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The Effects of In-Service Teacher Training on Correct Implementation of Assessment and Instructional Procedures for Teachers of Individuals with Profound Multiple Disabilities

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THE EFFECTS OF IN-SERVICE TEACHER TRAINING ON CORRECT IMPLEMENTATION OF ASSESSMENT AND INSTRUCTIONAL PROCEDURES FOR TEACHERS OF INDIVIDUALS WITH PROFOUND MULTIPLE DISABILITIES

by

Erin L. Horrocks

A dissertation submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Special Education

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2010
ABSTRACT

The Effects of In-Service Teacher Training on Correct Implementation of Assessment and Instructional Procedures for Teachers of Individuals with Profound Multiple Disabilities

by

Erin L. Horrocks, Doctor of Philosophy

Utah State University, 2010

Major Professor: Dr. Robert L. Morgan
Department: Special Education and Rehabilitation

A multi component training package (live training, video modeling, role playing, and feedback) was used to train teachers to assess and instruct students with profound multiple disabilities. Phase 1 of the study included training seven in-service teachers to conduct assessment in three areas: (a) preference assessment (i.e., potential reinforcing items), (b) controlled body movement assessment (i.e., gross and fine motor skills), and (c) access skill assessment (i.e., assessment of basic skills or prerequisite skills that are necessary for students to master before entering into further instruction). The assessment results yielded the following information for each student participant: (a) a list of three to four preferred items, (b) a list of body movements in which the student reliably uses to respond, and (c) a list of access skills that are mastered and not mastered. Four teacher/student pairs from Phase 1 participated in Phase 2, which consisted of using the multi component training package (same components as Phase 1) to train teachers to
instruct students on non mastered access skills. Teachers were trained to use one of the following instructional strategies to teach non mastered access skills: least-to-most prompting, most-to-least prompting, time delay, or graduated guidance. A multiple baseline design across four teacher participants was used to determine if the instructional training was effective in increasing the percentage of correctly implemented instructional steps. Data from Phase 1 suggested that the multi component training package was effective in increasing teachers’ skills in assessing students with profound multiple disabilities, as the percentage of correctly implemented assessment steps increased for all seven teacher participants from pre training to post training. Additionally, data from Phase 2 indicated that the training was effective in increasing the percentage of correctly implemented instructional steps from baseline to post training sessions, across multiple access skills. Data from student participants showed that overall, students were responsive to teachers’ instruction, as the percentage of independently performed student responses also increased from baseline to post training sessions.

(440 pages)
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CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II.</td>
<td>LITERATURE REVIEW</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Review of Literature on Assessment</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Review of Literature on Instructional Procedures</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Review of Literature on Teacher Training</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Purpose Statement and Research Questions</td>
<td>22</td>
</tr>
<tr>
<td>III.</td>
<td>METHODS - PHASE 1 (ASSESSMENT TRAINING)</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Participants</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Settings and Materials</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Dependent Variables</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Independent Variable (Assessment Training)</td>
<td>35</td>
</tr>
<tr>
<td>IV.</td>
<td>METHODS – PHASE 2 (INSTRUCTIONAL TRAINING)</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Participants and setting</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Dependent Variables</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Independent Variable (Instructional Training)</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Experimental Design</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Interobserver Agreement</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>Training Fidelity</td>
<td>55</td>
</tr>
<tr>
<td>V.</td>
<td>RESULTS</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>Assessment (PHASE 1)</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>Instruction (PHASE 2)</td>
<td>62</td>
</tr>
</tbody>
</table>
Social Validity ........................................................................... 70

VI. DISCUSSION ........................................................................... 72

The Multi-Component Teacher Training Package ................. 72
Participants ............................................................................. 75
Dependent Variables ................................................................. 78
Social Validity ......................................................................... 79
Limitations and Future Directions ........................................... 80
Implications ............................................................................. 81

REFERENCES ............................................................................ 83

APPENDICES ............................................................................. 93

Appendix A: Preference Assessment Checklist ................................. 94
Appendix B: Controlled Body Movement Assessment Checklist ........ 104
Appendix C: Access Skill Assessment Checklist ............................... 106
Appendix D: Operationalized Definitions for Correct Implementation of Preference Assessment Steps ........................................... 109
Appendix E: Operationalized Definitions for Correct Implementation of Controlled Body Movement Assessment Steps ........................................... 164
Appendix F: Operationalized Definitions for Correct Implementation of Access Skills Assessment Steps ........................................... 169
Appendix G: List of Access Skills ...................................................... 179
Appendix H: Order of Introduction of Stimuli Data Sheet .................. 182
Appendix I: Single Stimulus Preference Assessment Data Sheet ............ 184
Appendix J: Controlled Body Movement Assessment Data Sheet ........... 186
Appendix K: Access Skill Assessment Data Sheet ............................... 189
Appendix L: Script for Training on Preference Assessment ................. 192
Appendix M: Script for Training on Controlled Body Movement Assessment ........................................................................ 196
Appendix N: Script for Training on Access Skill Assessment ............... 199
Appendix O: Treatment Fidelity Checklist for Assessment Training ....... 207
Appendix P: Time Delay Checklist ..................................................... 210
Appendix Q: Least-to-Most Prompting Checklist .............................. 220
Appendix R: Most-to-Least Prompting Checklist ............................. 231
Appendix S: Graduated Guidance Checklist ...................................... 242
Appendix T: Time Delay Data Sheet ................................................. 256
Appendix U: Least-to-Most Prompting Data Sheet ............................ 258
Appendix V: Most-to-Least Prompting Data Sheet ........................... 260
Appendix W: Operationalized Definitions for Time Delay ................... 262
Appendix X: Operationalized Definitions for Least-to-Most Prompting ........ 314
Appendix Y: Operationalized Definitions for Most-to-Least Prompting .... 366
Appendix Z: Social Validity Questionnaire ..................................... 411
Appendix AA: Script for Training on Time Delay .......................... 414
Appendix BB: Script for Training on Least-to-Most Prompting .................. 418
Appendix CC: Script for Training on Most-to-Least Prompting .................. 421
Appendix DD: Treatment Fidelity Checklist for Instructional Training .......... 424

CURRICULUM VITAE ........................................................................................................ 426
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Table of Studies Including Individuals with Profound Multiple Disabilities</td>
<td>17</td>
</tr>
<tr>
<td>2 Demographic Information for Teacher Participants</td>
<td>25</td>
</tr>
<tr>
<td>3 Demographic Information for Student Participants</td>
<td>28</td>
</tr>
<tr>
<td>4 Assessment Training Details for Teacher Participants</td>
<td>30</td>
</tr>
<tr>
<td>5 Instructional Training Details for Teacher Participants</td>
<td>41</td>
</tr>
<tr>
<td>6 Table of Instructional Strategies and Access Skills for Teacher Participants</td>
<td>43</td>
</tr>
<tr>
<td>7 Interobserver Agreement for Dependent Measures</td>
<td>54</td>
</tr>
<tr>
<td>8 Inter-Rater Reliability on Assessment and Instructional Outcomes</td>
<td>55</td>
</tr>
<tr>
<td>9 Percentage of Correct, Partially Correct and Omitted Steps</td>
<td>60</td>
</tr>
<tr>
<td>10 Assessment Results for Students</td>
<td>62</td>
</tr>
<tr>
<td>11 Mean Percentages of Partially Correct and Omitted Instructional Steps</td>
<td>67</td>
</tr>
<tr>
<td>12 Mean Social Validity Ratings</td>
<td>71</td>
</tr>
</tbody>
</table>
### LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Percentage of correctly implemented assessment steps</td>
<td>57</td>
</tr>
<tr>
<td>2</td>
<td>Percentage of correctly implemented instructional steps</td>
<td>64</td>
</tr>
<tr>
<td>3</td>
<td>Percentage of independent and correct student responses</td>
<td>68</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

Researchers have reported the use of various teaching procedures to successfully teach self-care, daily living, vocational, and functional academic skills to individuals with developmental disabilities (see Matson & Mulick, 1983; Whitman, Scibak, & Reid, 1983; Snell, 1997 for selected reviews). Although the overall impact of research in this area has been to demonstrate successful teaching, there is one population of individuals with developmental disabilities for whom the impact has been less evident. Specifically, the efficacy of teaching procedures for individuals who have profound cognitive and physical disabilities has been limited in scope and is questionable in extant evidence (Landesman-Dwyer & Sackett, 1978; Rainforth, 1982). The uncertainty regarding the effectiveness of instructional procedures for individuals with profound multiple disabilities has been a continuing theme for several decades. In a review of the literature, including research dating as far back as 1949 on teaching procedures for individuals with profound multiple disabilities, the authors noted the lack of research on teaching procedures for individuals in this population (Reid, Phillips, & Green, 1991). A more recent review of the literature revealed that although past researchers have demonstrated individuals with severe disabilities can master functional skills and some academic responses, there is sparse literature on individuals with complex, multiple disabilities (Browder & Cooper-Duffy, 2003). The paucity of literature relates not only to effective instructional procedures but also to skill assessment of individuals with profound multiple disabilities (Reid et al., 1991).
A major difficulty in discussing the efficacy of assessment and teaching procedures involving individuals who have profound mental and physical developmental disabilities is uncertainty about who is included in this population (Guess et al., 1988). In the past, diagnosticians used the term profound mental retardation to refer to individuals who were un-testable or those with estimated intelligence quotients of less than 25 (Grossman, 1983). More recent terms used to describe this population include multiple disabilities, significant cognitive disabilities, developmental disabilities, intellectual disabilities and severe disabilities. These, and other similar diagnostic terms identify a very heterogeneous group of individuals with a wide range of skills and disabilities (Bailey, 1981; Rainforth, 1982). For purposes of this paper, the target group will be a subpopulation of individuals with developmental disabilities who fall at the extreme left side of the frequency distribution for intelligence and adaptive behavior, and will be referred to as individuals with profound multiple disabilities. This subpopulation was described by Miller (1976) and Haywood, Meyers, and Switzky (1982) as individuals with “absolute” profound mental retardation, who lack adaptive behaviors and who may exist in a medically fragile state. This same subpopulation was also described by Landesman-Dwyer and Sackett (1978) as “nonambulatory, profoundly retarded individuals,” who show high variability in their responses on developmental scales with overall performance below 6 months and low levels of movements characterized by reflexive patterns.

Individuals with profound multiple disabilities fall within broad categories such as individuals with significant cognitive disabilities or severe disabilities, but exhibit a number of characteristics that set them apart. First, these individuals are often considered
un-testable on intelligence tests because they can perform minimal, if any, of the tasks included on the tests (Bailey, 1981). Second, this population often exhibits signs of serious neuromuscular dysfunction, such as severe spasticity, muscle rigidity, and skeletal deformities (Landesman-Dwyer & Sackett, 1978). As a result of neuromuscular dysfunction, these individuals are frequently non-ambulatory, small for their chronological age (Rice, McDaniel, Stallings, & Gatz, 1967), and have little or no control over motor movements (Guess et al., 1988). Third, individuals with profound multiple disabilities usually have frequent medical complications relating to, for example, seizure disorders (Guess et al., 1988) and physical difficulties with food ingestion (Korabek, Reid, & Ivancic, 1981). Given these characteristics, instructors of these individuals often have difficulty conducting assessments and teaching meaningful skills (Guess et al., 1988).

