EFFECTS OF THREE INSTRUCTIONAL SCHEDULES ON SKILL ACQUISITION AND GENERALIZATION IN THE USE OF TWO-WAY RADIOS TO REPORT TASK COMPLETION BY HIGH SCHOOL STUDENTS WITH MODERATE INTELLECTUAL DISABILITIES

by

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Education in the Department of Child, Family and Community Sciences in the College of Education at the University of Central Florida
Orlando, Florida

Spring Term
2005

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ABSTRACT

Educators of students with moderate and severe intellectual disabilities face a significant challenge in preparing their students while in school to function, acquire, and maintain skills that would facilitate successful performance in the workforce while in supported and/or independent employment after graduation. The field of special education still debates about the best way to teach students with moderate intellectual disabilities, the best setting for their instruction and the best instructional schedule. The current research investigated the effectiveness and efficiency of three instructional schedules in the skill acquisition and generalization of two-way radio usage to report task completion by high school students with moderate intellectual disabilities. The instructional schedules investigated were: (a) community-based instruction only (CBI), (b) community based instruction plus simulated instruction in the classroom-same day (CBISC) and (c) simulated instruction in the classroom only (SICO).

A Multiple Probe Design across participants with intermittent probe trials within each instructional group, and an added generalization phase (Horner & Baer, 1978; Tawney & Gast, 1984; Alberto & Troutman, 2003) was employed in this study. Nine high school students with moderate intellectual disabilities, three in each instructional schedule, were taught to use a two-way radio to report task completion. The results of the study revealed that the CBI instructional schedule was the overall most efficient instructional schedule for skill acquisition. Two of the CBI participants required the least number of trials to learn to use a two-way radio to report task
completion. The second most efficient schedule was the CBISC and the least efficient instructional schedule was the SICO. Based on Mean scores, learning efficiency appeared to be greater for the participants in the CBI and CBISC instructional schedule. These participants required the least number of intrusive prompts. Results indicated that the SICO instructional scheduled was more efficient for only one participant. This participant only required verbal prompts for acquisition of the skill. However, participant one on the SICO instructional schedule required the most intrusive prompts of all participants across groups. For generalization, the CBISC instructional schedule appeared to be the most effective. In this schedule, the two participants that concluded the study generalized the skill across three novel settings with 100% accuracy. The SICO schedule, also had two participants generalized the skill across three novel settings; however, one participant in that group failed to generalize the skill in two settings. The CBI instructional schedule appeared to be the least effective for skill generalization in this study. In this schedule, only one participant generalized the skill in all three novel settings.
This dissertation is dedicated to my wonderful and funny husband, Michael D. Turner. You are the best thing that has happened to me. You inspired and encouraged me to be a better person. You showed me how to live life with a positive and calm attitude. I love you with all my soul and heart.

War eagle.

A my familia, por todo el apoyo y el amor que siempre me han dado.

Los quiero mucho
ACKNOWLEDGMENTS

I want to acknowledge and thank all the people that gave me the opportunity to demonstrate the passion I have for my profession and students. Since the beginning of my studies in the United States, there have always been helping hands that guided me through the difficult moments. To all those hands thank you.

Throughout the doctoral program, many people believed in my abilities and understood my message in spite of my southern accent. Without their support, I would not have been able to continue. Dr. Miller, you gave me great opportunities to demonstrate my skills and present my ideas. You brought me into fabulous and exciting research projects that provided great and immeasurable benefit to my professional development. You, in your own Miller way, gave me the freedom to redefine my goals. You became a mentor and a friend, thank you “Blues 1” for everything. Thank you also to Dr. Wienke, who always smiled and gave me kind words of encouragement. You gave me important feedback that I will always remember. Thank you to Dr. Martin for the great support and the opportunity to see the work of a woman in a leadership position. I want to thank Dr. Sivo for his participation in this process. Special thanks to Dr. Alberto for his support and ideas that helped shape this research.

Writing a dissertation takes more than a well-developed research design; it takes planning, dedication, and the help of a fantastic editor. I have the pleasure and the privilege to count on the help from a great editor. Cynthia, “Who 1”, thank you for your advice, suggestions,
and most of all your friendship. You encouraged, listened, and laughed with me many times. You shared your experiences and your passion for the behavioral science and best of all you shared many happy hours that helped in the development of many research ideas and projects. Thank you for your presence and your marvelous Canadian ways. You will always be “Who” number 1.

Special thanks to my cohort, Mary. We went through tough times, but we made it. Thank you for your support. Thank you Leslie for sharing your dinosaur stories and those airport rides. Special thanks to Magnolia, Alice, Bonnie, and the happy hour crew for being there. Thank you to Lisa for riding the extra mile and playing the extra game. Last but not least, thank you to all the students I had the opportunity to teach, you guys are my motivation.
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CHAPTER ONE: INTRODUCTION

Following the enactment of the Education for All Handicapped Children Act (P.L.105-17), students with moderate intellectual disabilities previously educated in segregated environments began to be moved to public school settings and engaged in more systematic education. In the absence of curriculum models to educate this population, public schools accommodated the influx of students with disabilities by adapting existing early childhood programming to teach students with moderate disabilities from grades K through 12. In this practice, known as the developmental model, students with moderate and severe disabilities were taught based on mental age and not on ability levels or chronological age. However, by the late 1970s, educational researchers began to question the developmental model and a new functional approach to curriculum for students with moderate and severe disabilities emerged. The idea of a functional curriculum was introduced with standards for teaching this population. The standards included skills that would be of use in the community. Brown, Branston, Hamre-Nietupski and Pumpian (1979) provided a framework for developing activities to teach functional and chronological-age-appropriate skills to students with moderate intellectual disabilities. They started by defining what functional skills were and in which specific settings the skills should be demonstrated. Functional skills were defined as any skill that is frequently demanded in natural environments. Furthermore, functional skills are not limited to those that affect the actual survival or physical well-being on an individual; but also include skills that influence an individual’s ability to perform as independent and productive as possible in many situations.
including activities at work, social situations and activities related to safety. The settings in which these skills are required included home, vocational settings, and community environments. The research of Brown et al., (1979) promoted the practice of taking students with moderate disabilities into the community and teaching them in naturalistic settings. Additionally, the research findings provided a strong blueprint for creating meaningful educational curriculum.

At the middle and high school level, functional curriculum continues to focus on the adaptation of the general core curriculum to incorporate the teaching of functional skills and provide opportunities for participation in age appropriate activities, increasing the emphasis on transition planning and services with the specific focus on successful transition from school to work. Transition services for students with moderate disabilities include, but are not limited to: vocational rehabilitation, vocational training, supported employment, adult services, assistive technology, independent and semi-independent living, and community participation.

Transition as defined by the *Individuals with Disabilities Act* (IDEA) (2004) states:

Transition is a coordinated set of activities for a student with a disability that—(1) Is designed within an outcome oriented process, that promotes movement from school to post-school activities, including postsecondary education, vocational training, Integrated employment (including supported employment), continuing and adult education, adult services, independent living, or community participation; (2) Is based on the individual student’s needs, taking into account the student’s preferences and interests; and (3) Includes—(i) Instruction; (ii) Related services; (iii) Community experiences; (iv) The development of employment and other post-school adult living objectives (p.13).
Transition services should address all domains in a person’s life (Lehman, Clark, Bullis, Rinkin, & Castellanos, 2002). Lohrmann-O’Rouke and Gomez (2001) identified four domains; living, working, playing and learning. Based on the federal definition, students with disabilities, especially students with moderate intellectual disabilities, in middle and high school, should participate in goal setting and work related employability skills related to transition outcomes. Furthermore, students should be taught to set and reach goals based on preferences and abilities (Agran, Blanchard & Wehemeyer, 2000; Wehemeyer, 2002). While in job-training, students should set goals to develop skills that allow them to participate as a natural part of the employment force with the same opportunities to manipulate and use technology and equipment used by workers without disabilities in comparable jobs. Scanners and two-way radios are examples of technology that employees in the service and hospitality industry are often required to operate.

Teachers of middle and high school students with moderate and severe disabilities face a significant challenge in preparing their students to function, acquire, and maintain successful performance in the workforce while in supported and/or independent employment after graduation. Teachers, school officials, and experts in the field still debate about the best way to teach students with moderate intellectual disabilities and the best setting for their instruction. One of the earliest works reflecting the need to teach functional skills to students with moderate disabilities in a systematic way was written by Williams, Brown, and Certo (1975). According to Williams et al., (1975) an important consideration for curriculum programming and service delivery for students with intellectual disabilities is determining the most appropriate and
enhancing setting to teach functional skills. Teachers and researchers have demonstrated that students can learn the necessary purposeful skills to function appropriately in the workforce through classroom-simulated instruction (Taber, Alberto, Hughes, & Seltzer, 2002; Colyer & Collins, 1996; Wolery, Ault, Gast, Doyle, & Griffen, 1990) and community-based instruction under naturalistic circumstances (Alberto, Heflin, & Andrews, 2002; Cooper & Browder, 1998; Taylor, Collins, Schuster, & Kleinert, 2002). Other researchers have investigated the effect of a combined approach, providing classroom simulated instruction and community instruction for the acquisition and generalization of functional skills (Neef, Iwata, & Page, 1978; McDonnell, 1984; Browder, Snell, & Wildonger, 1988; Branham, Collins, Schuster, & Kleinert, 1999; Bates, Cuvo, Miner, & Korabek, 2001; Cihak, Alberto, Kessler, & Taber, 2004).

Research shows that technology has the potential to provide clear advantages to those who deliver supportive, appropriate learning and productive experiences for students with and without disabilities (Hitchcock & Stahl, 2003). Several studies have investigated various instructional approaches to teach students with moderate intellectual disabilities to use public phones (Test, Spooner, Keul & Grossi, 1990), cell phones (Taber et al., 2002; Taber, Alberto, Seltzer, & Hughes, 2003), and other assistive technology devices to facilitate communication between students and teachers, students and employers, and students and their families (Stock, Davies, & Brown, 2004). A variety of technology and Assistive Technology (A.T.) devices are available to help students communicate. A.T., as defined by IDEA (2004) includes devices and services and these refer to:

(1) Assistive technology device- means any item, piece of equipment, or product system,
whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of a child with a disability. (2) Assistive technology services-means any service that directly assists a child with a disability in the selection, acquisition, or use of an assistive technology device. Such term includes: (A) the evaluation of the needs of such child, including a functional evaluation of the child in the child's customary environment; (B) purchasing, leasing, or otherwise providing for the acquisition of assistive technology devices by such child; (C) selecting, designing, fitting, customizing, adapting, applying, maintaining, repairing, or replacing of assistive technology devices; (D) coordinating and using other therapies, interventions, or services with assistive technology devices, such as those associated with existing education and rehabilitation plans and programs; (E) training or technical assistance for such child, or, where appropriate, the family of such child; and (F) training or technical assistance for professionals (including individuals providing education and rehabilitation services), employers, or other individuals who provide services to, employ, or are otherwise substantially involved in the major life functions of such child (p. 8-9).

Technology and A.T. offer powerful options to assist students with disabilities in becoming independent and actively integrated into the community. There are software programs, computers, Personal Digital Assistants (PDA) and communication enablers that help individuals with disabilities participate in many activities individuals without disabilities enjoy. Examples of such activities include making calls while in the community and communicating with co-workers during job-training or employment.
Companies are starting to modify wireless technology and cell phones to make them more accessible to individuals with disabilities. Devices such as the pocket accessible communication enabler (ACE) are adapting pocket wireless PC technology to make cell-phone-like hardware devices more available and user friendly for individuals with intellectual disabilities (Stock, et al., 2004). Additionally, two-way radio technology also has the potential to help students with disabilities communicate in many situations and opportunities. This technology represents a viable option for teaching and improving communication skills while students are placed in job settings during job-training and employment after graduation. This technology is available in cell phones and in short range handheld radios with family radio service channels (FRS). Two-way radios with FRS are popular devices used by families while in the community at malls and parks, and by workers in retail stores, restaurants, hotels, and hospitals (Vinson, 2002; Motorola Company, 2004; Wiener, 2001). Furthermore, two-way radios can serve as an A.T. tool to help students with disabilities stay connected while at work or in the community during recreational activities.

Statement of the Problem

Controversy persists between researchers, parents and school officials regarding the most appropriate settings to teach students with moderate intellectual disabilities when they reach transition age. Supporters of inclusion argue that, when determining the level of integration for students with moderate disabilities, some participation in regular classroom settings is essential
Some experts support the idea of incorporating students with disabilities in inclusive settings when the skills taught are appropriate for that setting; however, for more functional skills such as vocational and employability skills, teachers and school officials should select the most appropriate settings to teach needed skills (Nietupski & Hamre-Nietupski, 1997). This approach allows students with moderate intellectual disabilities to generalize functional skills learned to other settings. Research suggests that students with moderate and severe disabilities can acquire basic skills when included in the regular classroom with non-disabled peers (Browder, 1997). However, there is a lack of research identifying which skills should be taught in this setting (Browder, 1997; Dymond & Orelove, 2001). Evidence suggests some skills may be learned best in general education classroom settings, whereas others are best learned in the community-based instruction (CBI) (Browder, 1997). CBI provides students the opportunity to learn the skills that they are expected to perform in that particular setting or environment (Alberto et al., 2002).

Some research has shown that a combined setting, simulated instruction in the classroom plus CBI, was effective when teaching students with moderate intellectual disabilities functional skills such as sending a fax, and withdrawing money form automatic teller machine (Cihak et al., 2004). However, the research in instructional schedules is limited. An extensive review of the literature found no published research on the use of two-way radios to report task completion by high school students with moderate disabilities. The use of two-way radios is widely spread in many job sites including hotels, supermarkets, and retail stores (Technology Review, 2004; Vinson, 2002). These settings represent potential employment sites for students with moderate
intellectual disabilities. The use of two-way radios to report to supervisors and co-workers can be an important skill for preparing students with disabilities to work in independent or supported employment setting that use two-way radios. In order to put together an effective and efficient program, it is important to determine which instructional schedule is most effective and efficient when teaching the use of two-way radios to students with disabilities.

Purpose of Study

The purpose of this study was to determine the effectiveness of three instructional schedules in the skill acquisition and generalization of two-way radio usage to report task completion by high school students with moderate intellectual disabilities. The instructional schedules investigated were:

1. Community-Based Instruction only (CBI)
2. Community Based Instruction plus Simulated Instruction in the Classroom -same day (CBISC)
3. Simulated Instruction in the Classroom Only (SICO),

It was anticipated that, this research study would contribute to the research-based literature and knowledge regarding teaching strategies and instructional schedule for students with moderate intellectual disabilities. In addition, this study provided a research-based example of how to incorporate existing technology to support and help students with moderate intellectual disabilities communicate while in job-training and employment settings. This study investigated
three instructional schedules to teach a functional vocational skill to students with moderate intellectual disabilities.

Research Question

The primary emphasis of this study was to investigate the effect of three different instructional schedules to teach students with moderate intellectual disabilities to use two-way radios to report task completion. The following questions were addressed:

1. Is there a difference in the number of instructional trials to a set criteria needed for students with moderate intellectual disabilities to acquire the skill of using a two-way radio to report task completion, when taught using one of the following instructional schedules: community based instruction only (CBI), combined instructional schedule, community based instruction plus simulated instruction in the classroom in the same day (CBISC) and simulated instruction in the classroom only (SICO)?

2. Is there a difference in the number and types of prompts needed to a set criteria for students with moderate intellectual disabilities to acquire the skill of using a two-way radio to report task completion, when taught using one of the following instructional schedules: community based instruction only (CBI), combined instructional schedule, community based instruction plus simulated instruction in the classroom in the same day (CBISC) and simulated instruction in the classroom only (SICO)?

3. Is there a difference in the generalization of the skill of using a two-way radio to
report task completion across settings for students with moderate intellectual disabilities, when taught using one of the following instructional schedules: community based instruction only (CBI), combined instructional schedule, community based instruction plus simulated instruction in the classroom in the same day (CBISC) and simulated instruction in the classroom only (SICO)?

Dependent Variables

The dependent variables that were targeted for intervention during the acquisition phase were: (a) number of trials needed to a set criteria (100% independence performance of all steps in the task analysis) for skill acquisition to operate a two-way radio to make a call to a designated person to report task completion when taught in CBI; (b) number of trials needed to a set criteria for skill acquisition to operate a two-way radio to make a call to a designated person to report task completion when taught in CBISC; (c) number of trials needed to a set criteria for skill acquisition to operate a two-way radio to make a call to a designated person to report task completion when taught in SICO. Additional data was gathered to report the number and types of levels of prompts needed for skill acquisition when students were taught in CBI, CBISC, or SICO. The dependent variables targeted for the generalization phase were: (d) total number of trials performed with 100% independence that results in the use of two-way radio to report task completion to a designated person when taught in CBI; (e) total number of trials performed with 100% independence that results in the use of two-way radio to report task completion to a
designated person when taught in CBISC; and (f) total number of trials performed with 100% independence that resulted in the use of two-way radio to report task completion to a designated person when taught in SICO. Detailed operational definitions are presented in Chapter Three.

Independent Variables

The independent variables were the three instructional schedules in which the students learned how to use a two-way radio to make a call to a designated person to report task completion. The instructional schedules were: (a) community based instruction only, (CBI): In this instructional schedule, three students were taught in the community, at a local retail store, to use a two-way radio to call a designated person to report task completion; (b) combination, community based instruction plus simulated instruction in the classroom in the same day (CBISC): In this instructional schedule, three students were taught in the community at the local retail store and in the classroom to use a two-way radio to call a designated person to report task completion; and (c) simulated instruction in the classroom Only (SICO): In this instructional schedule, three students were taught, in the classroom, to use a two-way radio to call a designated person to report task completion;. Instructional schedules and their procedures are described in full in Chapter Three.

Research Design

A Multiple Probe Design across participants with intermittent probe trials within each
instructional group, and an added generalization phase (Horner & Baer, 1978; Tawney & Gast, 1984; Alberto & Troutman, 2003) was employed to research the effect of three instructional schedules in skill acquisition and generalization across settings for the use of two-way radios to report task completion by high school students with moderate intellectual disabilities.

Definition of Terms

**Moderate Intellectual Disabilities.** Disabilities characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills that originate before age 18. Individuals with moderate intellectual disabilities have significant impairments in adaptive behavior requiring attention or treatment and an approximate I.Q. range of 35 to 49. Most individuals with moderate intellectual disabilities can learn to develop some degree of independence in areas such as self-help, communication and academic skills. These individuals will need varying degrees of support to live and work in the community (America Association on Mental retardation [AAMR], 2002).

**Florida Definition of Mentally Handicapped.** A mental handicap is defined as a significant sub-average general intellectual functioning existing concurrently with deficits in adaptive behaviors and manifested during the developmental period (Florida Statues and State Board of Education Rules [FSSBE], 6A-6. pg 111, 2004).

**Florida Definition of Trainable Mentally Handicapped (TMH).** A trainable mentally handicapped student is a student who is moderately or severely impaired in intellectual and
adaptive behaviors and whose development reflects a reduced rate of learning. The measured intelligence of a TMH student falls between three and five standard deviations below that of other students of the same age and socio-cultural group (FSSBE 6A-6. pg 111, 2004).

**Instructional Schedules.** The types of instructional options, including different times and settings, in which instruction for students with disabilities occurs (Cihak, et al., 2004).

**Simulated Instruction in the Classroom Only (SICO).** SICO is an instructional schedule in which all teaching takes place in a controlled setting such as a classroom. It is designed to simulate conditions that appear in the natural environmental context, but does not involve the conditions under which such behavior is to be performed.

**Community Based Instruction (CBI) or Community Instruction Only.** CBI is an instructional schedule in which teaching takes place in community settings. This type of instructional schedule replaces teaching that occurs at the school. During CBI, learning takes place in natural performance settings, and allows for learning that has natural cues, consequences, and criteria. (Alberto, et al., 2002).

**Community Based Instruction plus Simulated instruction in the Classroom (CBISC).** CBISC is an instructional schedule that combines CBI and simulated instruction in the classroom. The purpose of the CBISC schedule is to provide CBI in a naturalistic setting to enhance opportunities for generalization of skills taught and complement the instruction with classroom instruction in a simulated controlled setting, where there are fewer distractions.

**Two-way Radio.** Wireless technology for communication. For the purposes of this study the TALKABOUT® T5720 Two-Way NiCD Rechargeable manufacture by Motorola was used.
Features include: Up to five miles range, QT Noise Filter, 10 Audible Call Tones and VOX/hands-free capable when used with optional accessories.

