evidence-based practices for teaching individuals with pervasive developmental disabilities, autism, and autism spectrum disorder
DD4K3	Specialized curriculum specifically designed to meet the needs of individuals with pervasive developmental disabilities, autism, and autism spectrum disorder
Skills	
ICC4S1	Use strategies to facilitate integration into various settings
ICC4S2	Teach individuals to use self-assessment, problem-solving, and other cognitive strategies to meet their needs
ICC4S3	Select, adapt, and use instructional strategies and materials according to characteristics of the individual with exceptional learning needs
ICC4S4	Use strategies to facilitate maintenance of generalization of skills across learning environments
ICC4S5	Use procedures to increase individual's self-awareness, self-management, self-control, self-reliance, and self-esteem
ICC4S6	Use strategies that promotes successful transitions for individuals with exceptional learning needs

Standard 5: Learning Environments/Social Interactions	
Knowledge	
ICC5K1	Demands of learning environments
ICC5K2	Basic classroom management theories and strategies for individuals with exceptional learning needs
ICC5K3	Effective management of teaching and learning
ICC5K4	Teacher attitudes and behaviors that influence behavior of individuals with exceptional learning needs
ICC5K5	Social skills needed for educational and other environments
ICC5K6	Strategies for crisis prevention and intervention
ICC5K7	Strategies for preparing individuals to live harmoniously and productively in a culturally diverse world
ICC5K8	Ways to create learning environments that allow individuals to retain and appreciate their own and each other's respective language and cultural heritage
ICC5K9	Ways specific cultures are negatively stereotyped
ICC5K10	Strategies used by diverse populations to cope with a legacy of former and continuing racing
Skills	
ICC5S1	Create a safe, equitable, positive, and supportive learning environment in which diversities are values
ICC5S2	Identify realistic expectations for personal and social behavior in various settings
ICC5S3	Identify supports needed for integration into various program placements
ICC5S4	Design learning environments that encourage active participation in individual and group activities
ICC5S5	Modify the learning environment to manage behaviors
ICC5S6	Use performance data and information from all stakeholders to make or suggest modifications in learning environments
ICC5S7	Establish and maintain rapport with individuals with and without exceptional learning needs
ICC5S8	Teach self-advocacy
ICC5S9	Create an environment that encourages self-advocacy and increased independence
ICC5S10	Use effective and varied behavior management strategies
ICC5S11	Use the least intensive behavior management strategy consistent with the needs of the individual with exceptional learning needs
ICC5S12	Design and manage daily routines
ICC5S13	Organize, develop, and sustain learning among individuals with exceptional learning needs within the learning environment in ways that enhance any culture, group, or person
ICC5S14	Mediate controversial intercultural issues among individuals with exceptional learning needs within the learning environment in ways that enhance any culture, group, or person
ICC5S15	Structure, direct, and support the activities of paraeducators, volunteers, and tutors
ICC5S16	Use universal precautions
DD5S1	Provide instruction in community-based settings

DD5S2	Demonstrate transfer, lifting and positioning techniques
DD5S3	Use and maintain assistive technologies
DD5S4	Structure the physical environment to provide optimal learning for individuals with developmental disabilities
DD5S5	Plan instruction for individuals with development disabilities in a variety of placement settings

Standard 6: Language

Knowledge	
ICC6K1	Effects of cultural and linguistic differences on growth and development
ICC6K2	Characteristics of one's own culture and use of language and ways in which these can differ from other cultures and uses of language
ICC6K3	Ways of behaving and communicating among cultures that can lead to misinterpretation and misunderstanding
ICC6K4	Augmentative and assistive communication strategies
Skills	
ICC6S1	Use strategies to support and enhance communication skills of individuals with exceptional learning needs
ICC6S2	Use communication strategies and resources to facilitate understanding of subject matter for individuals with exceptional learning needs whose primary language is the not the dominant language
DD6S1	Plan instruction on the use of alternative and augmentative communication systems
DD6S2	Use pragmatic language instruction to facilitate ongoing social skills instruction

Standard 7: Instructional Planning

Knowledge	
ICC7K1	Theories and research that form the basis of curriculum development and instructional practices
ICC7K2	Scope and sequence of general and special curricula
ICC7K3	National, state or provincial, and local curricula standards
ICC7K4	Technology for planning and managing the teaching and learning environment
ICC7K5	Roles and responsibilities of the paraeducator related to instruction, intervention, and direct service
DD7K1	Model career/vocational transition programs for individuals with developmental disabilities including career/vocational transition
Skills	
ICC7S1	Identify and prioritize areas of the general curriculum and accommodations for individuals with exceptional learning needs
ICC7S2	Develop and implement comprehensive, longitudinal individualized programs in collaboration with team members
ICC7S3	Involve the individual and family in setting instructional goals and monitoring progress
ICC7S4	Use functional assessments to develop intervention plans
ICC7S5	Use task analysis
ICC7S6	Sequence, implement, and evaluation individualized learning

	objectives
ICC7S7	Integrate affective, social, and life skills with academic curricula
ICC7S8	Develop and select instructional content, resources, and strategies that respond to cultural, linguistic, and gender differences
ICC7S9	Incorporate and implement instructional and assistive technology into the educational program
ICC7S10	Prepare lesson plans
ICC7S11	Prepare and organize materials to implement daily lesson plans
ICC7S12	Use instructional time effectively
ICC7S13	Make response adjustments to instruction based on continual observations
ICC7S14	Prepare individuals to exhibit self-enhancing behavior in response to societal attitudes and actions
ICC7S15	Evaluate and modify instructional practices in response to ongoing assessment data
DD7S1	Plan instruction for independent functional life skills relevant to the community, personal living, sexuality, and employment
DD7S2	Plan and implement instruction for individuals with developmental disabilities that is both age-appropriate and ability-appropriate
DD7S3	Select and plan for integration of related services into the instructional program for individual with developmental disabilities
DD7S4	Design, implement, and evaluate specialized instructional programs for persons with developmental disabilities that enhance social participation across environments

Standard 8: Assessment

Knowledge

ICC8K1	Basic terminology used in assessment
ICC8K2	Legal provisions and ethical principles regarding assessment of individuals
ICC8K3	Screening, prereferral, referral, and classification procedures
ICC8K4	Use and limitations of assessment instruments
ICC8K5	National, state or provincial, and local accommodations and modifications
DD8K1	Specialized terminology used in the assessment of individuals with developmental disabilities
DD8K2	Environmental assessment conditions that promote maximum performance of individuals with developmental disabilities
DD8K3	Adaptive behavior assessment
DD8K4	Laws and policies regarding referral and placement procedures for individuals with developmental disabilities

Skills

ICC8S1	Gather relevant background information
ICC8S2	Administer nonbiased formal and informal assessments
ICC8S3	Use technology to conduct assessments
ICC8S4	Develop or modify individualized assessment strategies
ICC8S5	Interpret information from formal and informal assessments
ICC8S6	Use assessment information in making eligibility, program, and placement decisions for individuals with exceptional learning needs, including those from culturally and/or linguistically diverse

	backgrounds
ICC8S7	Report assessment results to all stakeholders using effective communication skills
ICC8S8	Evaluate instruction and monitor progress of individuals with exceptional learning needs
ICC8S9	Create and maintain records
DD8S1	Select, adapt, and use instructional assessment tools and methods to accommodate the abilities and needs of individuals with mental retardation and developmental disabilities

Standard 9: Professional and Ethical Practice		
Knowledge		
ICC9K1	Personal cultural biases and differences that affects one's teaching
ICC9K2	Importance of the teacher serving as a model for individuals with exceptional learning needs
ICC9K3	Continuum of lifelong professional development
ICC9K4	Methods to remain current regarding research-validated practices
DD9K1	Organizations and publications in the field of developmental disabilities
Skills		
ICC9S1	Practice within the CEC Code of Ethics and other standards of profession
ICC9S2	Uphold high standards of competence and integrity and exercise sound judgment in the practice of the professional
ICC9S3	Act ethically in advocating for appropriate services
ICC9S4	Conduct professional activities in compliance with applicable laws and policies
ICC9S5	Demonstrate commitment to developing the highest education and quality-of-life potential of individuals with exceptional learning needs
ICC9S6	Demonstrate sensitivity for the culture, language, religion, gender, disabilities, socioeconomic status, and sexual orientation of individuals
ICC9S7	Practice within one's skill limits and obtain assistance as needed
ICC9S8	Use verbal, nonverbal, and written language effectively
ICC9S9	Conduct self-evaluation of instruction
ICC9S10	Access information on exceptionalities
ICC9S11	Reflect on one's practice to improve instruction and guide professional growth
ICC9S12	Engage in professional activities that benefit individuals with exceptional learning needs, their families, and one's colleagues
ICC9S13	Demonstrate commitment to engage in evidence-based practices
DD9S1	Participate in the activities of professional organizations in the field of developmental disabilities

Standard 10: Collaboration		
Knowledge		
ICC10K1	Models and strategies of consultation and collaboration
ICC10K2	Roles of individuals with exceptional learning needs, families, and school and community personnel in planning of an individualized program
ICC10K3	Concerns of families of individuals with exceptional learning needs and strategies to help address these concerns

ICC10K4	Culturally responsive factors that promote effective communication and collaboration with individuals with exceptional learning needs, families, school personnel, and community members
DD10K1	Services, networks, and organizations for individuals with developmental disabilities
Skills	
ICC10S1	Maintain confidential communication about individuals with exceptional learning needs
ICC10S2	Collaborate with families and others in assessment of individuals with exceptional learning needs
ICC10S3	Foster respectful and beneficial relationships between families and professionals
ICC10S4	Assist individuals with exceptional learning needs and their families in becoming active participants in the educational team
ICC10S5	Plan and conduct collaborative conferences with individuals with exceptional learning needs and their families
ICC10S6	Collaborate with school personnel and community members in integrating individuals with exceptional learning needs in various settings
ICC10S7	Use group problem-solving skills to develop, implement, and evaluate collaborative activities
ICC10S8	Model techniques and coach others in the use of instructional methods and accommodations
ICC10S9	Communicate with school personnel about the characteristics and needs of individuals with exceptional learning needs
ICC10S10	Communicate effectively with families of individuals with exceptional learning needs from diverse backgrounds
ICC10S11	Observe, evaluate, and provide feedback to paraeducators
DD10S1	Collaborate with team members to plan transition to adulthood that encourages full community participation

APPENDIX B

Comparison Identified Evidence-Based Practices From the

National Autism Center and the National Professional Development Center in Autism Spectrum Disorders

Overlap Between Evidence-Based Practices Identified by the National Professional Development Center (NPDC) on ASD and the National Standards Project (NSP)											
Evidence-Based Practices Identified by the National Professional Development Center (NPDC) on ASD	Established Treatments Identified by the National Standards Project (NSP)										
	Antecedent Package	Behavioral Package	Story-based Intervention Package	Modeling	Naturalistic Teaching Strategies	Peer Training Package	Pivotal Response Treatment	Schedules	Self-Management	Comprehensive Behavioral Treatment for Young Children	Joint Attention Intervention
Prompting	X			X						The NPDC on ASD did not review comprehensive treatment models. Components of The Comprehensive Behavioral Treatment of Young Children overlap with many NPDC-identified practices.	The NPDC on ASD considers joint attention to be an outcome rather than an intervention. Components of joint attention interventions overlap with many NPDC-identified practices.
Antecedent-Based Intervention	X										
Time delay	X										
Reinforcement		X									
Task analysis		X									
Discrete Trial Training		X									
Functional Behavior Analysis		X									
Functional Communication Training		X									
Response Interruption/Redirection		X									
Differential Reinforcement		X									
Social Narratives			X								
Video Modeling				X							
Naturalistic Interventions					X						
Peer Mediated Intervention						X					
Pivotal Response Training							X				
Visual Supports								X			
Structured Work Systems								X			
Self-Management									X		
Parent Implemented Intervention	The NSP did not consider parent-implemented intervention as a category of evidence-based practice. However, 24 of the studies reviewed by the NSP under other intervention categories involve parents implementing the intervention.										
Social Skills Training Groups	Social Skills Training Groups (Social Skills Package) was identified as an emerging practice by the NSP.										
Speech Generating Devices	Speech Generating Devices (Augmentative and Alternative Communication Device) was identified as an emerging practice by the NSP.										
Computer Aided Instruction	Computer Aided Instruction (Technology-based Treatment) was identified as an emerging practice by the NSP.										
Picture Exchange Communication	Picture Exchange Communication System was identified as an emerging practice by the NSP.										
Extinction	Extinction (Reductive Package) was identified as an emerging practice by the NSP.										

APPENDIX C

Human Subjects

This is a fillable form

Pittsburg State University
Application for Approval of Investigations
Involving the Use of Human Subjects

This application must be completed by the Investigator and sent to the Office of Continuing and Graduate Studies by the first Tuesday of the month during the fall and spring academic semesters to be considered for full review on the second Tuesday of the month. Expedited and exempt reviews can be turned in any time. For questions about the review process contact Brian Peery in Russ Hall, #112, Ext. 4175.