Researchers have reported specific behavioral characteristics that describe individuals with profound multiple disabilities and attest to the difficulties often experienced in assessing and teaching this population. First, individuals with profound disabilities frequently do not exhibit a consistent motor response with which to begin developing meaningful skills (Rice et al., 1967; Utley, Duncan, Strain, & Scanlon, 1983). Similarly, finding stimuli that function as reinforcers for shaping or engaging in new behaviors can be challenging (Green et al., 1988; Haskett & Hollar, 1978). Stimuli that typically function as reinforcers for individuals who have less serious disabilities (e.g., edibles) may not have reinforcing effects with individuals who have profound multiple disabilities, or these stimuli may be contraindicated due to physical complications with eating (Correa, Poulson, & Salzberg, 1984; Korabek et al., 1981). Levels of alertness
also vary significantly across and within days, and responsiveness to teaching
procedures is frequently variable. Additionally, these individuals may be drowsy or fall
asleep during teaching sessions (Brownfield & Keehn, 1966; Deiker & Bruno, 1976;
Haskett & Hollar, 1978). The latter problem is often related to the frequent use of
medication in attempting to control seizures, spasticity, allergies, and so forth, and the
corresponding side effects of medication (Haskett & Hollar, 1978).
CHAPTER II
LITERATURE REVIEW

A review of the literature on assessment and instructional procedures for individuals with profound multiple disabilities, proceeded by a review of the literature related to in-service training for teachers will follow. These reviews establish the need to identify assessment procedures and effective teaching strategies for individuals with profound multiple disabilities. The literature reviews will be presented in narrative format due to the paucity of literature involving individuals with profound multiple disabilities.

Review of Literature on Assessment

The use of assessment data to inform instruction and drive student learning has become an increasingly central component of classroom teaching and school improvement efforts (McMillan & Syrja, 2009). A vast amount of literature on assessing individuals with significant cognitive disabilities, including individuals with profound multiple disabilities is related to the alternate assessment, which has emerged due to recent federal regulations. The 1997 amendments to the Individuals with Disabilities Act (IDEA 1997) require states to include individuals with disabilities in assessments by allowing these individuals to take assessments with appropriate accommodations or to participate in alternate assessments. Alternate assessments are designed for those individuals who cannot participate in typical assessments, even with accommodations. Additionally, No Child Left Behind (NCLB, 2002) requires states to establish content
standards, implement assessments that measure student performance against those standards, and establish accountability for achievement in reading, math, and science.

The intent of high stakes testing for all students may be to enhance expectations for student achievement. Expectations for students with significant cognitive disabilities have historically been low (Wehmeyer, Lattin, & Agran, 2001), and the amendments to IDEA may serve to positively influence these expectations. Despite the laudable intents of these mandates, a number of issues, particularly for students with profound multiple disabilities, have been raised. First, given that individual skills are specifically assessed in academic areas (i.e., language arts, math, and science), the possibility of narrowing the curriculum may occur, and the result may be that instruction is focused only on core academic content areas, to the exclusion of other areas that may be just as, or more important for students with the most significant disabilities (e.g., activities of daily living, functional skills). Ultimately, the intent of curriculum development for students with disabilities, particularly for those with more intensive support needs, is to teach skills that will promote independence and the highest possible quality of life (Knowlton, 1998; Wehmeyer, Sands, Knowlton, & Kozleski, 2002). A second area of concern with alternate assessments is data collection, specifically, how the assessment and data collection inform teachers for instructional purposes (Browder, 2001; Browder & Cooper-Duffy, 2003; Kleinert & Kearns, 2001). Large-scale assessments, such as the alternate assessment, may not provide enough information to measure ongoing and specific progress, particularly for students with profound multiple disabilities. In large scale assessments, the unit of measurement may be too broad or general to be sensitive to small changes in skill levels evidenced by individuals with profound multiple disabilities.
While large-scale assessments serve a purpose in education, more specific assessments are needed to provide teachers with information to guide instruction.

Specific and ongoing assessment of basic or “prerequisite” skills may provide instructors of students with profound multiple disabilities with specific and meaningful information to guide instruction. Prerequisite skills for students with profound multiple disabilities to enter into instruction include basic discrimination, cause and effect, imitation, responding to visual, tactual, or auditory stimuli, and so forth. These basic skills are often termed “access” skills, because they serve as prerequisite skills for access to general education curriculum or as a foundation for other academic skills (Browder & Spooner, 2006). Although language arts, math, and science are the areas in which mandated assessment is necessary, access skills may be considered prerequisite to the academic areas that are assessed. For example, responding to auditory stimuli, such as signifying “yes” or “no” in response to a question is a skill that is necessary to master before other academic skills are addressed. These access skills develop in the preschool years for most individuals; however, they need to be specifically assessed and taught to students with profound multiple disabilities.

Along with assessment of access skills, other behaviors must be assessed before meaningful instruction can begin. In a review of the literature on teaching individuals with profound multiple disabilities, Reid and colleagues (1991) suggested that future researchers should develop a behavioral assessment protocol specifically for individuals with profound multiple disabilities. Because of the previously defined characteristics of individuals with profound multiple disabilities (e.g., lack of consistent motor response with which to begin developing meaningful skills, difficulty identifying effective
reinforcers, decreased and variable levels of alertness, etc.), assessment procedures used to develop teaching programs for individuals on the higher end of the continuum of individuals with developmental disabilities are often of little value with individuals with profound multiple disabilities. Consequently, the development of assessment procedures to assist teachers in planning teaching programs is necessary.

To construct a behavioral assessment protocol for persons with profound multiple disabilities, Reid, and colleagues (1991) identified two sets of interdependent measures. First, the number of controlled body movements an individual exhibits seems to represent an important factor in terms of suggesting the specific behaviors and number of different behaviors that can be the target of instructional programs. Generally, as the number of controlled movements increases (i.e., the number of response modalities), the possibilities also increase for teaching discriminations and/or using shaping or chaining procedures to teach meaningful behaviors or skills (Cooper, Heron, & Heward, 2007). The importance of the number of controlled body movements as an indicator of the potential utility of operant training procedures, as well as an indicator of what behaviors to teach, was noted in early research with persons with profound multiple disabilities (Rice et al, 1967), although this variable still has not been incorporated into assessment processes for individuals with profound multiple disabilities.

A review of motor movement assessments in the physical/occupational therapy literature revealed validated assessments that evaluate motor movements, most frequently for infants. The assessment most relevant to the current research was the Alberta Infant Motor Scales (Piper, Pinnell, & Darrah, 1992), because it is an observational assessment scale. The Alberta Infant Motor Scales (AIMS) is a norm referenced observational
measure that examines spontaneous movement repertoire in infants from birth to walking. The assessor observes infants as they go into and out of four positions (prone, supine, sitting, and standing) and provides scores on qualitative movement criteria such as weight bearing, postural alignment, and anti-gravity movement that contribute to early motor skills. The main purpose of this assessment (as with most motor assessments) is to identify delays in early motor development and detect deviations from typical motor development. The main purpose of a “controlled body movement” assessment for this paper is to identify which body movements (if any) a student uses to respond. In other words, the purpose of the body movement assessment in this paper is to identify response forms in which a student can reliably use. The reason for this type of assessment, which is specific to individuals with profound multiple disabilities, is to aid the instructor in determining which movements a student can reliably make in response to instruction in comparison to uncontrolled body movements which are typical for individuals with profound multiple disabilities. This type of assessment provides the instructor with a specific body movement, such as a left hand movement or an eye gaze, which the student reliably uses to respond.

A second set of relevant measures is the number of environmental stimuli to which an individual will reliably make a response. As the number of stimuli resulting in reliable responding increases (which may include controlled body movements on the part of the participant), more successful teaching may occur. For example, some researchers suggest that by evaluating approach behaviors, stimuli that will function subsequently as reinforcers in skill training programs can be identified (Green et al., 1988; Pace, Ivancic, Edwards, Iwata, & Page, 1985). Those stimuli to which individuals demonstrate the most
consistent approach behavior, or are considered as preferred, seem to be the most useful to incorporate in teaching programs. A significant outcome of the early research was the identification of sensory reinforcers for individuals with profound multiple disabilities, such as flickering lights or vibrations (Bailey & Meyerson, 1970). The importance of identifying sensory stimuli as reinforcers established in the early research has been supported in other studies demonstrating the reinforcing properties of these types of stimuli (Pace et al., 1985; Utley et al., 1983), and the lack of reinforcing effects of more traditional stimuli such as verbal praise (Zucker, D’Alonzo, Williams, & McMullen, 1978).

Pace et al., (1985) developed a method for identifying reinforcers for individuals with profound multiple disabilities, in which sixteen stimuli were selected for use in the assessment. The sixteen items were selected because of their accessibility and ease of presentation, and included items such as mirrors, lights, music, vibrations, heating pads, fans, etc. Each session consisted of 20 trials; during which four predetermined stimulus items were presented five times in a counterbalanced order. Over the eight assessment sessions, each of the 16 stimuli was presented 10 times. The method for assessing stimulus preference consisted of measuring approach responses to each of the 16 stimuli. Approach was defined as movement toward the stimuli with hand or body within 5 s of either the first or second stimulus probe. Nonoccurrence was defined as the absence of any differential response within 5 s. A trial began by presenting a stimulus to the individual, and if the individual approached the item within 5 s, the stimulus was made available for an additional 5 s. For example, a trial with the light stimulus would begin by placing the inactivated light in front of the individual. If the individual approached the
light, the flashing light was activated for 5 s. If there was no approach within 5 s, the occasion to respond was removed and the individual was prompted to sample the stimulus. The prompt component was included to ensure that an individual’s lack of preference was not solely a function of unfamiliarity with the stimulus. For example, in prompting the light, the experimenter ensured that the individual was making eye contact with the light, and then activated the light for 5 s. A second probe was then provided; if an approach response occurred, 5 s of access to the stimulus was provided. If the participant did not respond in 5 s, the stimulus was removed and the next stimulus was presented. The responses used to measure preference of stimuli were approach and nonoccurrence. The data indicated that all participants differentially approached the assessment stimuli. Additionally, patterns of responding were idiosyncratic, meaning that there was no consistent between-child approach to any of the 16 stimuli. These results suggested a formal means of identifying reinforcers for individuals with profound multiple disabilities. Pace and colleagues also conducted a second study to determine the reinforcement value of the identified preferred and nonpreferred stimuli. The results of this study indicated that overall, the contingent use of preferred stimuli increased the occurrence of target behaviors relative to baseline and nonpreferred conditions. The current study will train teachers to assess the two aforementioned repertoires (i.e., controlled body movements and preferences), as well as assess basic access skills.
Review of Literature on Instructional Procedures

Early research involving persons with profound multiple disabilities was concerned primarily with determining whether operant procedures could change behavior in this population (Evans & Scotti, 1989). Researchers were not necessarily concerned with teaching useful skills, but rather with demonstrating that a principle of learning (i.e., positive reinforcement) could be used to change behavior in individuals with profound multiple disabilities. To evaluate the responsiveness of individuals to positive reinforcement paradigms, stimuli were provided contingently on simple behaviors such as lifting an arm or pressing a lever. Research on positive reinforcement applications began with Fuller’s (1949) initial report and represented the focus of behavioral research among persons with profound multiple disabilities throughout the 1960s and most of the 1970s. In the Fuller study, an individual with profound multiple disabilities was provided with sugar milk solution contingent upon raising his right arm to a vertical position. During baseline conditions, the rate of arm movement was less than one per minute and at the final session; the rate of arm movement was three per minute. The service providers who worked with this individual thought it “was impossible for this individual to learn anything.” According to them, he had not learned anything in the 18 years of his life. Yet, in only four experimental sessions, by using operant conditioning techniques, an addition was made to his behavior repertoire. Those who participated in or observed the experiment stated that if time permitted, other responses could be conditioned and discriminations learned. The outcomes of this study were influential in guiding future research in terms of teaching individuals with profound multiple disabilities. Overall,
early behavioral investigations suggested simple behaviors of persons with profound multiple disabilities could be changed to some degree through the contingent application of various stimuli.