**Community Skills.** Skills that target learning and performance of activities or behaviors to be used in a community setting and/or the use of a community object such as a city bus, vending machine, teller machine, public phone, or two-way radio (Westling & Floyd, 1990).

**Employability Skills.** Skills that facilitate individuals with and without disabilities to acquire and maintain employment. These skills include communication, interpersonal, problem solving, decision making among other skills (Bettina, 1990).

**Communication Skills.** Skills required to interact with and express wants and needs to others. Communication skills involve turn taking, listening, and information exchange between two or more individuals in person or by using communication devices.

**Social Skills.** These are socially acceptable behaviors that allow individuals to interact effectively and successfully with others. Social skills embrace the areas of interpersonal behaviors such friendship development, asking or offering help, self-related behaviors including controlling anger, and dealing with problems and others (Elksnin & Elksnin, 2001).

**Supported Employment.** It is the opportunity offered to individuals with severe disabilities to acquire a paid job with continues training and long term support that would assist them in maintaining the employment in a integrated setting (Wheeler, Bates, Marshall & Miller, 1988; Wehman, Revell, & Brooke, 2003).
**Trial.** A trial is an opportunity for the performance of a behavior or the performance of all the steps in a task analysis.

**Prompt.** A prompt is an additional stimulus that increases the probability that a target response or behavior will occur. A prompt is given after the discriminative stimulus if a response is not provided within a given time (Alberto & Troutman, 2003).

**Least to Most Prompting System.** A series of prompts designed to give assistance during the acquisition of a skill when teaching students with moderate intellectual disabilities. There were four levels of prompts used in this study: verbal, verbal plus gesture, verbal plus model, and verbal plus physical guidance (Taber, et al., 2003).

**Skill Acquisition.** The initial or basic level of students’ response for a newly learned skill with some criterion of accuracy (Westling & Floyd, 1990).

**Skill Generalization.** The adequate performance of a learned behavior in an untrained situation or location (Westling & Floyd, 1990).

**Assumptions**

This study was based on the following assumptions:

1. The participants in this study were representative of the high school population of students with moderate intellectual disabilities in the State of Florida.

2. The setting in the community that was used for the study had the appropriate conditions for possible CBI and independent or supported employment for the
3. Instructional schedules impacted the skill acquisition and generalization of using a two-way radio to report task completion.

4. The use of two-way radios was a functional skill learned that will be a valuable employability skill for participants in the study.
CHAPTER TWO: LITERATURE REVIEW

Introduction

Service delivery models for students with moderate intellectual disabilities vary widely in terms of curriculum, instructional strategies, and settings. In some instances, students with moderate intellectual disabilities are taught in inclusive settings following a functional curriculum that concentrates on teaching skills that would be of use in the community (Nietupski & Hamre-Nietupski, 1997). In other instances, they are taught using a combination of the regular and functional curriculum (Wolery & McWilliam, 1998) or the regular education curriculum is followed with some modifications (Jackson, Ryndak & Billingsley, 2000; Browder, Flowers, Ahlgrim-Delzell, Spooner & Algozzine, 2004). Clearly, experts in the field of special education have not reached a clear consensus as to which curriculum to use and in what setting to use it to best serve the population of students with moderate intellectual disabilities. Some argue that students with moderate intellectual disabilities should be taught in the regular classroom (Ryndak, et al., 2000). Others support teaching some skills in the community where students with moderate disabilities will ultimately need to perform and generalize the skills learned (Browder, 1997; Morse & Schuster, 2000). The argument continues, but as programs and settings for serving students with moderate disabilities transform, and appropriate functional training becomes more expensive with schools struggling to fund well planned community-based
instruction (CBI), the idea of using simulated classroom instruction has flourished. Furthermore, evidence suggests that the strategy of combining community-based plus classroom simulated instruction (CBISC) instead of strictly CBI or simulated instruction in the classroom (SICO) is viewed as a viable and efficient instructional schedule to teach functional skills (McDonnell, 1984; Branham, et al., 1999; Browder, et al., 1987). However, as yet, there is no a clear consensus with regard to which specific skills are best taught in SICO, which are best taught in CBI and which specific skills are best taught using a CBISC.

Along with changes in curriculum and instructional settings for students with moderate disabilities, changes in technology and the use of A.T. devices has influenced the instruction of students with moderate disabilities. Technology takes many forms and is used at all levels and in all areas of education. For the general population, the use of technology has become, in many instances, the main medium for functioning and communicating while in training, at work or in the community. In special education, the use of technology has influenced students’ communication, training and employability opportunities. A.T. includes many hardware and software devices specially designed to help students with disabilities in several areas. Unfortunately, this equipment is often very costly and sometimes difficult to program and operate. To reduce costs, there is an increasing need in the field of special education to modify and adapt everyday technology used by the general population to teach and to provide opportunities to students with moderate disabilities during training at school or in the community.
Characteristics of Individuals with Moderate Intellectual Disabilities

Overtime, identification and classification systems to describe individuals with intellectual disabilities have undergone numerous changes and improvements. In 2002, the American Association on Mental retardation (AAMR) updated the definition and the classification of mental retardation, characterizing intellectual disability as significant limitations in intellectual functioning and adaptive behavior. These limitations are expressed in difficulties conceptualizing learning, responding to life changing situations and performing practical skills that are necessary for everyday functions in the individual specific sociocultural and environmental contexts (AAMR, 2002; Wehmeyer, 2003a). In this updated version of the definition, AAMR classifies mental retardation based on levels of needed support including: (a) intermittent, (b) limited, (c) extensive, and (d) pervasive. Still despite modifications and improvements in the definition and efforts to steer away from the emphasis on IQ scores, in order to be identified as having an intellectual disability and qualify for educational and mental services, individuals still need to perform approximately two standard deviations below the mean of the population on appropriate intelligence assessment instruments and adaptive behavior scales. Many states continue to use an educational classification, based on IQ scores, to determine the educational levels of the disability and provide services (Denning, Chamberlain & Polloway, 2000). Based on IQ scores, intellectual disabilities can be classified as (a) Mild (IQ 70-50), (b) Moderate (IQ 49-35), (c) Severe (IQ 34-20) and (d) Profound (IQ below 20) (AAMR, 2002). Each classification level has specific developmental and learning characteristics.

For the purpose of this study, the focus will be on the characteristics of individuals with
moderate intellectual disabilities. Individuals with moderate intellectual disabilities are a heterogeneous population with a wide range of characteristics, needs and desires. Although there are significant differences among this population, individuals with moderate intellectual disabilities frequently exhibit deficits in their cognitive abilities, language, and social emotional development (Taylor, Richards & Brady, 2005).

**Cognitive Characteristics**

Individuals with moderate intellectual disabilities have difficulty learning abstract concepts and making connections between prior and current learning. These deficits interfere with their ability to transfer learning and generalize skills to other areas and situations. Short-term memory deficits impede their ability to retain information to be use for short periods of times. In addition, individuals with moderate intellectual disabilities have difficulties processing information and attending to relevant stimuli (Taylor, et al. 2005).

**Language Development**

Individuals with moderate intellectual disabilities have significant deficits in the area of communication (Mclean, Brady & Mclean, 1996). These deficits include difficulties in expressive language due to speech disorders (e.g., articulation problems, voice disorders or fluency disorders) and receptive language (e.g., understanding complex messages and multi-step directions) (Taylor, et al. 2005). However, this population has extensive and diverse forms of
communication that include gestures, vocalization, signs, single word utterances or a combination of expressive communication forms that are used to express wants and needs in a variety of settings (Harvey, 1999).

**Social Emotional Development**

Individuals with moderate intellectual disabilities have significant difficulties developing appropriate social emotional skills (e.g., self-sufficiency, personal-social responsibility, self-help, daily living, occupational and safety), that impair them in functioning independently when generalizing learned skills in the community (AAMR, 2002, Heiman & Margalit, 1998). Based on these limitations and deficits in the social emotional area, individuals with moderate intellectual disabilities require specific instruction and many opportunities for practice in order to develop appropriate social relations with peers and adults and to make appropriate decisions when dealing with difficult situations (e.g., avoid danger, keep a work schedule, maintain conversations with co-workers) (Heiman & Margalit, 1998).

While, individuals with moderate intellectual disabilities share some common developmental characteristics, each individual is unique and brings specific social-cultural and environmental traits that determine his/her performance. This performance can be enhanced by living situations, parental involvement and educational curriculum and programming. In particular, educational curriculum and program services play an essential role in the appropriate development of individuals with intellectual disabilities. Consequently, it is imperative that
educators select research based curriculum and instructional approaches.

**Historical Perspective of Curriculum**

Instructional curriculum, at any level of education, refers to the content that is to be taught (Nietupski & Hamre-Nietupski, 1997; Browder, et al., 2004). In special education, especially in the area of moderate to severe intellectual disabilities, concerns with instructional curriculum have generated emphatic controversies amongst experts (Browder, et al., 2004). These controversies have resulted in programming transformations that started in the early 1970s. Initial attempts to formally teach students with moderate and more severe intellectual disabilities were based on the students’ developmental levels (Dymond & Orelove, 2001). During the 1970s, the education of students with moderate and more severe disabilities was guided by the early childhood curriculum known as the developmental model. This model professed teaching students with intellectual disabilities based on mental age and not on ability levels or chronological age (Dymond & Orelove, 2001; Browder et al., 2004; Billingsley & Kelley, 1994). However, by the late 1970s, researchers and educational experts in the area of intellectual disabilities began to question the developmental model and proposed a new model for instruction based on functional skills that could be used in the community. Brown, et al. (1979) provided a framework for developing chronologically-age-appropriate activities to teach necessary functional skills to be performed in the community. They defined functional skills as those that are frequently required in naturalistic environments such as home, vocational settings
and community environments. Functional skills affect the individual’s actual survival and physical well-being and influence his/her ability to perform with more autonomy and productivity. The philosophy of the functional skills model led to changes in instructional settings. Increasingly, students with moderate intellectual disabilities were taken out to community settings to be taught. Teaching in naturalistic settings became a force for creating meaningful educational curriculum and the functional approach dominated the field of special education.

As decades pass and changes in society take place, perspectives regarding special education curriculum have also changed. In particular, functional curriculum encountered some shifting since the early to mid 1990s. Professionals in the field voiced their thoughts on the need to incorporate students with moderate and severe intellectual disabilities in regular schools and classrooms and teach them based on the general curriculum standards. Evidence suggested that via regular education placements, students with moderate intellectual disabilities would gain important social benefits through increased opportunities to develop appropriate socialization and communication skills, and developing friendships and positive self-identity (Stainback, S. & Stainback, W. 1992; Stainback, S., Stainback, W., East, & Sapon-Shevin 1994).

In the late 1990s and 2000s, the focus on inclusion broadened beyond the provision of social opportunities. Social inclusion remained important, but self-determination and adaptive curriculum to promote inclusive learning opportunities emerged as a strong presence in research related to instruction for students with moderate intellectual disabilities (Jackson, et al., 2000). Inclusion continues to be a controversial topic among parents, teachers, state officials and
researchers. While there is general agreement with the need to include students, there is controversy in regard to specifically defining inclusion across states and determining the degrees of appropriate inclusive practices within the regular curriculum (Jackson et al., 2000). Despite the efforts to adopt the general curriculum, in many states and school systems, functional curriculum is still the preferred instructional curriculum for teaching students with moderate intellectual disabilities (Browder et al., 2004).

Research suggests that functional curriculum in inclusive settings is an effective approach to teach students with moderate disabilities using full or partial participation (Nietupski & Hamre-Nietupski, 1997). Adapting the general curriculum to functional tasks and skills facilitates student transition from one setting to another. According to Wehmeyer (2002), teaching students to make choices is one of the most important skills to be taught. This promotes self-determination and involves the identification and communication of preferred items and activities. In keeping with the inclusion philosophy, self-determination is defined as the right and capacity of all people to exercise control over and direct their lives (Wehmeyer, 2002). Self-determination for students with moderate and severe disabilities focuses on promoting goal setting, problem solving, decision-making and self-advocacy. These skills require (a) awareness of personal preference, (b) the ability to differentiate between wants and needs, (c) the ability to make choices based on those preferences, and (d) the ability to initiate and take action when needed, including self-regulation of behaviors. This is only possible if students are provided with opportunities to use the skills (Wehmeyer, 2003b) in a community in which all students learn, work, and develop together with a strong sense of peer support and acceptance, and where
the ultimate goal is to develop self-identities (Stainback, et al., 1994). In recent studies, Agran, et al. (2000) and Wehemeyer (2003b) reported that teaching functional skills and giving students with more severe disabilities the opportunity to participate in appropriate activities can ensure a successful transition from school to work. For this to occur, students should participate in goal setting, especially goals related to transition outcomes (Agran, et al., 2000; Wehemeyer, 2002).

Current research supports teaching students an array of functional skills and tasks that facilitate their transition to vocational settings, as well as supported employment and community participation. According to Lehman, Clark, Bullis, Rinkin, and Castellanos (2002) and Lohrmann-O’Rouke and Gomez (2001), these skills should include appropriate social interactions, work habits, and use of technology related to different tasks and activities found in vocational settings.

In summary, instructional approaches or curriculums for students with moderate intellectual disabilities continue to transform based on new ideas and perspectives in education. New policies and mandates at the state and federal level such as No Child Left Behind (NCLB) (2002), the Individuals with Disabilities Act (IDEA) (2004), NCLB (2002), and IDEA (2004) require that school districts and state officials provide free and appropriate education to all students with disabilities. These laws also require that each state supply every classroom in America with a qualified teacher with skills, knowledge and dispositions that enable them to implement appropriate teaching strategies and instructional methods to meet the need of students with disabilities (Ryndak, Clark, Conroy & Stuart, 2001). These efforts demonstrate the commitment of all stakeholders, including experts in the field to continue to offer appropriate
education to students with disabilities, leaving no child behind.

Evidence-based Instructional Practices

Education of students with disabilities requires well conceived and formulated approaches to curriculum to guide the activities and skills that these students must learn to successfully function in society. After determining what to teach and at what level, it is imperative to consider and follow best instructional practices for the particular skill and population to be taught. Instructional strategies to teach students with moderate intellectual disabilities have been neglected and much work is needed to keep pace with curriculum choices (Dymond & Orelove, 2001; Nietupski & Hamre-Nietupski, 1997; Wehmeyer & Schalock, 2001; Jackson et al., 2000; Wolery & Shuster, 1997). Unfortunately, research-based best teaching strategies and instructional methods proven effective when teaching functional skills to students with moderate disabilities are limited. Further research in this area is crucial to effective instruct this population.

System of Least to Most Prompt

One evidence-based best practice proven effective is the system of least-to-most prompts. The system of least-to-most is a response prompt procedure. This procedure is used to ensure that target responses or behaviors will occur by providing various types of assistance (Snell & Zirpoli, 1987). Response prompts can include verbal instruction, gestures, modeling or physical
assistance. Prompts can be used separately, in combination or as part of a hierarchical system. The system of least-to-most prompting, also known as the increasing assistance procedure (Wolery et al., 1990), is a hierarchical system of prompts. It consists of a sequence of two or more levels of prompts arranged and used in a least-to-most intrusive order in an instructional trial (Snell & Zirpoli, 1987). Systematic and hierarchic prompts can be used to teach skills that involve more than one step. Task analysis is used to break down the skill to be taught into systematic steps of observable motor skill components (Kana, 1997). Task analysis forms the foundation for many of the teaching strategies, including the system of least-to-most prompt, that are used to teach complex functional and vocational skills to students with moderate intellectual disabilities. Prior to instruction, the task must be broken down into manageable components for the student to learn. Without task analysis for skills with two or more steps, instructional strategies are ineffective (Alberto & Troutman, 2003).

The system of least-to-most prompting has been used effectively with students with moderate intellectual disabilities (Wolery et al., 1990). With this prompt system, the student is initially given the opportunity to perform the task or step independently. When an error or no response occurs, the student is provided with the next prompt in the hierarchical chain. This process continues until the student responds correctly (Wolery et al., 1990). The system of least-to-most prompting is also referred to as the self-fading system because, as the students learn to respond independently to perform each step, less and less prompting or assistance is provided (Kana, 1997). Prior to instruction and after the task analysis for the skill has been developed, the number and type of prompts should be selected and arranged in order of complexity from least-
to-most intrusive. This is then applied one level at a time with a short constant latency period, usually three to five seconds between each presentation of the next prompt in the hierarchy to allow for an independent response to occur (Snell & Zirpoli, 1987; Doyle, Wolery, Ault & Gast, 1988; Kana, 1997). If an error response occurs, the student’s action is interrupted immediately and the next most intrusive prompt is presented regardless of the constant latency period. After the student gives a correct response, specific verbal reinforcement is provided regardless of the prompt level applied (Snell & Zirpoli, 1987; Doyle et al., 1988; Kana, 1997).

For decades, many skills have been taught successfully by using the system of least-to-most prompt in the community, daily living and vocational domains (Doyle et al., 1988). Cuvo, Leaf and Borakove (1978) used four level of least-to-most prompts to teach six individuals with moderate intellectual disabilities janitorial skills. In this study, participants were taught to clean a school bathroom. The task of cleaning the bathroom was broken down into sub-tasks. Clean the sink and mirror is an example of one sub-task. Each sub-task was then broken down into steps formulating the task analysis. Cuvo et al. (1978) used a prompt sequence that included (a) no assistance, (b) verbal instruction, (c) verbal plus model and (d) verbal plus graduated physical guidance. They implemented a latency period with a five second delay between prompts. The results of the study revealed that all the participants reached criterion of 90% (no assistance) after nine training sessions. For the generalization and maintenance phase, participants were able to perform each sub-task after an average of 2.67 hours of training. Results of the study demonstrated that the use of the least-to-most prompting system was effective for teaching janitorial tasks to all the participants.
Breen, Haring, Pitts-Conway and Gaylord-Ross (1985) conducted a study that used a least-to-most prompting system. In this study, a sequence of five least-to-most prompts was followed to teach social skills to four high school students with autism. The participants were taught to verbally interact with co-workers without disabilities during break times. The task included thirteen steps that consisted of a script of verbal statements and responses for interaction with co-workers. Breen et al. (1985) used the following sequence of prompts: (a) indirect verbal (“what do you do next”), (b) direct verbal instruction of the step, (c) gesture, (d) partial physical and (e) full physical. They implemented a latency period with three second delay between prompts. The results of the study revealed that all participants reached criterion for mastery in an average of eight instructional sessions, demonstrating that the system of least-to-most prompting was effective in teaching a skill that required social and motor responses.

Hill, Wheman and Horst (1982) investigated the effectiveness of a sequence of four least-to-most prompts to teach three students with severe intellectual disabilities to operate an electronic pinball game. The task of using the pinball game was broken down into a task analysis with nineteen steps. In order, from least-to-most, the prompt sequence included (a) verbal prompt, (b) modeling, (c) gesture and (d) physical guidance. They allowed a ten second latency period for each step of the task before presenting the next level of prompting. All the participants reached a performance level of 80% accuracy demonstrating that the system of least-to-most prompting was effective to teach a game skill to students with severe disabilities.

Collins, Branson, Hall, and Wheatley (2001) used five levels of least-to-most prompting to teach four steps in writing a letter to three high school students with moderate intellectual
disabilities. The prompts in sequence were (a) independent, (b) verbal, (c) gesture plus verbal cue, (d) model plus verbal cue and (e) physical plus verbal cue. Collins et al. (2001) found that all participants reached criterion for completing at least two components of the task. Their findings demonstrated that the least-to-most system of prompting was effective in teaching the various components of a task to students with moderate intellectual disabilities.

Numerous studies demonstrate that over the years, the system of least-to-most prompt has been effective in teaching a variety of skills to students with moderate intellectual disabilities. The variations and flexibility within the hierarchy of prompts allows for modifications based on students’ abilities and the complexity of the tasks. Even though the research in this area is extensive, there is a need to determine what combination or variation of prompts is more effective in promoting independence of performance in different skills.