1. Investigator(s) Name(s): **Terri Cooper Swanson**   Department: **Special Services and Leadership Studies**

2. Local Address: **12345 W 95th St., Lenexa, KS 66215**

3. Phone: **913-522-8010**   E-mail Address: **tswanson@pittstate.edu**

4. Project Title: **A Comparison of Face-to-Face and Synchronous Interactive Television Instruction**

5. Expected Starting Date **September 2011**   Expected Completion Date: **May 2012**

6. Is this project (check all that apply): Use review criteria in Form CR-1 to determine which category of review applies.

- ☐ Application for Full Review
- ☐ Application for Expedited Review
- ☒ Application for Exempt Review
- ☐ Protocol Change
- ☐ Continued Review
- ☒ Faculty Research
- ☐ A Class Project
- ☐ Thesis/Special Investigation
- ☐ Being submitted for external support
- ☐ Being conducted in a foreign country
- ☒ Publishable research

7. If notification of human subject approval is required give date required : **Sept 15**

Name of agency: **Pittsburg State University**

8. If you are a student, complete the following:

Faculty Sponsor: Department: Phone:

**** If submitted externally, a complete copy of the proposal must be submitted to the IRB.****

CERTIFICATION AND APPROVAL.

Certification by Investigator: I certify that (a) the information presented in this application is accurate, (b)only the procedures approved by the IRB will be used in this project, (c)modifications to this project will be submitted for approval prior to use, and that all guidelines outlined in the PSU Policy and Assurance Handbook for the Protection of Human Research Subjects will be followed as well as all applicable federal, state and local laws regarding the protection of human subjects in research as outlined in Form VA-1.

Signature of Investigator   8/24/2011
Date

Faculty Sponsor: If the Investigator is a student, his/her Faculty Sponsor must approve this application.
I certify that this project is under my direct supervision and that I accept the responsibility for ensuring that all provisions of approval are met by the investigator.

Signature of Faculty Sponsor   Date

Department Review Committee Chair: I acknowledge that this research is in keeping with the standards set by our department, university, state and federal agencies and I assure that the student principal investigator has met all departmental requirements for review and approval of this research.

Signature of Department Review committee Chairperson   9/6/2011
Date

CPHRS Chairperson   9/9/11 BP
Date

2/16/2012
HSCL #19931

Terri Cooper Swanson
18723 W. 163rd St.
Olathe, KS 66062

The Human Subjects Committee Lawrence reviewed your research update application for project

19931   Cooper Swanson/Walther-Thomas (SPED) Comparison of Face-to-Face Synchronous Interactive Videoconferencing: Learning Experiences of Kansas Educators Enrolled in an Autism Certificate Program

and approved this project under the expedited procedure provided in 45 CFR 46.110 (f) (7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

The Office for Human Research Protections requires that your consent form must include the note of HSCL approval and expiration date, which has been entered on the consent form sent back to you with this approval.

1. At designated intervals until the project is completed, a Project Status Report must be returned to the HSCL office.
2. Any significant change in the experimental procedure as described should be reviewed by this Committee prior to altering the project.
3. Notify HSCL about any new investigators not named in original application. Note that new investigators must take the online tutorial at http://www.rcr.ku.edu/hscl/hsp_tutorial/000.shtml.
4. Any injury to a subject because of the research procedure must be reported to the Committee immediately.
5. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity. If you use a signed consent form, provide a copy of the consent form to subjects at the time of consent.
6. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.

Please inform HSCL when this project is terminated. You must also provide HSCL with an annual status report to maintain HSCL approval. Unless renewed, approval lapses one year after approval date. If your project receives funding which requests an annual update approval, you must request this from HSCL one month prior to the annual update. Thanks for your cooperation. If you have any questions, please contact me.

Sincerely,

Jan Butin
HSCL Associate Coordinator
University of Kansas

cc: Chriss Walther-Thomas

APPENDIX D

Email Correspondence

Initial Invitation

Dear _____

I am writing to ask you for your help to evaluate the quality of the learning experiences in Characteristics of Students with Autism Spectrum Disorder (Introduction to Students with ASD). You completed this course in the fall of 2008. I am completing my dissertation at the University of Kansas and will be using the data collected from this survey to compare the knowledge and skills acquisition and experiences of students who participated in the class through face-to-face or through distance learning. XX University is also dedicated to the Autism Certificate Program and will use the collected data to make improvements to the program.

In the next week you will receive another email from me that outlines the purpose of the research study, provides a Statement of Informed Consent, and a link to a survey on Survey Monkey.

If you have any questions I am happy to discuss the research study at anytime during and after the data has been collected. Please feel free to contact me by email) or phone (913-529-4487, ex. 222). Thank you for your cooperation and willingness to participate in the research study.

Sincerely,
Terri Cooper Swanson, M.S. Ed.
Department of Teaching & Leadership
XX University

Letter of Consent (second email)

Dear _____

I am writing to request for your willingness to participate in the research study that will take place in Characteristics of Students with Autism Spectrum Disorders (Introduction to Students with Autism Spectrum Disorder). The research study will compare the experience and knowledge and skill gained by students at the remote sites to students at the host site.

We must have your informed consent to participate, and are able to receive this consent from you via Survey Monkey. In the survey you must indicate your having received the study information and that you agree or do not agree to participate. Your survey response will serve as your signature.

Your consent gives me permission to use information gained from the course either through face-to-face, interactive television or through online learning sections of the course for research purposes only.

If you choose to participate you must understand the following:
1. The purpose of the research study is to better understand the similarities and differences of face-to-face and interactive television instruction. These will include student experiences, and comparisons of knowledge and skills acquisition.
2. The results from this research will be used to further develop programs that utilize interactive television for instruction by identifying strengths and weaknesses of this instructional medium.
3. Your name will not be associated in any way with the research findings. It is possible, however, with internet communications, that through intent or accident, someone other than the intended recipient may see your response.
4. If you decide that you do not want to participate, or at a later date change your mind about participating, you are free to do so at anytime.
5. To participate in the research study go to the following link:_____

Completion of the survey indicates your willingness to participate in this project and that you are at least age eighteen. If you have any additional questions about your rights as a research participant, you may call (785) 864-7429), write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, or email irb@ku.edu.

If you have any questions I am happy to discuss the research study at anytime during and after the data has been collected. Thank you for your cooperation and willingness to participate.

Sincerely,
Terri Cooper Swanson, M.S. Ed.
Principal Investigator
Department of Teaching & Leadership
XXUniversity

Chriss Walther-Thomas, Ph.D.
Faculty Supervisor
Department of Special Education
University of Kansas
1122 W. Campus Rd.
Joseph R. Pearson Hall, Room 530
Lawrence, KS 66045-3101
(785) 864-0545
chrisswt@ku.edu

<center>Third Email</center>

Dear _____

About two weeks ago I sent you an email with a link to a survey for Characteristics of Students with ASD. I have not yet received your completed survey. The following survey will take less than 20 minutes of your time to complete: https://www.surveymonkey.com/s.aspx .

The results of the survey are very important to me. They will be a part of my dissertation, a project that I have been working on for over four years! I really need as many completed surveys as possible so I can have a research project with strong validity and reliability.

The results will also be used further evaluate the program and make improvements. These changes may not directly benefit you, but by sharing your experiences in the program, you will help guide me in determining what would be beneficial for future educators.

Thanks again for your help!

Take Care,
Terri

Please note: If you do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.
https://www.surveymonkey.com/optout.aspx

<center>Fourth Email</center>

Dear _____

I received a great response this past week to my last email request for completing the survey on Characteristics of Students with ASD. But I still need your help to reach my goal of 100 completed surveys.

Reaching this goal will help me to have a very strong research project and have publishable results! Please take a few minutes to help me reach my goal.

Here is the a link to the survey:
https://www.surveymonkey.com/s.aspx

Thanks so much for your help!
Terri Swanson

Please note: If you do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.
https://www.surveymonkey.com/optout.aspx

Final Email

Dear _____

I am sending a note to everyone who has taken a course in the ASD Certificate Program to share a couple announcements about the program.

1. Beginning fall 2012 we will be offering the program online in addition to the IVC sites. For individuals who earned the "Classic" or HFA/AS certificate, this will allow you to more easily take that last course to earn your dual certificate.

2. We have launched a Facebook page: www.facebook.com/XXXXX as a way to stay connected with students and friends of the program.

3. ASD Summer Institute – June 5 – 7 – Quality Literacy Instruction and Students with ASD. Join Drs. Christina Carnahan and Pamela Williamson for this three-day workshop. The workshop will be broadcast from XXX to several sites across the state.
Finally, thank you to all who completed the survey for my dissertation research! 86 surveys have been completed so far (my goal is 100). If you have partially completed your survey or haven't started yet there is still time to complete one. Just click on the following link: https://www.surveymonkey.com/s.aspx . Over the next few weeks I will be working with statistician to analyze your responses. When I have results I will send each of you a summary.

Thanks again!
Terri

Please note: If you do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.
https://www.surveymonkey.com/optout.aspx

APPENDIX E

Fall 2011 Course Schedule

Date	Lecture Topics	Readings & Video	E-learning Activities
8/21	● Program Orientation ● Course Orientation ● Overview of ASDs	● Introductory Folder (ANGEL) ● Chapter 1: An Overview of Autism Spectrum Disorders (Buron & Wolfberg, 2009)	●Autism Internet Modules [AIM]: Assessment for Identification (Aspy & Grossman, 2008)
9/6	● History of ASD ● Early intervention and screening tools ● Restricted patterns of behavior, interests, and activities ● Cognition ● Emotional Vulnerability	● Chapter 2: Brain-Behavior Connections in Autism (Buron & Wolfberg, 2009) ● Chapter 3: Getting a Good Start: Effective Practices in Early Intervention (Buron & Wolfberg, 2009) ● Embarrassed Often…Ashamed Never (Elliot 2002) (pp. 1-26, 41-54, 63-67) ● The Culture of Autism (Mesibov & Shea, 2005) ● Tegrity Recording [TR]: Refrigerator Mothers (Kartemquin Films, 2002)	●AIM: Restricted Patterns of Behavior, Interests, and Activities (Szakas, 2009)

9/20	● Symbolic communication ● Social cognition	● Chapter 4: Symbolic Communication: Common Pathways and Points of Departure (Buron & Wolfberg, 2009) ● Chapter 8: Fostering Peer Play and Friendships: Creating a Culture of Inclusion (Buron & Wolfberg, 2009) ● Chapter 9: Social Thinking: Cognition to Enhance Communication and Learning (Buron & Wolfberg, 2009) ● Embarrassed Often…Ashamed Never (Elliot 2002) (pp. 29 – 40, 55-62) ● True Life: I have Autism (MTV, 2007)	● AIM: Functional Communication Training (Franzone & Collet-Lingenberg, 2010)
10/4	● Sensory processing ● Motor skills ● Data collection procedures	● Chapter 6: Sensory Processing: Identifying Patterns and Support Strategies (Buron & Wolfberg, 2009) ● Data Collection (Babkie , 2007) ● Teachers as Researchers (Babkie & Provost, 2004)	● AIM: Antecedent Based Intervention (Neitzel & Wolery, 2010)

		● Embarrassed Often…Ashamed Never (Elliot 2002) (pp. 85-108)	
10/18	● Environmental Supports ● Prompting Procedures ● Task Analysis	● Chapter 5: Structured Teaching and Environmental Supports (Buron & Wolfberg, 2009)	● TR: Mode & Direction Assessment (Kansas Instructional Support Network, 2011)
11/1	● Positive behavior supports ● Collaboration	● Chapter 7: Teaching a Different Way of Behaving: Positive Behavior Supports (Buron & Wolfberg, 2009) ● Chapter 12: The Education Team: Positive, Effective Interdisciplinary Collaboration (Buron & Wolfberg, 2009) ● TR: Difficult Moments for Children and Youth with Autism Spectrum Disorders (Myles, 2004)	● AIM: The Incredible 5-Point Scale (Coffin & Smith, 2009).
11/15	● Instructional Technology ● Assistive Technology	● Chapter 10: Systemizing Emotions: Using Interactive Multimedia as a Teaching Tool (Buron & Wolfberg, 2009) ● Video: Best AT Tools for 2010 (Ohio Center for Autism and Low Incidence Disabilities, 2010)	● Assistive Technology Internet Modules: Speech Generating Devices (Franzone, & Collet-Klingenberg, 2010)

		● TR: Instructional and Assistive Technology (Swanson, 2011)	
11/29	● Transition ● Personal Perspectives	● Chapter 11: Supporting the Transition Years (Buron & Wolfberg, 2009) ● Chapter 13: Growing Up with Autism: One Parent's Perspective (Buron & Wolfberg, 2009) ● Chapter 14: Educational Experiences Across the Lifespan: A Personal Perspective (Buron & Wolfberg, 2009) ● Embarrassed Often…Ashamed Never (Elliot 2002) (69-84, 109-133) ● Who will care for Dana? (Chen, 2011)	● AIM: Preparing individuals for employment (Rosenshein, 2009)

Note. Sample course syllabus for 2010-2011. Similar content was targeted during 2008-2009 with the course meeting every week.