Subsequent researchers began to investigate methods of teaching individuals with severe disabilities (not exclusively individuals with profound multiple disabilities) more important and meaningful skills. In the late 1970’s, researchers including Lou Brown (Brown et al., 1979) espoused and developed the “criterion of ultimate functioning” to select skills for instruction for students with severe disabilities. Practitioners began to consider whether skills were functional (i.e., meaningful and useful in daily life) and age appropriate (i.e., typical of same age peers who are nondisabled). Nearly all curricular models that followed (Browder, 1987; Falvey, 1989; Ford et al., 1989; Neel & Billingsley, 1989) shared two common characteristics: (a) the identification of life domains for curriculum planning (e.g., community, vocational, home, recreation) and (b) some type of prioritization process to select skills for an individual based on preference and functional use. Research on skill acquisition has also reflected this focus on functional skills. In a comprehensive review, Snell (1997) identified 124 studies demonstrating successful acquisition of functional skills of students with intellectual disabilities. Demonstration of functional skills acquisition included all major life domains, such as vocational, leisure, home community, communication, choice making, functional academics, and motor skills. Despite this large volume of research, few studies included participants with profound multiple disabilities.

Past and current researchers have investigated instructional methods, practices, and strategies involved in educating students with significant disabilities, and these have
encompassed entire textbooks (e.g., Cipani & Spooner, 1994; Westling & Fox, 2000). This large body of literature signifies the work of many investigators and practitioners; however, the portion of literature addressing the instructional methods specifically for individuals with profound multiple disabilities will be the focus here. One crucial difference in teaching procedures utilized with individuals with profound multiple disabilities, as differentiated from individuals with less severe disabilities, is the degree of precision required in assessment and instructional programming (Brown & York, 1974).

In general, most studies addressing instructional procedures for individuals with multiple profound disabilities follow an applied behavior analysis methodology, which requires (a) operationalizing behavior, (b) using procedures to promote and transfer stimulus control from teacher prompting to stimulus materials, (c) providing feedback, and (d) reinforcing correct responses (Alberto & Troutman, 2009). Another common feature of the investigations involving individuals with profound multiple disabilities is the use of a task analysis to break skills down into the steps required to complete a response chain (e.g., Gast & Winterling, 1992). The skills required and fostered by a task analysis are ideally suited for teachers of individuals with profound multiple disabilities. Task analysis requires precise delineation of skills within a particular curriculum area, the division of those skills into component parts, and the sequencing of those skills from simple to complex. According to Resnick, Wang, and Kaplan (1973), task analysis involves the development of hierarchies of learning objectives such that mastering objectives lower in the hierarchy facilitates learning of higher objectives. This involves a process of task analysis in which specific behavioral components are identified and prerequisites for each of these are determined. For example, Browder, Trela, and Jiminez
(2007) trained three middle school teachers to follow a task analysis to teach story-based literacy lessons to students with moderate to severe disabilities (the study did not include individuals with multiple profound disabilities). A multiple probe across participants design was used to examine the effects of training teachers to follow a task analysis on the number of steps correctly completed by teachers on the task analysis and the number of correctly and independently completed steps performed by students. The teachers were trained to follow a task analysis, to use systematic prompting for all steps in the task analysis, and to self-monitor adherence to the steps in the task analysis. Results indicated a relationship between teacher training and the number of task analysis steps followed, with a corresponding increase in student’s correct responding.

In addition to task analysis procedures, the use of response-prompting strategies has been the focus of considerable research, particularly for individuals with severe disabilities (including individuals with profound multiple disabilities, but not exclusively individuals with profound multiple disabilities) (Wolery et al., 1992). Procedures such as time delay (progressive and constant), systems of least prompts (increasing assistance), most-to-least prompting (decreasing assistance), simultaneous prompting, and graduated guidance have all been used and found to be effective in teaching individuals with severe disabilities. In time delay, the instructor gives immediate assistance for errorless responding, and then delays this prompt by a few seconds over teaching trials. In least intrusive prompts, the instructor uses graduated assistance (e.g. from a verbal direction, to presenting a model, to providing physical guidance) until the student makes the target response. Graduated guidance involves providing progressive physical assistance as needed. Several other authors have also provided comprehensive reviews that support
the effectiveness of these methods (Demchak, 1990; Schoen, 1986). An interesting finding is that these strategies, with the possible exception of graduated guidance, can be used effectively with both discrete and chained responses, suggesting the procedures are highly flexible. A related finding is that the same skills can be taught with different strategies, suggesting the strategies tend to be equally effective (Wolery & Schuster, 1997).

Although the above teaching procedures have been shown to be effective in teaching new skills, determining an empirically tenable system of how to teach new skills to individuals with profound multiple disabilities is difficult, particularly because delineating an appropriate method of how to teach individuals with profound multiple disabilities is commonly confounded due to varying degrees of visual, auditory, motor, and attending skills. What may be an effective procedure for teaching one student with profound multiple disabilities may not be appropriate for another; thus, teachers may need to try more than one instructional approach to determine which is most effective with an individual. The current study will train teachers to use certain instructional procedures (including those described above) based on assessment results, the individual’s skill level, and specific circumstances.

It is difficult to determine the degree of disability among participants in previous research because of insufficient description of participants. Also, in some cases, individuals with profound multiple disabilities were part of a larger group of experimental participants that included individuals with less serious disabilities, and results were not described with sufficient detail to allow an analysis of how the persons with profound multiple disabilities responded. Table 1 provides those published
### Table 1

Table of Studies Including Individuals with Profound Multiple Disabilities

<table>
<thead>
<tr>
<th>Study</th>
<th>Number of Participants with PMD</th>
<th>Target Behaviors</th>
<th>Independent Variable/ Instructional Strategy used</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correa, Poulson, and Salzberg (1984)</td>
<td>2</td>
<td>Reaching and grasping behavior</td>
<td>Graduated guidance and contingent stimulus application</td>
<td>Participants increased reaching and grasping behavior of various noise-making toys, although the increase was very slight with one participant</td>
</tr>
<tr>
<td>Jones, Favell, Lattimore, and Risley (1984)</td>
<td>13</td>
<td>Interaction with infant toys</td>
<td>Securing toy holders in specific positions on participant’s wheelchairs</td>
<td>11 of 13 participants increased their interaction relative to toys simply being placed (unsecurely) on the wheelchair or having no toys available. It is unclear whether the participants learned new skills; it is possible that interaction with the toys existed in participants’ repertoires and increased because the toy remained available</td>
</tr>
<tr>
<td>Meehan, Mineo, and Lyon (1985)</td>
<td>1</td>
<td>Activating micro switch</td>
<td>Graduated guidance</td>
<td>Micro switch activations increased over time</td>
</tr>
<tr>
<td>Reid and Hurlbut (1977)</td>
<td>4</td>
<td>Use of communication boards</td>
<td>Fading physical prompts (did not exactly follow most-to-least prompting steps)</td>
<td>Some use of communication boards, but with some sort of physical prompt required (no independent responses)</td>
</tr>
<tr>
<td>Spiegel-McGill, Bambara, Shores, and Fox (1984)</td>
<td>2</td>
<td>Head orientation, vocalizations, and gestures</td>
<td>Putting participants in close proximity to one another</td>
<td>Target behaviors increased when participants were put in close proximity to one another. However, given the definitions used, it’s not clear to what extent participants were actually communicating in terms of passing or receiving information.</td>
</tr>
</tbody>
</table>

(table continues)
<table>
<thead>
<tr>
<th>Authors</th>
<th>Study Number</th>
<th>Topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sternberg, Pegnatore, and Hill (1983)</td>
<td>2</td>
<td>Communication behavior (Smiling)</td>
<td>Increase in smiling was exhibited by participants; however, the relationship of smiling may not have been a means of communication. The increased smiling could be interpreted as an increase in responsiveness to a change in the environment, but may not have been representative of expressing a want or need.</td>
</tr>
<tr>
<td>Ulicny, Thompson, Favell, and Thompson (1985)</td>
<td>1</td>
<td>Self-Feeding</td>
<td>Eating skills initially improved; however improvement reversed with when researchers discontinued their teaching and turned it back over to routine caregivers. End results revealed that participant did not learn how to feed herself independently. Difficult to analyze results, because of weak design (A-B-C Design)</td>
</tr>
</tbody>
</table>

Investigations for which the results can be analyzed specifically with regard to participants who have profound multiple disabilities.

**Review of Literature on Teacher Training**

Practicing teachers often find their knowledge and skills are out of date and sometimes not congruent with current best practice, even just a few years out of their pre-service programs. Additionally, teachers of students with profound multiple disabilities may never have acquired the requisite skills in pre-service training because, as described above, effective practices are unclear and lacking validation evidence. Special education and related services personnel, especially those working with low incidence populations
or in rural areas, are often isolated from their colleagues, have little opportunity to interact with peers or experts, and have limited access to training to update specialized knowledge and skills (Cooley & Yovanoff, 1996). These factors create stress and burnout in teachers and lead to high attrition rates in many school districts (Frank & McKenzie, 1993). Special educators have cited inadequate in-service opportunities as one factor that increases the likelihood of leaving a teaching position (Westling & Whitten, 1996). Thus, teachers in special education are in need of in-service training opportunities to stay informed of and engaged with new ideas and evidence based practices. In-service training is one way to update the knowledge and skills of teachers.

Researchers have demonstrated several effective techniques for training teachers and staff who work with individuals with disabilities. Specifically, multi component intervention packages (Reid & Parsons, 1995; Shore, Iwata, Vollmer, Lerman, & Zarcone, 1995) and self-management strategies (Belfiore & Browder, 1992; Doerner, Miltenberger, & Bakkan, 1989; Suda & Miltenberger, 1993) have been effective in training teachers and direct service staff to work with individuals with disabilities. Multi component training packages generally consist of a brief in-service lecture or presentation, modeling and role playing, and ongoing feedback on teachers’ performance. Multi component training packages have been used to teach teachers and staff many new skills, such as the use of decision rules (Belfiore & Browder, 1992), reinforcement procedures (Doerner et al., 1989), prompting strategies (Suda & Miltenberger, 1993), behavior management (Davis & Russell, 1990), choice making (Salmento & Bambara, 2000), and various academic instructional skills (e.g., Browder et al., 2007).
A meta-analysis related to in-service teacher training conducted by Oorsouw, Embregts, Bosman, and Jahoda (2009) signified the specific ingredients (i.e., goals, format, and techniques) for in-service training that are related to improvements in teacher behavior and/or skills. Results of 55 reviewed studies revealed: (a) the combination of in-service training with on-the-job coaching was the most powerful format; that is, this type of format yielded the most significant changes in teacher behavior (b) training packages containing multiple techniques (i.e., in-service lectures or presentation of information, modeling, and role playing) produced the greater changes in teacher behavior and (c) training packages that included verbal feedback on-the-job, as well as praise and correction produced greater improvements in teacher behavior. The current study will incorporate the training components found effective; that is, training in the current study will include in-service training with on-the-job coaching, verbal feedback, praise, and correction. This multi-component training package will include live in-service trainings, video modeling and role playing of assessment and instructional procedures, on-the-job coaching, and feedback regarding teachers’ performance.