*Instructional Schedules*

The use of various instructional schedules is another evidence-based instructional practice. Instructional schedules are defined as the different types of instructional options, including different times and settings, in which instruction for students with disabilities occurs (Cihak et al., 2004). Scheduling instruction in the most appropriate settings to teach students with moderate intellectual disabilities has generated a variety of opinions among researchers, teachers, parents and school officials. Ryndak et al. (2000) stated that some participation in regular classroom settings is essential for students with disabilities in order to gain important
skills. Nietupski and Hamre-Nietupski (1997) reported that students with moderate intellectual disabilities should be taught in the community for functional vocational skills and then find opportunities to include them in regular classrooms to practice and generalize other functional skills such as communication and social behaviors skills. Some researchers considered community-based instruction as the best setting for teaching important functional skills to students with moderate intellectual disabilities (Cihak et al., 2004; Brown et al., 1979; Brown, Nisbet, Ford, Sweet, Shiranga, York & Loomis, 1983; McDonnell, Hardman, Hightower, Kiefer-O’Donnell & Drew, 1993). Strong supporters of inclusion argue that instruction in the regular classroom is the best setting for teaching students with disabilities (Dymond & Orelove, 2001; Browder et al., 2004; Jackson et al., 2000). However, teaching in the segregated and inclusive classrooms, requires simulation of instruction as opposed to natural or naturalistic instruction.

**Simulated Instruction in the Classroom (SICO)**

As defined in this study, SICO is training that simulates the conditions that appear in the natural environmental, but does not involve the conditions under which such behavior is to be performed. Supporters of simulated instruction have argued that this type of instruction: (a) provides opportunities for repeated practice over short periods of time, (b) can be more cost effective because materials can be used in several trial and opportunities, (c) requires less time because there is no traveling between settings, and (d) reduces the risk factors that come with teaching skills such as crossing the street or use of transportation (Nietupski, Hamre-Nietupski,
Studies in which classroom based simulated instruction have been used report positive results (Risley & Cuvo, 1980; Cihak et al., 2004; Neef et al., 1978). Some of the skills that have been taught include safety skills, functional living skills and vocational skills.

Risley and Cuvo (1980) used simulated instruction to teach three students with moderate intellectual disabilities to make emergency phone calls. Students in this study were trained using photographs of three emergency situations and three emergency numbers. Students were taught to dial a seven digit number and provide their name, and address. Results of the study indicated that all students were able to generalize the response to novel situations within the classroom, this demonstrated that classroom based simulated instruction was effective in teaching the skill of making an emergency call.

Cihak et al. (2004) conducted a study in which simulated instruction was one of four instructional schedules used to teach four students with moderate intellectual disabilities the skill of sending a fax. Results of the study indicated that all students were able to acquire and generalize the skill of sending a fax with a mean independence performance of 93%. While simulated instruction proved to be effective in teaching the skill of sending a fax, all students needed at least one extra instructional session during the follow-up phase.

Neef et al. (1978) evaluated the effectiveness of simulated instruction in teaching bus riding skills to five students with intellectual disabilities. The researcher used role playing, manipulation of the actions of a doll on a simulated model and slide presentation as the simulation procedures. Results indicated that all students mastered, generalized and maintained the skills in different city buses for twelve months after training. In this case, simulated
instruction was very effective not only for the acquisition of the skill, but also for maintenance of the skill over an extended period of time.

While numerous studies have demonstrated that simulated instruction can be effective in teaching a variety of skills to students with moderate intellectual disabilities (Risley & Cuvo, 1980; Cihak et al., 2004; Neef et al., 1978), extra training session were required for participants to generalize the skills to untrained settings or stimuli. To alleviate some of this difficulty, Nietupski et al. (1986) proposed guidelines to improve the generalizability of simulated instruction. In order to conduct appropriate simulated instruction an inventory of the stimuli and responses encountered in the community should be conducted. This should include a comparable replication of the physical environment to which the skill should generalize. Training sessions for the skills to be taught should vary to provide a range of stimulus and responses to foster generalization in other similar settings. In addition, Nietupski et al. proposed that simulated instruction can be used effectively for intensive practice or training in specific problem areas for specific skill steps.

In summary, various studies have demonstrated that simulated instruction was effective in teaching some skills to some student populations under certain conditions. Specific practices and guidelines to improve the probability that simulated instruction will be most effective have been identified (Nietupski et al., 1986) Simulated instruction is a viable alternative when CBI is not available or when the cost for schools and parents is prohibitive.
Community-based Instruction (CBI)

Many experts consider CBI to be the ideal instructional schedule for teaching important functional skills to students with moderate intellectual disabilities (Cihak et al., 2004; Brown et al., 1979; Brown, et al., 1983; McDonnell, et al., 1993). CBI, as defined in this study, is an instructional schedule in which teaching takes place in community settings. This type of instructional schedule replaces teaching that occurs at the school. During CBI, learning takes place in natural performance settings, allowing for learning that has natural cues, consequences, and criteria (Alberto, et al., 2002). The emphasis on preparing students with moderate disabilities to operate in the community by fostering community skills promotes the use of CBI (Westling & Floyd, 1990). Students with moderate intellectual disabilities have difficulty generalizing or applying skills learned in the classroom to real and natural settings in the community. Evidence suggests that CBI is crucial for skill generalization (Collins, 2003; McDonnell et al., 1993). Numerous studies have reported the benefits of teaching students with moderate disabilities in the community and in settings where potential employment may be a possibility (Kraemer & Blacher, 2001; McDonnell et al., 1993; Agran, et al., 2000; Wheeler, et al., 1988).

Test, et al. (1990) conducted a study in which two students with severe disabilities were taught to use a public telephone to call home. Skill instruction took place in a shopping mall for one participant and in convenience store for the second participant. Training sessions were conducted an average of twice a week with two training trials per session. Test et al. found that both students were able to master the skill and later generalize the skill to untrained settings with 100% accuracy, demonstrating that CBI was effective in teaching the skill of using a public
Copper and Browder (1998) used CBI to teach three adults with severe intellectual disabilities to make five choices in purchasing items in fast food restaurants. The instruction took place in three different sites each week, with one training trial per session. They found that all students made the five choices, but they all required at least one verbal prompting. Though the students did not reach 100% independent performance, they were able to make choices with minimal assistance.

McGlashing, Agran, Sitlington and Cavin (2003) taught four students in respective job-sites to set individual goals, make action plans, implement the plans, and adjust their plans as needed. The results of this study indicated that three out the four students mastered their respective target skill. While this study taught the skills in the community, the main contributor factor for skill acquisition was attributed to the self-determined learning model of instruction.

CBI has demonstrated its effectiveness in promoting the acquisition of a variety of skills by students with moderate intellectual disabilities. However, there is still the need to design adequate and cost efficient CBI that provides opportunities to students with moderate intellectual disabilities to practice and generalize skills learned. In summary, more research is needed to establish guidelines to plan and conduct instruction in the community. Further, it is imperative to increase collaboration between school systems and community businesses that can serve as partners in this process.
Community-based Instruction plus Simulated Instruction (CBISC)

Separately, SICO and CBI have proven to be effective in teaching students with moderate intellectual disabilities (Test et al., 1990; McGlashing, et al., 2003; Copper & Browder, 1998; Risley & Cuvo, 1980; Cihak et al., 2004; Neef et al., 1978). However, some researchers in the field have combined the two approaches in efforts to solve some of the problems or difficulties encountered with SICO and CBI schedules (McDonnell, 1984; Branham, et al., 1999; Morse & Schuster, 2000). Simulated instruction in the classroom plus community-based instruction (CBISC) is defined as an instructional schedule that combines simulated instruction and CBI. The purpose of this instructional schedule is to provide instruction in a controlled setting, such as a classroom, where there are fewer distractions, and to complement that instruction with CBI in a naturalistic setting to provide better opportunities for generalization of skills taught.

McDonnell (1984) conducted one of the early studies that investigated the effectiveness of a combined instructional schedule including simulation in the classroom plus in vivo training. In this study, he compared CBI and combined instruction. The combined sequence was simulation followed by CBI. Four secondary students with moderate and severe disabilities were taught to shop for grocery items daily on consecutive days, using simulation plus CBI schedule. Another four students were taught using CBI only. For the combined instruction, (simulation plus CBI schedule) simulated instruction took place in the students’ classroom. In the simulated setting, students were taught using role-play with flash cards and slides. Instructional sessions ranged from forty to sixty minutes per day. CBI for both groups took place at the local supermarket. Students were required to match pictures presented of an item to the real item.
following the verbal instruction, “find the item.” Training sessions ranged from forty to sixty minutes each. McDonnell (1984) reported that only the students that were taught using a combined instruction, (simulation plus CBI schedule) were able to generalize the skills of purchasing grocery items in novel settings. This study demonstrated that a combined instruction, simulation plus CBI schedule was more effective that CBI in teaching the skill for finding grocery items.

In a similar study, Branham, et al., (1999) investigated the effect of three instructional schedules: (a) combined instruction, simulation plus CBI, (b) videotape modeling plus CBI, and (c) SICO plus videotape modeling plus CBI. Three secondary students were taught to mail a letter, cash a check, and cross a street. The students were taught in their classroom using SICO. For the videotape modeling instruction, the students were taught in their classroom using a video cassette recorder. CBI occurred in two local post offices, banks and streets around the school. The result of the study indicated that, even though all instructional schedules were effective in teaching and generalizing the skills, combined instruction (simulation plus CBI) proved to be the most efficient instructional schedule in terms of time to criterion.

Morse and Schuster (2000) investigated the effectiveness of combined instruction (simulation plus CBI) in teaching ten elementary students with moderate intellectual disabilities to shop for grocery. For the CBI, the students were taught once a week at the local grocery store located a mile from the school. For the SICO the students were taught three times a week using photographs. Results from the study indicated that six students reached criterion and were able to generalize the skill in novel stores after six weeks. Four students did not reach criterion due to
the end of the school year. This study demonstrated that a combined instruction (simulation plus CBI) was effective in teaching six out of ten elementary students the skill of purchasing grocery items.

Cihak et al. (2004) investigated the effect of four instructional schedules, (a) SICO, (b) CBI, (c) combined instruction, simulation plus CBI in the same day, and (c) combined instruction, simulation plus CBI in consecutive days to teach five secondary students with moderate disabilities. The students were taught to send a fax, withdraw twenty dollars from an automatic teller machine, purchase two items, and collate a five-page letter. All the simulated instruction sessions took place in a resource classroom at the students’ school, the CBI sessions occurred at a local grocery store with an automatic teller machine. Training sessions for collating a letter occurred at the administrative office of the students’ school. Cihak et al. (2004) found that all students were able to learn and generalize the skills. However, the combined instructional schedules were the most effective for skill acquisition.

Studies have demonstrated that SICO plus CBI was more effective for skill acquisition and generalization than any other instructional schedule in isolation. The literature in this area of instruction for students with moderate intellectual disabilities is increasing across skills and settings. However, more research is needed in order to identify the most effective way to combine simulated and community instruction. The findings of this study will add to the existing literature on instructional schedules and it will provide empirical results for future decision making in regards to instructional delivery models for teaching students with moderate intellectual disabilities.
In summary, this review of the literature presented the underlying topics addressing some of the issues related to instructional schedules and strategies used when teaching students with moderate intellectual disabilities indispensable skills. The presented study aimed to add to the literature in this area, and to provide a practicable design and format for developing instructional schedules when teaching students intellectual disabilities.
CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

Research Design

A single subject research design was employed to investigate the effect of three instructional schedules on skill acquisition and generalization across settings on the use of two-way radios to report task completion by high school students with moderate intellectual disabilities. Specifically, this involves a multiple probe design across participants, with intermittent probe trials within each instructional group, and an added generalization phase (Horner & Baer, 1978; Tawney & Gast, 1984; Alberto & Troutman, 2003)

Design Review

The purpose of single subject research design is to document the functional or causal relationship between the independent and dependent variables in a study (Horner, Carr, Hale, McGee, Odom & Wolery, 2005). This type of design has been used in the field of special education to investigate the effect of different strategies and teaching methods when teaching a range of skills to students with moderate intellectual disabilities. Single subject research is recommended as a useful method to examine clinical liability and provide valuable documentation regarding treatments and behavior changes in special education research (Zhan & Ottenbacher, 2001). There are numerous examples of single subject research in the field
demonstrating its effectiveness and validity. Well-known researchers in moderate intellectual disabilities (Alberto, et al., 2002; Wolery, et al., 1990; Browder, et al., 1988) have conducted studies that demonstrate how single subject research can be implemented to generate important and valuable answers to an array of important research questions (Spooner & Browder, 2003). Single subject research design is based on observations, experimental applications, and rigorous data analysis that demonstrate social validity and reliability, both of which are quality indicators identified in No Child Left Behind (2002) as guidelines for acceptable scientific research methodology in education (Spooner & Browder, 2003).

There are three basic variations of single subject design: (1) AB design and its extensions (ABAB, ABA); (2) multiple baseline design and its alternative (multiple probe design); and (3) alternative treatment design (Tawney & Gast, 1984; Zhan & Ottenhacher, 2001; Alberto & Troutman, 2003). Each variation may be used to answer different research questions. Multiple baseline designs are used to demonstrate how an intervention alters the target behavior or dependent variable across settings, behaviors or subjects (Horner & Baer, 1978). However, multiple baseline design can present a problem if baseline data is collected over extensive periods of time and sessions (Alberto & Troutman, 2003). By exposing participants to extended baseline measurements, there is a risk for a threat in the internal validity of the study due to prolonged testing. In order to address this limitation, a variation of multiple probe design, the proposed design in this study, offers an alternative to test the extent to which the behavior or dependent variable has become independent on testing or treatment exposure (Horner & Baer, 1978). In multiple probe design, the independent variable is introduced to one behavior, setting
or subject at a time. In multiple probe design, baseline data is not collected on a continuous basis for the dependent variables that have not been introduced or exposed to the independent variable or treatment. Probe trials of the behaviors or dependent variables are conducted intermittently prior to true baseline and intervention phase. Multiple probe design provides data that will reveal or evaluate whether the dependent variable is changing or is stable prior to the introduction of the independent variable or treatment phase (Tawney & Gast, 1984). In multiple probe design across participants, within groups, with added generalization phase, the intervention is introduced across several participants that exhibit the same target behavior under the same experimental condition. The participants are introduced to the independent variable one participant at a time in each group. Baseline of the target dependent variable is taken for the first participant of each group for a minimum of three consecutive data points, or until the data of the target behavior presents a stable trend; meanwhile probe data is taken intermittently for the other participants in the study in each group. In this study, baseline was taken for six consecutive data points for each participant in each group during baseline phase. After the baseline and intervention phases were completed for the first participant of each group, and that participant for the respective group reached a set criterion level of performance for the dependent variable during the intervention phase (which was set to demonstrate 100% independent performance of all the steps in the task analysis for making a call using a two- way radio for three consecutive trials), true baseline was taken for the second participant in each group. After six consecutive data points or a stable trend in the data, the intervention was introduced for that second participant. The same procedure was followed in sequence for all the participants in the group for each group. The monitoring of the
dependent variable after criterion with multiple probes measures intra-subject generality and assesses for durability of the dependent variable over time and across settings (Tawney & Gast, 1984). In conclusion, single subject design, and in particular, multiple probe design, has the ability to identify the optimum treatment or teaching method for individuals with disabilities in clinical research oriented toward practitioners (Zhan & Ottenbacher, 2001).

Research Questions

The primary emphasis of this study was to investigate the effect of three different instructional schedules to teach students with moderate intellectual disabilities to use two-way radios to report task completion. The following questions were addressed:

1. Is there a difference in the number of instructional trials to a set criteria needed for students with moderate intellectual disabilities to acquire the skill of using a two-way radio to report task completion, when taught using one of the following instructional schedules: community based instruction only (CBI), combined instructional schedule, community based instruction plus simulated instruction in the classroom in the same day (CBISC) and simulated instruction in the classroom only (SICO)?

2. Is there a difference in the number and types of prompts needed to a set criteria for students with moderate intellectual disabilities to acquire the skill of using a two-way radio to report task completion, when taught using one of the following instructional schedules: community based instruction only (CBI), combined instructional schedule,
community based instruction plus simulated instruction in the classroom in the same day (CBISC) and simulated instruction in the classroom only (SICO)?

3. Is there a difference in the generalization of the skill of using a two-way radio to report task completion across settings for students with moderate intellectual disabilities, when taught using one of the following instructional schedules: community based instruction only (CBI), combined instructional schedule, community based instruction plus simulated instruction in the classroom in the same day (CBISC) and simulated instruction in the classroom only (SICO)?

Description of Participants

Nine students participated in the study. There were five females and four males with ages ranging from 17 to 21. The participants’ mean age was 19.67. The State of Florida categorical label of Trainable Mentally Handicapped (TMH) or Moderate Intellectual Disabilities identified all the participants. The later label was used as the primary term to describe the population throughout the study. Seven students were assigned by the school district to 12th grade, and two were assigned to 10th grade for the 2004-2005 school year. Participants’ descriptions and demographical information is provided in Table 1.

All participants were attending a school in a metropolitan community in Central Florida. The school was built in 1973 as a public school for students with intellectual and physical disabilities. Since then, the school has continued to serve a highly specialized population that
includes students with mental, developmental and physical challenges. Many students are identified as medically fragile; some have a loss of vision or hearing and some that exhibit behaviors that are self-injurious or injurious to others. During the 2004-2005 school year, the school served 250 students with different degrees of intellectual disabilities.

A pilot on-the-job training program for two classes with high school age students began in September of the 2004-2005 school year. The students selected for the study participated in the on-the-job training program at a local retail store. The participants attended on-the-job training two days a week for two and a half hours each day. In addition, students participated in the school workshop class in which tasks simulated a variety of vocational activities and settings found in retail stores and hospitality jobs. Since participants did not have previous on-the-job training or systematic instruction in the community, the on-the-job training program at the retail store was a novel experience and environment.
### Table 1

**Participant Demographics**

<table>
<thead>
<tr>
<th>Participant</th>
<th>DOB</th>
<th>Sex</th>
<th>Label</th>
<th>Race</th>
<th>Scale</th>
<th>Grade</th>
<th>Residence</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.F. (Rx)</td>
<td>1-12-83</td>
<td>M</td>
<td>TMH</td>
<td>W</td>
<td>**43</td>
<td>12</td>
<td>G.H.</td>
</tr>
<tr>
<td>B.H.</td>
<td>3-25-85</td>
<td>M</td>
<td>TMH/SLI</td>
<td>W</td>
<td>*50</td>
<td>12</td>
<td>P.</td>
</tr>
<tr>
<td>C.S. (Rx)</td>
<td>4-13-87</td>
<td>M</td>
<td>TMH/SLI</td>
<td>W</td>
<td>**45</td>
<td>10</td>
<td>P.</td>
</tr>
<tr>
<td>D.B.</td>
<td>12-23-82</td>
<td>F</td>
<td>TMH</td>
<td>B</td>
<td>**43</td>
<td>12</td>
<td>P.</td>
</tr>
<tr>
<td>E.P.</td>
<td>11-29-82</td>
<td>F</td>
<td>TMH</td>
<td>H</td>
<td>***46</td>
<td>12</td>
<td>P.</td>
</tr>
<tr>
<td>F.J.</td>
<td>9-19-85</td>
<td>M</td>
<td>TMH/SLI</td>
<td>B</td>
<td>**45</td>
<td>10</td>
<td>P.</td>
</tr>
<tr>
<td>G.M. (Rx)</td>
<td>6-23-85</td>
<td>F</td>
<td>TMH</td>
<td>W</td>
<td>**47</td>
<td>12</td>
<td>G.H.</td>
</tr>
<tr>
<td>H.G.</td>
<td>12-21-82</td>
<td>F</td>
<td>TMH</td>
<td>H</td>
<td>**42</td>
<td>12</td>
<td>P.</td>
</tr>
<tr>
<td>I.A. (Rx)</td>
<td>6-29-83</td>
<td>F</td>
<td>TMH/SLI</td>
<td>H</td>
<td>**45</td>
<td>12</td>
<td>P.</td>
</tr>
</tbody>
</table>

Note: DOB indicates date of birth. (Rx) indicates that participant takes medication. TMH indicates Trainable Mentally Handicapped. SLI indicates Speech and Language Impaired. M. indicates males. F. indicates female. W. indicates white Caucasian. H. indicates Hispanic. B indicates Black. * indicates Bayley Scale of Infant Development. ** indicates Stanford-Binet Intelligence Scale: Form L-M. *** indicates WISR-Full Scale. P. indicates participant lives with parents. G.H. indicates participant lives in a group home.