APPENDIX F

Screenshot of ANGEL® Course Webpage

APPENDIX G

CEC Professional Knowledge and Skill Competencies Targeted In *Characteristics of Students with Autism Spectrum Disorders*

	Standard 1: Foundations
Knowledge	
ICC1K1	Models, theories, philosophies, and research methods that form the basis for special education practice
ICC1K2	Laws, policies, and ethical principles regarding behavior management planning and implementation
ICC1K3	Relationship of special education to the organization and function of educational agencies
ICC1K4	Rights and responsibilities of individuals with exceptional learning needs, parents, teachers, and other professionals, and schools related to exceptional learning needs
ICC1K5	Issues in definition and identification of individuals with exceptional learning needs, including those from culturally and linguistically diverse backgrounds
ICC1K6	Issues, assurances and due process rights related to assessment, eligibility, and placement within a continuum of services
ICC1K7	Family systems and the role of families in the educational process
ICC1K8	Historical points of view and contribution of culturally diverse groups
ICC1K9	Impact of the dominant culture on shaping schools and the individuals who study and work with them
ICC1K1	Potential impact of differences in values, languages and customs that can exist between the home and school

DD1K1	Definitions and issues related to the identification of individuals with developmental disabilities
DD1K2	Continuum of placement and services available for individuals with developmental disabilities
DD1K3	Historical foundations and classic studies of developmental disabilities
DD1K4	Trends and practices in the field of developmental disabilities
DD1K5	Theories of behavior problems of individuals with developmental disabilities

Standard 2: Development and Characteristics of Learners

Knowledge

ICC2K1	Typical and atypical human growth and development
ICC2K2	Educational implications of characteristics of various exceptionalities
ICC2K3	Characteristics and effects of the cultural and environmental milieu of the individual with exceptional learning needs and family
ICC2K4	Family systems and the role of families in supporting development
ICC2K5	Similarities and differences of individuals with and without exceptional learning needs
ICC2K6	Similarities and differences of individuals with exceptional learning needs
ICC2K7	Effects of various medications on individuals with exceptional learning needs
DD2K1	Medical aspects of developmental disabilities and their implications for learning
DD2K2	Psychological, social/emotional, and motor characteristics of individuals with developmental disabilities
DD2K3	Identification of significant core deficit areas for individuals with pervasive

	developmental disabilities, autism, and autism spectrum disorder
DD2K4	Factors that influence overrepresentation of culturally and/or linguistically diverse individuals
DD2K5	Complications and implications of medical support services
Standard 3: Individual Learning Differences	
Knowledge	
ICC3K1	Effects an exceptional condition(s) can have on an individual's life
ICC3K2	Impact of learners' academic and social abilities, attitudes, interests, and values on instruction and career development
ICC3K3	Variation in beliefs, traditions, and values across and within cultures and their effects on relationships among individuals with exceptional learning needs, family, and schooling
ICC3K4	Cultural perspectives influencing the relationships among families, schools, and communities as related to instruction
ICC3K5	Differing ways of learning of individuals with exceptional learning needs, including those from culturally diverse backgrounds and strategies for addressing these differences
DD3K1	Impact of multiple disabilities on behavior
Standard 4: Instructional Strategies	
Knowledge	
ICC4K1	Evidence-based practices validated for specific characteristics of learners and settings

DD4K1	Specialized materials for individuals with developmental disabilities
DD4K2	Evidence-based practices for teaching individuals with pervasive developmental disabilities, autism, and autism spectrum disorder

Skills	
ICC4S3	Select, adapt, and use instructional strategies and materials according to characteristics of the individual with exceptional learning needs
ICC4S6	Use strategies that promotes successful transitions for individuals with exceptional learning needs
DD4S1	Use specialized teaching strategies matched to the need of the learner
DD4S2	Relate levels of support to the needs of the individual

Standard 5: Learning Environments/Social Interactions	

Knowledge	
ICC5K1	Demands of learning environments
ICC5K2	Basic classroom management theories and strategies for individuals with exceptional learning needs
ICC5K3	Effective management of teaching and learning
ICC5K4	Teacher attitudes and behaviors that influence behavior of individuals with exceptional learning needs
ICC5K5	Social skills needed for educational and other environments
ICC5K6	Strategies for crisis prevention and intervention
ICC5K7	Strategies for preparing individuals to live harmoniously and productively in a culturally diverse world

ICC5K8	Ways to create learning environments that allow individuals to retain and appreciate their own and each other's respective language and cultural heritage
ICC5K9	Ways specific cultures are negatively stereotyped
ICC5K10	Strategies used by diverse populations to cope with a legacy of former and continuing racism
Skills	
ICC5S5	Modify the learning environment to manage behaviors
DD5S4	Structure the physical environment to provide optimal learning for individuals with developmental disabilities
Standard 7: Instructional Planning	
Knowledge	
ICC7K2	Scope and sequence of general and special curricula
ICC7K4	Technology for planning and managing the teaching and learning environment
Skills	
ICC7S4	Use functional assessments to develop intervention plans
ICC7S5	Use task analysis
ICC7S15	Evaluate and modify instructional practices in response to ongoing assessment data

Lesson Plan: Prompting and Task Analysis

Objectives: After completing the assigned readings, asynchronous E-learning activity and synchronous lesson students will be able to:
 	
• Create a task analysis with fidelity:
    o Identify the target skill
    o Identify the prerequisite skills of the learner and the materials needed to teach the task
    o Break the skill into components
    o Confirm that the task is completely analyzed
    o Determine how the skills will be taught
    o Implement task analysis and monitor process

Council for Exceptional Children Professional Standards: Initial Practitioner Knowledge and Skills in Developmental Disabilities and Autism • DDA4K1: Specialized curriculum designed to meet the needs of individuals with developmental disabilities/autism spectrum disorders • ICC4S3: Select, adapt, and use instructional strategies and materials according to characteristics of the individual with exceptional learning needs • ICC4S4: Use strategies to facilitate maintenance and generalization of skills across learning environments • ICC7S1: Identify and prioritize areas of the general curriculum and accommodations for individuals with exceptional learning needs • ICC7S1: Identify and prioritize areas of the general curriculum and accommodations for individuals with exceptional learning needs • ICC7S2: Develop and implement comprehensive, longitudinal individualized programs in collaboration with team members

- ICC7S5: Use task analysis

- ICC7S11: Prepare and organize materials to implement daily lesson plans

- ICC7S13: Make responsive adjustments to instruction based on continual observations

- DDA7.S1: Plan instruction for independent functional life skills and adaptive behavior

- DDA7.S4: Plan systematic instruction based on learner characteristics, interests, and ongoing assessment

- ICC8S1: Gather relevant background information.

- ICC8S8: Evaluate instruction and monitor progress of individuals with exceptional learning needs

- ICC10S7: Use group problem-solving skills to develop, implement, and evaluate collaborative activities

Assigned Online Activities:

Coffin, A. B., & Smith, S. M. (2009). *The incredible 5-point scale.* In Ohio Center for Autism and Low Incidence (OCALI), *Autism Internet Modules,* www.autisminternetmodules.org. Columbus, OH: OCALI.

Myles, B. S. (2004). *Difficult moments for children and youth with autism spectrum disorders* [DVD]. Shawnee Mission, KS: Autism Asperger Publishing Company.

Assigned Reading:

Pratt, C. (2008). Teaching a different way of behaving: Positive behavior supports. In K. D. Buron & P. Wolfberg (Eds.) *learners of the autism spectrum: Preparing highly qualified educators* (pp. 160-181). Shawnee Mission, KS: AAPC Textbooks.

Jacobsen, P. (2008). The education team: Positive, effective interdisciplinary collaboration. In K. D. Buron & P. Wolfberg (Eds.) *learners of the autism spectrum: Preparing highly qualified educators* (pp. 278-305). Shawnee Mission, KS: AAPC Textbooks.

Synchronous IVC Instruction Class Agenda:

1. Group advising for spring semester enrollment

2. Sharing of resources

3. Prompting procedures

       a. What are prompting procedures?

       b. Benefits of using prompting procedures

       c. Evidence based research

       d. Step-by-step instructions

       e. Implementation checklist

       f. Examples

       g. In class practice

4. Task analysis procedures

       a. What is task analysis?

       b. Benefits of using task analysis?

       c. Evidence based research

       d. Step-by-step instructions

       e. Implementation checklist

       f. Examples

       g. In class practice

5. End of Semester Assignment

6. Review of after class online activity

7. Review of assigned readings for the next class

Prompting & Task Analysis

November 1, 2011

Agenda

- Group Advising for Spring Semester
- Resources
- Prompting
- Task Analysis
- End of Semester Assignment
- After this class

Prompting Procedures

Neitzel, J., & Wolery, M. (2010). Prompting for children and youth with autism spectrum disorders: Online training module. In Ohio Center for Autism and Low Incidence (OCALI), *Autism Internet Modules*, www.autisminternetmodules.org. Columbus, OH: OCALI.

Prompting Procedures

- Any help given that assists a person in using a specific skill
- Increases the probability that the learner will use the target skill correctly by systematically providing and removing prompts

Neitzel, J., & Wolery, M. (2010).

Why Use Prompting?

- Includes a set of procedures designed to reduce incorrect responding while learner acquires a new skill

- Learners with ASD required direct instruction as they have difficulty learning new skills through imitation or understanding the most important or relevant details of a task (National Research Council, 2001)

- Prompting procedures target skills correctly and minimize errors and negative effects learners experience when target skills are not used successfully (Kurt & Tekin-Iftar, 2008; Mueller, Palkovis, & Maynard, 2007; West & Billingsley, 2005)

- Efficient and effective way to maximize success and increase generalized use of target skills.

Neitzel, J., & Wolery, M. (2010).

Who Can Use Prompting and Where Can It Be Used?

- Who:
  - Generally used by teachers, therapists & classroom assistants
  - Anyone who has received basic training on the procedures
- Where:
  - Research supports prompting in clinical and 1:1 teaching sessions (research has not been conducted in naturalistic settings)
  - Prompting should also be used in ongoing classroom routines & activities, in the home, or in community-based settings.

Neitzel, J., & Wolery, M. (2010).

What Age Is Prompting Most Effective?

- Research shows that prompting is an effective intervention for learners with ASD between the ages of 3 to 22 years of age (research has not been conducted with adults)
- Can be used effectively regardless of cognitive level or expressive communication abilities.

Neitzel, J., & Wolery, M. (2010).

What Factors Should Be Considered Before Using Prompting?

- Intervention planning
  - Prompt hierarchy
  - A controlling prompt is identified prior to instruction
  - Reinforcers are delivered for successful use of target skill (prompted and no-prompt)

Neitzel, J., & Wolery, M. (2010).

Tips for Using Prompts Effectively

- Prompts should be as minimal as possible
  - Use the least restrictive prompt to complete a target skill successfully
- Prompts should be faded as quickly as possible
  - Providing prompts for too long = prompt dependence
  - Systematic fading
    - the learner with ASD use target skills only when a natural cue is present
    - Increases independence & generalization of target skill

Neitzel, J., & Wolery, M. (2010).

Main Components of Prompting

- The **antecedent**
  - Target stimulus and cue/task direction tells the learner to use the target skill
- The **target skill**
  - Learner response is the target skill we want the learner to acquire
- The **consequence**
  - Reinforcement and feedback after the learner's response

Neitzel, J., & Wolery, M. (2010).

Types of Prompts

- Gestural
- Verbal
- Visual
- Model
  - Partial Model
  - Full Model
- Physical
  - Partial Physical
  - Full Physical

- Select prompt types based upon the needs & characteristics of the learner (Bryan & Gast, 2000)

Neitzel, J., & Wolery, M. (2010).

Effective Prompting Procedures for Learners with ASD

- Least-to-most prompting procedure
- Simultaneous prompting
- Graduated guidance

Neitzel, J., & Wolery, M. (2010).

Least-to-Most Prompting
(Least Prompts or Increasing Assistance)

- Prompt hierarchy used to teach:
  - New target skills
  - Target skills used inconsistently
  - Regressing with a mastered skill
- Types of skills used to teach
  - Discrete skills – single responses
  - Chained skills – a series of behaviors that form a complex skill
  - Response classes – group of responses that have the same function
    - Imitating peers – clapping, waving, driving a toy
    - Having a conversation with peers – different words & topics of conversation
    - Initiating social interactions – speaking to a peer, offering a toy,

Neitzel, J., & Wolery, M. (2010).