Training Prior to Implementation

Researchers have demonstrated that training outside the classroom with sufficient intensity and practice prior to implementing an intervention or assessment may result in adequate acquisition (Iwata et al., 2000; Roscoe & Fisher, 2008) and maintenance of these skills (Lerman, Tetreault, Hovanetz, Strobel, & Garro, 2008; Lerman, Vorndran, Addison, & Kuhn, 2004). In some of these studies, individual feedback after initial training was minimal. Roscoe and Fisher provided training on a relatively simple skill
(conducting preference assessments). However, in other studies, participants learned a variety of more complex skills that required differential responding to student responses (e.g., functional analysis procedures; time out procedures), and applied different instruction or behavior management skills based on student responses. In two of these studies (Iwata et al., 2000; Roscoe & Fisher, 2008), the skills were acquired in the training setting, but generalization to the applied setting was not assessed. In the other studies, participants acquired the skills during brief, intensive interventions in the training setting and generalized these skills to the applied setting. Maintenance of these skills up to six months after training was demonstrated for most participants in Lerman and colleague’s (2008) study.

While these studies evaluated different training packages and various target skills, they all included features that would likely enhance generalization from the training setting to the classroom. For example, Lerman et al. (2008) included common stimuli in the training setting and classroom setting, and provided numerous practice opportunities with performance feedback in the training setting. Moore and Fisher (2007) evaluated the effectiveness of several versions of video modeling and didactic training (reading a manual) on conducting a functional analysis. They found that video modeling that included a more complete set of exemplars was more effective in helping the participants acquire the skills than less complete video models and didactic training. Generalization of these skills to a clinical setting was demonstrated for all participants. The studies that include intensive training suggest that with attention to features that may enhance generalization, training outside the classroom may result in generalization and maintenance of skills.
Some components of the teacher training package in the current study will take place outside of the classroom (i.e., live presentation, viewing video models, and role-playing) and other components will take place in the classroom (e.g., on-the-job coaching, performance feedback). For training components that take place outside of the classroom, features demonstrated in the literature to enhance generalization to the classroom will be used. That is, materials used in the video models will also be used in the classroom setting and numerous opportunities to practice assessment and instructional strategies with feedback provided on performance will be provided.

**Purpose Statement and Research Questions**

From the review of the literature, it is evident that additional research is needed involving individuals with profound multiple disabilities, particularly in the area of training teachers to conduct assessments and use the results of the assessment to guide instruction. The purpose of the current study was to determine if an in-service training program was effective in increasing the skills of teachers in assessing and instructing students with profound multiple disabilities. This study addressed the following research questions:

1. Will a multi-component teacher training package (live presentations, video modeling, role playing, on-the-job coaching, and feedback based on performance) affect the percentage of correct implementation of assessment steps for teachers of students with profound multiple disabilities?
2. To what extent does an in-service teacher training program affect the percentage of correct implementation of instructional steps for teachers of students with profound multiple disabilities?

3. To what extent does an in-service teacher training program affect the percentage of independent student responses?

4. To what extent do teachers view the in-service teacher training program as socially valid (i.e., acceptability of training)?
CHAPTER III

METHODS: PHASE 1 (ASSESSMENT)

Participants

Teachers

A total of seven female teachers participated in Phase 1 of the study. Table 2 displays teacher participants’ demographic information, including (a) endorsement area (mild/moderate or severe), (b) education level (bachelors or masters), (c) number of years teaching, (d) number of years working with students with profound multiple disabilities (including other experiences working with this population outside of classroom teaching), (e) the type of district each participant works in (rural or suburban), (f) the type of school providing educational services (inclusive school, meaning that general education students also attend this school, or all special education school, meaning that only special education student attend this school), (g) the type of classroom in which the teacher works (medically fragile unit, meaning all students in classroom are in wheelchairs and are considered to have profound multiple disabilities or severe unit where there are a variety of disabilities represented in the class), (g) assessments that teachers have experience conducting for students with profound multiple disabilities and (h) how teachers determine IEP goals and objectives (i.e., what teacher does to determine students present level of performance and/or write IEP goals for student with profound multiple disabilities).

The investigator of the study contacted numerous Special Education Directors across Eastern Utah to determine school districts that were interested in participating in
the study. Each Special Education Director who was interested in participating and the investigator determined teachers within the school districts who met the eligibility criteria to participate in the study. Teachers were required to meet the following inclusion criteria: (a) teach in a K-6 class where at least one student in his/her class had profound multiple disabilities who met the student eligibility criteria (see student selection criteria below), (b) indicate license to teach special education in Utah, (c) indicate plans to continue teaching in his/her classroom for the remainder of the school year, (d) agree to attend training meetings, and (e) agree to assess his/her student with multiple profound disabilities based on the information presented at training meetings. Due primarily to the low incidence of students with profound multiple disabilities, teaching experience or number of years in which a teacher had taught was not specified nor included in the eligibility criteria. At the onset of the study, ten special education teachers in five school districts were identified as meeting all inclusion criteria and were selected to participate in Phase 1 of the study. Three teachers did not complete the study due to various reasons, including the inability to get student consent forms returned, lack of time to attend training and/or inability to be absent from classroom to attend training, and illness.

Table 2

Demographic Information for Teacher Participants

<table>
<thead>
<tr>
<th>Teacher 1</th>
<th>Endorsement Area/Level</th>
<th>Number of Years Teaching</th>
<th>Number of years working with Individuals with PMD</th>
<th>District Type</th>
<th>School Type</th>
<th>Classroom Type</th>
<th>Assessments/ How to determine IEP goals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Severe B.S.</td>
<td>4 years</td>
<td>4 years as teacher, 6 previous years in adult services</td>
<td>Rural</td>
<td>All SPED school</td>
<td>Medically Fragile Unit- 10 students with PMD, serves students K-Post High</td>
<td>None/Uses IEP goals from previous year (student typically doesn’t master goals), or uses other goals that she’s used in the past for other students with PMD</td>
</tr>
<tr>
<td>Teacher 2</td>
<td>Severe</td>
<td>2 years</td>
<td>2 years as teacher, 4 previous years as paraprofessional</td>
<td>Rural</td>
<td>Inclusive</td>
<td>Self-Contained Unit-1 student w/PMD in class, serves students K-5</td>
<td>UAA, reads through assessments conducted by school psych, writes goals she thinks student can reach, but no present level of performance measure</td>
</tr>
<tr>
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<td>----------------------------------------------------------</td>
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<td>-----------</td>
<td>---------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Teacher 3</td>
<td>Mild/Moderate</td>
<td>3 years</td>
<td>2 years as teacher, 4 previous years as paraprofessional</td>
<td>Rural</td>
<td>All SPED school</td>
<td>Self-Contained Unit-1 student w/PMD in class, serves student K-Post High</td>
<td>Couldn’t remember the name of assessment she uses, stated that it doesn’t really provide useful information anyway, difficulty determining IEP goals based on assessment results, used same goals from previous teacher</td>
</tr>
<tr>
<td>Teacher 4</td>
<td>Severe</td>
<td>9 years</td>
<td>4 years as classroom teacher, 3 years substitute teaching, 8 years paraprofessional, 3 years in adult services</td>
<td>Suburban</td>
<td>All SPED school</td>
<td>Medically Fragile Unit-12 students with PMD, serves students K-4</td>
<td>None/ Selects pre-written goals on Goal View for IEP goals</td>
</tr>
<tr>
<td>Teacher 5</td>
<td>Mild/Moderate</td>
<td>1st year teaching</td>
<td>None</td>
<td>Suburban</td>
<td>All SPED school</td>
<td>Self-Contained Unit-1 student w/PMD in class, serves students K-4</td>
<td>Vineland, Brigance, Woodcock Johnson, UAA/ Had not ever written goals for student with PMD</td>
</tr>
<tr>
<td>Teacher 6</td>
<td>Severe</td>
<td>22 years</td>
<td>18 years</td>
<td>Suburban</td>
<td>All SPED school</td>
<td>Wheelchair Unit-8 students with PMD (all in wheelchairs), serves students K-4</td>
<td>UAA and Vineland/ Uses results from Vineland to write IEP goals</td>
</tr>
<tr>
<td>Teacher 7</td>
<td>Mild/Moderate</td>
<td>5 years</td>
<td>2 years</td>
<td>Suburban</td>
<td>All SPED school</td>
<td>Self-Contained Unit-2 students w/PMD in class, serves student K-4</td>
<td>Most familiar with mild/moderate assessments, such as Woodcock Johnson, but does not use this for student w/PMD, IEP goals are selected based on what OT tells teacher to write as goals</td>
</tr>
</tbody>
</table>

**Students**

With the investigator’s assistance, each of the seven teacher participants recruited one student from their classroom to participate in the study. Students were eligible to
participate if they met the following selection criteria: (a) primary diagnosis of multiple disabilities given criteria established by the Utah State Office of Education, (b) IQ score that characterized the student as having a severe intellectual disability (IQ score of lower than 39), (c) consistent attendance, and (d) recipient of special education services in a K-6 grade classroom. Although the student participant age/grade range was relatively wide, it allowed for selection of sufficient numbers of students with similar skill levels. Additionally, assessment and instruction of access skills was appropriate across the selected age/grade ranges. Because the population of individuals with profound multiple disabilities is quite heterogeneous, the investigator met each student individually before the study began to determine that he/she met the criteria for participation and exhibited characteristics previously mentioned (e.g., neuromuscular dysfunction, limited control over motor movements, etc.) as typical of individuals with profound multiple disabilities. Table 3 presents demographic information for student participants, including age, grade, gender, disability diagnosis, IQ, and other relevant medical information.