### Selection

Participants selected for the study met the following minimum criteria; (a) primary classification of moderate intellectual disabilities (TMH); (b) participation in on-the-job training program; (c) verbal as primary form of communication; (d) no prior training with two-way radios.
In order to determine if participants met criteria for the inclusion into the study, school records including Individual Educational Plans (IEP) and Matrix of Services were used. For criterion (d) the participants’ parents were asked if their son/daughter had used a two-way radio at home or if they had being taught how to use one prior to the study. The participants were also asked if they knew what a two-way radio was or if they knew how to use one. See Appendix F for a sample of the data sheet used for pre-assessment to determine if the students met criterion (d).

Consent to participate in the study was obtained from the intended participants, the participant’s parent or guardian, the teachers that were assigned to the respective classrooms, the principal of the school, the Senior Director of Program Services for research in Orange County School District, and the Institutional Review Board (IRB) at the University of Central Florida.

Participants

Participant 1. A.F. was a 21 year old white male assigned to 12th grade at the time of the study. He had attended the center school for five years. A.F.’s primary categorical label, as stated in the Florida Department of Education Matrix of Services, was TMH. He had received occupational therapy services for two years, but was dismissed in the Spring of 2004 based on performance and progress. He verbally communicated wants and needs with some prompting. A.F. occasionally exhibited non-compliant behaviors such as refusing to continue his work when he became frustrated with tasks or activities. Due to his behaviors, A.F. lived at a group home at
the time of the study. A.F. took Ritalin twice a day to help him control his behaviors and impulsivity. On the 2003-2004 Vocational Assessment Curriculum Guide, A.F. performed at the level of a four year old with supportive assistance. Information gathered from his three year re-evaluation conclude in Spring of 2003 during which the Developmental Profile II (DP-II) was implemented, (DP-II is an inventory of skills which provides an age-level profile assessing five areas of a child functional development), indicated that A.F. was functioning at a very low category of cognitive ability. He functioned at a physical age of 56 months, a self-help age of 80 months, a social age of 82 months, an academic age of 60 months and a communication age of 40 months. A.F. had minimal experiences in CBI throughout his educational career and had never participated in systematic vocational training in the community prior to the study.

Participant 2. C.S. was a 17 year old white male assigned to 10th grade at the time of the study. He had attended the center school for seven years. His categorical labels, as stated in the Florida Department of Education, Matrix of Services, were TMH and Speech and Language Impaired. C.S. verbally communicated his wants and needs without prompting. He performed tasks with moderate supervision. On the 2003-2004 assessment with the Brigance Diagnostic Inventory of Basic Skills, C.S. performed at the participatory level. Information gathered from his last tree year re-evaluation conducted in the 2002-2003 school year during which the Developmental Profile II was administered, placed him in the very low category of cognitive ability. C.S. functioned at a physical age of 60 months, a self-help age of 84 months, a social age of 86 months, an academic age of 79 months and a communication age of 56 months. C.S. took medication that helped him control his behaviors at home and medication for seizure control.
C.S. had some experiences in CBI throughout his educational career, but had never participated in systematic vocational training in the community prior to the study.

Participant 3. B.H. was 19 year old white male with Down’s Syndrome assigned to the 12th grade at the time of the study. He had attended the center school for six years. His primary categorical labels as stated in the Florida Department of Education Matrix of Services, were TMH and Speech and Language Impaired. B.H. verbally communicated his wants and needs without prompting. He performed tasks with moderate supervision. On the assessment of the Vocational Assessment Curriculum guide completed in the 2003-2004 school year, B.H. performed at an increased level of independence. B.H.’s. social interactions were reported to be appropriate. Information gathered from last three year re-evaluation conducted in 2003, in which the Developmental Profile II was implemented, placed B.H. in the very low category of cognitive ability. DP-II results indicated that he was functioning at a physical age of 70 months, a self-help age of 86 months, a social age of 88 months, an academic age of 79 months and a communication age of 58 months. B.H. had some previous experiences in CBI in his educational career, but had never participated in systematic vocational training in the community prior to the study.

Participant 4. D.B. was 21 year old Black female assigned to 12th grade at the time of the study. She had attended the center school for eight years. Her primary categorical label as stated in the Florida Department of Education Matrix of Services, was TMH. She used a power wheelchair for mobility. D.B. verbally communicated her wants and needs without prompting. She performed tasks with moderate supervision. On the 2003-2004 assessment of the
Prevocational Assessment and Curriculum guide (PACG), D.B. performed above workshop level in areas of independence, behaviors and social skills. D.B’s. social interactions are reported to be appropriate. Information gathered from last three year re-evaluation conducted in 2002, during which the Developmental Profile II was implemented, placed her in the very low category of cognitive ability. DP-II results indicated that D.B. was functioning at a physical age of 54 months, a self-help age of 88 months, a social age of 82 months, an academic age of 67 months and a communication age of 42 months. D.B. had minimal previous experience in CBI in her educational career and had never participated in systematic vocational training in the community prior to the study.

Participant 5. E.P. was 21 year old White-Hispanic female assigned to 12th grade at the time of the study. She had attended the center school for eleven years. Her primary categorical label, as stated in the Florida Department of Education, Matrix of Services, was TMH. E.P. verbally communicated her wants and needs with some prompting. She performed tasks with moderate supervision and some reminders. On the 2003-2004 portfolio assessment, E.P. performed at the participatory level. E.P.’s. social interactions were reported to be appropriate. Information gathered from her last three year re-evaluation conducted in 2003 during which the Developmental Profile II was implemented, placed her in the very low category of cognitive ability. DP-II results indicated that E.P. was functioning at a physical age of 50 months, a self-help age of 54 months, a social age of 42 months, an academic age of 40 months and a communication age of 54 months. E.P. had some previous experience in CBI in her educational
career, but had never participated in systematic vocational training in the community prior to the study.

**Participant 6.** F.J. was 19 year old Black male assigned to 12th grade at the time of the study. He had attended the center school for three years. His categorical labels as stated in the Florida Department of Education Matrix of Services, were TMH with Speech and Language Impaired as secondary label. F.J. verbally communicated his wants and needs without prompting. He used a manual wheelchair for mobility. He performed tasks with moderate supervision. He had difficulty using his left hand due to cerebral palsy; however, he had appropriate control and use of his right hand. On the 2003-2004 portfolio assessment, F.J. performed at the participatory level in all areas. F.J.’s social interactions were reported to be appropriate. Information gathered from his last three year re-evaluation conducted in 2003 during which the Developmental Profile II was implemented, placed him in the very low category of cognitive ability. DP-II results indicated that F.J. was functioning at a physical age of 65 months, a self-help age of 64 months, a social age of 60 months, an academic age of 64 months and a communication age of 60 months. F.J. had minimal previous experience in CBI in his educational career and had never participated in systematic vocational training in the community prior to the study.

**Participant 7.** G.M. was a 19 year old White female assigned to 12th grade at the time of the study. She had attended the center school for five years. Her primary categorical label, as stated in the Florida Department of Education Matrix of Services, was TMH. G.M. verbally communicated her wants and needs without prompting. She performed tasks with moderate supervision. On the 2003-2004 Vocational Assessment Curriculum Guide, G.M. performed at
the pre-academic level. G.M. was reported to have made inappropriate physical contacts and comments toward males in the past. G.M. had a diagnosis of bi-polar disorder at the time of the study. She took two different medications for her condition, Zyprexa and Geodon, which are drugs that are used to help control acute agitation in schizophrenia and bipolar mania. Due to her behaviors, G.M. lived in a group home at the time of the study. G.M. had minimal previous experiences in CBI due to her past behaviors. Recently information indicated that G.M.’s behaviors were appropriate and she was selected to participate in the school on-the-job training program. She had not participated in systematic vocational training in the community prior to the study.

Participant 8. H.G. was a 21 year old White-Hispanic female with Down’s Syndrome assigned to 12th grade at the time of the study. She has attended the center school for nine years. Her primary categorical label, as stated in the Florida Department of Education Matrix of Services, was TMH. H.G. verbally communicated her wants and needs without prompting when she was familiar with the environment. She performed tasks with moderate supervision. On the 2003-2004 Vocational Assessment Curriculum Guide, H.G. performed between kindergarten and first grade level. H.G.’s. social interactions were reported to be appropriate. Information gathered from her last three year re-evaluation conducted in 2002 during which the Developmental Profile II was implemented, placed her in the very low category of cognitive ability. DP-II results indicated that H.G. was functioning at a physical age of 50 months, a self-help age of 54 months, a social age of 40 months, an academic age of 54 months and a communication age of 40 months. H.G. had minimal previous experience in CBI and had not participated in systematic
vocational training in the community prior to the study.

**Participant 9.** I.A. was a 21 year old White-Hispanic female with Down’s syndrome assigned to 12th grade at the time of the study. She had attended the center school for ten years. Her categorical labels as stated in the Florida Department of Education Matrix of Services were TMH and Speech and Language Impaired. I.A. verbally communicated her wants and needs without prompting. She performed tasks with moderate supervision. I.A. took Ritalin twice a day to help her control her behaviors and impulsivity. On the 2003-2004 portfolio assessment, I.A. performed at the participatory level in all areas. I.A.’s. social interactions were reported to be appropriate. Information gathered from her last three year re-evaluation conducted in 2002 during which the Developmental Profile II was implemented, placed her in the very low category of cognitive ability. DP-II results indicated that I.A. was functioning at a physical age of 40 months, a self-help age of 54 months, a social age of 46 months, an academic age of 38 months and a communication age of 30 months. I.A. had some previous experience in CBI in her educational career but had never participated in systematic vocational training in the community prior to the study.

**Instructional Groups**

Students were divided into three groups. Each group was assigned to a different instructional schedule. Each group or instructional schedule had three students. Match sampling was used in order to reduce variables amongst groups. Match sampling involved having similar
number of males and females students in each group. In addition, an effort was made to have similar ages, performance levels and reported I.Q. scores amongst groups. After groups were selected, using the described match sampling definition above, participants in each group were randomly assigned their position or placement in the intervention order, using SPSS randomization process. See Table 2 for a graphic demonstration of sampling distribution.

Table 2

*Instructional Schedule Participants*

<table>
<thead>
<tr>
<th></th>
<th>SICO</th>
<th></th>
<th>CBI</th>
<th></th>
<th>CBISC</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Sex</td>
<td>Age</td>
<td>I.Q. Scale</td>
<td>P</td>
<td>Sex</td>
<td>Age</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td>-------</td>
<td>------------</td>
<td>-------</td>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>A.F</td>
<td>M</td>
<td>21</td>
<td>43</td>
<td>D.B</td>
<td>F</td>
<td>21</td>
</tr>
<tr>
<td>I.A.</td>
<td>F</td>
<td>21</td>
<td>45</td>
<td>H.G</td>
<td>F</td>
<td>21</td>
</tr>
<tr>
<td>C.S</td>
<td>M</td>
<td>17</td>
<td>45</td>
<td>B.H</td>
<td>M</td>
<td>19</td>
</tr>
</tbody>
</table>

P indicates participant

Setting

Settings for the study consisted of the students’ classrooms for SICO training and the simulated portion of CBISC and a local retail store for the CBI schedule and the community-
training portion of the CBISC schedule. For the generalization phase, three settings were selected. Two different areas of the retail store, novel to the students, were used for the SICO, CBI and CBISC. One of these settings was the Warehouse area of the store located in a separate building adjacent to the store in which merchandise trucks downloaded boxes. Activities or tasks in this area included: (a) store boxes, (b) unpack merchandise, (c) label merchandise, (d) hang merchandise on rolling racks and (e) sort hangers. The second area of the store used for generalization was the home decor area located in the far right corner of the store. Participants did not work or visit this area of the store due to the characteristics of the merchandise shown in this area. Merchandise consisted of glass objects, mirrors, vases, and other breakables objects. Activities or tasks in this area for generalization included: (a) organize candles on shelves, (b) organize picture frames on shelves and (c) organize wooden decorative pieces on shelves. The third setting used for generalization was a portable unit used as thrift store organized by the PTA at the school. The thrift store was a novel setting for all participants. This setting was only open on Wednesdays and accessible to staff and parents only. The portable unit was located at the back of the school near a separate entrance to which students from the school did not have access. This unit was organized as a typical thrift store or garage sale setting. The unit had areas for clothes, shoes, jewelry and toys. The unit had a register and an area for sorting and preparing the items to be sold. Parents from the Parent Teacher Association (PTA) and some volunteer elderly from a nearby assisted living facility ran the thrift store. Activities or tasks for generalization included: (a) sort shoes, (b) sort clothing items, (c) hang clothing items and (d) price items.
Simulated Settings

One classroom was used as the training site for simulated instruction for the SICO schedule and the simulated portion of the CBISC schedule. The classroom had a layout similar to a retail store. This type of physical organization helps students generalize the learned skills when performing them in the community (Nietuspski, et al., 1986). The classroom had rolling stands for hanging clothes, shelves for stacking shoe boxes and tables for folding shirts or other items. Original signs obtained from the local retail store designated sale items and areas such as Men’s Shirts, Women’s Shoes, Coats, and others were used around the different areas in the simulated classroom. The simulated classroom had different items donated by the local retail store. These items consisted of coats, pants, shirts, ties, sweaters, price tags, size tags racks with numbers and letters and hangers for sorting. Students in the simulated classroom had different areas with different vocational activities that required them to move and stand while performing the activities similar to what they did during on the job training at the retail store. These areas were independent from each other and separated by tall racks or cabinets. The activities and the arrangement in the simulated classroom were occasionally rearranged to provide better simulated settings and more opportunities to practice the skills in a slightly different manner (Nietuspski, et al. 1986).

CBI Settings

A local retail store was used for the community training for the CBI and CBISC
instructional schedules and generalization for all three instructional schedules. The store is located one mile from the center school. The retail store is a national chain department retail store. The store features different departments for outerwear, apparel, shoes, accessories, baby clothes, furniture, toys, home decor, and gifts. Each department within the store provided a novel environment for the students. Initial training was provided in the clothing department for men’s and women’s clothing. This department is located at the entrance of the store on the left hand side from the entrance. The students participating in the program learned the skills related to the items displayed in this department for the first three months of on the job training. The skills targeted included sorting men’s shirts by size, sorting men’s and women’s coats by color, hanging men’s and women’s coats, restocking men’s socks, zipping and buttoning men’s and women’s coats, and pricing men’s shirts with provided sticker price.

Dependent Variable

The primary dependent variable for the intervention phase during acquisition of the skill was: (a) number of trials needed for skill acquisition in which all steps were performed independently in the absence of prompts to operate a two-way radio to make a call to a designated person to report task completion when taught in SICO, CBI and CBISC. The skill was counted as meeting criteria for acquisition when participants performed each step of the task analysis independently of any assistance. Independence was defined as performing each step using the two-way radio to report task completion absent of any type of prompt after the initial
verbal cue or SD “(Student’s name), you are finished with your task, call (name of assigned person) with the two-way radio and report it.” This level of criteria (100% independent performance for all steps) had to be demonstrated for three consecutive trials that resulted in the performance of the functional skill of completing a call using a two-way radio to report task completion.

Data were collected for a secondary dependent variable, the number and types of levels of prompts needed to perform the skill of using a two-way radio. There were four levels of prompts; verbal, verbal plus gesture, verbal plus model, and verbal plus physical guidance. Verbal prompts were defined as the verbalizations of the specific steps of the task analysis after the initial SD of, “(Student’s name), you are finished with your task, call (name of assigned person) with the two-way radio and report it”. Gesture prompts were defined as physical movements performed to direct students’ attention to a specific step in the task analysis. Gesture prompts consisted of pointing or tapping in the direction of two-way radio or the position where the students has to place their hands or move their fingers to perform the step. Model Prompts were defined as the physical demonstrations with the student’s two-way radio of how to perform the particular step in the task analysis. Physical prompts were defined as the physical guidance of the student’s hand to perform specific steps. This prompt started with partial physical which involved a brief touch on the student’s hand, or a lightly pulling or pushing of the students’ hands or fingers to perform the step and if needed the prompt progressed to full physical which involved hand-over-hand assistance for the performance of a step. Levels of prompts were adapted from studies done by Storey, Bates and Hanson (1984) and Hill, et al. (1982).
The dependent variables for the generalization phase were the total number of trials performed across the three novel settings that resulted in the independent use of a two-way radio to report task completion to a designated person. Each participant had a trial in each of the three novel settings to demonstrate skill generalization. The level of criteria (100% independent performance for all steps) had to be demonstrated for each generalization probe to be counted as valid.

Independent Variables

The independent variables were the three different instructional schedules in which the students learned how to use a two-way radio to make a call to a designated person to report task completion. The instructional schedules were as follows: community based instruction only (CBI); combined instructional schedule, community based instruction plus simulated instruction in the classroom on the same day (CBISC); and simulated instruction in the classroom only (SICO).

In the CBI schedule, three students were taught to use a two-way radio to call a designated person to report task completion at the selected retail store during the on-the-job training program. The sessions were conducted in the clothing and coat department on Mondays. There were two sessions with three trials each. The first session started at approximately 9:45am. The second session of the day started at approximately 11:00am. Each session was less than ten minutes. In the CBISC schedule, three students were taught while they were in CBI training at
the retail store followed by instruction in their classrooms to use a two-way radio to call a designated person to report task completion. The CBISC training sessions were conducted on Tuesdays. There were two sessions with three trials each. The first session started at approximately 10:20am. The second session of the day (in the classroom) started at approximately 12:45pm. In the SICO instructional schedule, three students were taught, in a simulated classroom, to use a two-way radio to call a designated person to report task completion. The training sessions were conducted on Thursdays. There were two sessions with three trials each. Session one started at approximately 10:20am and did not last more than ten minutes. The second session of the day started at approximately 12:45pm and did not last more than ten minutes. All instructional schedule groups started the same week. Table 3 depicts the three instructional schedules.

Table 3

Instructional Schedules

<table>
<thead>
<tr>
<th>Instructional Group</th>
<th>Day of Week</th>
<th>Trials</th>
<th>Starting time</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBI</td>
<td>Session 1</td>
<td>1,2,3</td>
<td>9:45 am</td>
<td>Burlington Coat Factory</td>
</tr>
<tr>
<td></td>
<td>Session 2</td>
<td>1,2,3</td>
<td>11:00 am</td>
<td></td>
</tr>
<tr>
<td>CBISC</td>
<td>Session 1</td>
<td>1,2,3</td>
<td>10:20 am</td>
<td>Burlington Coat Factory</td>
</tr>
<tr>
<td></td>
<td>Session 2</td>
<td>1,2,3</td>
<td>12:45 pm</td>
<td>Classroom</td>
</tr>
<tr>
<td>SICO</td>
<td>Session 1</td>
<td>1,2,3</td>
<td>10:20 am</td>
<td>Classroom</td>
</tr>
<tr>
<td></td>
<td>Session 2</td>
<td>1,2,3</td>
<td>12:45 pm</td>
<td></td>
</tr>
</tbody>
</table>
Apparatus

The apparatus that was used in this study consisted of a set of two-way radios for each group. Motorola Company manufactured the set of radios. The model used was the TALKABOUT® T5720 Two-Way NiCD Rechargeable Double Pack Nordic Blue series. The two-way radios were equipped with 22 channels (7 General Mobile Radio Service (GMRS) and Family Radio Service (FRS), 7 FRS, and 8 GMRS) and 38 sub-codes to cut down on channel interference from outside groups. Only the FRS channels were used in the study. These channels did not require licenses for operation. All sets of radios were set to the same channel. The T5700 two-way radios were weather-resistant. The model also had QT feature that offered noise filtering beyond the sub-codes that was important for receiving clear messages from students and teachers. A Motorola earpiece (earbuds) model 53728 was used. The earbuds contour to the ear so individuals could listen without holding the two-way radios. The earbuds delivered clear sound in noisy places. The earbuds provided privacy for communication and diverted extra attention from individuals outside the study. One modification was made to the radios. A piece of green electrical tape was placed and glued on the PTT button for easier identification by the participants. The researcher purchased the two-way radio sets and the earbuds. The cost of each set was $69.99 plus tax and the earbuds were $14.99 each plus tax. At the end of the study, the two-way radios sets and earbuds were donated to the school for continued use at the on-the-job training site and for future uses in other areas.
Procedures

Introduction

Each of the participants that were involved in the study participated in two sessions per training day. Each training session had three training trials for a total of six training trials per training day. Training sessions occurred in the morning and in the afternoon for the CBISC and SICO schedules. The training sessions for the CBI schedule occurred in the morning. This was due to the amount of time the participants were scheduled to participate in on-the-job training. Students participated in on-the-job training twice a week for a maximum of two and a half hours per day. Individual instructional sessions for all schedules did not exceed seven minutes. The student’s teacher provided one-on-one instruction. The criterion for mastery or skill acquisition was set to 100% independent performance of all steps of the task analysis that results in the performance of the functional skill of using a two-way radio to report task completion for three consecutive trials. This criterion was used for all instructional schedules.