Least-to-Most Prompting

- System of least prompts, sometimes using increasing assistance
- A prompt hierarchy is used to teach new skills
  - Comprise of three levels
    - First level – provides the learner the opportunity to respond without prompts
    - Remaining two levels include prompts that process from least to most amounts of assistance
    - The third level – is a controlling prompt – ensures the learner responds correctly

Neitzel, J., & Wolery, M. (2010).

Implementation Checklist for Least-to-Most Prompting

Planning the Intervention

1. Identify the target skill/behavior (discrete or chained task)
2. Identify the target stimulus (naturally occurring, completion of an event/activity, or external signal)
3. Select cues or task direction
4. Select reinforcers
5. Identify activities and times to teach
6. Select the number of levels if the hierarchy
7. Select the types of prompts
8. Sequence prompts from least-to-most
9. Determine length of response interval

Implementing the Intervention

1. Establish learner attention, deliver stimulus, and provide cue
2. Wait for learner to respond
3. Respond to learner's attempt
4. Monitor learner outcomes

Note. See: Neitzel & Wolery, (2009). Implementation checklist for least-to-most prompting

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Simultaneous Prompting

- Uses two types of sessions
  - Instructional or teaching sessions
  - Probe sessions
- Used to teach new target skills
- Can be used with both discrete and chained skills

Neitzel, J., & Wolery, M. (2010).

Implementation Checklist for Simultaneous Prompting

Implementing the Intervention

1. Establish learner attention, deliver stimulus, and provide cue
2. Implement the prompt
   - Instructional Sessions
   - Probe Sessions
3. Monitor learner outcomes
   - Instructional Sessions
   - Probe Sessions

Note. See: Neitzel & Wolery, (2009). *Implementation checklist for simultaneous prompting*

Graduated Guidance

- During teaching activity adult makes judgments based on the learner's response
  - Uses a controlled prompt ensuring the learner will do the target skill correctly
- Used only with chained behaviors
- Embedded within ongoing routines and activities

Neitzel, J., & Wolery, M. (2010).

Implementation Checklist for Graduated Guidance

Preparing the Intervention

1. Select and describe the target behavior
2. Identify the target stimulus
3. Select cue or task direction
4. Select reinforcers
5. Identify the controlling prompt
6. Determine the length of the response interval
7. Specify prompt fading procedures
8. Identify activities and times for teaching

Implementing the Intervention

1. Implement graduated guidance
2. Monitor progress

Note. See: Neitzel & Wolery, (2009). *Implementation checklist for graduated guidance*

Why are prompting procedures important for learners with ASD?

- How would you decide which prompting procedure and prompt type to use with a particular learner with ASD?

- How are each of the prompting procedures similar to each other

- How are each of the prompting procedures different from each other?

Task Analysis

Szidon, K., & Franzone, E. (2010). Task Analysis: Online Training Module. In Ohio Center for Autism and Low Incidence (OCALI), *Autism Internet Modules*, www.autisminternetmodules.org. Columbus, OH: OCALI.

Task Analysis

- Task Analysis: The process of breaking a skill into smaller, more manageable steps in order to teach the skill.
- Other practices such as reinforcement, prompting, visual supports, and structured work systems should be used to facilitate learning of the smaller steps
- As the smaller steps are mastered, the learner becomes more and more independent in his/her ability to perform the larger skill.

Szidon, K., & Franzone, E. (2010).

Task Analysis - Evidence Base

- Effective in promoting:
    - Appropriate behavior
        - Self-help
        - Task completion
        - Reducing fear (dental procedures)
    - Increased communication skills
        - Social play skills

Szidon, K., & Franzone, E. (2010).

Task Analysis - Steps

Step 1: Identifying the Target Skill

- Identify the target skill that you want to teach the learner
  - Based upon learner's IEP/IFSP goals
  - Target skill should consist of a series of chained discrete steps

    - Example 1:
      - Too simple: Turn on the sink (discrete skill)
      - Just right: Washing dishes
      - Too complex: Preparing, serving and cleaning up dinner (multiple variables and multiple outcomes)

    - Example 2:
      - Too simple: Turn on the computer (discrete skill)
      - Just right: Turn on the computer and start a familiar program
      - Too complex: Turn on the computer, and create a personal webpage (multiple variables and multiple outcomes)

Szidon, K., & Franzone, E. (2010).

Step 2: Identifying the Prerequisite Skills of the Learner and the Materials Needed to Teach the Task

- Determine whether the learner has the required prerequisite skills needed to learn the task
  - Use the learner's PLEP on the IEP/IFSP goals
  - Ask the following three
    1. Are you asking for performance of a skill that is too hard?
    2. Are you asking for performance of a skill that has not been taught?
    3. Are you asking for a task to be accomplished without the necessary supports?
  - Collect baseline data on the target skill
- Define the necessary materials needed to teach the task
  - Depends on the individual needs of the learner (real vs. pretend items)

Szidon, K., & Franzone, E. (2010).

Step 3: Breaking the Skill into Components

- Segment the target skill into more manageable components
  - Complete the skill and record each step, or
  - Observe another person complete the activity and record the steps
- Confirm that each component consists of a discrete skill.

  - Practice:
    - Washing the dishes
    - Turning on the computer and start a familiar program

Szidon, K., & Franzone, E. (2010).

Step 4: Confirming that the Task is Completely Analyzed

- Confirm that the task is completely analyzed by having someone follow the steps verbatim
  - Co-worker, student/peer, spouse
  - Revise as needed

Szidon, K., & Franzone, E. (2010).

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Step 5: Determining How the Skill Will be Taught

- Select the appropriate teaching method by matching the method to:
    - the learner's temperament,
    - the learner's learning style,
    - the history of what has and has not worked for this learner,
    - the learner's IEP/IFSP, and
    - the environments within which the learner functions.

- Present the steps of the task analysis to learners in an age and developmentally appropriate manner.
    - What evidence-based practice(s) will be effective in teaching the learner?
        - Strategies learner this semester: reinforcement, prompting, visual supports, structured work systems and task organization
    - Steps should be presented in an efficient, clearly understood manner that does not attract undue attention to learners

Szidon, K., & Franzone, E. (2010).

Step 6: Implementing Intervention and Monitoring Progress

- Implement the evidence-based practices identified as appropriate to teach the target skills using the steps for implementation and implementation checklist for the selected practices.

- Follow appropriate data collection procedures to monitor learner progress for the specific evidence-based practices chosen to teach the target skills

Szidon, K., & Franzone, E. (2010).

- Prior to writing out the task analysis, one should determine the prerequisite skills...why is this?

- When selecting instructional methods for teaching a task analysis what types of things should be considered?

- When teaching a task analysis one should plan for generalization. What should be considered?

- Why is it important to be aware of the level of prompting necessary for the learning to perform the task analysis?

Task Analysis Example 1

Step 1: Identifying the Target Skill

- The student will follow a work system to prepare Fast Mac

Created by XXXXXXXXXXXXX

Step 2: Breaking the Skill into components

- Task Analysis: Cooking Fast Mac
  - Get Spoon
  - Get Bowl
  - Get scissors
  - Get measuring cup
  - Get Fast Mac Box
  - Open Fast Mac box
  - Get 1 package out
  - Cut package down the middle
  - Get macaroni bag
  - Cut open macaroni bag
  - Pour Macaroni Bowl
  - Measure 2/3 cup of water
  - Pour water in bowl
  - Put bowl in microwave
  - Turn microwave on for 3:50 minutes
  - Get cheese sauce mix package
  - Cut open cheese sauce mix package
  - Get bowl out of microwave
  - Pour cheese sauce mix in bowl
  - Stir cheese sauce in noodle
  - Ready to eat

Step 3: Confirming the steps of the task analysis

- When finished with the task analysis I had one of my paraeducators follow the task analysis to make sure that they could follow the steps to prepare Fast Mac.

Step 4: Determining how the skill will be taught

- The teacher will model each step (point to the step the work system prior to completing each step and then check off each step when finished).

- The student will follow the steps and check off the steps on the work system (teacher will provide modeling or gesture prompts as needed).

Step 5: Implementing Intervention and Monitoring Progress

- After the teacher has modeled the steps the first time, data will be collected. Data will be collected on all steps, including level of prompting

- When the student is able to complete all the steps with out prompts, the recipe is sent home to be used at home.

Data: (+) no prompt, (g) gesture, (m) model	Date	Date	Date	Date	Date
Steps					
Get spoon					
Get bowl					
Get scissors					
Get measuring cup					
Get Fast Mac box					
Open Fast Mac box					
Get 1 package out					
Cut package down the middle					
Get macaroni bag					
Cut open macaroni bag					
Pour macaroni bowl					
Measure 2/3 cup of water					
Pour water in bowl					
Put bowl in microwave					
Put bowl in microwave					
Turn microwave on for 3:50 minutes					
Get cheese sauce mix package out					
Cut open cheese sauce mix package					
Get bowl out of microwave					
Pour cheese sauce mix in bowl					
Mix cheese sauce in noodles					
Eat					

Fast Mac Directions

☐ Get Materials

☐ Spoon

☐ Get bowl

☐ Get Scissors

☐ Get measuring cup

☐ Get Fast Mac box

☐ Open Fast Mac box.

☐ Get 1 package out.

☐ Cut package down the middle.

☐ Get macaroni bag.

☐ Cut open macaroni bag.

☐ Pour macaroni in bowl.

☐ Measure 2/3 cup of water.

☐ Pour water in bowl.

☐ Put bowl in microwave.

☐ Turn microwave on for [3] [5] [0] minutes.

☐ Get cheese sauce mix package.

☐ Cut open cheese sauce mix package.

☐ Get bowl out of microwave.

☐ Pour cheese sauce mix in bowl.

☐ Mix cheese sauce in noodles.

☐ Ready to eat.

Task Analysis Example 2

Step 1: Identifying the Target Skill

*   Making a Peanut Butter and Jelly Sandwich

Created by XXXXXXXXXXXXXXXX

Step 2: Breaking the Skill into Components

*   Get Plate
*   Get Loaf of Bread
*   Get Peanut Butter
*   Get Jelly
*   Get 2 Slices of Bread
*   Open Peanut Butter Jar
*   Spread Peanut Butter on one slice of bread
*   Open Jelly
*   Spread Jelly on other slice of bread
*   Put slices of bread together
*   Eat your sandwich

Step 3: Confirming the Steps of the Task Analysis

- The Behavior Analyst and Autism Instructional Assistant confirmed the steps of the task analysis.

Step 4: Determining How the Skill will be Taught

- The student will be taught all steps in the process through direct instruction. A visual task strip will be made available to the student. As each step is completed, the student will move the visual icon down on the strip. Gestural prompts will be given as needed as a controlling prompt. The reinforcer is a natural one. The student gets to eat the sandwich upon completion of all steps.

NOTE: If the items that the student needs for this task are in storage cabinets the student will remove the icon from the task strip and match it to a like icon on the storage cabinets where the items are located. This would be the process to show completion of the first four steps in the task analysis (e.g., get plate, get loaf of bread, get peanut butter, get jelly).

Step 5: Intervention and Progress Monitoring

- After teaching using DI and guided practice, the student will look at his visual schedule, find icon for this task and complete it independently using visual mini task strip (structured work system).

- Data will be collected at this point for progress monitoring of each step and prompts that were needed to complete. The goal for the student is to complete the making of the sandwich independently.

Task Analysis Example 3

Step 1: Identify the target skill

- Put on and tie shoes

Step 2: Breaking the skill into components

1. Put the shoe on your foot
2. Pick up the right (R) whoe lace in your left hand
3. Pick up the left (L) shoe lave in your left hand
4. Pull the laces away from each other until the shoe begins to feel tight.
5. Cross the shoe laces one over and then under the other
6. Pull the laces away from one another until they begin to feel tight against the top of your foot
7. Make a loop with one lace and hold it. [right lace for right foot; left lace for left foot]
8. Wind the other lace over and around the top
9. Come underneath with a new loop.
10. Grab both loops and pull then away from each other until you have a tight bow

Step 3: Confirming the steps of the task analysis

- Practiced the steps with my spouse. She helped me fine-tune them.

Step 4: Determining how to skill will be taught

- Currently the student will not comply with a request to tie his shoes. Will tantrum when he sees the shoe or asked to perform the task
- To minimize anxiety, will implement backward chaining (adult will complete non-mastered steps)
- Video modeling will be used
    - http://www.tvlesson.com/video/24584_how-to-tie-your-shoes.html
- Reinforcement: will receive verbal praise and high fives or tickles for completing requested task

Step 5: Implementing Intervention and Monitoring Progress

- + for steps completed independently
- Record prompt given:
  - G (gesture)
  - M (model)

Steps:			
10. Grab both loops and pull	10	10	10
9. Come under with a new loop.	9	9	9
8. Wind lace over/ around the loop.	8	8	8
7. Make a loop and hold it	7	7	7
6. Pull the laces	6	6	6
5. Cross the shoe laces	5	5	5
4. Pull the laces	4	4	4
3. Pick up left (L) lace in left hand	3	3	3
2. Pick up right (R) lace right hand	2	2	2
1. Put shoe on	1	1	1

Small Group – Groups of 2-3

- Complete a task analysis on greeting a peer
  - Determine prerequisite skills
  - Identify the components of the skill
- As a class will discuss how this approach helps clarify the many aspects that may impact task demands

Task Analysis Project Directions
Due Dec 7 – 100 points

1. Complete a task analysis for an individual as outlined in *Task Analysis: Steps for Implementation* (Franzone, 2009) using the following interventions:
   - structured work systems,
   - prompting procedures,
   - reinforcement procedures,
   - may use additional strategies, and
   - develop a data collection system.