**Settings and Materials**

The investigator provided training to each teacher individually in a room in each teacher’s school. A laptop computer was used for all teachers to view the video models, except Teacher 4, who had a hearing impairment. A large TV and DVD player was used to view video models for Teacher 4, which allowed for greater control of volume levels. Assessment observations were also conducted by the investigator and took place in the teacher’s special education classrooms or nearby rooms within the school.
### Demographic Information for Student Participants

<table>
<thead>
<tr>
<th>Student</th>
<th>Gender</th>
<th>Age</th>
<th>Grade</th>
<th>Disability Classification</th>
<th>Assessment Scores</th>
<th>Medical Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student 1</td>
<td>Female</td>
<td>6</td>
<td>1st</td>
<td>Multiple Disabilities</td>
<td>No current testing (last testing was completed when student was 3 years old).</td>
<td>Seizure disorder, medication for seizures, G-Tube for feeding, Legally blind</td>
</tr>
<tr>
<td>Student 2</td>
<td>Female</td>
<td>7</td>
<td>1st</td>
<td>Multiple Disabilities</td>
<td>None</td>
<td>Seizure disorder, medication for seizures, G-Tube for feeding, good hearing and vision, had swine flu during study</td>
</tr>
<tr>
<td>Student 3</td>
<td>Male</td>
<td>6</td>
<td>1st</td>
<td>Multiple Disabilities</td>
<td>Estimated score of 19 on Slosson Intelligence Test</td>
<td>Seizure disorder, G-Tube for feeding, can eat some solid foods, good hearing, some vision problems, engages in self-injurious behavior (head hitting, hand biting), multiple ear infections throughout study</td>
</tr>
<tr>
<td>Student 5</td>
<td>Male</td>
<td>9</td>
<td>3rd</td>
<td>Multiple Disabilities</td>
<td>None</td>
<td>Good hearing and vision, eats solid foods, some mobility with walker, severe food allergies</td>
</tr>
<tr>
<td>-----------</td>
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<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Student 6</td>
<td>Male</td>
<td>10</td>
<td>4th</td>
<td>Multiple Disabilities</td>
<td>Estimated score of 29 on Slosson Intelligence Test, Mental age of 2 years and 6 months</td>
<td>Hydrocephaly, shunt, seizure disorder, medication for seizures, good hearing and vision, low muscle tone in lower extremities, severe food allergies, G-Tube for feeding, eats some solid foods</td>
</tr>
<tr>
<td>Student 7</td>
<td>Female</td>
<td>8</td>
<td>2nd</td>
<td>Multiple Disabilities</td>
<td>None</td>
<td>Shunt, seizure disorder, medication for seizures, good hearing and vision, eats solid foods</td>
</tr>
</tbody>
</table>

**Assessment Training**

Training was conducted on the following three assessments: (a) preference assessment, (b) body movement assessment, and (c) access skill assessment. Training was provided at a time that was convenient for each teacher. The amount of training time required was variable across participants, depending on specific circumstances, including the amount of time teachers had available for training during each session, the number of questions teachers asked during training, and the amount of time necessary for role playing before teachers met criteria. Across the seven teacher participants, mean time for preference assessment training was 88.6 min (range: 60 - 145 min). Mean time for controlled body movement assessment training was 35 min (range: 20 – 60 min). Mean time for access skill assessment training was 98.6 min (range 75 – 120 min). Table 4 summarizes assessment training details for each teacher participant.
<table>
<thead>
<tr>
<th>Teacher</th>
<th>Time of Day Training was Conducted</th>
<th>Where Training was Conducted</th>
<th>Number of Training Hours/Days for Preference Assessment</th>
<th>Number of Training Hours/Days for Body Movement Assessment</th>
<th>Number of Training Hours/Days for Access Skill Assessment</th>
<th>Total Training Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 1</td>
<td>During School Hours (During Prep-time)</td>
<td>School Conference Room</td>
<td>Live Presentation- (2) 25 min sessions for 2 consecutive days</td>
<td>Live Presentation- (1) 20 min session</td>
<td>Live Presentation- (2) 35 min sessions for 2 consecutive days</td>
<td>215 min (3 hours, 35 min)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Role Playing- 25 additional min on day 2 of live presentation</td>
<td>Role Playing- 10 additional min after live presentation</td>
<td>Role Playing- 40 min on day 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total Time: 75 min</td>
<td>Total Time: 30 min</td>
<td>Total Time: 110 min</td>
<td></td>
</tr>
<tr>
<td>Teacher 2</td>
<td>During School Hours (During Prep-time)</td>
<td>School Conference Room</td>
<td>Live Presentation- (2) 30 min sessions for 2 consecutive days</td>
<td>Live Presentation- (1) 15 min session</td>
<td>Live Presentation- (1) 60 min session</td>
<td>190 min (3 hours, 10 min)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Role Playing- 15 additional min on day 2 of live presentation</td>
<td>Role Playing- 10 additional min after live presentation</td>
<td>Role Playing- 30 min on day 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total Time: 75 min</td>
<td>Total Time: 25 min</td>
<td>Total Time: 90 min</td>
<td></td>
</tr>
<tr>
<td>Teacher 3</td>
<td>After School Hours</td>
<td>Classroom</td>
<td>Live Presentation- (1) 65 min session</td>
<td>Live Presentation- (1) 25 min session</td>
<td>Live Presentation- (1) 70 min session</td>
<td>215 min (3 hours, 35 min)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Role Playing- 20 additional min on day 1 of live presentation</td>
<td>Role Playing- 15 additional min after live presentation</td>
<td>Role Playing- 20 min on day 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total Time: 85 min</td>
<td>Total Time: 40 min</td>
<td>Total Time: 90 min</td>
<td></td>
</tr>
<tr>
<td>Teacher 4</td>
<td>During School Hours</td>
<td>School Faculty Room</td>
<td>Live Presentation- (3) 35 min sessions for 3 days (break between day 2 and 3)</td>
<td>Live Presentation- (1) 40 min session</td>
<td>Live Presentation- (3) 30 min sessions for 3 consecutive days</td>
<td>320 min (5 hours, 20 min)</td>
</tr>
</tbody>
</table>
### Assessment Observations

Assessment observations were also conducted by the investigator and took place in the teacher’s special education classrooms or nearby rooms within the school. Teacher
conducted the assessments in the school’s conference room which contained a large table and about ten chairs, and teachers 4, 5, 6, and 7 conducted assessments in their school’s “time out” rooms, which were not being used at the time of assessment, and contained a small table and 1 chair. Teachers 1 and 3 conducted assessment in their classrooms during a time when all other students were not present. In all instances, only the participating teacher, student, and the investigator were present during assessment. Given the vast differences in communication modalities, alertness to environmental stimuli, and other varying characteristics that are evident in individuals with profound multiple disabilities, the teachers worked with their students in a controlled environment to increase the likelihood of a reliable assessment. Performance feedback was provided to teachers after each assessment had been conducted, and was provided in the same setting in which the assessment was performed.

Dependent Variables

Assessment Checklists

The primary dependent variable was the percentage of assessment steps correctly implemented by the teacher on three assessments: (a) preference assessment, (b) controlled body movement assessment, and (c) access skill assessment. The primary investigator was present for direct observations of teachers conducting assessments, and used the assessment checklists to score each teacher’s performance. See Appendices A-C for assessment checklists (Appendix A: Preference Assessment Checklist, Appendix B: Controlled Body Movement Assessment Checklist, and Appendix C: Access Skill Assessment Checklist). Teachers’ performance was measured as the percentage of steps
correctly implemented on each of the three assessments. If the teacher completed a step independently and correctly, with no prompting, the step was coded as an “I.” If the teacher completed a step, but did not meet the criteria for correct implementation, the step was coded with an “E.” If the teacher did not perform a step, the step was be marked with an “O.” If the teacher omitted a step or asked a question during the assessment, the investigator provided a prompt and/or answered the question; however, that step was marked as an “O” in order to keep the checklists used in baseline and intervention phases consistent.

Reliability of Dependent Measures

All assessment sessions (100% of baseline and post-training sessions across all participants) were video recorded for purposes of obtaining interobserver agreement (IOA). IOA for the instructional checklists were obtained by having a second trained observer view videotapes and independently score assessment sessions. Coding of each step was compared for exact agreement and interobserver agreement was computed as agreements divided by total number of steps multiplied by 100%. To facilitate reliable data collection, the criteria for correct performance of each step was operationalized as shown in Appendices D-F (Appendix D: Preference Assessment Checklist, Appendix E: Controlled Body Movement Assessment, and Appendix F: Access Skill Assessment). The interobserver was trained by the primary investigator and was required to have at least 80% agreement across three sessions with primary investigator before training of the interobserver was completed.
Data Collection Procedures

Measurement of correct implementation of assessment procedures took place at two points in time; before training was provided (baseline) and after training was provided (post training). Teachers were directly observed assessing their student with profound multiple disabilities on the three assessments.

Baseline. Data collection for baseline sessions took place separately for each of the three assessments. For preference assessment baseline sessions, the teacher was given the preference assessment data sheets (Appendices H and I) and access to a bin of potential reinforcers including items such as balls, light flashers, cause and effect toys, etc. The teacher was instructed to demonstrate how she typically identifies preferences or items that the student likes. More specifically, the teacher was instructed to demonstrate how she determines preferences for eight items (could be items from the bin or other items from the classroom). For controlled body movement baseline sessions, each teacher was given the body movement checklist (Appendix J), and was asked to demonstrate how she typically determines what body movements (if any) the student can reliably use. In other words, the teacher was asked to demonstrate how she assessed the body movements that the student can use on a consistent and reliable basis. Teachers were told they could use any materials that were typically employed for assessing body movements. For access skill baseline sessions, teachers were given the access skill data sheet (Appendix K) and a bin with materials that could be used to assess the 20 access skills (e.g., auditory stimuli, visual stimuli, books, items for grasping, etc.) No training was provided on how to conduct these three assessments. If teachers asked questions related to methods of conducting the assessments during baseline sessions, the investigator instructed teachers
to perform the task as she normally does in her classroom. If the teacher did not typically conduct this type of assessment and/or did not know how to perform this type of assessment, the teacher was instructed to state this. The percentage of correctly implemented assessment steps was recorded using the checklists in Appendices A-C.

**Post training.** The investigator used the same checklists as in baseline to measure the percentage of correctly implemented assessment steps after the assessment training occurred.

**Inter-rater Reliability on Assessment Outcomes**

In order to measure the accuracy of the outcomes of the assessments, the primary investigator also scored each assessment using the same data sheet as the teacher. The two data sheets were compared to determine the percentage of exact agreement across observers on 100% of assessment sessions.

**Independent Variable**

The independent variable was the multi component training package that included: (a) a live presentation on the how to assess characteristics of individuals with profound multiple disabilities, including single stimulus preference assessment, controlled body movement assessment, and basic access skills assessment; (b) video models of how to assess students on these three areas; (c) role playing assessment procedures in the training setting; and (d) feedback provided by the investigator after assessment sessions.
**Live Presentations**

Each teacher met with the investigator and received training in a one-on-one format. Live presentations on all three assessments were interactive; i.e., teachers were periodically asked questions about the content during presentations, were asked to provide specific information regarding their individual student, and were asked how to individualize assessments specifically for their student (e.g., asked what specific materials should be used in assessments that are meaningful and functional for their student). See Appendices L-N for specific information provided to each participant (Appendix L: script for preference assessment training, Appendix M: script for controlled body movement assessment training, and Appendix N: script for access skill assessment training). Teachers were trained to conduct a single stimulus preference assessment, with procedures similar to those used in the Pace et al. 1985 study. The procedures for the controlled body movement assessment were developed by the primary investigator and were adapted from the Alberta Infant Motor Scales (Piper et al., 1992). The procedures for the access skill assessment were also developed by the investigator, and teachers were trained to conduct individual assessment of 20 access skills. The list of access skills (Appendix G) is a revised version of the access skills that were identified by teachers and the Utah State Office of Education (Carver & Timothy, 2009). The initial list of access skills contained 35 skills; however, for purposes of this study, only 20 were used. The 20 access skills were selected by the investigator and the participating teachers based on relevance of the skills for students with profound multiple disabilities. The list of 35 access skills was presented to all participating teachers, and they were asked to select all skills on the list which were important and obtainable for students with profound multiple disabilities.
disabilities. Teachers were trained to provide the access skill assessment in an individualized manner. They used materials and set up assessment scenarios that they judged meaningful to each specific student. For example, for Access Skill 4, which is to associate activities with environmental cues, teachers were trained to select both activities (e.g., lunch time) and environmental cues (e.g., tube for tube feeding) that were functional and typically found in their student’s routine schedule to assess. Therefore, the procedures and materials for the access skill assessment were slightly different for each teacher, but individualized for each student. The purpose of this assessment was to provide very specific and individualized information regarding students’ present levels of performance to use later for instructional purposes (in Phase 2).