A four level least-to-most system of prompts was used to teach the skill of using a two-way radio to report task completion with a total task sequence. Total task sequence involved the introduction and teaching of all steps of the task analysis in each instructional trial (Test, et al., 1990; Snell & Zirpoli, 1987). After the student completed each training session, the student was given a five-minute break as reinforcement at the end of each instructional session. Students were allowed to go to the employees’ lounge while at the store during the CBI and CBISC
schedules to rest if requested, or the SICO schedule participants could sit in the rest area at the simulated classroom. Participants in all schedules were allowed to select one small eatable, or have a drink if desired. Reinforcers were selected during pre-intervention by asking the participants what kind of eatable, magazine, or drink or other reinforcers they liked. Eatables were carried in a small clear plastic bag. The reinforcers were offered at each instructional schedule. Reinforcers were held constant in a continuous schedule across the entire study (Alberto & Troutman, 2003).

**Baseline Procedure**

During true baseline phase, only one student was observed for baseline data. Baseline data were collected for six consecutive trials. After the six trials of baseline data were collected, the instructional phase was introduced to the participant exiting the baseline phase. This occurred for each participant one in each instructional group or instructional schedule. During the CBISC schedule, three trials of baseline data were taken at the retail store and three were taken in the classroom. Identical procedures were followed for true baseline and intermittent probes. Intermittent probes were taken for participant two and three in each instructional schedule. Probes were taken once every other week on the same training day but at different times for all instructional schedules. During baseline and probe data, the students carried the two-way radio and wore the earbud. They were given one simple task to complete such as hang three men’s shirts, hang three coats, stack three pairs of socks, or zip three coats. After students finished the
task, they were asked by the teacher to use the two-way radio to call the researcher and report that they were finished. The researcher was also the transition coordinator for the on the job training program. No other instructions, prompts, or specific feedback was given. After 15 seconds of no performance of a specific step of the task analysis, the student was asked if she/he was finished with the call (Cihak et al., 2004). The probe ended if the student responded affirmative to the question or if no response was given for 30 more seconds. Time was taken by the researcher using a digital small hand held timer. The teacher conducting baseline was instructed to look at the researcher for the signal of the times. The researcher collected data during baseline. Baseline data consisted of marking the steps the students performed independently. During true baseline, the students kept the equipment on for the entire session. After the end of each session, the students took off the equipment. During probe data, students took the equipment off after the trial ended.

**Intervention Procedure**

A multiple probe design across participants was used to determine the effect of each instructional schedule in the skill acquisition and generalization of the use of two-way radios to report task completion by high school students with moderate intellectual disabilities. The skill was taught using a system of least to most prompts in all instructional schedules. An instructional script (see appendix H for sample instructional script) was followed by the teachers to teach the
skill of using a two-way radio to report task completion in all instructional schedules.

Instructional sessions were provided once a week. Each session was divided into three instructional trials. After each session the students were given a five minute break in which they selected reinforcers of choice. Prior to all instructional sessions, students had the two-way radios and the earbud in the appropriate position and turned on. For each instructional session, in each instructional schedule, the students were given a task to complete. After they finished the task, instructional trials for the use of two-way radio to report task completion started. As students were instructed in each step of the task sequence, a system of four levels for least to most prompts was used until the student performed the step independently. An interval of five seconds between the presentation of each prompt was implemented. The prompts were verbal, gesture, model and physical. Each prompt was accompanied by the verbal cue for each step. The levels of prompts were used to ensure correct responses during the instructional phase for all instructional schedules. Each instructional session started with the verbal statement, “(Student’s name) you are finished with your task, call your (name of assigned person) with the two-way radio and report it”. Then the teacher waited five seconds for a response. If the student did not start within five seconds the first step, a verbal prompt for the next step was provided and the teachers waited five seconds. If no response was given, the next level of prompt was introduced with the verbal cue of the step. This procedure was followed for each step in the task analysis during each instructional trial for all instructional schedules. Time between prompts was kept mentally by the teachers, and using a digital hand held timer by the researcher for every instructional trial in each group. Data were collected for the type of prompts needed for each step and the number of
independent steps performed per trial. See appendix C, D, E, and H for complete description of
the task analysis and teaching script. In order to achieve criterion for skill acquisition, the student
was required to perform all steps of the task analysis with 100% independence in the absence of
prompts that resulted in the use of the two-way radio.

**Generalization Procedures**

The generalization phase was conducted a week after students reached criterion for skill
acquisition. This procedure was followed for each instructional schedule. For the generalization
phase, three settings were selected with one generalization trial in each setting. Two different
areas of the retail store novel to the students were used for the SIO, CBI and CBISC, the other
setting was a portable unit used as a thrift store organized by the center school PTA parents. This
setting was also a novel setting for all the students. Generalization trials in the community took
place on Wednesdays in which no other students from any instructional schedules were being
instructed in the use of two-way radio. This took place in two novel departments for all
participants at the retail store. Generalization phase followed the same initial baseline procedure.
After the student had finished the task, the teacher told the student to use the two-way radio to
call the researcher and report that she/he was finished. No other instructions, prompts or specific
feedback were given. After 15 seconds of no performance of a specific step of the task analysis,
the student was asked if she/he was finished with the call (Cihak et al., 2004). The generalization
probe ended if the student responded affirmative to the question or if no response was given for
30 more seconds. If the student did not perform with 100% accuracy during a generalization trial, an instructional trial was conducted immediately following the instructional procedure protocol. Data were collected for the steps the students performed independently for each generalization trial.

Instrumentation

A task analysis containing all the steps of the task for using a two-way radio to make a call was developed. This task analysis served as the data collection instrument used during the baseline, intervention, and generalization phases. The same instrument was used for each participant in each instructional schedule. The data collection instruments designed for the study were adapted from different data collection procedures obtained from Alberto and Troutman (2003). Prior to the study, the instrument was piloted with three students with moderate intellectual disabilities not participating in the project. Modifications to the instruments were made following the piloting phase. Modifications were made in collaboration with the research team. Members of the research team were the primary researcher, the two master teachers serving as instructors for the study at the school, a behavior specialist, and exceptional education faculty at the University of Central Florida. All members in the team have extended experience developing task analysis, data collection instruments and instructing students with moderate intellectual disabilities. A sample of each instrument can be found in appendixes C, D, and E. The intervention and generalization instrument provided information regarding types of prompts.
needed for each step and the number of independent steps performed by each participant in each instructional schedule per trial.

Instructors’ Training

Two teachers were selected to participate as the instructors in the study. The teachers were the assigned teachers of the two classes participating in the on the job training program at the time of the study. Both teachers had master degrees in special education, and more than five years experience working with students with moderate and severe disabilities at the high school level. They were experienced in collecting data and using prompts. One of the teachers had prior experience working in on the job training programs at other schools. The other teacher had participated in regular CBI trips with previous students. Four training sessions were conducted prior to the beginning of the study. Each session lasted approximately two hours. Training sessions consisted of teachers viewing tapes in which different students were being taught to use a two-way radio. The training videos followed the teaching script and used the least to most levels of prompts employed in the study. After viewing the videos and discussing the prompts used, the teachers practiced teaching the skill and following the script with each other. While practicing teaching the skill, the teachers were video taped. The video tapes were used for observation and identification of errors during the training sessions. The primary researcher took notes on prompt and waiting time errors in each session to be reviewed and corrected with the
teachers after each training session. After the fourth training session, the teachers performed a practice teaching session with each other free of prompt and waiting time errors.

During the study, procedural reliability was assessed to determine if teachers were following the instructional protocol. Instructional protocol consisted of following the appropriate sequence of prompts and waiting the designated time length between each prompt (five seconds). Procedural reliability was taken at the same time that interobserver reliability was been taken using the same data collection instrument. The researcher was responsible for taking procedural reliability. The procedural reliability was calculated by taking the number of steps in the task analysis (six) and dividing it by the sum of the number of steps and the number of discrepancies (waiting time different from five second or error on the prompt sequence) within a session. On average, the procedural reliability for teacher one was 94.2 %. Procedural reliability for teacher two averaged 97.7 %.

Interobserver Reliability

Two observers were used in order to confirm the accuracy of recorded measurements. One of the observers was the primary researcher; the other observer was the behavior specialist at the center school. Before the training sessions, the researcher provided the teaching script to the second observer, explained, and demonstrated the different prompts and the appropriate sequence for the steps. After the researcher and second observer discussed the script and the prompt system, the training sessions started. The observers attended four training sessions using
sample videos of three other students not related to the study being instructed to use the two-way radio. The training sessions served to train the observers in the use of the data collection instruments and to determine which prompts were presented during each step of the task analysis. Observers watched the video and reliability checks were performed in the form of dual coding. The coding for each observer training session was done on a blank replica of the study data collection instrument. After each data collection, training session comparisons were made on the sets of data. The percentage of agreement between the investigator and the observer were calculated by dividing the total number of agreements by the number of agreements plus disagreements within a session, then multiplying by 100. Interobserver agreement after the first training session was 83.3%, after the second training session interobserver agreement was 94.4%, after the third and fourth training sessions interobserver agreement was 100%. Reliability checks were done across all groups and participants on 44% of all the sessions during the intervention phase in the study. Interobserver agreement during the intervention phase was 98.8%, ranging from 94.4 to 100%.

Data Analysis

Event recording (controlled presentation) was used to record the number of steps performed independently by the students on the task analysis. After data was collected, data points were plotted using a separate axis for each participant during baseline, intervention, and generalization phases. Data points for total number of independent steps performed in each trial
were reported using a single line graph for each participant under each condition. Number of independent steps that were performed per trial, per participant and groups were collected to identify which instructional schedule produced the highest number of independent steps that resulted in the performance of the functional skill of using a two-way radio to report task completion for the acquisition and generalization phase. This data also provided the number of trials per student per instructional schedule needed to master the skill as well as information on the type and number of prompts needed for each participant to complete the task on each instructional schedule. A non-parametric test, Kruskal-Wallis, was used to examine if a significance difference existed between the three instructional schedules and the dependent variable for question one and two. Bar graphs were used to illustrate results and differences between groups.

Social Validity

It was very important to determine if the study and the questions that were answered were socially valid for the participants and if the participants were going to benefit from their participation. In order to determine the social validity of the study, the researcher informally interviewed three employees and two managers at the retail store. They were asked if they considered the skill of using a two-way radio in the work place to be valuable and important for potential employees to have when communicating with co-workers and managers in the store. The employees and managers agreed that knowing how to operate the two-way radios was an
asset while working in the store, especially if the employee was assigned to perform different duties such as cleaning or bringing merchandize from the Warehouse to the store. A manager of the store indicated that having such a skill might not determine if the individual would be hired or not; however, it would facilitate communication with the employee and make work more efficient. Three parents were asked, via phone, if they considered the skill of using a two-way radio useful and important for their son or daughter to have and if they would use a two-way radio for a variety of situations to communicate with their son or daughter. All the parents agreed that, if her son or daughter was to work in the community, having a skill that allowed them to communicate with job coaches or their employers was a very valuable skill to learn and use. One parent added that she would be using the two-way radios when going on family trips with her daughter.
CHAPTER FOUR: RESULTS

This study examined the effect of three instructional schedules, community based instruction (CBI); community based instruction plus simulated instruction in the classroom (CBISC); and simulated instruction in the classroom only (SICO), on the skill acquisition and generalization when teaching high school students with moderate intellectual disabilities on the use two-way radios to report task completion. The research questions focus on three student outcomes: (1) the number of instructional trials needed for skill acquisition; (2) the number and types of prompts required for acquiring the skill; and (3) accuracy in generalization of the skill across three novel settings. Data for the number of trials needed for acquisition are presented in graphic form. Data for the number and types of prompts per instructional group are tallied and presented in table form. Data for generalization are shown in graphic form representing the number of generalization trials performed across the three settings with 100% independence with the absence of prompts.

Data results from baseline and part of intervention phase for participant two in the CBISC instructional schedule are presented but not include in the analysis and interpretation of the data. This participant was exhibiting side effects from her medications. Participant two in the CBISC had a bi-polar disorder diagnosis. This participant, during the intervention phase, was experiencing severe episodes of depression. She was having atypical manifestations of behaviors, (e.g., loud crying and drooling) and uncontrollable physical movements on her face (e.g., locking of the jaw and body shakes). Due to her condition at the time of the study,
participant two was unable to acquired the skill, her data showed an unstable trend that did not change even after the 51st instructional trial.

Question One

Question One asked: “Is there a difference in the number of instructional trials to a set criteria needed for students with moderate intellectual disabilities to acquire the skill of using a two-way radio to report task completion, when taught using one of the following instructional schedules: community based instruction only (CBI), combined instructional schedule, community based instruction plus simulated instruction in the classroom in the same day (CBISC) and simulated instruction in the classroom only (SICO)?”

The data for each trial in each instructional phase are presented in a graphic format that shows the results and progression for the acquisition of the skill for each participant in the three different instructional groups. In the graphs, the ordinate represents the dependent variable, number of independent steps performed by each participant in each group. The abscissa represents the number of trials needed for each of the phases (baseline-probe phase, intervention phase and generalization phase). The phase one baseline data points are represented with a circle. A separate figure was provided for each instructional schedule, each figure has multiple graphs representing the participants in each group (see Figure 1, Figure 2, Figure 3). For question one, the graphs, which delineate the intervention phase for each participant in each group, exhibit the progression on how participants acquired the skill. The data points for this phase appear as
squares under the title “intervention”.

Figure 1 Total Number of Independent Steps per Phase by CBI Participants.
Figure 2 Total Number of Independent Steps per Phase by CBISC Participants.
Figure 3 Total Number of Independent Steps per Phase by SICO Participants.
In the CBI instructional schedule (see Figure 1), participant one acquired the skill of using a two-way radio to report task completion in her 28th trial in the intervention phase. Participant two in the same group reached acquisition of the skill in her 13th trial in the intervention phase. The last participant reached acquisition of the skill in his 14th trial in the intervention phase. The Mean score for trials needed for acquisition for the CBI instructional group was 18.3. In the CBISC group (see Figure 2), participant one acquired the skill in her 15th trial in the intervention phase. Participant two, was unable to acquire the skill, even with 51 trials in the intervention phase. Participant three acquired the skill in his 16th trial in the intervention phase. The Mean score for trials needed for acquisition for the CBISC instructional group was 15.5. Data from participant two was not included in the Mean calculation due to the fact that she did not meet criteria because of her medical and mental condition. In the SICO group (see Figure 3), participant one acquired the skill in his 27th trial in the intervention phase, participant two acquired the skill in her 17th trial in the intervention phase and the last participant acquired the skill in his 17th trial in the intervention phase. The Mean score for trials needed for acquisition for the SICO instructional group was 20.3. Table 4 demonstrates the total number of trials for acquisition per participant per group.
Table 4

*Total Number of Trials to Acquisition of the Skill by Participants per Group*

<table>
<thead>
<tr>
<th>Instructional Schedules Groups</th>
<th>Total Number of Trials per Participant</th>
<th>CBI</th>
<th>CBISC</th>
<th>SICO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>28</td>
<td>15</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Participant 2</td>
<td>13</td>
<td>51*</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Participant 3</td>
<td>14</td>
<td>16</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Total number of trials per group</td>
<td>55</td>
<td>31**</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>14</td>
<td>15.5**</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Mean score of trials needed per group</td>
<td>18.3</td>
<td>15.5**</td>
<td>20.3</td>
<td></td>
</tr>
<tr>
<td>Mean ranks*</td>
<td>3.67</td>
<td>3.50**</td>
<td>6.00</td>
<td></td>
</tr>
</tbody>
</table>
* Indicates that the participant did not acquire the skill. ** Indicates that the score does not include participant 2. * Kruskal-Wallis test.

A Kruskal-Wallis test was conducted to examine if a statistically significant difference existed between the three instructional schedules and the number of trials that participants needed for the acquisition of the skill (Table 4). Means ranks for CBI, CBISC and SICO was 3.67, 3.50 and 6.00 respectively. The results of the Kruskal-Wallis test indicated that no significant difference was found $\chi^2(2) = 1.82, p = .401$, indicating that the groups did not differ significantly from each other regarding the number of trials needed for skill acquisition. However, figure 4 illustrates that the CBISC instructional schedule group required the least amount of trials for acquisition based on Mean scores followed by the CBI and the SICO.
Data were collected to indicate the amount of time needed for the acquisition and mastery of the skill within each session for each participant in each group. These data provided additional results that were used to evaluate the efficiency of each instructional schedule for each participant for the acquisition of the skill of using a two-way radio to report task completion. Table 5 indicates the total time to acquisition of the skill for each participant in each instructional group.
Table 5

*Total Time to Acquisition of the Skill by Participants per Group*

<table>
<thead>
<tr>
<th>Instructional Schedules</th>
<th>CBI</th>
<th>CBISC</th>
<th>SICO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>0:33:45</td>
<td>0:10:35</td>
<td>0:35:05</td>
</tr>
<tr>
<td>Participant 2</td>
<td>0:08:15</td>
<td>0:57:05*</td>
<td>0:09:42</td>
</tr>
<tr>
<td>Participant 3</td>
<td>0:06:04</td>
<td>0:17:08</td>
<td>0:08:35</td>
</tr>
<tr>
<td>Total time per group</td>
<td>0:48:04</td>
<td>0:27:43**</td>
<td>0:53:22</td>
</tr>
<tr>
<td>Mean time per group</td>
<td>0:16:01</td>
<td>0:13:52**</td>
<td>0:17:47</td>
</tr>
</tbody>
</table>

* Indicates that the participant did not acquire the skill. ** Indicates that total time does not include participant 2 total time.

In summary, for the acquisition of the skill, all instructional schedules were effective when teaching high school students with moderate intellectual disabilities to use a two-way radio to report task completion. All participants that completed the study learned the skill and demonstrated mastery. Based on group results and Mean scores per group, learning efficiency appeared to happen more rapidly in the CBISC group followed by the CBI group and the SICO group. Individual data; however, showed that learning efficiency occurred the quietest for two of the participants in the CBI group (participant 2 and 3), requiring the least number of trials of all the other participants in the study. The CBISC group was the second most efficient schedule for acquisition of the skill per participants. The SICO group was the least efficient of three...
instructional schedules with the most number of trials needed for acquisition of the skill per group and per participants, and with the highest Mean scores. Total times per sessions also corroborate these findings (see Table 4 and Table 5).

Question Two

Question Two asked: “Is there a difference in the number and types of prompts needed to a set criteria for students with moderate intellectual disabilities to acquire the skill of using a two-way radio report task completion, when taught using one of the following instructional schedules: community instruction only (CBI), combined instructional schedule, community based instruction plus simulated instruction in the classroom in the same day (CBISC) and simulated instruction in the classroom only (SICO)?”

This question concerned with investigating the number and types of prompts required by participants in each group to acquire the skill. Table 6 shows total number and types of prompts per group. Table 7 depicts the total number and types of prompts per participant.

The data indicate that the verbal plus model prompt was the least required prompt for all participants across groups with a total of 8 (not counting participant 2 in the CBISC group). The next least required prompt across groups was verbal plus gesture with a total of 18 (not counting participant 2 in the CBISC group). Verbal plus physical prompts were required for a total of 32 across groups (not counting participant 2 in the CBISC group). Verbal prompts were required 119 times across groups (not counting participant 2 in the CBISC group).
Table 6

*Total Number of Types of Prompts per Group*

<table>
<thead>
<tr>
<th>Prompt Type</th>
<th>CBI Participants</th>
<th>CBISC Participants</th>
<th>SICO Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Mean</td>
<td>Total</td>
</tr>
<tr>
<td>Verbal</td>
<td>34</td>
<td>11*</td>
<td>129</td>
</tr>
<tr>
<td>V + Gesture</td>
<td>7</td>
<td>2.3*</td>
<td>10</td>
</tr>
<tr>
<td>V + Model</td>
<td>4</td>
<td>1.3*</td>
<td>2</td>
</tr>
<tr>
<td>V + Physical</td>
<td>13</td>
<td>4.3*</td>
<td>11</td>
</tr>
<tr>
<td>Total Prompts</td>
<td>58</td>
<td>19.3*</td>
<td>39</td>
</tr>
<tr>
<td>Mean ranksª</td>
<td>3.33</td>
<td>4.50**</td>
<td>5.67</td>
</tr>
</tbody>
</table>

*Indicates that the score includes participant 2 scores. ** Indicates that scores do not include participant 2 totals. ª Kruskal-Wallis test.