Task Analysis Project Directions Cont.

2. All submitted projects *must* be submitted as <u>one document</u> to Canvas and <u>include the following</u>:
   - A short discussion & reflection paper (approx 8-10 pages double spaced):
     - Discusses how you completed each of the steps of the task analysis (5-8 pages), including creating structured work system, prompting and data collection procedures
     - A reflection on what you learned, what would you do differently next time and how you could incorporate task analysis into your teaching (2-3 pages)
   - a structured work system (e.g. photo, Boardmaker icons converted to PDF or other format)(whatever length is appropriate)
   - sample data collection sheet (1 page)

After This Class

- Online Activity #7
  - Tegrity Recording: Mode & Direction Assessment
    - Due 10/24

November 1

Assigned Reading:

- Chapter 7: Teaching a Different Way of Behaving: Positive Behavior Supports
- Chapter 12: The Education Team: Positive Effective Interdisciplinary Collaboration

Tegrity Recording:

- Difficult Moments for Children and Youth with ASD

Autism Internet Module Included in

Characteristics of Students with Autism Spectrum Disorders

Module Title	Description of Module Content
1. Assessment for Identification	Early identification, differences between diagnosis and eligibility, and the difference between interdisciplinary assessment and multidisciplinary assessment
2. Restricted Patterns of Behavior, Interests, and Activities	Describes, identifies and explains this characteristics in individuals with ASD, and provides examples of how to use restricted patterns for reinforcement
3. Functional Communication Training	Describes how to select, implement, and monitor progress on a replacement behavior that aids in communication
4. Antecedent Based Intervention(ABI)	Describes how antecedent events impact behavior, how to assess, implement and adapt eight ABI
5. Parent Implemented Intervention	Describes the rational and steps for including parents in intervention and the process of developing an individualized intervention plan
6. The Incredible 5-Point Scale	develop and understanding of the 5-point scale strategy and how to use task analysis for breaking a task or concept into more manageable parts
7. Speech Generating Devices (SGD)	Describes how to select an SGD for an individual with ASD and key considerations for using SGD in the classroom

Note. Refer to APPENDIX E to see how each module aligned with course topics.

APPENDIX J

Example of Exam Questions

Midterm

1. List and briefly describe the disorders on the autism spectrum. (5 points)

Correct answer(s):

Autism: a child has a severe qualitative impairment in reciprocal social interaction and communication and a restricted range of activities and interests.

Rett's Disorder: appears to occur only in girls and is a progressive neurological disorder. It is typified by loss of purposeful hand use, hand wringing, spasticity of lower extremities, microcephaly, seizures, and high supports for daily living.

Childhood Disintegrative Disorder: a rare condition in which a child develops typically on all milestones until between the ages of three and five. The child then experiences rapid deterioration across all areas to the point at which he demonstrates significant and severe difficulties across social, communication and intellectual skills.

Pervasive Developmental Disorder: Not Otherwise Specified: is somewhat vague but is generally used to refer to children who demonstrate some signs of autism but not demonstrate a clear diagnosis. The author of the chapter describes PDD-NOS as "fragments of autism".

Asperger's Disorder/Syndrome: includes lack of the significant early language and cognitive skills deficits that are commonly seen in autism; no clinically significant delay in self-help skills or adaptive behavior; and less likelihood of motor mannerisms.

2. In addition to sharing the "triad of impairments," which item contains the best description of the similarities between high functioning autism and Asperger syndrome? (1 point)

◻ A) Both disorders meet the developmental milestones for language.

◻ **B) Both disorders have normal to above normal intelligence quotient.**

◻ C) Both disorders experience a significant delay in language when under the age of 3, then have an advanced vocabulary when school aged and beyond

◻ D) Both experience a lack of significant early language and cognitive skills deficits.

3. Briefly name and describe the three core areas that are consistent with diagnostic criteria for autism spectrum disorders. (3 points)

Correct answer(s):

Social Interaction: lack of understanding/use of nonverbal communication, difficulty with peer relationships, lack of reciprocity

Communication: delay or lack of spoken language, idiosyncratic language, lack of varied, spontaneous play, impairment in initiating and sustaining conversation

Restricted patterns of behavior: inflexibility, nonfunctional routines or rituals, preoccupation with parts of objects, repetitive motor mannerisms

4. Above is a visual example of the "Sally Anne test." This test is used to determine whether a person has developed theory of mind skills. Answer the following two questions. (2 points)

      1. How would a person with theory of mind answer the question "Where will Sally look for her ball?" **Correct answer(s):** Basket

      2. How would a person with weak theory of mind answer the question "Where will Sally look for her ball?" **Correct answer(s):** Box

5. Name and briefly define the three core cognitive deficits in ASD. (3 points)

Correct answer(s):

Theory of Mind: An inability to recognize that other people have thoughts, feelings and intentions that are different to one's own, and an inability to intuitively guess what these might be.

Weak Central Coherence: An inability to bring together various details from perception to make a meaningful whole; excludes sensory, motor, memory, & expressive deficits.

Executive Functioning: Impairment of deficits in the higher-order processes that enable us to plan, sequence, initiate, and sustain our behavior towards some goal, incorporating feedback and making adjustments along the way.

6. Explain the difference between viewing ASD as a psychologically based disorder and viewing it as having a neurological origin. (2 points)

Correct answer(s):

The difference between viewing ASD as a psychological disorder and viewing it as having a neurological origin changed how we work with individuals and families.

No longer was the disorder seen as a **reaction** to distant (refrigerator) mothers, but, instead, as a **brain-based disorder** that caused individuals to process information differently, respond to stimuli differently, and difficulties with working memory, among other issues.

The change in views impacts intervention as well as our understanding of how individuals with ASD learn.

7. Match the following terminology related to executive functioning with the corresponding behavior (12 points)

A. Inhibition
B. Shift
C. Emotional Control
D. Initiation
E. Working Memory
F. Planning/Organization
G. Organization of Materials
H. Self-Monitoring
I. Goal Directed Persistence
J. Metacognition
K. Flexibility
L. Problem-solving

[▼] Anna was upset because she did not get an A on her paper and wanted to cry. But she knew that crying in class, in front of her peers was not appropriate.

Correct answer(s): C. Emotional Control

[dropdown] Mrs. Jensen gave her class oral instructions for what they were to do in group work. When she finished giving instructions her students got up from their seats, got into their groups, and then began their projects.

Correct answer(s): E. Working Memory

[dropdown] Trevor is taking a test in beginning music. He is being tested on all of the notes for the treble clef. He remembers the mnemonic Every Good Boy Does Fine to remember the notes that fall on the lines.

Correct answer(s): J. Metacognition

[dropdown] Ramone is trying to emptying the dishwasher but the phone keeps ringing. For each call he writes down the message that is being left for his sister, his mother, and his father and then each time goes back to emptying the dishwasher until it is empty.

Correct answer(s): I. **Goal Directed Persistence**

[dropdown] Jeremy became angry at one of his peers and began to yell. He then stopped yelling and asked the teacher if he could go to the safe room.

Correct answer(s): A. Inhibition

[dropdown] Mike has an oral presentation due in three weeks. He uses his planner to map out all of the steps of the project so that it will be completed on time.

Correct answer(s): F. Planning/Organization

[dropdown] Shelley was working on a project in English class. The bell rang and she packed up her materials and walked to her next class. When she got to her desk she got her math materials out and was ready for the teacher to begin the lesson.

Correct answer(s): B. Shift

[dropdown] Janey is going to give a Power Point presentation at work. When she gets ready to begin the presentation she realizes that her computer battery is dead and she doesn't have her power cord. She asks around the office and eventually finds a power cord that she can borrow.

Correct answer(s): L. Problem-solving

[dropdown] Jimmy uses a 5 point scale every 30 minutes to determine his anxiety level.

Correct answer(s): H. Self-Monitoring

▾ Robin is excited to go on the school trip to the amusement park tomorrow, but when she gets up for school it is raining and the trip has been postponed until next week. She is bummed because now she has to go to school, but thinks it is ok because she knows she will get to go next week.

Correct answer(s): K. Flexibility

▾ Kelly uses containers and labels to keep her closet neat and orderly.

Correct answer(s): G. Organization of Materials

▾ Mona had a meeting at 11am with one of her professors to talk about her program plan for the spring semester. Her professor did not show up at 11am so Mona began outlining her plan while she waited.

Correct answer(s): D. Initiation

8. Name two of the benefits of early intervention for children with ASD. (2 points)

> **Correct answer(s):**
>
> The benefits of early intervention for children with ASD include better potential gains in level of independence, cognitive functioning and communication.

9. Why is joint attention so important to developing social communication? (3 points)

> **Correct answer(s):**
>
> 1. Joint attention is important in the development of social communication because social communication is based on a shared awareness and engagement, something that is gained through joint attention activities.
>
> 2. Additionally, research shows that the amount of joint attention engaged in is highly correlated with vocabulary development and
>
> 3. Sets the stage for intention reading.

10. Why is it important for infants to engage in interactive games to assist them in developing social communication? (2 points)

Correct answer(s):

It is important for infants to engage in interactive games to assist in developing social communication because such games provide opportunities for **joint attention, affect sharing, and social reciprocity,** all of which help the infant develop the **interpersonal relatedness** needed for later social communication.

11. Nolan is a student in your class and he does not like getting bumped into. Briefly describe an active strategy and a passive strategy he might use when navigating the busy hallway during the passing period. (2 points)

Correct answer(s): Answers will vary but should indicate:

Active Strategy: Children work to control their sensory input

Passive Strategies: Children let sensory input occur and then respond to it

12. How might individuals with ASD differ from neurotypical peers in terms of sensory processing? (2 points)

Correct answer(s):

    1. Individuals with ASD are more likely to be <u>sensitive</u> to touch, as well as auditory and oral sensory processing.

    2. They also have <u>significantly different scores </u>on <u>low registration </u>and <u>avoiding</u>, and

    3. Have been found to display significant differences on virtually all areas of sensory processing.

13. What is baseline? (1 point)

Correct answer(s): Collecting data on the learner's target behavior prior to the beginning of the intervention program

14. A student is displaying a low incidence behavior with a definite beginning and end. What type of data collection method would be best? (1 point)

☑ **A) Event recording**

☐ B) Latency recording

☐ C) Duration recording

☐ D) Time sampling

☐ E) Permanent product recording

☐ F) Interval recording

15. All target behaviors must be: specific, observable, measurable, voluntary, and replicable. Why must target behaviors meet each of these criteria? (5 points)

Correct answer(s): Answer will vary but should generally include:

1.   Specific – It is clear enough so that the two independent observers would count the same number of instances of behavior

2.   Observable – You can see it

3.   Measurable – You can count it in some fashion

4.   Voluntary – It may be changed

5.   Replicable – It may be done again

16. A student is engaging in behavior such as having a temper tantrum. What type of data collection method would be best? (1 point)

☐ A) Event recording

☐ B) Latency recording

☑ **C) Duration recording**

☐ D) Time sampling

☐ E) Permanent product recording

☐ F) Interval recording

17. You have given a student a direction and you wanted to see how long it takes for her to respond. What type of data collection method would be best? (1 point)

- ☐ A) Event recording
- ◉ **B) Latency recording**
- ☐ C) Duration recording
- ☐ D) Time sampling
- ☐ E) Permanent product recording
- ☐ F) Interval recording

18. You want to record data after the target behavior had occurred. Which data collection method would be best? (1 point)

- ☐ A) Event recording
- ☐ B) Latency recording
- ☐ C) Duration recording
- ☐ D) Time sampling
- ◉ **E) Permanent product recording**
- ☐ F) Permanent product recording
- ☐ G) Interval recording

19. A student is engaging in a high-frequency behavior. Which two data collection methods would be best for recording data on this type of behavior? (1 point)

- ☐ A) Event recording
- ☐ B) Latency recording
- ☐ C) Duration recording
- ☑ **D) Time sampling**
- ☐ E) Permanent product recording
- ☑ **F) Interval recording**

Final Exam

1. Why is it important to determine the prerequisite skills needed for a specific task?

Correct answer(s):

The learner must already the skill in their repertoire before a given task can be taught successfully.