**Video Models**

The videos included a model teacher conducting the three assessments on a student with profound multiple disabilities. The teacher in the videos was an undergraduate student entering the field of special education. The investigator trained the teacher in the video models extensively before the video models were developed, and the investigator was present while video models were being recorded to provide assistance to the model teacher. Teachers were instructed to pay specific attention to the model teacher’s behavior as well as the student’s behavior in response to the assessment. Data sheets for each respective assessment were given to teachers, and they were instructed to take data on the student’s performance while viewing the video models. This provided training on how to collect data for each assessment. The investigator was present while teachers viewed the video models to answer questions, provide feedback on practice data.
collection, and re-play clips for teachers if necessary. The lengths of the videos were as follows: preference assessment (19 min), controlled body movement assessment (4 min), and access skill assessment (14 min).

**Role Playing**

After completing the live training and viewing the video models, teachers engaged in role-playing of each assessment. Teachers were asked to perform each assessment, while the investigator portrayed the actions of the student. The investigator collected data on the teachers’ performance using the assessment checklists, and teachers were required to complete 80% of the steps correctly during role-play sessions. Levels of mastery criteria in previous literature relating to role-playing varied depending on the skill being taught. An 80% criterion was set for the current study because performance feedback (described below) was also provided after role playing. That is, after role playing was completed, additional training components (performance feedback) was provided. If the teacher did not complete 80% of the steps correctly, the investigator provided specific feedback regarding the areas in which the teacher needed to improve, and the teacher was asked to role-play the assessment procedures again. If the teacher completed 80% of the steps correctly, the investigator provided verbal praise.

**Performance Feedback**

The investigator provided verbal feedback on teachers’ performance after each assessment was complete. Feedback was provided immediately after teachers finished each assessment, with the exception of Teacher 3 on the preference assessment.
Performance feedback was provided to her the next day because of scheduling issues on the day she conducted the preference assessment with her student. Feedback included describing specific behaviors that the teachers performed correctly as well as behavior needing improvement. Because the assessments were only conducted at two points in time (baseline and post-training), teachers were not asked to re-assess their student in order to incorporate the feedback; however, teachers were instructed to write down the feedback they received for future use in conducting these assessments.

**Training Fidelity**

A trained observer assessed implementation fidelity of the training package using a checklist of targeted components (e.g., providing the live presentation, showing video models of each assessment, implementing role playing, etc.). See Appendix O for the assessment training fidelity checklist. The observer assessed implementation fidelity by completing the checklist on 71% of the training sessions (5/7 preference assessment trainings, 5/7 controlled body movement assessment trainings, 5/7 access skill assessment trainings). The number of components completed accurately was divided by the total number of components, and multiplied by 100% for the measure of implementation fidelity.
Participants and Settings

Four of the teacher/student pairs who participated in Phase 1 also participated in Phase 2. The teacher/student pairs were randomly selected by the investigator, and included Teachers 1, 2, 4, and 6. For purposes of this study, teachers will be identified in the following manner: Teacher 1: Ms. Parker, Teacher 2: Ms. Green, Teacher 4: Ms. Lane, and Teacher 6: Ms. Brown. Each of the four teachers taught at different schools and continued to work with the same student as in Phase 1. The settings for instructional training and instructional observations were the same as Phase 1. That is, in-service training on instructional procedures and instructional observations were provided by the investigator and occurred in the teacher’s school (i.e., in the classroom or other nearby room) at a time convenient for each participating teacher. Across the four teacher participants, mean training time on instructional strategies was 63.8 min (range: 45 – 95 min). See Table 5 for specific training information for each teacher participant.

Dependent Variables

Data were collected on both teacher and student behaviors. The primary dependent variable was the percentage of instructional steps correctly implemented by the teacher, and the secondary dependent variable was the percentage of independent student responses.
### Table 5

**Instructional Training Details for Teacher Participants**

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Time of Day Training was Conducted</th>
<th>Where Training was Conducted</th>
<th>Number of Training Hours/Days for Instructional Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms. Brown (Teacher 6 in Phase 1)</td>
<td>Before School Hours</td>
<td>Classroom</td>
<td>Live Presentation- (1) 25 min session Role Playing- 20 additional min after live presentation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total Time: 45 min</td>
</tr>
<tr>
<td>Ms. Parker (Teacher 1 in Phase 1)</td>
<td>During School Hours (During Prep-time)</td>
<td>School Conference Room</td>
<td>Live Presentation- (1) 30 min session Role Playing- 30 additional min after live presentation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total Time: 60 min</td>
</tr>
<tr>
<td>Ms. Green (Teacher 2 in Phase 1)</td>
<td>During School Hours (During Prep-Time)</td>
<td>School Conference Room</td>
<td>Live Presentation- (1) 35 min session Role Playing- 25 minutes on day after live presentation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total Time: 55 min</td>
</tr>
<tr>
<td>Ms. Lane (Teacher 4 in Phase 1)</td>
<td>During School Hours</td>
<td>School Faculty Room</td>
<td>Live Presentation- (1) 55 min session Role Playing- 40 additional min on day after live training</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total Time: 95 min</td>
</tr>
</tbody>
</table>

### Instructional Checklist

The primary dependent variable was the percentage of instructional steps correctly implemented by the teacher on one of four instructional strategies: (a) time delay, (b) least-to-most prompting, (c) most-to-least prompting, and (d) graduated guidance. Although all four instructional strategies were available for training, only three were used in this study. Graduate guidance was not used, because the access skills being taught and/or the specific teaching environment was not conducive to this strategy. The
primary investigator was present for direct observations of teachers providing instruction on access skills, and used the instructional checklists to score each teacher’s performance. See Appendices P-S for instructional checklists (Appendix P: Time Delay Checklist, Appendix Q: Least-to-Most Prompting Checklist, and Appendix R: Most-to-Least Prompting Checklist, and Appendix S: Graduated Guidance Checklist). Teacher’s performance was measured as the percentage of steps correctly implemented on one of the instructional strategies. Each instructional step received one of three codes, which were the same as in the assessment checklist. That is, if the teacher completed a step independently and correctly, with no prompting, the step was coded as an “I.” If the teacher completed a step, but did not meet the criteria for correct implementation, the step was coded with an “E.” If the teacher did not perform a step, the step was marked with an “O.” If the teacher omitted a step or asked a question during an observation, the investigator provided a prompt and/or answered the question; however, that step was marked as an “O” in order to keep the checklists used in baseline and instructional observation phases consistent.

The instructional strategy that each teacher was trained to use was selected by the investigator. After the access skill assessment was complete, the teacher was asked to select at least five access skills from the list of non-mastered access skills that aligned with IEP goals and objectives. From the five non-mastered access skills that the teacher selected, the investigator selected three access skills that could be taught to the student using the same instructional technique. Once the three access skills were determined, each teacher was asked to prioritize the order of importance in acquiring each skill. Teachers were asked to select the access skill that was most important for the student to
learn first, then second, and then third. The reason for prioritizing the skills was in the instance that not all three access skills could be addressed due to time constraints. Three access skills were targeted for instruction in order to assess generalization across access skills. That is, each teacher was trained to use a specific instructional strategy, and was asked to teach each access skill using the selected instructional strategy for all three access skills (if time permitted). See Table 6 for specific access skills and instructional strategies that were implemented by each teacher participant.

Table 6

*Table of Instructional Strategies and Access Skills for Teacher Participants*

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Instructional strategy</th>
<th>Access skills (In order of teacher assigned priority)</th>
</tr>
</thead>
</table>
| Ms. Brown | Least-to-Most Prompting | Access Skill #7: Tolerate Interaction with Others  
Access Skill #4: Associate Activities with Environmental Cues  
Access Skill #5: Initiate Requests |
| Ms. Parker | Most-to-Least Prompting | Access Skill #11: Manipulate Objects  
Access Skill #4: Associate Activities with Environmental Cues  
Access Skill #9: Initiate Requests |
| Ms. Green | Time Delay | Access Skill #9: Initiate Requests  
Access Skill #11: Manipulate Objects  
Access Skill #12: Release Objects |
| Ms. Lane | Time Delay | Access Skill #4: Associate Activities with Environmental Cues  
Access Skill #3: Demonstrate Cause and Effect  
Access Skill #6: Maintain Eye Contact |
Correct and Independent Student Responding

To investigate changes in student behaviors in response to each teacher’s use of the instructional training, student’s independent and correct responses were measured. Student behavior was measured to ensure that teacher instruction was effective. Although teachers may implement instructional steps correctly, student behavior must also change in order for instruction to be considered meaningful. The teacher and the investigator scored students responses during baseline sessions and instructional sessions using the given data sheet for each instructional strategy. The data recorded varied with the instructional strategy; however, the one code that remained consistent across all instructional strategies was I, (independent and correct response). The following codes were used with each instructional strategy: for time delay a PP (physical prompt), and for least-to-most and most-to-least prompting a VP (verbal prompt), G (gestural prompt), M (Model prompt), and PP (physical prompt). (See Appendices T-V; Appendix T: Time Delay Data Sheet, U: Least-to-Most Prompting Data Sheet, and V: Most-to-Least Prompting Data Sheet).

Reliability of Dependent Measures

Interobserver agreement (IOA) for both teacher and student checklists was obtained by having a second trained observer view videotaped instructional sessions and independently score a subset of at least 33% of the instructional sessions (across baseline, training, and follow-up phases). IOA for the checklists was obtained by having a second trained observer view videotapes and independently score instructional sessions. Coding of each step was compared for exact agreement and interobserver agreement was
computed as agreements divided by total number of steps multiplied by 100%. To facilitate reliable data collection, the criteria for correct performance of each step was operationalized as shown in Appendices W-Y (Appendix W: Operationalized Definitions for Time Delay, Appendix X: Operationalized Definitions for Least-to-Most Prompting, and Appendix Y: Operationalized Definitions for Most-to-Least Prompting). The interobserver was trained by the primary investigator and was required to have at least 80% agreement across three sessions with primary investigator before training of the interobserver was completed.

**Social Validity Measures**

A questionnaire was used to measure the acceptability and usefulness of training (in Phases 1 and 2). At the end of training, teachers completed a questionnaire regarding the training procedures. The questionnaire included 23 statements about the training with a 5-point Likert-type scale ranging from “Strongly Agree” to “Strongly Disagree.” The questionnaire included 7 questions related to assessment, 5 questions related to instruction, and 11 general training questions. Teachers who participated only in Phase 1 of the study were asked to complete the assessment training and general training portions of the social validity questionnaire, and the four teachers who participated in both Phase 1 and Phase 2 completed the entire questionnaire. Statements included, “The training I received helped me more accurately assess my student with multiple profound disabilities,” “The instructional strategy I learned was useful in teaching access skills,” and “I enjoyed participating in the training.” See Appendix Z for the full questionnaire.
Independent Variable

The independent variable was a multi-component training package that included:

(a) a live presentation on how to implement the steps in one of four instructional strategies (i.e., time delay, least-to-most prompting, most-to-least prompting, and graduated guidance); (b) video models of how to implement each of the selected instructional strategy; (c) role playing of instructional procedures; (d) on-the-job coaching while teachers were implementing instructional strategies, and (e) feedback provided by the investigator after instructional sessions.

Live Presentations

Similar to assessment training, each teacher met with the investigator and received training in a one-on-one format. Live presentations on instructional strategies were interactive; i.e., teachers were periodically asked questions about the content during presentations, were asked to provide specific information regarding their individual student, and were asked how to individualize instruction specifically for their student. See Appendices AA-CC for specific training information provided to each participant (Appendix AA: script for time delay training, Appendix BB: script for least-to-most prompting training, and Appendix CC: script for most-to-least prompting training).