Participants in the SICO instructional schedule required the most verbal plus gesture and verbal plus physical prompts across groups with Means of 3.3 and 5.6. The participants in the CBI instructional group required the next most verbal plus physical prompts with a Mean of 4.3 and the verbal plus gesture prompts with a Mean of 2.3. The CBI group participants required the verbal plus model prompts the most with a Mean of 1.3. Verbal prompts were required the most for participants in the CBISC group with a Mean of 17.5. In comparison, participants in the CBISC group required the least number of prompts with 39. Participants in the CBI group
required a total of 58 prompts and participants in the SICO group required the most of all three instructional schedules with a total of 80 prompts.

Table 7

*Total Number of Types of Prompts per Participant*

<table>
<thead>
<tr>
<th>Prompt Type</th>
<th>CBI</th>
<th>CBISC</th>
<th>SICO</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P1</td>
<td>P2</td>
<td>P3</td>
<td>P1</td>
</tr>
<tr>
<td>Verbal</td>
<td>18</td>
<td>9</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>V + Gesture</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>V + Model</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>V + Physical</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>11</td>
<td>9</td>
<td>19</td>
</tr>
</tbody>
</table>

* Indicates that the participant did not acquire the skill. P indicates participant. ** Indicates that total does not include scores from participant 2 in the CBISC group.

A Kruskal-Wallis test was conducted to examine if a statistically significant difference existed between the three instructional schedules and the number of prompts that participants needed for the acquisition of the skill (see Table 6 and Table 7). Means ranks for CBI, CBISC and SICO was 3.33, 4.50 and 5.67 respectively. The results of the Kruskal-Wallis indicated that no significant difference was found $\chi^2(2) = 1.36, p = .506$, indicating that the groups did not differ significantly from each other in regards of the number of prompts needed for skill acquisition.
acquisition. However, Means scores indicated that the participants in the SICO instructional schedule required more intrusive prompts that any other group of participants. Figure 5 provides a graphic representation of the total Means scores for the type of prompts required per group.

![Figure 5](image_url)

**Figure 5** Mean scores for Number and Type of Prompts by Instructional Schedule.

In summary, per instructional group based on Mean scores, the least intrusive prompts were required by the CBISC instructional schedule. Participants on this schedule required in average more verbal cues, which are the least intrusive of any of other prompt on the least to most system of prompts. Based on this data, learning efficiency appeared to be greater for the participants in this group. In this group, only two verbal plus physical prompts were needed during the intervention phase. These were needed by participant one.

Individual data results indicated that the SICO instructional scheduled was more efficient for participant three in this group. This participant only required verbal prompts for acquisition
of the skill. However, participant one on the SICO instructional schedule required the most intrusive prompts of all participants across groups with a total of 17 verbal plus physical prompts, four verbal plus gesture and 2 verbal plus model.

In the CBI instructional schedule, participant two and participant three required only verbal and verbal plus gesture prompts to reach acquisition and mastery of skill. However, participant one from the same group required the second most intrusive prompts across all groups for acquisition and mastery of the skill with a total of 13 verbal plus physical, four verbal plus model and three verbal plus gesture (See Table 6 and Table 7).

Question Three

Question Three asked: “Is there a difference in the generalization of the skill of using a two-way radio to report task completion across settings for students with moderate intellectual disabilities, when taught using one of the following instructional schedules: community based instruction only (CBI); combined instructional schedule, community based instruction plus simulated instruction in the classroom in the same day (CBISC); and simulated instruction in the classroom only (SICO)?”

This question was concerned with determining what instructional schedule was more effective and efficient when participants performed the skill in three novel environments after reaching criteria for mastering the skill of using a two-way radio to report task completion. The novel settings were: (a) store Warehouse, (b) store Home Décor and Gifts Department and (c)
school Thrift Store. Figure 1, Figure 2 and Figure 3 graphically demonstrates each participant’s performance per group during this phase. Generalization data points for the Warehouse generalization setting appear as triangles in the graphs. Generalization data points for the Home Décor and Gift Department generalization setting appear as a diamond in the graphs. Generalization data points for the Thrift Store generalization setting appear as an unfilled circle in the graphs. In the CBI instructional schedule (see Figure 1), only participant 1 generalized the skill in all three settings with 100% accuracy. Participant 2 generalized the skill in two out the three settings. This participant failed to perform the skill with 100% accuracy in the Warehouse setting. Participant three in this instructional schedule failed to generalize the skill in any of the settings. In the CBISC instructional schedule (see Figure 2), only two participants reached criteria for the generalization phase. Participants 1 and 3 generalized the skill in all three settings with 100% accuracy. In the SICO instructional schedule, participants 1 and 3 generalized the skill in all three settings with 100% accuracy in the absence of prompts. Participant 2 only generalized the skill in one setting. This participant failed to generalize the skill at the Warehouse and at the Thrift store (see Figure 3). Participants across instructional groups that failed to generalize the skill were able to perform at 83.3% accuracy. All participants who failed to generalize needed a verbal prompt for step three in the task analysis (“Press and hold the green button down and say I am finished”) during the extra instructional trial. A summary of the findings demonstrating the total number of trials and steps for the skill performed with 100% independence in the absence of prompts is shown in Table 8 and Table 9 and Figure 1, Figure 2 and Figure 3.
Table 8

*Total Number of Generalization Settings Demonstrating 100% Accuracy per Participant per Group*

<table>
<thead>
<tr>
<th>Instructional Schedules</th>
<th>Settings</th>
<th>N=3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant 1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Participant 2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Participant 3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>CBISC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant 1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Participant 2</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Participant 3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SICO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant 1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Participant 2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Participant 3</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

N Indicates the number of settings for generalization. * Indicates participant did not engage in the generalization phase.
Table 9

**Percentage of Independent Steps Performed in Each Generalization Setting per Participant per Group**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Generalization Settings</th>
<th>Setting 1 (Warehouse)</th>
<th>Setting 2 (Home Decor and Gift Department)</th>
<th>Setting 3 (Thrift Store)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Participant 1</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Participant 2</td>
<td>83.3%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Participant 3</td>
<td>83.3%</td>
<td>83.3%</td>
<td>83.3%</td>
</tr>
<tr>
<td>CBISC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Participant 1</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Participant 2</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Participant 3</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>SICO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Participant 1</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Participant 2</td>
<td>83.3%</td>
<td>100%</td>
<td>83.3%</td>
</tr>
<tr>
<td></td>
<td>Participant 3</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

* Indicates that the participant did engage in the generalization phase. 100% Indicates 6 out of 6 steps were performed independently. 83.3% indicates that 5 out of 6 steps were performed independently.

In summary, the participants on the CBISC instructional schedule group that concluded
the study generalized learning in all three novel settings. Participant one and three in the CBISC instructional schedule group did not require any review or additional instructional trials to perform the skill in the three novel settings for generalization. They performed the task in generalization settings with 100% accuracy requiring no prompts. Results for participant number two in the CBISC instructional schedule group who did not engage in the generalization due to medical problems were removed. Therefore, data indicate that the CBISC instructional schedule was most effective when demonstrating the skill in novel settings. Similarly, in the SICO instructional schedule group, two out of the three participants were successful in generalizing the skill in all three novel settings with 100% accuracy requiring no prompts. Participant two in the SICO instructional schedule group was successful in generalizing the skill in only one novel setting, failing to perform the skill at criterion level at the Warehouse and at the Thrift Store. Participant two also required an extra instructional trial at each of these two settings. The CBI instructional schedule appeared to be effective for the generalization of learning across all three settings for only one participant. Participant one in the CBI instructional schedule group was successful in performing the skill of using a two-way radio to report task completion with 100% accuracy requiring no prompts in all three novel settings. Participant two in the CBI instructional schedule group generalized the skill in two novel settings and participant three in the CBI instructional schedule group failed to generalize the skill in all three settings.
Overall Summary of Findings

Results of data analysis for the three instructional schedules can be summarized as follows:

1. Eight out of the nine participants in the three instructional schedules acquired the skill for using a two-way radio to report task completion according to the study’s set criterion.

2. The CBISC instructional schedule required the least number of trials for acquisition of the skill of using a two-way radio to report task completion with the lowest Mean score and second lowest Median score. The CBI required second least number of trials with the lowest Median and the second lowest Mean scores

3. The CBI instructional schedule was the most efficient since two out the three participants in that group required the least amount of intrusive prompts. The CBISC instructional schedule was the second most efficient instructional schedule concerning the number and type of prompts needed for the participants. The SICO instructional schedule was the least efficient instructional schedule for participant one and two.

4. The CBISC instructional schedule was the most effective instructional schedule for generalization of the skill across three novel settings. The SICO instructional schedule was the second most effective schedule for participant one and three.

5. Overall assessment of the effectiveness and efficiency of the three different instructional schedules for learning the skill of using a two-way radio to report task completion appeared to be based also on the individual characteristics of the participants in each group. Medical, mental and demographics, such living condition and medication intake, are important
factors to consider when determining instructional schedules and training for individuals with moderate intellectual disabilities.
CHAPTER FIVE: CONCLUSION

Instructional schedules and meaningful settings to teach students with moderate intellectual disabilities have been topics of discussion among experts in the field of special education (Ryndak et al., 2000; Browder, 1997). Research clearly supports the teaching of functional skills such as vocational, employability skills, and work related settings where these tasks naturally occur (Nietupski & Hamre-Nietupski, 1997). Instruction of functional skills to individuals with moderate intellectual disabilities should incorporate appropriate practices to facilitate generalization of skills to other settings. Research suggests that students with moderate and severe disabilities can acquire skills when taught in the classroom, in the community or in a combination of both settings (Browder, 1997; Bates et al., 2001; McDonnell, 1984; Cihak et al., 2004). However, there is a lack of research identifying which skills should be taught and which settings are most appropriate for specific skills.

This research study was designed to contribute to the empirical data on instructional schedules when teaching students with moderate intellectual disabilities. The effectiveness and efficiency of three instructional schedules, (a) community-based instruction (CBI), (b) community-based instruction plus simulated instruction in the classroom the same day (CBISC), and (c) simulated instruction in the classroom only (SICO) were compared on skill acquisition and generalization of the use of two-way radios to report task completion by students with moderate intellectual disabilities.
Major Findings

The overall effectiveness and efficiency of three instructional schedules, (a) CBI, (b) CBISC and (c) SICO, to teach students with moderate intellectual disabilities to use two-way radios to report task completion, was investigated in the study. Specifically, three research questions were addressed. The first question investigated the number of trials required for skill acquisition. Question two investigated the number and types of prompts required for skill acquisition. The third question investigated the accuracy of skill generalization across three novel settings.

Effectiveness of Instructional Schedules

An examination of the data obtained during this research study revealed that, whether participants were taught in the CBI, CBISC or SICO instructional schedule, the skill of using a two-way radio to report task completion was acquired. These results provided evidence that all three instructional schedules were effective, given the conditions of this study. These results also corroborated the finding of others studies that investigated instructional schedules and found that instructions in simulated, community and/or combined settings are effective for teaching a variety of skills to students with moderate intellectual disabilities (Bates et al., 2001; Collins, Stinson & Land, 1993; Cihak et al., 2004; Westling, Floyd & Carr, 1990; Risley & Cuvo, 1980; Test et al., 1990; Davies et al., 2002).

The CBI instructional schedule participants acquired the skill in a combined total of 55
instructional trials. The total of trials to acquisition for the CBISC instructional schedule participants was 31. The SICO instructional schedule participants acquired the skill in 61 instructional trials. However, the number of participants that completed the study in each instructional schedule affected the total number of trials to acquisition. The CBI and SICO instructional schedules concluded the study with three participants each; whereas the CBISC instructional schedule only had two participants that completed the study. Due to this discrepancy in participants, the total number of trials was higher for the instructional schedules with more participants. Other statistical measurements, such as, Mean or Median scores provided an additional way to analyze the effectiveness of each instructional schedule implemented. Mean scores revealed that the CBISC instructional schedule was slightly more effective than the other two instructional schedules with the lowest Mean (M = 15.5), the CBI instructional schedule had the second lowest Mean (M = 18.3) and the SICO instructional schedule had the highest Mean (M = 20.3). Median score revealed that participants in the CBI instructional schedule (Mdn = 14) had the lowest median. Participants in the CBISC instructional schedule (Mdn = 15.5) had the second lowest, but with only 1.5 point difference. Participants in the SICO instructional schedule had the highest Median (Mdn = 17). In analyzing these results, two instructional schedules, CBI and CBISC, interchange the position of being the most effective with regard to trials needed for acquisition of skill. The results for the CBISC instructional schedule must be interpreted with caution due to the difference in number of students completing the study. Therefore, no firm conclusion can be made based on the mixed results.
**Efficiency of Instructional Schedules**

In order to provide a more concise and clear analysis of the data, individual participant results were analyzed in terms of effectiveness and efficiency. The results indicated that efficiency of learning to use a two-way radio to report task completion varied by participant. The CBI instructional schedule included the two participants ranking first and second in terms of the lowest number of trials required for acquisition. Participant 2 (CBIP2) acquired the skill in 13 trials and Participant 3 (CBIP3) acquired the skill in 14 trials. In the CBISC instructional schedule group participant 1, (CBISCP1) ranked third for least number of trials, requiring 15 trials to acquisition. Participant 3 in the CBISC instructional schedule group (CBISCP3) ranked fourth. This participant required 16 trials to learn the skill. Participants in the SICO instructional schedule group ranked fifth, sixth and seventh. Participant 2 (SICOP2) and 3 (SICOP3) each needed 17 trials to learn the skill. The two participants that required the most trials to acquisition were Participant 1 in the CBI instructional schedule group (CBP1) and Participant 1 (SICOP1) in the SICO instructional schedule group. SICOP1 required 27 trials to learn the skill; CBIP1 required the highest number of trials of all participants with 28 trials to acquisition.

Many factors could have contributed to these results (see Table 10). For all participants, with the exception of CBIP2, the lower the number of trials needed, the higher the I.Q. This may be because, individuals with more severe disabilities often experience more confounding issues in the areas of cognition, learning and memory than many individuals with milder intellectual disabilities (Taylor et al., 2005). This usually results in a greater amount of time and number of instructional trials required to learn new skills (Brown, et al., 1983). Interestingly, CBIP2, who
had the lowest I.Q. measure, required the least number of trials. This variation may be due to the fact that CBIP2 was a bilingual student, speaking both English and Spanish. Even though CBIP2 spoke and was given instruction in English at school, the primary language spoken at home was Spanish. It is possible that during the initial I.Q. testing and evaluation for placement for services in special education, CBIP2 might not have had appropriate understanding of the English language resulting in a lower performance than expected. There is no information clarifying if CBIP2 was initially tested in both languages.

Two other relevant characteristics may have influenced the efficiency of the instructional schedules. One was that two of the three participants with the most number of trials needed for successful skill acquisition took medication for behavior control or health related conditions. A second unique characteristic was that the two participants with the most number of trials needed for acquisition did not live with their parents. One lived in a group home (SICOP1) due to behavioral problems at the family home, and the other (CBIP1) lived with grandparents due to previous parental abuse and neglect. These conditions may have had an impact on the efficiency of the instructional groups and the overall findings.
Table 10

Efficiency of Instructional Schedule

<table>
<thead>
<tr>
<th>Participants</th>
<th>Instructional Schedule</th>
<th>Total Trials</th>
<th>I.Q.</th>
<th>Medication</th>
<th>Residence</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2</td>
<td>CBI</td>
<td>13</td>
<td>42</td>
<td>No</td>
<td>Parents</td>
</tr>
<tr>
<td>P3</td>
<td>CBI</td>
<td>14</td>
<td>50</td>
<td>No</td>
<td>Parents</td>
</tr>
<tr>
<td>P1</td>
<td>CBISC</td>
<td>15</td>
<td>46</td>
<td>No</td>
<td>Parents</td>
</tr>
<tr>
<td>P3</td>
<td>CBISC</td>
<td>16</td>
<td>45</td>
<td>No</td>
<td>Parents</td>
</tr>
<tr>
<td>P2</td>
<td>SICO</td>
<td>17</td>
<td>45</td>
<td>Yes</td>
<td>Parents</td>
</tr>
<tr>
<td>P3</td>
<td>SICO</td>
<td>17</td>
<td>45</td>
<td>Yes</td>
<td>Parents</td>
</tr>
<tr>
<td>P1</td>
<td>SICO</td>
<td>27</td>
<td>43</td>
<td>Yes</td>
<td>Group Home</td>
</tr>
<tr>
<td>P1</td>
<td>CBI</td>
<td>28</td>
<td>43</td>
<td>No</td>
<td>Grand-Parent</td>
</tr>
<tr>
<td>P2*</td>
<td>CBISC</td>
<td>51*</td>
<td>47</td>
<td>Yes</td>
<td>Group Home</td>
</tr>
</tbody>
</table>

* indicates that participant did not acquire the skill and scores are not included in the analysis.

In summary, the results of this study corroborate the findings from previous investigations that found CBI to be more effective and efficient than SICO in relation to number of trials to acquisition of skills (Cihak, et al., 2004; Bates et al., 2001; McDonnell et al., 1984). This research also shares similar results with the studies of Cihak, et al., (2004) and Branham et al., (1999) that found CBISC to be more effective and efficient that SICO. Similarly, the present study corresponded with the Cihak, et al., (2004) findings regarding number of trails to skill
acquisition. In Cihak, et al., (2004) as in the present study, the CBISC instructional schedule participants needed more trials than the participants in the CBI instructional schedule to acquire the skill. However, in the present study the CBISC instructional schedule participants needed fewer trials than the SICO participants for skill acquisition. While similar studies had arranged simulated instruction prior to community instruction, and the present study community instruction was followed by simulated instruction, the findings are similar. Such findings might indicate that as long as the instructional schedule includes community instruction whether or not it is combined with simulated instruction, the skills will be learned more efficiently and effectively than if instruction is limited to simulated instruction only.

Efficiency of Instructional Schedules and Prompts

Analysis of the gathered data revealed efficiency of learning based on number and types of prompts varied across participants. Overall, participants in the CBISC instructional schedule required less intrusive prompts than any other participant from the CBI or SICO group for skill acquisition (see Table 6, Table 7, and Figure 5). Based on these results, the CBISC instructional schedule appeared to be more efficient than the other two instructional schedules. However, it is important to distinguish that the CBISC group had two participants completing the study, while the CBI and SICO groups each had three.

After examining participants’ data regarding number of prompts, CBIP3 and CBIP2 required fewer prompts than any other participant in the study with 9 and 11 total prompts,
respectively. SICOP2 followed with 15 prompts needed. CBISCP1 ranked fourth in number of prompts required (n = 19) followed by CBISCP3 (n = 20) and SICOP3 (n = 22). The participants that required the most number of prompts were CBIP1 (n = 38) and SICOP1 (n = 43). These two participants also required the most intrusive prompts.

In the present study, the majority of the intrusive prompts were provided to redirect students to perform step three in the task analysis (Press and hold down the green button with your fingers and at the same time say, “I am finished”). These errors in motor activities, especially when two actions must be performed at the same time, are consistent with errors found in similar studies (Cihak et al., 2004; Bates, et al., 2001). As stated in the literature, students with more severe disabilities will encounter more difficulties performing complex tasks with multiple steps (Taylor et al., 2005). This might explain why the majority of the errors and prompts required were to perform step three. It is possible that if step three was taught in isolation or pre-taught, results on number and type of prompts needed for all of the participants would have been different. In order to support this possible analysis, additional research is needed regarding different arrangement, presentation and variation of prompts.