- To determine the skills needed to perform the task
- to assess the learner's skill set as it relates to the task
- To ensure that the learner can be successful at all of the TA steps

2. In which step of a task analysis should baseline data be collected?

- ☐ A) Identify the target skill
- ☐ **B) Identify the prerequisite skills of the learner and the materials needed to teach the task**
- ☐ C) Break the skill into smaller parts
- ☐ D) Confirm that the task is completely analyzed
- ☐ E) Determine how the skill will be taught
- ☐ F) Implement the intervention and monitor progress

3. Which three components are required for prompting procedures.

- ☑ **A) Target response**
- ☐ B) controlling prompt
- ☐ C) Physical prompt
- ☑ **D) Antecedent**
- ☐ E) Least restrictive prompt
- ☐ F) visual cue
- ☐ G) Least-to-most prompting
- ☑ **H) consequence**
- ☐ I) Simultaneous prompting
- ☐ J) Graduated guidance

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4. Match the terminology with the correct definition.

| A. Least-to-most prompting |
| B. Gradual guidance |
| C. Simultaneous prompting |

[▼] This prompting procedures is used only with chained skills and usually includes physical prompting.

Correct answer(s): Gradual guidance

[▼] One of the most effective near-errorless teaching procedures. Used to teach new skills that are discrete or chained.

Correct answer(s): Simultaneous prompting

[▼] Uses a hierarchy that has at least three levels of prompting. May be used for discrete or chained skills. Can be used to teach new or re-teach previously mastered or regressing skills.

Correct answer(s): Least-to-most prompting

5. Which description best matches the term controlling prompt.

○ A) Part of the prompt hierarchy

◉ **B) Ensures the learner responds correctly**

○ C) Provides the learner opportunity to respond without prompts

○ D) Ensures that the learner responds correctly with a middle level prompt

○ E) Ensure the learner responds correctly by waiting for the full response interval

6. What are the four questions structured work systems should answer by providing the learner with visual information and organization of the environment?

Correct answer(s): a. What work? b. How much work? c. When am I done? d. What is next?

7. Match the terminology to the appropriate definition/description.

| A. Physical Structure |
| B. Individual schedules |
| C. Work systems |
| D. Routines and Strategies |
| E. Visual Structure of Tasks |

[C ▼]Tells the person what they will be doing in a specific setting

Correct answer(s): Work systems

[E ▼]Visual organization, clarity and instructions

Correct answer(s): Visual structure of tasks

[A ▼]Establish clear physical and visual boundaries, organize space, & minimize visual and auditory distractions

Correct answer(s): Physical structure

[D ▼]A person's way to problem solve

Correct answer(s): Routines and Strategies

[C ▼]Lets the person know where they are going throughout their day

Correct answer(s): Individual schedule

8. In the State of   , when does the individualized transition plan begin?

- ☑ **A) 14**
- ☐ B) 15
- ☐ C) 16
- ☐ D) 17

9. When a person wants to obtain services through the developmental disabilities system in
        , which organization serves as the single point of entry?

☐ A) Social Security

☐ B) Vocational Rehabilitation

☐ C) The local school system

◉ **D) Community Developmental Disability Organization**

☐ E) Families Together

10. Match the educational or disability principle/law with the most appropriate definition

A. Individuals with Disabilities Education Act
B. Appropriate education
C. Parent and student participation
D. Nondiscriminatory evaluation
E. Least restrictive environment
F. Section 504 of the Rehabilitation Act
G. Elementary and Secondary Education Act (also called No Child Left Behind)
H. Zero Reject
I. Procedural due process

[D ▾] Through this principle students with disabilities are able to demonstrate what they are able to do and not do

Correct answer(s): D. Nondiscriminatory evaluation

[F ▾] This law is outcome neutral and focuses on promoting access

Correct answer(s): F. Section 504 of the Rehabilitation Act

[I ▾] Parents have the right to protest of behalf of their children

Correct answer(s): I. Procedural due process

[▾] Requires school systems to employ scientifically based research as the foundation for general education programs and classroom instruction

Correct answer(s): G. Elementary and Secondary Education Act (also called No Child Left Behind)

[dropdown]Under this principle parents have the right to be part of the student's team and access their child's records

Correct answer(s): C. Parent and student participation

[dropdown]Forbids states an local schools districts from excluding students with disabilities from educational programs.

Correct answer(s): H. Zero Reject

[dropdown]This law, first implemented in 1975 provides equal educational opportunity for students with disabilities.

Correct answer(s): F. Section 504 of the Rehabilitation Act

[dropdown]This principle is based upon the results of a nondiscriminatory evaluation.

Correct answer(s): B. Appropriate education

[dropdown]The core provisions of this principle are that the child has access to the general education curriculum and that students are educated with same-age non-disabled peers

Correct answer(s): E. Least restrictive environment

11. What does the term "systemizing" mean in reference to individuals with ASD?

Correct answer(s): Systemizing refers to a person's drive to analyze or build systems to understand and predict the behavior of rule-based events. Most individuals with ASD are hyper-attentive to detail and prefer predictable, rule-based environments, both of which assist in systemizing.

12. What is PL 94-142, and why was it important for educating learners with ASD?

Correct answer(s):

1. Gave students with special needs access to education.

2. Gave parents rights and a voice

PL 94-142, passed in 1975 and now known as IDEA 2004, was important because it mandated public school services for ALL children with disabilities. Additionally, the law required that schools involve parents in all aspects of their child's schooling, from permission to conduct assessment, to placement decisions, to development of educational plans for the child. Prior to passage of PL 94-142, schools were not required to provide educational services for students with disabilities, including those on the autism spectrum. Therefore, options ranged from institutionalization to home teaching to placement in a regular class with the hope that teachers would be supportive.

13. Why is using the special interests of a person with ASD usually an effective way of engaging him in learning?

Correct answer(s): Using the special interest of a person with ASD is a good way of engaging her in learning because (a) it can provide a vehicle to interact with others who have shared interests or engage in similar activities; (b) it can help the teacher get the person focused on the academic task at hand; and (c) it can motivate the student to become involved in the classroom.

14. Which ASD is primarily found in girls

- ☐ A) Childhood Disintegrative Disorder
- ☐ B) Asperger Syndrome
- ☐ C) Autism
- ☑ **D) Rett Syndrome**
- ☐ E) Pervasive Developmental Disorder - Not Otherwise Specified

15. Which theory blamed parenting as the cause for the child developing autism?

○ A) Brain differences

○ B) Holy Fools

◉ **C) Refrigerator mothers**

○ D) Genetics

16. What is the difference between autism and high functioning autism?

○ A) Theory of Mind (ToM)

○ B) Weak central coherence theory

○ C) Verbal ability

◉ **D) Intelligence quotient (IQ)**

○ E) Executive functioning

Side-by-Side Comparison of the Culminating Assignments

Description	Functional Behavior Assessment	Task Analysis
Required Fundamental Elements of Interventions	• Data collection: ABC • Develop hypothesis for function of behavior	• Data collection
Required Evidence-Based Practices	• None	• Task analysis • Individualize structured work system • Prompting procedures • Additional EBP as needed
Instructions	• Choose a specific behavior, operationally define, and establish inter-rater reliability • Complete the ABC with 5 to 10 data collection points, develop hypothesis for function of behavior, select appropriate intervention • Complete TEACCH ABC using same data collection for time, antecedent, behavior, consequences. Add underlying characteristics of ASD that may impact the operationally defined behavior, develop hypothesis for function of behavior, select appropriate intervention • Answer questions as outlined in the instructions	• Complete a task analysis as outlined in *Task Analysis: Steps for Implementation* (Franzone, 2009). Must include a structured work system, prompting procedures, and data collection for a minimum of one data collection session. • Develop a 5 – 10 page reflection paper that discusses how you completed each of the steps of the task analysis (5-8 pages), and then reflect on what you learned, what would you do differently next time and how you could incorporate task analysis into your teaching (2-3 pages)

Requirements for Submission	• Data collection sheets with 5-10 data collection points (ABC, TEACCH ABC) • Paper providing responses to specified questions	• Reflection paper (describes steps taken to complete the task analysis and required components, reflection question) • Picture of the structured work system • Data collection form
Scoring	• 100 points • No scoring rubric used	• 100 points • 54 point grading rubric (points converted to a grade on a 100 point scale, i.e., 52/54 points equaled 92.3% or 92.3 points)

Culminating Assignment – Functional Behavior Assessment

Functional Behavior Assessment:

You will be taking data using a direct observation tool that helps to pinpoint the events occurring in the individual's environment that may be the cause of the displayed behavior. The direct observation system is an Antecedent-Behavior-Consequences Analysis (ABC Analysis). It has also been adapted to better help us understand the behavior of individuals with ASD – this is called the TEACCH Antecedent-Behavior-Consequences-Iceberg (TEACCH ABC).

For this assignment you are going to choose a specific behavior to observe. After choosing a behavior you will operationally define the behavior. Keep in mind that "the behavior must be observable and measurable and using the operational definition, two people are able to identify the behavior when it occurs" (Aspy & Grossman, p. 41, 2008). The behavior does not have to be a negative behavior – it can be any behavior that you frequently observe. In addition, it is preferable that you do this assignment with a person with an ASD, however, it is not required. You may do this assignment with typically developing students/children, individuals with other disabilities, your spouse or even yourself. What is important is that you go through the ABC and ABC-I processes and understand how to determine that cause of behavior and how the underlying characteristics of ASD impact behavior.

1. Choose a specific behavior and operationally define.
   A. Have another person take data with you on the operationally defined behavior before completing the ABC data collection. Answer the following questions:
      Q1: Were you both able to accurately identify the behavior the first time you took data together?
      Q2: If you were able to both accurately identify the behavior tell me why you were able to do that.
      Q3: If you were unable to both accurately identify the behavior tell me why you were not able to do that and how you changed the operationally define behavior so that you could both identify.

2. Take ABC data on 5 to 10 instances of the operationally define behavior. Answer the following questions.
   Q4: Was there a common antecedent?
   Q5: Was there a common consequence?
   Q6: What do you think is the function of the behavior?
   Q7: What would you do to change the behavior based upon the data collected in the ABC?

3. From the ABC cut and paste the following data into the TEACCH ABC: date, time, antecedent, behavior, consequences.

4. Fill in underlying characteristics of ASD that may impact the operationally defined behavior (these may be bulleted/brief phrases) (i.e., Communication: nonverbal – is unable to express needs using words). Answer the following questions.
   Q8: Based upon the completed TEACCH ABC what do you think function of the behavior was?
   Q9: What would you do to change the behavior based upon the data collected in the TEACCH ABC?

5. Compare and contrast your finding in the ABC and TEACCH ABC.
   Q10: Are there differences between your findings in function of behavior between the ABC and TEACCH ABC?
   Q11: Which data collection method do you think provided you with the best information in understanding the function of the behavior?

ABC Analysis					
Date:		Initials of Person Observed:		Name of Observer:	
Operationally define behavior(s):					
Date	Time	Setting Events	Antecedent	Behavior	Consequence

Possible Function of Behavior:
□ Escape/Avoidance   □ Adult/Peer Attention   □ Tangible Items
□ Sensory Stimulation   □Access to Preferred Activity   □ Other _____

ABC - Iceberg Analysis					
Date:		Initials of Person Observed:		Name of Observer:	
Operationally define behavior(s):					
Date	Time	Setting Events	Antecedent	Behavior	Consequence
Underlying Characteristics of ASD:					
Possible Function of Behavior: □ Escape/Avoidance □ Adult/Peer Attention □ Tangible Items □ Sensory Stimulation □Access to Preferred Activity □ Other _____					

QUESTIONS
1: Were you both able to accurately identify the behavior the first time you took data together?
2: If you were able to both accurately identify the behavior tell me why you were able to do that.
3: If you were unable to both accurately identify the behavior tell me why you were not able to do that and how you changed the operationally define behavior so that you could both identify.
4: Summarize the collected data (was there a common setting event, antecedent, consequence, etc.)
5: Based upon the data collected in the ABC, what is your hypothesis (i.e., what is the function of the behavior)?
6. Briefly describe your intervention plan (i.e., develop your plan, who would be involved, how would you implement the plan).
7: How would you monitor progress?

8: Summarize the collected data (was there a common setting event, antecedent, consequence, underlying characteristic, etc.)
9: Based upon the data collected in the ABC-I, what is your hypothesis (i.e., what is the function of the behavior, what underlying
characteristics need to be addressed)?
10. Briefly describe your intervention plan (i.e., develop your plan, who would be involved, how would you implement the plan).
11: How would you monitor progress?
12: What are the similarities between your findings in function of behavior between the ABC and ABC-I?
13: What are the differences between your findings in function of behavior between the ABC and ABC-I?

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Task Analysis Project Directions

Task analysis is the process of breaking a skill into smaller, more manageable steps in order to teach the skill. As the steps are mastered, the learner becomes more and more independent in his/her ability to perform the larger skill (Franzone, 2009). Other strategies should be used to facilitate learning of the smaller steps. For this project you are required to utilize <u>structured work systems</u> and <u>prompting procedures</u>. You may use additional strategies as appropriate.