Teachers were trained on one instructional strategy, and the steps for implementing each strategy were similar to those used in the literature related to instructional strategies for individuals with profound multiple disabilities (Demchack, 1990; Wolery & Schuster, 1997). Training included how to incorporate the identified reinforcers from the preference assessment into instruction (i.e., contingent application of preferred stimuli
after correct responses), how to use the identified controlled body movements for instructional purposes (i.e., teachers were instructed to look for student responses using the body movement identified as controlled and only mark those as correct responses), and how to instruct students on non mastered access skills. During live presentations, the teacher and investigator discussed specifically how to teach the highest priority access skill using the selected instructional strategy (e.g., Ms. Brown discussed how to teach the skill tolerating interaction with others using least-to-most prompting). This discussion included how to individualize the instruction to the student, what materials should be used, and how to implement the instructional strategy specifically for the highest priority access skill. The other two access skills were not discussed, for purposes of assessing teacher’s generalization from one access skill to another. That is, teachers engaged in direct instruction and role-playing only on the highest priority access skill.

**Video Models**

The videos included a model teacher implementing each of the four instructional strategies with a student with profound multiple disabilities. The teacher in the videos was an undergraduate student entering the field of special education. The investigator trained the teacher in the video models extensively before the video models were developed, and the investigator was present while video models were being recorded to provide assistance to the model teacher. Teachers were instructed to pay specific attention to the model teacher’s behavior as well as the student’s behavior in response to instruction. Data sheets for each respective instructional strategy were given to teachers, and they were instructed to take data on the student’s performance while viewing the
video models. This provided training on how to collect data. The investigator was present while teachers viewed the video models to answer questions, provide feedback on practice data collection, and re-play clips if necessary. The lengths of the videos were as follows: time delay (8 min), least-to-most prompting (5 min), and most-to-least prompting (6 min).

**Role Playing**

After completing the live training on instruction and viewing the video models, teachers engaged in role-playing of the instructional strategy that they learned. Teachers were asked to perform their selected instructional strategy to teach their highest priority access skill, while the investigator portrayed the actions of the student. The investigator collected data on the teachers’ performance using the instructional checklists, and teachers were required to complete 80% of the steps correctly during role-play sessions. Levels of mastery criteria in previous literature relating to role-playing varied depending on the skill being taught. An 80% criterion was set for the current study because additional on-the-job coaching and performance feedback (described below) were also provided after role playing. That is, after role playing was completed, additional training components were provided. If the teacher did not complete 80% of the steps correctly, the investigator provided specific feedback regarding the areas in which the teacher needed to improve, and the teacher was asked to role-play the instructional strategy again. If the teacher completed 80% of the steps correctly, the investigator provided verbal praise. Role-playing did not take place with the other two (lower priority ranked) access skills.
On-the-job Coaching

The investigator was present during all instructional sessions to answer questions, model instructional strategies, and provide correction if necessary. If teachers were implementing an instructional procedure incorrectly (on a consistent basis, i.e., on more than two or three trials), the investigator stopped the session and provided correction, so the teacher was not practicing errors. However, having questions answered and models provided was teacher initiated, meaning that it was only provided when the teacher initiated it. For example, if the teacher needed to ask the investigator a question or ask for a demonstration of how to implement an instructional strategy, the investigator answered the question or provided the model. Otherwise, the investigator simply observed the teacher implement the instruction. On-the-job coaching was available during all instructional observations, (for all three access skills), so if teachers were continually practicing errors and/or asked for demonstrations during observations of all three access skills, on-the-job coaching was provided. However, on-the-job coaching was not provided during follow-up sessions.

Performance Feedback

The investigator provided verbal feedback on teachers’ performance after each instructional session. Feedback was provided immediately after teachers finished their sessions. Feedback included describing specific behaviors that the teachers performed correctly as well as behavior needing improvement. Performance feedback was also provided during all instructional observations (for all three access skills); however, it was not provided during follow-up sessions. Because the instructional sessions occurred
multiple times, teachers were asked to implement the specific feedback they received to help improve their performance during future sessions.

**Training Fidelity**

A trained observer assessed implementation fidelity of the training components using a checklist of targeted components (e.g., providing the live presentation, showing video models of each assessment, implementing role playing, etc.). See Appendix DD for the instructional training fidelity checklist. The observer assessed implementation fidelity by completing the checklist on 100% of the instructional training sessions. The number of components completed accurately was divided by the total number of components, and multiplied by 100% for the measure of implementation fidelity.

**Experimental Design**

A multiple-probe across participants design (Cooper et al., 2007) was used to examine the effects of the in-service training on the correct implementation of instructional steps by teachers. A multiple probe design is a variation of a multiple baseline design in which data are collected intermittently in order to estimate trends and patterns in data within and between tiers (Horner & Baer, 1978; Kennedy, 2005). Specifically, probes (instructional observations of access skills in which the teacher was not directly trained to teach using the selected instructional strategy) were conducted for all teachers and students prior to each teacher and student pair entering intervention. Ongoing data were collected once the teacher entered intervention. There were three phases of data collection: (a) baseline observations to determine teachers’ proficiency implementing the given instructional strategy (including baseline probe observations), (b)
instructional observations, and (c) follow-up observations to determine if skill levels of both students and teachers maintained over time. Individual sessions were staggered across teachers in a multiple probe design. When Teacher 1 was in training, data were not collected for Teachers 2, 3, or 4 or their students. Once Teacher 1 received the intervention, all teachers and students were observed again, and then Teacher 2 received the intervention. All teachers and students were assessed prior to introduction of Teacher 3, and so forth with Teacher 4.

**Baseline**

During baseline sessions, teachers instructed students on one of the three identified access skills targeted for instruction (i.e., the access skill identified as the highest priority by the teacher). Probes of the other two access skills were intermittently collected across participants during baseline. No training was provided to teachers on how to implement instructional procedures. For baseline sessions, teachers were told the name of the instructional strategy in which they were to implement, were given the data sheet for their specific instructional strategy (see Appendices T-V; Appendix T: Time Delay Data Sheet, Appendix U: Least-to-Most Prompting Data Sheet, and Appendix V: Most-to-Least Prompting Data Sheet), and were given access to a bin which included materials for providing instruction on access skills. If teachers asked questions related to instructional procedures during baseline sessions, they were instructed to teach the skill using the given instructional strategy as best as they knew how. If the teacher did not typically use this instructional strategy and/or did not know what the instructional strategy was (and/or how to implement any part of it), the teacher was instructed to state
this. The percentage of correctly implemented instructional steps was recorded using the checklists in Appendices P-R.

**Instructional Observations**

After teachers received training (i.e., live presentations, video modeling, and role playing), they were observed implementing the instructional strategy while teaching the highest priority access skill. The same checklists were used to record the percentage of correctly implement instructional steps as in baseline (Appendices P-R). Feedback and on-the-job coaching were provided during this phase; however, when teachers asked questions and or required prompts, those steps were coded as an “O,” which means they were not scored as correctly implemented. Measures of teachers’ performance without feedback and on-the-job training were observed during follow-up sessions. Teachers provided instruction on access skills until they implemented at least 80% of the steps correctly for three consecutive sessions. Once teachers met this 80% criteria, they were observed implementing the same instructional strategy, but with a different access skill. Again, once teachers reached 80% for three sessions, they were observed on the third access skill.

**Follow-up Observations**

One month following the last data point for two of the four teacher/student pairs in post-intervention observations, follow-up observations took place to determine if teacher and student behaviors sustained over time. Only two teacher/student pairs were involved in follow-up observations due to time constraints. The two teacher/student pairs were randomly selected by the investigator, and included Ms. Brown and Ms. Lane. The
same checklists were used as in baseline and instructional observations. During follow-up observations, teachers were not provided with on-the-job coaching or performance feedback. Teachers were instructed to teach the access skill that they were last observed teaching, but they would not be provided with any prompts, feedback, or on-the-job coaching. The investigator informed teachers that if they had questions during follow-up sessions to write them down, and they would be answered after the final follow-up observation.

**Inter-rater Reliability on Instructional Outcomes**

In order to measure the accuracy of the outcomes of the instructional procedures, the primary investigator also scored 33% of the instructional sessions using the same data sheet as the teacher. That is, the investigator scored student responses while teachers were implementing instructional strategies during 33% of instructional sessions. The two data sheets were compared to determine the percentage of exact agreement across observers.

**Interobserver Agreement**

Table 7 displays the percentage of sessions in which interobserver agreement was assessed for dependent measures in both Phase 1 and 2 and the mean agreement across steps in each checklist. The assessment checklists are reported individually and the instructional checklists are combined across all four teacher participants. That is, the time delay checklists, least-to-most prompting checklists, and most-to-least prompting checklists are reported as a combined average measure. The relatively low IOA
percentages (65.42% on a single preference assessment checklist agreement and 67.89% on a single instructional checklist agreement) were due to the difficulty in interpreting and coding student responses. In coding the preference assessment checklist, the inter-observer would sometimes count a response from the student as an “approach” behavior, when the investigator did not, or vice versa. The teacher’s behavior is different following an “approach” behavior as compared to “non-approach” behavior. This led to variances between the investigator’s coding of steps and the inter observer’s coding of steps. For the instructional checklists, the relatively low IOA score was due to discrepancies between the correct and independent code (I) and the partially correct code (E). Generally, across all dependent measures, the difference in codings between observers was related to the I and E codes, meaning that on one instance the investigator coded a step as I, and the interobserver coded the same step as an E, or vice versa.

Table 7

*Interobserver Agreement for Dependent Measures*

<table>
<thead>
<tr>
<th>Dependent measure</th>
<th>Percentage of sessions</th>
<th>Mean agreement</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preference Assessment Checklist</td>
<td>100%</td>
<td>87.53%</td>
<td>65.42-100.00%</td>
</tr>
<tr>
<td>Body Movement Assessment Checklist</td>
<td>100%</td>
<td>94.16%</td>
<td>76.79-100.00%</td>
</tr>
<tr>
<td>Access Skill Assessment Checklist</td>
<td>100%</td>
<td>90.62%</td>
<td>70.39-100.00%</td>
</tr>
<tr>
<td>Instructional Checklist</td>
<td>33%</td>
<td>93.45%</td>
<td>67.89-100.00%</td>
</tr>
</tbody>
</table>
Table 8 displays inter-rater reliability on assessment and instructional outcomes. This table presents the agreement between the teacher’s ratings and the investigator’s ratings on student responses during assessment and instructional sessions. The low inter-rater score of 45.76% was on a single preference assessment agreement, and was again due to the difficulty in interpreting student responses. The investigator sometimes coded student responses as “approach” behavior while the teacher marked the student response as “non-approach” behavior, or vice versa.