In summary, results concerning efficiency of instructional schedules and the number and type of prompts are mixed. Group results indicated that the CBISC instructional schedule was more efficient requiring less intrusive prompts, although the individual data presented otherwise. Therefore, additional research is needed in order to make an educated decision and conclusion regarding efficiency of instructional schedules and prompts when applied to tasks similar to those required in this study.
Analysis of the data concerning skill generalization across three novel settings showed that generalization of learning occurred with 100% accuracy in the CBISC instructional schedule group. The two participants in this instructional schedule group performed all the steps in the task analysis independently in all three novel settings. These findings corroborate other studies that indicated the superiority of CBISC instructional schedules when generalizing functional skills (Cihak et al., 2004; McDonnell, et al., 1984; Browder et al., 1988). Combined instruction is particularly effective when the simulated environment follows specific guidelines that incorporate relevant stimuli, responses and examples found in the natural setting (Nietupski et al., 1986). These guidelines will facilitate the transfer or generalization of learning to untrained settings. The present research followed some of these guidelines when designing the CBISC instructional schedule. The CBISC instructional schedule was the most efficient and effective schedule for skill generalization. Surprisingly, and contrary to other research findings (Cihak et al., 2004), the second most effective and efficient schedule for skill generalization was the SICO schedule. In this group, two out of the three participants, SICOP1 and SOICOP3, generalized the skill in all three novel settings with 100% independence. SICOP2 only generalized the skill with 100% independence in one novel setting (see Table 8 and Table 9). SICOP1, a participant who required the most trials and prompts for skill acquisition, was one of the participants who generalized in all three settings without assistance. One possible explanation for this finding could be that, because SICOP1 needed more trials to acquisition, learning may have been anchored by the greater variety of tasks presented in the simulated setting indicating that
stimulus generalization had occurred. However, more research should be conducted in this area to clearly determine possible explanations.

Data analysis indicated that generalization of learning was least effective and least efficient in the CBI instructional schedule. In this group, only one participant, CBIP1, generalized the skill in all three novel settings with 100% independence. CBIP2 generalized the skill in two settings and CBIP3 failed to generalize in any of the settings. Cihak et al. (2004) found similar results. In the current study, two participants in the CBI instructional schedule group needed extra instructional sessions when performing the skill in novel settings. These results indicate that even though participants in the CBISC instructional schedule group may have required more trials for the skill acquisition, this schedule appears to be more effective and efficient for skill generalization than the CBI instructional schedule group.

It is important to point out that setting 1 for generalization, the store Warehouse, was the setting most frequently failed in the generalization phase; the Thrift Store at the school was the setting with the second most failures, while the store’s Home and Décor Department had the fewest failures of all settings. This could be attributed to the environmental characteristics of each setting. Heavy machinery, including a forklift, were operating during generalization trials at the warehouse. This made the noise level higher than in the other two settings. While the noise level at the Thrift Store was not as high as the Warehouse, it surpassed the Home and Décor Department. These environmental characteristics could be important considerations when arranging and scheduling instruction in the community or in simulated settings. Teachers may want to include settings for instruction that present some of the characteristics of the actual
environment to help to reduce distractibility during generalization and increase the chances for transfer of learning.

Implications

Instruction on functional and practical skills for individuals with moderate intellectual disabilities remains a concern for teachers and researchers in the field. Some researchers suggest that community-based instruction, instead of classroom instruction, is necessary for learning community skills (Westling & Floyd, 1990). Their rational is that students with moderate disabilities will ultimately need to perform and generalize the skills learned in actual community or job settings (Browder, 1997; Morse & Schuster, 2000). However, appropriate functional training is becoming increasingly expensive for schools struggling to fund well planned CBI. Evidence suggests that the strategy of combining community-based plus classroom simulated instruction is a viable and efficient instructional schedule to teach functional skills (McDonnell, 1984; Branham, et al., 1999; Browder, et al., 1988). While the findings of this study support CBI, there is also support for instruction of functional community or vocational skills in a combined format (CBI plus classroom simulation) to make instruction both effective and efficient.

In the current study, participants not only learned to use two-way radios but also appeared to enjoy interacting with the equipment. All participants verbally expressed their motivation for using the two-way radios. They seemed to enjoy carrying the radios in their apron pocket and listening to another person through the earpiece. Facial expressions and smiles
corroborated their statements of satisfaction when using the two-way radios. Many settings such as schools, retail stores, restaurants and other vocational settings are now using two-way radios as a practical in store communication tool. All these settings represent potential employment placements for individuals with moderate intellectual disabilities. Learning to use two-way radios can improve productivity in the work place (Vinson, 2002). Because verbal instructions are easily provided through two-way radios, this technology can become part of the planning and implementation of natural work place supports for students with moderate intellectual disabilities.

The data revealed that the majority of the prompts provided for all participants were verbal prompts; this has an important implication when training job coaches and planning the provision of natural supports to individuals with moderate intellectual disabilities while working. Verbal prompts are the least intrusive type of prompt and can be easily provided, after training, by any employee or co-workers working with individuals with moderate intellectual disabilities. This type of natural support in the work environment facilitates integration, acceptance, and performance of individuals with intellectual disabilities who are in job training or supported employment situations (Trach & Shelden, 1999).

Another important implication of the study is that individual characteristics of students should be considered before a decision is made regarding training and instructional schedules. The impact of factors such as I.Q., medication, and dual diagnosis must be considered when designing instruction and planning for adequate time to acquire skills. These considerations will assist educators as they seek to select the best format of instruction for the specific learning
characteristics of the students.

An additional implication of the study is that while planning simulated instruction, the arrangement of simulated settings should include specific stimuli, as well as similar environmental characteristics found in the community settings in which students are expected to perform the skill. This may increase the likelihood that the skill will be generalized to other untrained settings. A final implication of this study is that some learners may require that specific steps of a task be taught in isolation. Teachers may find that during instruction a particular step or steps continues to present difficulties for students thereby interfering with learning. When this occurs, teachers may want to teach the specific step in isolation and make the necessary modifications to enhance student performance and learning.

Limitations

The results and the interpretation of this study are limited by the following:

1. All participants in the study were intellectually functioning within the moderate range of intellectual disabilities (I.Qs. 42 to 50). The conclusions and interpretations of the results may not apply to other populations with different intellectual functioning.

2. The age range of participants in the study was between 18 and 22. Therefore, conclusions and interpretations of the results regarding effectiveness and efficiency of instructional schedules may not apply to populations of different ages.

3. All participants in the study did not have formal CBI training and had never worked in
the community prior to the study. Consequently, conclusions and interpretations of the results may not apply to populations with extensive CBI training.

4. The external validity of these results and conclusions is limited due to the small sample size in each instructional group.

Future Research

The present study supports some findings from other studies (McDonnell, 1984; Branham, et al., 1999; Browder, et al., 1987; Cinhak, et al., 2004) that investigated the effectiveness and efficiency of instructional schedules in acquisition and generalization of functional and vocational skills. However, the results of the present study expanded the existing research by offering another comparison between three instructional schedules.

Recommendations for future studies are as follows:

1. The conclusion related to efficiency and the number of trials to acquisition should be replicated with a larger sample in order to determine if the conclusions maintain validity with other participants.

2. Given that the participants in this study did not have extensive CBI experience, future studies should include participants with and without CBI experience in order to determine if the findings apply to both populations of students.

3. Since the present study investigated the effect of three instructional schedules in skill acquisition and generalization on participants that had attended a segregated setting (center
school) for many years, future studies should investigate the effect of instructional schedules with students that attend more inclusive educational settings.

4. In the present study, generalization was performed across settings. It is recommended that in future studies generalization of the skill should include generalization with untrained member of the response class and determining is response generalization occurs.

5. In this study, maintenance of the skill was not investigated. It is important that future studies research the effect of instructional schedules in different skills after longer periods of time to check for skill maintenance.

6. In this study, the combined instructional schedule had CBI first followed by simulated instruction in the classroom. It is recommended that future research investigate more variations of combined schedules to include: (a) simulation plus community-based plus simulation, (b) video simulation or multimedia plus community-based instruction and (c) other forms of schedules. Studies that investigate these variations may identify more effective and efficient alternatives to teach functional skills to students with moderate intellectual disabilities.

7. The participants of the present study attended a school considered an urban school or setting. Future research should investigate the effect of instructional schedules in rural and inner-city high poverty settings to determine if the results hold with the populations in these areas.

8. Future research should replicate the procedures and characteristics of the present study to extend the findings. This will also assist educators as they design instructional schedules to teach high school students with moderate intellectual disabilities.
9. Future studies should investigate the many applications of the use of two-way radios for vocational tasks, as well as for recreational and safety purposes.
APPENDIX A

INTERNAL REVIEW BOARD
THE UNIVERSITY OF CENTRAL FLORIDA
INSTITUTIONAL REVIEW BOARD (IRB)

IRB Committee Approval Form

PRINCIPAL INVESTIGATOR(S): Geraldine Perez-Turner, M.E. IRB #: 04-2045

PROJECT TITLE: Effects of Three Instructional Scheduling on Acquisition and Generalization for the Use of Two-Way Radio to Report Task Completion by High School Students with Moderate Intellectual Disabilities

Committee Members:

Dr. Theodore Angelopoulos: __________________
Ms. Sandra Browdy: __________________
Dr. Jacqui Byers: __________________
Dr. Rama Chakrabarti: __________________
Dr. Karen Dennis: __________________
Dr. Barbara Fritzschke: __________________
Dr. Robert Kennedy: __________________
Dr. Gene Lee: __________________
Ms. Gail McKinney: __________________
Dr. Debra Reinhart: __________________
Dr. Valerie Sims: __________________

Full Board

[ ] Contingent Approval
Dated: __________

[ ] Final Approval
Dated: __________

[ ] Expiration
Date: __________

Chair

[ ] Expedited Approval
Dated: 13 Sept 2004

[ ] Exempt
Dated: __________

[ ] Expiration
Date: 12 Sept 2005

NOTES FROM IRB CHAIR (IF APPLICABLE): ____________________

________________________
Chair, IRB

Signed: Dr. Sophia Dragicevich

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C. **UCFIRB Form**

The complete IRB packet must be submitted by the 1st business day of the month for consideration at that monthly IRB meeting. Please see page 6 of this manual for detailed instructions on completing this form.

1. **Title of Project:** Effects of Three Instructional Scheduling on Acquisition and Generalization for the Use of Two-Way Radio to Report Task Completion by High School Students with Moderate Intellectual Disabilities

2. **Principal Investigator(s):**
   - **Name:** Geraldine Perez-Turner M.E.
   - **Degree:**
   - **Title:** Doctoral Student/Teacher
   - **Department:** Exceptional Education

3. **Supervisor:**
   - **Name:** Dr. Kevin Miller
   - **Degree:**
   - **Title:** Assistant Professor

4. **Dates of Proposed Project (cannot be retroactive):**
   - **From:** September 2004
   - **To:** September 2005

5. **Source of Funding for the Project:** (project title, agency, and account number) None

6. **Scientific Purpose of the Investigation:** To determine which instructional schedule, simulation instruction in the classroom, community-based instruction or combined simulation and community-based instruction is more effective in teaching the use of two-way radio to report task completion to high school students with moderate intellectual disabilities

7. **Describe the Research Methodology in Non-Technical Language:** (the UCFIRB needs to know what will be done with or to the research participants) Please see attached Methodology

8. **Potential Benefits and Anticipated Risks.** (Risks include physical, psychological, or economic harm. Describe the steps taken to protect participant. There are no anticipated risks to the participants in this study)
9. Describe how participants will be recruited, the number and age of the participants, and proposed compensation (if any): Please see attached Methodology and inform Consents Letters.

10. Describe the informed consent process: (include a copy of the informed consent document) Please see attached Child Assent Script and Consent Letters.

I approve this protocol for submission to the UCFIRB.

[Signature]
Department Chair/Director  4-12-24

Cooperating Department (if more than one Dept. involved) ____________________________

[Signature]
Department Chair/Director  Date
Child assent Script

Hello, (student’s name). How are you doing? It is nice to see you. I am a student at the University of Central Florida and a Teacher at this school. (Show UCF I.D. and Orange County School name badge). I am working on a project, assignment. I would like for you to work with me on this project.

I would like for you to learn how to use this two-way radio (show the students the two-way radio) to help you communicate with your teacher (point to the teacher) when you are finished with your job. Your teacher, (teacher’s name) (point at the teacher) is also going to help me to with this project; she/he will teach you how to use this two-way radio (show the two-way radio to the students) when you are learning different activities at school and when you are at Burlington Coat Factory.

I would like to take pictures of you when you use the two-way radio (show the two-way radio and a digital camera).

You may stop helping me on the project at any time.

Would you like to help with the project and learn how to use the two-way radio? (show the two-way radio)

_____ Students acknowledge with a yes
_____ Students acknowledge with a positive head signal
_____ Students acknowledge with a positive recognized indicator
_____ Students said no
_____ Students acknowledge with a negative head signal
_____ Students acknowledge with a negative recognized indicator

Student’s Name: ____________________________
Date consent was obtained: __________________
Consent was procured by: ____________________
Witness present during the process: ___________ Position: _________
September 2004

Dear Parent

I am a graduate student at the University of Central Florida and the Transition teacher at Magnolia. I am currently working on my PhD. I am under the supervision of a faculty member, Dr. Kevin Miller. I am conducting research on three different instructional schedules to teach students how to use a two-way radio to report to the teachers when they are finished with a task or activity. The purpose of this study is to find which instructional schedule is more effective in teaching the skill for manipulating a two-way radio to communicate task completion.

The results of this study may assist and support teachers, schools, and districts in designing and implementing effective instructional strategies for students with intellectual disabilities. It is anticipated that your child will benefit from the instructional interventions provided. This study will benefit your child now, and in the future, when served in a variety of settings.

Your child, if you choose to allow him/her to participate in this study, will be individually instructed by his/her teacher to use a two-way radio to report when he/she is finished with a task. Your child will be instructed either in the classroom, in the community-based instruction at Burlington Coat Factory or in both twice a week. Your child will be observed to determine the level or amount of prompts necessary to learn to use the two-way radio during based-line and intervention phases of the study by his/her teacher and me.

Your child will not be identified by name or singled out in any manner. When reporting results from the study your child will be identified by numbers only.

With your permission, I would like to take a picture of your child while using the two-way radio. The pictures will only be accessible to the research team for verification purposes. If you choose, at the end of the study the pictures will be destroyed.

Results of this study will be reported in the form of a manuscript, which will be reviewed by my faculty advisor and my Dissertation Committee. Further, I intend to attempt to publish the results of this study. In the manuscript for my Committee, and any subsequent manuscript sent for publication, your child’s identity will remain confidential.

You and your child have the right to withdraw consent for your child’s participation at any time without consequence. There are no known risks to the participants, and no compensation is offered for participation in this study. However, it is anticipated that the study participants will benefit from the increased staff and research team interaction, instruction and technology.

APPROVED BY
University of Central Florida
Institutional Review Board
SEP 13 2004
CHAIRMAN

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Please sign this consent letter. A second copy of this consent letter has been provided for your personal records- the copy is marked at the top of the page.

If you have any questions about this research project, please contact me at Magnolia School at (407) 296-6499 ext. 303 or at U.C.F. at (407) 823-1744. My faculty supervisor is Dr. Kevin Miller and he can be reached at (407) 823-5514. Questions or concerns about research participants’ rights may be directed to the UCFIRB office, University of Central Florida Office of Research, Orlando Tech Center, 12443 Research Parkway, Suite 207, Orlando, Florida 32826. The phone number is (407) 823-2901.

Sincerely,

Geraldine Perez-Turner

____ I have read the project/procedure described above.

____ I voluntarily give my consent for my child, ________________________________

__________________________(__________________________

to participate in Geraldine Perez-Turner study on instructional schedules arrangements to learn to use a two-way radio

____ I met with Geraldine Perez-Turner in my home or at school to review this consent letter and the proposed research project.

____ I wish for any pictures taken of my child for the purpose of the study be erased or destroyed at the conclusion of the study.

____ I give Geraldine Perez-Turner permission to maintain pictures of my child at the conclusion of the study.

_________________________________________ / ___________________________

Parent or Guardian Date

APPROVED BY

University of Central Florida
Institutional Review Board

CHAIRMAN
September 2004

Dear Teacher,

I am a graduate student at the University of Central Florida, and the transition teacher at Magnolia School. I am currently working on my PhD. In partial fulfillment of the requirements for the degree of Doctor of Education – Exceptional Education Track, I wish to conduct a study to measure the effect of three instructional schedules. The purpose of this research is to investigate the effect of three instructional schedules in teaching students with intellectual disabilities to use a two-way radio to report task completion.

I am asking you to support the proposed research project by teaching the selected students in your class how to use a two-way radio while at Burlington Coat Factory and/or at school. You have been identified as a highly successful and supportive teacher and a school-based team member. Your input, cooperation, and support of the research project will provide valuable information and insight of the selected students as well as the perceived necessity for effective instructional schedules when teaching functional tasks to students with intellectual disabilities.

The study will provide information regarding skill acquisition and generalization for the use of a two-way radio. The three instructional schedules are: simulation instruction in the classroom, community-based instruction and a combination of simulation in the classroom and community-based instruction.

You will be asked to participate in training sessions to learn how to teach the skill to the selected students and to ensure that all teachers are teaching the skill following the same format and teaching protocol. You will also be asked to participate in training for conducting observations.

Your identity will be kept confidential, and will not be revealed in any presentations or manuscripts that report the results of this research or within the final manuscript of my PhD Dissertation. There are no anticipated risks, compensation or other direct benefits to you for your support of this research study. You are free to withdraw your consent to support this research study at any time.

If you have any questions about this research project, please contact me at (407) 823-1784. My faculty supervisor is Dr. Kevin Miller and he can be reached at (407) 823-3314. Questions or concerns about research participants’ rights may be directed to the UCFIRB office, University of Central Florida Office of Research, Orlando Tech Center, 12443 Research Parkway, Suite 207, Orlando, Florida 32826. The phone number is (407) 823-2901.
I realize this research project will take some of your valuable time. It is hoped that the result will be well worth your effort and support. Please sign the enclosed copy of this consent letter. A second copy of this consent letter has been provided for your personal records - the copy is marked at the top of the page.

By signing this letter, you give me permission to share and report your participation anonymously with my faculty advisor, within the final manuscript of my PhD Dissertation, in conference presentations, and professional journal submissions.

Sincerely,

Geraldine Perez-Turner

I have read the project described above.
I voluntarily agree to support the project

Teacher’s Name / date

APPROVED BY
University of Central Florida
Institutional Review Board

13 Sep 2007
CHAIRMAN
Submit this form and a copy of your proposal to:
Program Services
P.O. Box 271
Orlando, FL 32802-0271

Orange County Public Schools
RESEARCH REQUEST FORM
Your research proposal should include: Project Title; Purpose and Research Problem; Instruments; Procedures and Proposed Data Analysis

Requester’s Name: Geraldine Perez
Date: ___________

Address: 2421 Ashington Park Drive, Apopka, Florida 32703
Business: Magnolia School 1990 Matterhorn Rd., Orlando, FL 32818
Phone: (407) 296-1111 ext. 303

Project Director or Advisor: Dr. Kevin Miller, Assistant Professor
Phone: (407) 823-5314

Address: University of Central Florida, College of Education P.O. Box 161250 Orlando, Florida, 32816-1250

Degree Sought (check one) □ Associate □ Bachelor’s □ Doctorate □ Master’s □ Specialist □ None

Project Title: Effects of Three Instructional Schedules on Acquisition and Generalization for the Use of Two-way Radio to Report Task Completion by High School Students with Moderate Intellectual Disabilities

ESTIMATED INVOLVEMENT

<table>
<thead>
<tr>
<th>PERSONNEL/CENTERS</th>
<th>NUMBER</th>
<th>AMOUNT OF TIME (DAYS, HOURS, ETC.)</th>
<th>SPECIFY/DESCRIBE GRADES, SCHOOLS, SPECIAL NEEDS, ETC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>9</td>
<td>Two days a week, two sessions per day, three teaching trials per session. Ten weeks total involvement</td>
<td>Students will range from 17 to 19 years of age. All students participating in the study are part of an on-the-job training program at the local Burlington Coat Factory. Students participating in the study are classified as having moderate intellectual disabilities (MID). Participants are working on vocational goals and objectives for their transition IEP for the 2004-2005 school year. All participants have signed consent from parents or guardians allowing the students to participate in the study. Students will have an explanation (at their intellectual level) of the project and what they will be learning. A visual of all materials will be shown to the students to ensure the student knows and recognizes the object they will be learning to manipulate (two-way radio) to report when they have finished with a task. Students will be supervised at all times by the teacher and primary investigator.</td>
</tr>
<tr>
<td>Teachers</td>
<td>2</td>
<td>Two days a week, two sessions per day, three teaching trials per session to teach the skill. Two training session of 30 minutes each for data collection and learning teaching strategy.</td>
<td>The two teachers participating on the study are Orange County Employees. They are the homeroom classroom teachers responsible for the students during the on the job training activities and all other instruction in the classroom. Teachers participating will sign an informal consent expressing their willingness to participate on the study. The informal consent will explain the purpose of the study and what is expected from them.</td>
</tr>
<tr>
<td>Administrators</td>
<td>N/A</td>
<td>N/A</td>
<td>The principal at the school Mrs. Linda Weekly</td>
</tr>
<tr>
<td>Schools/Centers</td>
<td>1</td>
<td>Same as teachers and students</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>---</td>
<td>-----------------------------</td>
<td></td>
</tr>
<tr>
<td>Others (specify)</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

Specify possible benefits to students/school system:

Students participating in the study will learn a skill that can benefit them during on-the-job training activities and future supported employment. Students participating will learn employability skills that would facilitate their placement after graduation in a supported employment environment with the many Orange County Schools partners in Education.