Directions:

1. Complete a task analysis as outlined in *Task Analysis: Steps for Implementation* (Franzone, 2009).

2. All submitted projects *must* be submitted as <u>one document</u> to ANGEL and <u>include the following</u>:

   - A short discussion & reflection paper (approx 8-10 pages double spaced):
     - o Discuss how you completed each of the steps of the task analysis (5-8 pages)
     - o A reflection on what you learned, what would you do differently next time and how you could incorporate task analysis into your teaching (2-3 pages)
   - a structured work system (e.g. photo, Boardmaker icons converted to PDF or other format)(whatever length is appropriate)
   - prompting procedures
   - data collection procedures and sample data collection sheet (whatever length is appropriate)

Resources (these can be found on ANGEL – 11/1 folder)

<u>Task Analysis</u>:

Franzone, E. (2009). *Implementation checklist for task analysis.* Madison, WI: The National Professional Development Center on Autism Spectrum Disorders, Waisman Center, University of Wisconsin.

Franzone, E. (2009). *Task analysis: Steps for implementation.* Madison, WI: The National Professional Development Center on Autism Spectrum Disorders, Waisman Center, University of Wisconsin.

<u>Structured Work Systems</u>:

Hume, K., & Carnahan, C. (2008). *Implementation checklist for structured work systems and activity organization.* Chapel Hill, NC: The National Professional Development Center on Autism Spectrum Disorders, Frank Porter Graham Child Development Institute, The University of North Carolina.

Hume, K., & Carnahan, C. (2008). *Steps for implementation: Structured work systems and activity organization.* Chapel Hill, NC: The National Professional Development Center on Autism Spectrum Disorders, Frank Porter Graham Child Development Institute, The University of North Carolina.

<u>Prompting Procedures</u>:

Neitzel, J., & Wolery, M. (2009). *Implementation checklist for least-to-most prompts.* Chapel Hill: NC: The National Professional Development Center on Autism Spectrum Disorders, FPG Child Development Institute, The University of North Carolina.

Neitzel, J., & Wolery, M. (2009). *Steps for implementation: Least-to-most prompts.* Chapel Hill: NC: The National Professional Development Center on Autism Spectrum Disorders, FPG Child Development Institute, The University of North Carolina.

Neitzel, J., & Wolery, M. (2009). *Implementation checklist for graduated guidance.* Chapel Hill: NC: The National Professional Development Center on Autism Spectrum Disorders, FPG Child Development Institute, The University of North Carolina.

Neitzel, J., & Wolery, M. (2009). *Steps for implementation: Graduate guidance.* Chapel Hill: NC: The National Professional Development Center on Autism Spectrum Disorders, FPG Child Development Institute, The University of North Carolina.

Neitzel, J., & Wolery, M. (2009). *Implementation checklist for simultaneous prompting.* Chapel Hill: NC: The National Professional Development Center on Autism Spectrum Disorders, FPG Child Development Institute, The University of North Carolina.

Neitzel, J., & Wolery, M. (2009). *Steps for implementation: Simultaneous prompting.* Chapel Hill: NC: The National Professional Development Center on Autism Spectrum Disorders, FPG Child Development Institute, The University of North Carolina.

Data Collection Procedures:

State Office of Education. (n.d.). LRBI checklist: Data collection. *Utah students at risk: Online staff development academy.* Retrieved from http://www.iseesam.com/teachall/text/behavior/LRBIpdfs/Data.pdf.

Task Analysis Scoring Rubric

Scoring Key: 2: Completed correctly 1: Completed partially correct 0: Not completed n/a: Not applicable	Scoring	Comments
Step 1. Identify target skill		
1. Target skill identified		
Step 2. Breaking the skill into components		
• Completed the skills themselves		
• Confirmed each component contained a discrete skill (Observed other person complete the skill)		
Step 3. Confirming the steps of the task analysis		
• Confirmed steps of task analysis by having someone complete the steps verbatim		
Step 4. Determining how the skill will be taught		
• Select appropriate teaching method by matching the structured work system to:		
o Learner's temperament		
o Learner's learning style		
o History of what has/has not worked for learner		
o Learner's IEP/IFSP		
o The environments in which the learner functions		
• Identified additional EBP to teach each step of the target skill if appropriate		
• Identifies types of prompting or reinforcement procedures they will use to teach steps identified by the task analysis and/or that are appropriate for specific EBP.		
STRUCTURED WORK SYSTEM		
Visually answers the four questions:	////////	
o What work?		
o How much work?		
o When am I done?		
o What is next?		
Teaches the learner how to use the work system		
PROMPTING PROCEDURES		
• Correctly followed planning procedures		
DATA COLLECTION PROCEDURES		
• Data collection form includes required components	////////	
o Target Skill (operationally defined)		
o Component skills		
o Key for scoring		
o Prompt level		
• Presents the steps of the task analysis to learner in an age and developmentally-appropriate manner.		
Step 5. Implementing intervention and monitoring progress		
• Structured work system using the steps for implementation and implementation checklist		
• Prompting procedures using the steps for implementation and implementation checklist		
• Data collection system using the steps for implementation		
• Describes system for monitoring progress		
Total Points	/54	

Perceived Knowledge and Skills – Autism Survey

APPROVAL TO PARTICIPATE IN THE RESEARCH STUDY

Thank you for taking the time to share your learning experience during _____ Characteristics of Students with Autism Spectrum Disorders (also called Introduction to Students with Autism Spectrum Disorders). The results from the survey will be used as part of my dissertation research project. This is a voluntary survey.

Completing this survey should take no more than 20 minutes. The questions are a combination of multiple choice, rating, rank and open ended.

Complete the questions below to indicate your consent to participate in the research study. Your name will not be associated with the research study.

1. Name

[   ]

2. I have read the Informed Consent Statement (included in the email with the link to this survey).

○ Yes

○ No

APPROVAL TO PARTICIPATE IN THE RESEARCH STUDY

1. I agree to participate in the research study.

○ Yes

○ No

DEMOGRAPHIC INFORMATION

The following section will ask questions about your demographics during the time you were enrolled in

1. Which year did you complete   Characteristics of Students with Autism Spectrum Disorders (Introduction to Students with Autism Spectrum Disorders)?

- ○ Fall 2008
- ○ Fall 2009
- ○ Fall 2010
- ○ Fall 2011

2. Which location did you attend?

- ○
- ○
- ○
- ○
- ○
- ○
- ○
- ○
- ○
- ○

3. The number of miles from your home to the location you attended (one-way).

- ○ Less than 5
- ○ 5-15
- ○ 16-25
- ○ 26-35
- ○ 36-45
- ○ 46-55
- ○ 56-65
- ○ 66-75
- ○ 76-85
- ○ 86-95
- ○ Over 95 miles

4. Highest degree earned prior to taking this course.

- ○ High school
- ○ Bachelors
- ○ Masters
- ○ Doctorate

DISTANCE LEARNING EXPERIENCE

The following section will ask questions about your experience with distance learning courses prior to completing SSLS 812. Please use the following definitions when answering the questions:

Online courses: Learning takes place over the internet. Classes may be live where the instructor and students are all logged in at the same time or may be recordings that the learner watches on their own.

Interactive television courses: The learner will attend their class at a site with other students present. Two or more sites connect for the class using the internet and specialized equipment where two or more sites can hear and see the presenter. The sites use microphones to communicate.

Hybrid courses: Combines two or more types of learning such as face-to-face and online, or interactive television and online. SSLS 812 was a hybrid course using face-to-face/interactive television and online learning.

1. Prior to beginning   , I had previously completed _____ online courses.

- ○ 0
- ○ 1-2
- ○ 3 or more

2. Prior to beginning   , I had previously completed ____ hybrid courses.

- ○ 0
- ○ 1-2
- ○ 3 or more

3. Prior to beginning   , I had previously completed ____ interactive television courses.

- ○ 0
- ○ 1-2
- ○ 3 or more

4. Which type of site(s) did you attend for the interactive television course(s) (select all that apply).

- ☐ Host (instructor present)
- ☐ Remote (viewed instructor on a television or projector screen)
- ☐ N/A

5. When did you participate in these distance learning courses?

- ☐ Bachelors
- ☐ Post Bachelors
- ☐ N/A

EMPLOYMENT INFORMATION

The following section asks questions about your employment when you were enrolled in

1. At the time you took   did you work in an educational setting (public or private school)?

○ Yes

○ No

EMPLOYMENT INFORMATION

1. When I tool :   my position in the educational setting was (check all that applied to you).

- ☐ Administrator
- ☐ General educator
- ☐ Occupational therapist
- ☐ Paraeducator
- ☐ Physical therapist
- ☐ Psychologist
- ☐ Social worker
- ☐ Special educator
- ☐ Speech language therapist
- ☐ Other (please specify)

2. When yo took   how many years had you worked in the field of education?

- ○ Less than 1 year
- ○ 2-3
- ○ 4-5
- ○ 6-10
- ○ 11-15
- ○ 16-20
- ○ Greater than 20 years

3. When you took   how many years had you worked with students with ASD?

- ○ Less than 1 year
- ○ 2-3
- ○ 4-5
- ○ 6-10
- ○ 11-15
- ○ 16-20
- ○ Greater than 20 years

4. At the time you took   **what county/counties were you working in?**

5. Type of educational setting you were employed by at the time you took the course.

- ○ School disctrict
- ○ Private school
- ○ Cooperative / Interlocal
- ○ Other (please specify)

STUDENT KNOWLEDGE AND SKILLS

The following section will asked questions about the knowledge and skills gained from completing

Use the following rating scale when answering the next set of questions, with a 1 meaning no-not at all, and a 7 meaning yes-very much.

1   2   3   4   5   6   7

No-Not At All   Yes-Very Much
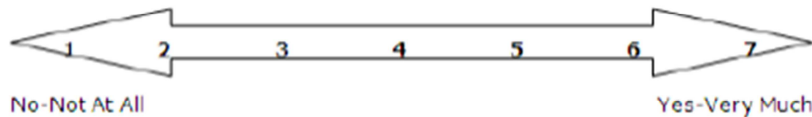
1. As a result of taking   , to what extent:

	1 - No-Not At All	2	3	4	5	6	7 - Yes-Very Much
Has your work-related knowledge increased?	○	○	○	○	○	○	○
Has your work-related skills increased	○	○	○	○	○	○	○
Did this course help you identify characteristics of learners with ASD?	○	○	○	○	○	○	○
Did this course help you identify evidence-based practices for students with ASD?	○	○	○	○	○	○	○
Did this this course provide information about how to implement evidence-based research practices with fidelity?	○	○	○	○	○	○	○
Did your practice with students with ASD change as a result of this course?	○	○	○	○	○	○	○

2. Name three ways you have implemented what you learned in   .

1.

2.

3.

COURSE OBJECTIVES

The following section will ask questions about how well   met the course objectives.

Use the following rating scale when answering the next set of questions, with a 1 meaning completely disagree, and a 7 meaning completely agree.

1   2   3   4   5   6   7

Completely Disagree   Completely Agree
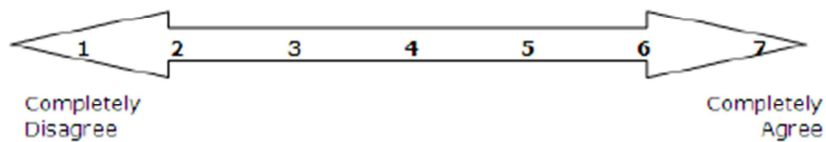
1. At the conclusion of taking   I felt confident in my abilities to:

	1 Completely Disagree	2	3	4	5	6	7 Completely Agree
Describe the core characteristics of ASD.	○	○	○	○	○	○	○
Describe the associated characteristics of individuals with ASD.	○	○	○	○	○	○	○
Describe the distinguishing features between disorders of the ASD.	○	○	○	○	○	○	○
Plan ASD strategies or interventions discussed in this course	○	○	○	○	○	○	○
Implement ASD strategies or interventions discussed in this course.	○	○	○	○	○	○	○
Evaluate the effectiveness of strategies or interventions discussed in this course.	○	○	○	○	○	○	○

STUDENT LEARNING EXPERIENCES

The following section will ask questions about your learning experiences during

Use the following rating scale when answering the questions, with a 1 meaning I don't recall, a 2 meaning completely disagree, and a 8 meaning completely agree.

```
  1      2      3      4      5      6      7      8
I don't  Completely                          Completely
recall   Disagree                              Agree
```
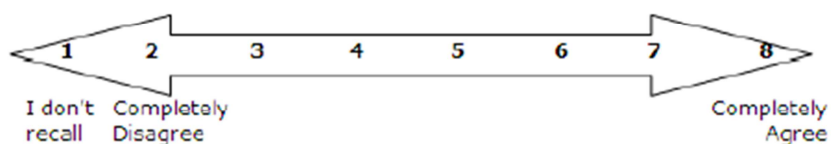
1. Use the following rating scale when answering the questions, with a 1 meaning I don't recall, a 2 meaning completely disagree, and a 8 meaning completely agree.