Teachers will learn how to better collect data, design task analysis for different tasks or activities and learn the appropriate procedure to teach students with intellectual disabilities using the research-based teaching strategy of least to most prompt system. Teachers can later serve as mentors to other teachers and transfer knowledge learned from their participation in the study.

The school system will have better prepared teachers in the area of intellectual disabilities with more research based skills on teaching strategies which is one of the goals on “No Child Left Behind”.

ASSURANCE

Using the proposed procedures and instrument, I hereby agree to conduct research in accordance with the policies of the Orange County Public Schools. Deviations from the approved procedures shall be cleared through the Senior Director of Program Services. Reports and materials shall be supplied as specified.

Requester’s Signature

Approval Granted: ☒ Yes ☐ No Date: 8-23-04

Signature of the Senior Director for Program Services

NOTE TO REQUESTER: When seeking approval at the school level, a copy of this form, signed by the Senior Director, Program Services, should be shown to the school principal.

Reference School Board Policy GCS, p. 249
APPENDIX C

BASELINE DATA COLLECTION INSTRUMENTS
Baseline Data Collection Sheet
Simulated Instruction in the Classroom

Date: ___________ Day of Week: ___________ Observation: 1 2 3 4 5 6

Participant: _____________________________________________________________

Observer: _______________________________________________________________

Instructor: _______________________________________________________________

Location: _______________________________________________________________

Starting Observation Time: ____________ Ending Observation Time: _____________

Total Time of Observation: ________________________________________________

Step in task Analysis for Operating a Two-way radio
After student is finished with task, with headset on and two-way radio on, the SD is given: “You are finished with your task, call (name of assigned person) with your two-way radio and report it”

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Take the two-way radio out of your apron pocket (with preferred hand)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Put the two-way radio in front of your face, close to your mouth</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3.</td>
<td>Press and hold the green button down with your fingers and at the same time say “I am finished “</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4.</td>
<td>Release/Let go off/ the green PTT button by opening your fingers</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5.</td>
<td>Wait and listen for what is said ( “Name , you can take a break now”</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>6.</td>
<td>Put your two-way radio back in your apron pocket (with preferred hand )</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Number of steps completed independently: ______________________________

Percentage of steps completed independently: ____________________________

Criteria required for satisfactory completion of task and mastery: 100% independent
Baseline Data Collection Sheet  
Combined Schedule Simulation Instruction and CBI

Date: ___________ Day of Week: ____________ Observation: 1 2 3 4 5 6

Participant: _____________________________________________________________

Observer: _______________________________________________________________

Instructor: ______________________________________________________________

Location 1: ______________________________ Location 2: _____________________

Starting Observation Time: ____________ Ending Observation Time: _____________

Total Time of Observation: ________________________________________________

Step in task Analysis for Operating a Two-way radio
After student is finished with task, with headset on and two-way radio on, the SD is given: “You are finished with your task, call (name of assigned person) with your two-way radio and report it”

<table>
<thead>
<tr>
<th></th>
<th>Step Completed Independently</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Take the two-way radio out of your apron pocket (with preferred hand)</td>
</tr>
<tr>
<td>2</td>
<td>Put the two-way radio in front of your face, close to your mouth</td>
</tr>
<tr>
<td>3</td>
<td>Press and hold the green button down with your fingers and at the same time say “I am finished “</td>
</tr>
<tr>
<td>4</td>
<td>Release/Let go off/ the green PTT button by opening your fingers</td>
</tr>
<tr>
<td>5</td>
<td>Wait and listen for what is said (“Name, you can take a break now”)</td>
</tr>
<tr>
<td>6</td>
<td>Put your two-way radio back in your apron pocket (with preferred hand )</td>
</tr>
</tbody>
</table>

Number of steps completed independently: _________________________________

Percentage of steps completed independently: ______________________________

Criteria required for satisfactory completion of task and mastery: 100% independent
### Baseline Data Collection Sheet
#### Community-based Instruction

Date: ___________  Day of Week: ___________  Observation: 1  2  3  4  5  6

Participant: ________________________________________________________________
Observer: ________________________________________________________________
Instructor: ________________________________________________________________
Location: ________________________________________________________________
Starting Observation Time: ____________  Ending Observation Time: _____________
Total Time of Observation: ________________________________________________

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#### Step in task Analysis for Operating a Two-way radio

After student is finished with task, with headset on and two-way radio on, the SD is given: “You are finished with your task, call (name of assigned person) with your two-way radio and report it”

**Step Completed Independently**

<p>| | | | |</p>
<table>
<thead>
<tr>
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<th></th>
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<td>Take the two-way radio out of your apron pocket (with preferred hand)</td>
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<td>No</td>
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<td>6.</td>
<td>Put your two-way radio back in your apron pocket (with preferred hand )</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Number of steps completed independently: ________________________________

Percentage of steps completed independently: ______________________________

Criteria required for satisfactory completion of task and mastery: 100% independent
Intervention Data Collection Sheet
Combined Instructional Schedule (SICCBI)

Date: ___________ Day of Week: ____________ Session: ______ 1 2

Participant: _____________________________________________________________
Observer: _______________________________________________________________
Instructor: ______________________________________________________________

Location (1) CBI ______________ Location (2) Simulated Classroom ______________
Starting Observation Time: ____________  Ending Observation Time: _____________
Total Time of Observation: ________________________________________________

Codes:
I-Independent   V-Verbal+Cue   G-Gesture+Cue   M-Model+Cue   P-Physical+Cue

Step in task Analysis for Operating a Two-way radio
After student is finished with task, with headset on and two-way radio on, the SD is given: “You are finished with your task, call (name of assigned person) with your two-way radio and report it”

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Take the two-way radio out of your apron pocket (with preferred hand)</td>
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<td>Put your two-way radio back in your apron pocket (with preferred hand)</td>
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<td></td>
</tr>
</tbody>
</table>

Number of Independent steps accomplished in trial 1: ____________________________

Number of Independent steps accomplished in trial 2: ____________________________

Number of Independent steps accomplished in trial 3: ____________________________

Percentage of independent steps accomplished: _________________________________

Criteria required for satisfactory completion of task and mastery: 100% independent___

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**Verbal prompt**
Number of steps accomplished with verbal prompt in trial 1: ______________
Number of steps accomplished with verbal prompt in trial 2: ______________
Number of steps accomplished with verbal prompt in trial 3: ______________
Percentage of steps accomplished with verbal prompt: ______________

**Gesture Prompt**
Number of steps accomplished with gesture prompt in trial 1: ______________
Number of steps accomplished with gesture prompt in trial 2: ______________
Number of steps accomplished with gesture prompt in trial 3: ______________
Percentage of steps accomplished with gesture prompt: ______________

**Model prompt**
Number of steps accomplished with model prompt in trial 1: ______________
Number of steps accomplished with model prompt in trial 2: ______________
Number of steps accomplished with model prompt in trial 3: ______________
Percentage of steps accomplished with model prompt: ______________

**Physical Prompt**
Number of steps accomplished with physical prompt in trial 1: ______________
Number of steps accomplished with physical prompt in trial 2: ______________
Number of steps accomplished with physical prompt in trial 3: ______________
Percentage of steps accomplished with physical prompt: ______________
**Intervention Data Collection Sheet**

**Community-based Instruction**

Date: ___________ Day of Week: __________ Session: _____ 1 2

Participant: _____________________________________________________________
Observer: _______________________________________________________________
Instructor: ______________________________________________________________
Location: _______________________________________________________________
Starting Observation Time: ____________ Ending Observation Time: _____________
Total Time of Observation: ________________________________________________

**Codes:**

I-Independent  V-Verbal+Cue  G-Gesture+Cue  M-Model+Cue  P-Physical+Cue

After student is finished with task, with headset on and two-way radio on, the SD is given: “You are finished with your task, call (name of assigned person) with your two-way radio and report it”

<p>| | | |</p>
<table>
<thead>
<tr>
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<td>Press and hold the green button down with your fingers and at the same time say “I am finished“</td>
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<td>4.</td>
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<td>Wait and listen for what is said ( “Name , you can take a break now”</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Put your two-way radio back in your apron pocket (with preferred hand )</td>
<td></td>
</tr>
</tbody>
</table>

Number of Independent steps accomplished in trial 1:__________________________

Number of Independent steps accomplished in trial 2:__________________________

Number of Independent steps accomplished in trial 3:__________________________

Percentage of independent steps accomplished: _____________________________

Criteria required for satisfactory completion of task and mastery: 100% independent
Verbal prompt
Number of steps accomplished with verbal prompt in trial 1:____________________
Number of steps accomplished with verbal prompt in trial 2:____________________
Number of steps accomplished with verbal prompt in trial 3:____________________
Percentage of steps accomplished with verbal prompt: _____________________

Gesture Prompt
Number of steps accomplished with gesture prompt in trial 1:____________________
Number of steps accomplished with gesture prompt in trial 2:____________________
Number of steps accomplished with gesture prompt in trial 3:____________________
Percentage of steps accomplished with gesture prompt: _____________________

Model prompt
Number of steps accomplished with model prompt in trial 1:____________________
Number of steps accomplished with model prompt in trial 2:____________________
Number of steps accomplished with model prompt in trial 3:____________________
Percentage of steps accomplished with model prompt: _____________________

Physical Prompt
Number of steps accomplished with physical prompt in trial 1:____________________
Number of steps accomplished with physical prompt in trial 2:____________________
Number of steps accomplished with physical prompt in trial 3:____________________
Percentage of steps accomplished with physical prompt: _____________________
Intervention Data Collection Sheet
Simulation Instruction in the Classroom

Date: ___________ Day of Week: ____________ Session: 1 2
Participant: _____________________________________________________________
Observer: _______________________________________________________________
Instructor: _______________________________________________________________
Location: _______________________________________________________________
Starting Observation Time: ____________ Ending Observation Time: _____________
Total Time of Observation: ________________________________________________

Codes:
I-Independent  V-Verbal+Cue  G-Gesture+Cue  M-Model+Cue  P-Physical+Cue

After student is finished with task, with headset on and two-way radio on, the SD is given: “You are
finished with your task, call (name of assigned person) with your two-way radio and report it”

1. Take the two-way radio out of your apron pocket (with preferred hand) 1 2 3
2. Put the two-way radio in front of your face, close to your mouth
3. Press and hold the green button down with your fingers and at the same time say “I am finished “
4. Release/Let go off/ the green PTT button by opening your fingers
5. Wait and listen for what is said (“Name , you can take a break now”
6. Put your two-way radio back in your apron pocket (with preferred hand )

Number of Independent steps accomplished in trial 1:__________________________
Number of Independent steps accomplished in trial 2:__________________________
Number of Independent steps accomplished in trial 3:__________________________
Percentage of independent steps accomplished: _____________________________
Criteria required for satisfactory completion of task and mastery: 100% independent
Verbal prompt
Number of steps accomplished with verbal prompt in trial 1:____________________
Number of steps accomplished with verbal prompt in trial 2:____________________
Number of steps accomplished with verbal prompt in trial 3:____________________
Percentage of steps accomplished with verbal prompt: ______________________

Gesture Prompt
Number of steps accomplished with gesture prompt in trial 1:____________________
Number of steps accomplished with gesture prompt in trial 2:____________________
Number of steps accomplished with gesture prompt in trial 3:____________________
Percentage of steps accomplished with gesture prompt: ______________________

Model prompt
Number of steps accomplished with model prompt in trial 1:____________________
Number of steps accomplished with model prompt in trial 2:____________________
Number of steps accomplished with model prompt in trial 3:____________________
Percentage of steps accomplished with model prompt: ______________________

Physical Prompt
Number of steps accomplished with physical prompt in trial 1:____________________
Number of steps accomplished with physical prompt in trial 2:____________________
Number of steps accomplished with physical prompt in trial 3:____________________
Percentage of steps accomplished with physical prompt: ______________________
APPENDIX E

GENERALIZATION DATA COLLECTION INSTRUMENT
Generalization Data Collection Sheet

Date: ___________ Day of Week: ____________ Day: 1 2 3
Participant: _____________________________________________________________
Observer: _______________________________________________________________
Instructor: ______________________________________________________________
Locations: (1)_________________(2)___________________(3)___________________
Starting Observation Time: ____________  Ending Observation Time: _____________
Total Time of Observation: ________________________________________________

Codes:
I-Independent   V-Verbal+Cue    G-Gesture+Cue    M-Model+Cue    P-Physical+Cue

After student is finished with task, with headset on and two-way radio on, the SD is given: “You are finished with your task, call (name of assigned person) with your two-way radio and report it”

1. Take the two-way radio out of your apron pocket (with preferred hand)  1  2  3
2. Put the two-way radio in front of your face, close to your mouth
3. Press and hold the green button down with your fingers and at the same time say “I am finished“
4. Release/Let go off the green PTT button by opening your fingers
5. Wait and listen for what is said ( “Name , you can take a break now”
6. Put your two-way radio back in your apron pocket (with preferred hand)

Number of Independent steps accomplished in setting 1: __________________________
Number of Independent steps accomplished in setting 2: __________________________
Number of Independent steps accomplished in setting 3: __________________________

Percentage of independent steps accomplished: __________________________
Criteria required for satisfactory completion of task and mastery: 100% independent
Pre Assessment Data

Name of Student: _____________________________________________________________

Observer: ___________________________________________________________________

Date: _____________________________________________________________________

Witness: __________________________________________________________________

Questions:

1. (Name of student) do you know what is a two-way radio? (Show a color picture)
   - YES   What it is? : _______________________________________________________
   - NO

2. (Name of Student) have you used a two-way radio, or a walkie-talkie?
   - YES   How? _____________________________________________________________
     Show me with your hand
   - NO

Criteria met:  □YES  □NO
APPENDIX G

APPARATUS
Motorola Earbuds
Model 53728
TALKABOUT® T5720
Two-Way Radios
NiCD Rechargeable Double Pack
Nordic Blue Series
APPENDIX H

TEACHING PROTOCOL
Teaching Protocol

Preparation:

1) Before starting, check the following:
   a) The two-way radio the student will be using for the session has sufficient battery power to complete teaching session.
   b) The two-way radio is turned on.
   c) Make sure the headset is placed correctly and that the student is comfortable.
   d) The student has the two-way radio inside his/her apron’s packet.

2) Explain to the student that he/she will be learning how to use the two-way radio after he/she is finished with the task.
3) Stay with student during the completion of the task.
4) After the student finished the vocational task, start the training trial following the teaching script.

TEACHING SCRIPT

Task analysis Step 1

Verbal cue: (name of student), you are finished with your task, call your (name of assigned person) with your two-way radio and report it (wait five seconds). If the student does not start within five seconds the first step, initiate the prompt hierarchy.

a) V- Take the two-way radio out of your apron pocket. Proceed to next level as needed if the student does not respond after five seconds.

b) Gesture prompt with the verbal cue, V- Take the two-way radio out of your apron pocket G-point to the two-way radio. Proceed to next level as needed if the student does not respond after five seconds.

c) Model prompt with a verbal cues V- Take the two-way radio out of your apron pocket and M-model how to pick-up the two-way radio and then place it back to the original position, Proceed to next level as needed if the student does not respond after five seconds.

d) Physical prompt with the verbal cue V- Take the two-way radio out of your apron pocket and P-take hand of student and place on the two-way radio then bring it out
of the apron’s pocket (start with partial physical but continue to full if necessary).

Task Analysis Step 2

Provide a verbal cue for Task Analysis step two

a) V- *Put the two-way radio in front of your face, close to your mouth* Proceed to next level as needed if the student does not respond after five seconds.

b) Gesture prompt with a verbal cue. V- *Put the two-way radio in front of your face, close to your mouth* and G- *show with your hand the place where you want the student to place the two-way radio*. Proceed to next level as needed if the student does not respond after five seconds.

c) Model prompt with a verbal cue V- *Put the two-way radio in front of your face, close to your mouth* and M- *bring the students’ two-way radio to the position where he/she should place it. Put it back to the original position*. Proceed to next level as needed if the student does not respond after five seconds.

d) Physical prompt with the verbal cue V- *Put the two-way radio in front of your face, close to your mouth* and P- *physically move students hand with two-way radio to the position where she/he should place the two-way radio*. (Start with partial physical but provide full physical if necessary).

Task Analysis Step 3

Provide a verbal cue for Task Analysis step three

a) V- *Press and hold the green button down with your fingers and at the same time say “I am finished”*. Proceed to next level as needed if the student does not respond after five seconds.

b) Gesture prompt with a verbal cue. V- *Press and hold the green button down with your fingers and at the same time say “I am finished”*. G- *show with your hand and fingers how to press or squish or push simulating that you have the two-way radio in your hand*. Proceed to next level as needed if the student does not respond after five seconds.
c) **Model prompt with a verbal cue** V- Press and hold the green button down with your fingers and at the same time say “I am finished”. M-take the student’s two-way radio and press the green PTT button. Put it back to the original position. Proceed to next level as needed if the student does not respond after five seconds.


d) **Physical prompt with the verbal cue** V- Press and hold the green button down with your fingers and at the same time say “I am finished”. P-physically press the students’ fingers to make pressure on the green button and maintain pressure for five seconds. Tell the students to say *I am finished* (Start with partial physical but provide full physical if necessary).

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**Task Analysis Step 4**

Provide a verbal cue for Task Analysis step five

a) V- Release/let go off/ the green button by opening your fingers. **Proceed to next level as needed if the student does not respond after five seconds.**

b) **Gesture prompt with a verbal cue.** V- Release/Let go off/ the green button by opening your fingers and G-show with your hand and fingers making the motion of releasing the PTT green button simulating that you have the two-way radio in your hand. Proceed to next level as needed if the student does not respond after five seconds.

c) **Model prompt with a verbal cue** V- Release/let go off/ the green button by opening your fingers and M-take the student’s two-way radio and release he green PTT button by opening your fingers. Put it back to the original position. Proceed to next level as needed if the student does not respond after five seconds.

d) **Physical prompt with the verbal cue** V- Release/let go off/ the green button by opening your fingers and P- physically open the students’ fingers to release the green button. (Start with partial physical but provide full physical if necessary).
Task Analysis Step 5

Provide a verbal cue for Task Analysis step six

a) V- Wait and listen for what I say, you will hear it through your ear piece. (the assigned person will say) “You can take a break now”. (This step does not require additional prompting but you can ask the student if he/she heard the massage through the headset) It may be necessary to gesture the student to wait or physically require she/he to wait. If this is necessary, proceed with the next intrusive prompt.

Task Analysis Step 6

Provide a verbal cue for Task Analysis step seven

a) V- Put your two-way radio back in your apron’s pocket. Proceed to next level as needed if the student does not respond after five seconds.

b) Gesture prompt with a verbal cue. V- Put your two-way radio back in your apron’s pocket and G-point to the apron’s pocket. Proceed to next level as needed if the student does not respond after five seconds.

c) Model prompt with a verbal cue V- Put your two-way radio back in your apron’s pocket and M-take the student’s two-way radio and place it into the apron pocket. Then, put it back to the original position. Proceed to next level as needed if the student does not respond after five seconds.

d) Physical prompt with the verbal cue V- Put your two-way radio back in your apron’s pocket and P- physically take students’ hand with two-way radio and put it into the apron pocket. (Start with partial physical but provide full physical if necessary).

Wrap up:

Praise the student for the specific task complete. “Great job (name of student) using the two-way radio to tell (Name of assigned person) that you are finished”. Ask student to choose reinforce from the previous identified choices after the session is finished...
Data will be collected to determine how many steps the student performed independently. Only independent steps will be counted towards criterion. All steps have to be marked as performed independently for three consecutive trials in order to count the skill has mastered.

This procedure protocol will be followed for each session and trial in all instructional schedules. There will be two sessions per day and three trials per session, for a total of six trials per training day.


America Association on Mental Retardation. (2002). Mental Retardation: Definition, classification and system of supports. (10th ed.). Annapolis: MD


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