	1 - I Don't Recall	2 - Completely Disagree	3	4	5	6	7	8 - Completely Agree
At the beginning of the course I received all of the instruction I needed to feel comfortable accessing the course materials online.	○	○	○	○	○	○	○	○
At the beginning of the course I received all of the instruction I needed to feel comfortable participating in the live class sessions (i.e., using the microphones to ask or respond to questions).	○	○	○	○	○	○	○	○
I participated more in the live class sessions that I usually do in a traditional face-to-face class.	○	○	○	○	○	○	○	○
This course provided the opportunity for me to network with my peers.	○	○	○	○	○	○	○	○
This course provided me the opportunity to develop rapport with my professor.	○	○	○	○	○	○	○	○
A valuable part of this course was the lecture provided by the professor or guest speakers.	○	○	○	○	○	○	○	○
A valuable part of this course was the interaction with the professor.	○	○	○	○	○	○	○	○
The amount of instructor/student interaction time during this course was adequate.	○	○	○	○	○	○	○	○
I was exposed to an appropriate range of experiences/techniques in this course.	○	○	○	○	○	○	○	○
The visuals displayed during the live class sessions were beneficial (i.e., PowerPoint, videos, etc).	○	○	○	○	○	○	○	○
I enjoyed taking this course.	○	○	○	○	○	○	○	○
I would recommend this course to others.	○	○	○	○	○	○	○	○

STUDENT LEARNING EXPERIENCES

1. Since taking this course I have stayed in touch with the instructor.

○ On-going

○ Infrequently

○ Not-at-all

2. Since taking this course I have stayed in touch with peers (select all that apply).

☐ Not-at-all

☐ Stayed in touch with peers from my site

☐ Stayed in touch with peers from other sites.

STUDENT LEARNING EXPERIENCES

1. Rank the following parts of the course from most-to-least beneficial (1 is the most beneficial, and 7 is the least beneficial).

	1 - Most Beneficial	2	3	4	5	6	7 - Least Beneficial
Assigned reading	○	○	○	○	○	○	○
Online activities (Autism Internet Modules, Discussion Board, Videos)	○	○	○	○	○	○	○
Quizzes/Tests	○	○	○	○	○	○	○
Projects/Assignments	○	○	○	○	○	○	○
In class activities (lecture, discussion)	○	○	○	○	○	○	○
Communication with class members	○	○	○	○	○	○	○
Communication with instructor	○	○	○	○	○	○	○

2. Do you have any suggestions on how to improve this course?

3. Do you have any other comments or feedback you would like to share about the course?

THANK YOU!

Thank you for taking the time to participate in the research study. I appreciate you supporting in improving the course and supporting myself in completing my dissertation research.

If you have any questions about the research study please let me know.

Sincerely,
Terri Cooper Swanson

APPENDIX O

Survey Responses to Items 47 and 48

Item 47: Do you have any suggestions on how to improve this course?

<u>Host Responses</u>:

1. I REALLY liked getting my hands "dirty" and doing the projects. I don't think the discussion boards were really that effective, however, LOVED the Autism Internet Modules.
2. No it was great!
3. None at this time. I wouldn't change anything.
4. Less instruction over the reading and more over things that were not in the book.
5. None
6. I really enjoyed this class. I had felt that being at the same site with the instructor was beneficial to me. There are really no suggestions on how to improve the course.
7. 1. This program should be offered on a national basis. 2, Students should be urged or required to sit as close to camera as possible. Students should be discouraged from sitting out of view of the camera. 3. Lighting for video capture could be improved.
8. Keep it face - to face....learning and discussing with others is the most important part of learning!
9. Continue to provide face to face programming. This course was great for me because of the contact with an instructor.
10. not really
11. N/a

Distance Responses:

1. This was really hard to rank least to most beneficial; I felt that everything was important during the class. I think everything was okay but it is hard to pay attention at times for such a long period of time when the class is on the TV and others are talking or I join in their conversation or we discuss what is being talked about.

2. I did enjoy the course and felt I gained knowledge about the topic. I only wish I didn't have to drive 2 hours round trip to attend. I would definitely take more courses like this if they were closer.

3. no

4. None at this time.

5. I thought the guest speakers were good. I would have liked more of that kind of thing.

6. I hated trying to work with the discussion boards. I am not that comfortable with technology. I met my first computer in the classroom when I was already teaching. I hated the technology, but I learned as much or more about technology in this class as I did autism. It was a huge stretch for me, but I gained a lot. The autism content was simple compared to the technological learning that had to take place for me.

7. I can't remember any suggestions at this time. I have participated in numerous ASD trainings/classes. I've learned a lot and store it all in the same place in my brain. I can't remember what I've learned from specific classes/trainings. Sorry.

8. I do not like the interactive; I prefer all on line

9. My computer skills were very limited in the beginning and I had difficulty managing the college site, but with practice and help from my son I mastered it. I think the level of online skills required was not explained in the beginning and without my son I would have great difficulty with the online portion.

10. This is a good course for the very beginner, and that is what it is supposed to be. Building a file of resources, online links, descriptions and suggestions (troubleshooting log) would be a great addition to the course and provide the students with materials that they would use a lot in their professions.

11. I don't know if this is possible, but I felt that the televised sessions that occurred once a week from 5:30 to 9:30 was long especially when you have worked all day.

12. Better organization

13. No not really.

14. I think that by keeping the communication open with other sites is a big factor for gaining knowledge of how to deal with students who are on the spectrum and this should be encouraged even after the class.

15. The visual aids are always helpful. I learned a lot in this course. I kept the textbook and have referenced it many times. I now am a teacher for an autism program so everything I learned in the autism program has been put to good use!

16. Try to develop more rapport with off-site students. It can be difficult to do this without being face to face though.

17. Offering this course online would be best. The distance to travel to a site makes the program prohibitive for some and expensive and challenging for others. 2. Tests should be administered so that efforts and results are valid and individualized. Thus, removing the opportunity for classmates to divide up the questions and share answers as a way to reduce or avoid the course work. This type of practice reducing learning and ethical practices.

18. Include more shared strategies from members. Ideas are so helpful.

19. More videos, interactive activities, and group in class assignments

20. I thought it was Super!! I had no complaints.

21. I once took an interactive course where the instructor went to different sites to present her lecture during the weeks of the class. This would help with the student/instructor interaction.

22. None at this time.

23. None

24. No

25. No, this was an awesome class. I thought I knew lots about autism going into the class, but continued to learn more throughout the course.

26. I don't know what I would suggest. I would take the class again in the future.

27. No. I think that this is a difficult way to teach, but that I was provided many different ways to learn the material. I do miss the face-to-face time of a traditional classroom.

28. Keep having guest lectures.

29. Not really.

30. It would have been helpful to watch video clips of different individuals on the spectrum (who have different characteristics) and work on recognizing the characteristics in those students. I think many professionals have difficulty recognizing the characteristics of AS or HFA in students. Also, in our area professionals have difficulty filling out autism screening tools accurately. It would be nice if students in the course were trained on autism screening tools.

31. It was hard to rate the parts of the course because to me it was all beneficial. I have implemented many of the strategies that I learned in this class. This to me didn't only apply to students with autism but to many of my behavior students as well.

Item 48: Do you have any other comments or feedback you would like to share about the course?

<u>Host Responses:</u>

1. There was a nice mixture of lecture, guest speakers, and projects. Time to interact with class members was also valuable to me, as I learned what others were doing in the field. I also liked the start time; I didn't have to leave work early in order to get to class. The teacher was knowledgeable, inviting, and elicited the best from all of us. Although I've worked in the field for many years, I still learned a lot from taking this class. I would certainly recommend it to anyone who works with or is going to work with children on the autism spectrum. Excellent!

2. I thought the course was most beneficial and all activities were as well. The instructor was most knowledgeable and easily and willingly shared her expertise. She was available at all times for support, direction and other needs. The projects were not a waste of time and were most beneficial to my job and school setting. I would highly recommend this instructor and this course to others.

3. I felt the instructor kept up on her research very well and I was always excited to hear that information and wished that more of the in class instruction was focused on information other than what we found in the textbook.

4. The instructor for this class has provided me with the most beneficial information in my line of work. There was never a class session that instruction and strategies given were not implemented in my classroom and proved successful. I would highly recommend any person interested in ASD enroll in any of Mrs. Swanson's class.

5. The support materials were very beneficial to me for the classroom that I teach in now. The guest speakers were practical of the real world we work in today to help with individuals with ASD.

6. This class was AWESOME.

7. Once again I want to stress the importance of having instructors available, please continue with a least a hybrid class model, as many colleges are moving towards online- that doesn't really provide the instruction piece that many non-traditional folks need to be successful. Thank you.

8. I really appreciated all of the additional articles and materials Terri provided us with.

9. N/a I enjoyed course :-)

1. I like how I can take classes in the evening this way because it works around my work schedule.

2. I enjoyed it

3. I appreciated the instructors prompt responses to emails. This has not always been my experience in other classes I've taken.

4. I enjoyed the way it was taught. I appreciate having a class that is interactive, because it is so hard to get to a face-to-face class, and internet classes aren't always the best ways to learn.

5. I feel this course was a great introduction to ASD, and it was full of important information about ASD. Our instructor did a good job explaining the many characteristics of ASD.

6. I wasn't working with children on the spectrum until just this year. I got the job I have now because I had this certification. I work one on one with a 16 year old girl who is autistic and the information I received by taking this class has been invaluable to me. I went into the experience with a great deal more confidence because I have taken these classes.

7. I wish I would have known more about autism 20 years ago!

8. I'm glad I participated in the ASD certificate program. I learned a lot and have put it to work. All teachers should be required to take classes in ASD.

9. The textbook is an excellent overview. You might have a few readings of research articles that would support some of the chapters. Speakers appropriate.

10. I really enjoyed Terri's presentation of the material and the way the class work was structured. I enjoyed being able to work at my own pace or work ahead. Terri's class was organized, and Terri was always available for questions or clarification of her expectations.

11. Prior to this course I had completed many inservice hours on the topic and I felt that I had a good understanding of the topic. I was validated in my knowledge and comfort level on the topic during this course, and reminded of things that I had been introduced to before. I do not feel that I learned a lot of new information, but the course was good for me in helping to create a portfolio of knowledge, resources, and contacts for support.

12. Good information. Learned a lot.

13. Coming into the class I knew next to nothing about ASD. After completing the course, I felt more capable of dealing not only with my own students with ASD but also working as part of

the Autism Intervention Team of which I was a member. I started from ground zero but made significant gains with the course.

14. It has helped greatly when trying to come up with interventions for students.

15. The whole autism program was very beneficial and I have been able to share things that I learned with other teachers in my COOP/District. One thing that was difficult for me was having to drive almost 2 hours to the XXX site. While I enjoyed being in class with my peers, having more of the courses online would be easier for most working people. While I was in the autism program at XXX I also attended several of the summer workshops with different speakers like Paula Kluth and others and those were really helpful also. I think it is a great program overall!

16. Overall, this course was beneficial to my understanding and work within the field of ASD. It may enhance some student's learning to have more direct student contact learning experiences. Such as observation of some specific situations where strategies are being used for teaching academics, behavior management, social skills instruction, and communication strategies.

17. I got a lot out of this course and it gave me resources to refer back to since taking the course and I will use in the future.

18. Reminder I was the only student at my site. I didn't really have interaction with other students.

19. I grew leaps and bounds taking the courses for the autism certificate!

20. I enjoyed the class as a whole. I appreciated the fact that it was available to me through other options versus traveling to the home site (i.e. via the TV.). However, I do feel that I myself would benefit more from face-to face lectures than via the TV screen/computer. This is just my particular type of learning style. I am the type of person that enjoys detailed conversations/discussions in class.

21. I think it is a great way to often a course. It provides the opportunity for people to take courses that otherwise probably would not have been able to take them. In the end, it gives many the information to in order to help become better providers.

22. I refer to my PowerPoint from the instructor and guest presenters quite often. The textbook was very good. It was an easy read and explains the spectrum of autism that is parent friendly

and I often show this chapter to parents. I remember the self assessments we took - those were fun to see the results. Just a lot of great information and ideas was presented.

23. The IVC site is no longer available. I believe that this is an important certification program and has given our area much needed support in the area of autism. Our team has lost two members that originally took the course, but the others are strong members/leaders in our cooperative.

24. It was very difficult to rate the parts of the course. All of the parts I felt were very useful.

25. I would like the STATE to recognize this as a certification not just something we can place on our resume.

26. I thought course was great. Have recommended it to others several times.

27. I enjoyed the class very much and learned a lot. The instructor was always available to help and was excellent. I would take more classes from her.

28. I enjoyed the ASD courses that I took from XXX.