Table 8

*Inter-rater Reliability on Assessment and Instructional Outcomes*

<table>
<thead>
<tr>
<th>Assessment/Instructional strategy</th>
<th>Percentage of sessions</th>
<th>Mean agreement</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preference Assessment</td>
<td>100%</td>
<td>82.76%</td>
<td>45.76-100.00%</td>
</tr>
<tr>
<td>Body Movement Assessment</td>
<td>100%</td>
<td>90.42%</td>
<td>82.79-100.00%</td>
</tr>
<tr>
<td>Access Skill Assessment</td>
<td>100%</td>
<td>80.59%</td>
<td>78.98-100.00%</td>
</tr>
<tr>
<td>Time Delay</td>
<td>33%</td>
<td>96.89%</td>
<td>93.42-100.00%</td>
</tr>
<tr>
<td>Least-to-Most Prompting</td>
<td>33%</td>
<td>95.73%</td>
<td>87.34-100.00%</td>
</tr>
<tr>
<td>Most-to-Least Prompting</td>
<td>33%</td>
<td>97.16%</td>
<td>89.54-100.00%</td>
</tr>
</tbody>
</table>

**Training Fidelity**

A trained observer assessed treatment fidelity during 71% (15/21) of assessment training sessions and 100% (4/4) of instructional sessions. Ninety-eight percent of the assessment training steps were implemented during assessment training sessions, and 96% of the instructional training steps were implemented during instructional training sessions. Occasionally, the investigator did not ask teachers if there were any questions before moving on.
CHAPTER V

RESULTS

Phase 1: Assessment

Teacher Behavior

Figure 1 presents the percentage of correctly implemented assessment steps across preference assessment, controlled body movement assessment, and access skill assessment. In general, baseline sessions across all three assessments were relatively low, with six baseline sessions (four body movement assessments, one preference assessment, and one access skill assessment) in which teachers implemented 0% of the steps correctly. In each of these instances, teachers stated that they did not typically assess these skills and/or did not know how to perform these assessments at all; therefore, they did not attempt to demonstrate the steps in these assessments. The mean baseline score across all three assessments was 8.27% (range: 0.00-30.00%). Mean baseline scores for individual assessments were as follows: preference assessment 2.19% (range: 0.00-4.93%), controlled body movement assessment 6.49% (range: 0.00-18.18%), and access skill assessment 16.13% (range: 0.00-30.00%). Post training scores increased from baseline scores for all seven teachers. The mean post training score across all three assessments was 84.63% (range: 63.00-100.00%). Mean post training scores for individual assessments were as follows: preference assessment 88.94% (range: 73.57%-99.47%), controlled body movement assessment 89.61% (range: 81.82-100%), and access skill assessment 75.36% (range: 63.00-85.18%).
Figure 1: Percentage of correctly implemented assessment steps
Percentage of Partially Completed and Omitted Steps

The data reported in Figure 1 represent steps that were coded as “I” or independent and correct responses. Table 9 represents the steps that were coded as “E” or steps in which teachers implemented a portion of the step correctly, but not the entire step correctly. The mean percentage of steps implemented partially correct (steps marked as “E”), as well as steps omitted or not performed at all (steps marked as “O”) across all three assessments during baseline and post training sessions are reported. The mean percentage of partially implemented steps across all three assessments during pre-training was 12.98% (range: 0.00-35.76%), and during post training was 14.12% (range: 0.00-29.63%). The mean percentage of omitted steps across all three assessments during pre-training was 78.80% (range 42.02-100.00%), and during post training was 1.25% (range: 0.00-6.57%).

As expected, the mean percentage of omitted steps greatly decreased from pre-training to post training sessions; however, the mean percentage of partially completed steps was similar across pre- and post training sessions, suggesting that teachers were implementing steps partially correct at similar levels before and after training. On average, during pre training sessions, teachers omitted the most steps during the body movement assessment, and averaged the highest on partially correct steps for the preference assessment. Of all assessments, the body movement assessment seemed to be the most unfamiliar to teachers, and the preference assessment, in general, seemed to be more familiar to teachers. Baseline performance on access skill assessment, in terms of partially correct steps, was the most variable across participants, perhaps because teachers were assessing multiple skills, and their experience seemed to vary in assessing
individual skills. For example, some teachers had experience assessing cause and
effect or initiating requests, and others did not. In terms of post training outcomes, the
highest percentage of partially completed steps took place during access skill assessment.
This is probably because teachers were assessing 20 different skills rather than
counting a repetitive assessment (demonstrating the same sequence of steps multiple
times), as was the case with both the preference assessment and the controlled body
movement assessment. The access skill assessment required that teachers remember and
implement more diverse steps after training than the other two assessments.

Table 9

Percentage of Correct, Partially Correct, and Omitted Steps

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.99%</td>
<td>23.76%</td>
<td>75.25%</td>
<td>81.60%</td>
<td>14.62%</td>
<td>3.78%</td>
</tr>
<tr>
<td>2</td>
<td>2.50%</td>
<td>12.34%</td>
<td>85.16%</td>
<td>92.12%</td>
<td>7.88%</td>
<td>0.00%</td>
</tr>
<tr>
<td>3</td>
<td>1.50%</td>
<td>19.67%</td>
<td>78.83%</td>
<td>94.22%</td>
<td>5.78%</td>
<td>0.00%</td>
</tr>
<tr>
<td>4</td>
<td>1.48%</td>
<td>28.31%</td>
<td>70.21%</td>
<td>73.57%</td>
<td>19.86%</td>
<td>6.57%</td>
</tr>
<tr>
<td>5</td>
<td>4.93%</td>
<td>37.42%</td>
<td>57.65%</td>
<td>99.47%</td>
<td>0.53%</td>
<td>0.00%</td>
</tr>
<tr>
<td>6</td>
<td>0.00%</td>
<td>0.00%</td>
<td>100.00%</td>
<td>97.22%</td>
<td>2.78%</td>
<td>0.00%</td>
</tr>
<tr>
<td>7</td>
<td>3.94%</td>
<td>9.86%</td>
<td>86.20%</td>
<td>84.29%</td>
<td>13.28%</td>
<td>2.43%</td>
</tr>
<tr>
<td>Mean</td>
<td>2.19%</td>
<td>18.77%</td>
<td>79.04%</td>
<td>88.92%</td>
<td>9.25%</td>
<td>1.83%</td>
</tr>
</tbody>
</table>

(table continues)
### Body Movement Assessment Pre-Training vs. Post-Training

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18.18%</td>
<td>2.48%</td>
<td>79.34%</td>
<td>81.82%</td>
<td>14.69%</td>
<td>3.49%</td>
</tr>
<tr>
<td>2</td>
<td>0.00%</td>
<td>0.00%</td>
<td>100.00%</td>
<td>90.90%</td>
<td>9.10%</td>
<td>0.00%</td>
</tr>
<tr>
<td>3</td>
<td>0.00%</td>
<td>0.00%</td>
<td>100.00%</td>
<td>81.82%</td>
<td>15.37%</td>
<td>2.81%</td>
</tr>
<tr>
<td>4</td>
<td>0.00%</td>
<td>0.00%</td>
<td>100.00%</td>
<td>90.91%</td>
<td>4.67%</td>
<td>4.42%</td>
</tr>
<tr>
<td>5</td>
<td>15.76%</td>
<td>9.09%</td>
<td>75.15%</td>
<td>100.00%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>6</td>
<td>0.00%</td>
<td>0.00%</td>
<td>100.00%</td>
<td>90.90%</td>
<td>9.10%</td>
<td>0.00%</td>
</tr>
<tr>
<td>7</td>
<td>9.56%</td>
<td>18.18%</td>
<td>72.26%</td>
<td>90.91%</td>
<td>6.33%</td>
<td>2.76%</td>
</tr>
<tr>
<td>Mean</td>
<td>6.21%</td>
<td>4.25%</td>
<td>89.54%</td>
<td>89.60%</td>
<td>8.47%</td>
<td>1.93%</td>
</tr>
</tbody>
</table>

### Access Skill Assessment Pre-Training vs. Post-Training

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19.64%</td>
<td>18.74%</td>
<td>61.62%</td>
<td>78.26%</td>
<td>21.74%</td>
<td>0.00%</td>
</tr>
<tr>
<td>2</td>
<td>0.00%</td>
<td>0.00%</td>
<td>100.00%</td>
<td>71.43%</td>
<td>28.57%</td>
<td>0.00%</td>
</tr>
<tr>
<td>3</td>
<td>30.00%</td>
<td>7.56%</td>
<td>62.44%</td>
<td>63.00%</td>
<td>37.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>4</td>
<td>11.11%</td>
<td>12.41%</td>
<td>76.48%</td>
<td>77.78%</td>
<td>22.22%</td>
<td>0.00%</td>
</tr>
<tr>
<td>5</td>
<td>22.22%</td>
<td>35.76%</td>
<td>42.02%</td>
<td>70.37%</td>
<td>29.63%</td>
<td>0.00%</td>
</tr>
<tr>
<td>6</td>
<td>14.81%</td>
<td>20.96%</td>
<td>64.23%</td>
<td>85.18%</td>
<td>14.82%</td>
<td>0.00%</td>
</tr>
<tr>
<td>7</td>
<td>14.81%</td>
<td>16.12%</td>
<td>69.07%</td>
<td>81.48%</td>
<td>18.52%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Mean</td>
<td>16.08%</td>
<td>15.94%</td>
<td>67.98%</td>
<td>75.36%</td>
<td>24.64%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

### Student Assessment Outcomes

Table 10 displays the results of the three assessments for each student participant. The three most preferred items identified from the preference assessment, the controlled body movement in which the student used consistently as a response form, and lists of mastered access skills (skills which student demonstrated during assessment) are reported in Table 10.
## Table 10

**Assessment Results for Students**

<table>
<thead>
<tr>
<th>Student</th>
<th>Preferred items</th>
<th>Controlled body movement</th>
<th>Mastered access skills</th>
</tr>
</thead>
</table>
| Student 1| 1. Gears  
2. Elmo Tickle  
3. Fan | Left Hand                | 1, 7, 10, 15, 16, 17    |
| Student 2| 1. Pom Poms  
2. Gears  
3. Top | Right Arm (any part of right arm) | 1, 2, 5, 7, 15        |
| Student 3| 1. Carousel  
2. Jump Rope  
3. Squishy Ball | Right Hand               | 5, 7, 8, 10, 16       |
| Student 4| 1. Piano  
2. Hair  
3. Bells | Right Arm (any part of right arm) | 1, 2, 8            |
| Student 5| 1. Eraser  
2. Block  
3. Cell Phone | Left Hand or Right Hand   | 1, 2, 5, 7, 8, 9, 10, 15, 16 |
| Student 6| 1. TV Screen Toy  
2. Timer Man  
3. Piano | Right Hand               | 1, 2, 3, 5, 10, 15, 16 |
| Student 7| 1. Paper  
2. Green Spikes  
3. Wrapper | Left Hand                | 1, 5, 8, 10, 12, 17   |

### Phase 2: Instruction

#### Teacher Behavior

Figure 2 presents the percentage of correctly implemented instructional steps for teacher participants. Across all four teachers, baseline measures were relatively low and stable. Ms. Green performed 0% of the instructional steps correctly across all three access skills, as she stated that she did not know what time delay was or how to implement any of the steps in the time delay teaching sequence. The baseline probe
measures (measures of implementation of the instructional strategy on two other access skills in which teachers were not trained) were comparable to regular baseline measures in terms of level, signifying that teachers performed steps of the instructional strategy, regardless of the skill they were teaching, at low levels prior to training. The percentage of correctly implemented instructional steps increased after training for all four teachers, and remained at levels above baseline throughout the follow-up checks (conducted only for Ms. Brown and Ms. Lane).

Ms. Brown began teaching Access Skill #7 (Tolerating Interaction with Others) using least-to-most prompting, and she met mastery criteria (80% for three sessions) after four sessions. She then moved on to Access Skill #4 (Associating Activities with Environmental Cues), which was not a skill in which she received training on how to teach. Lastly, Ms. Brown taught Access Skill #9 (Initiating Requests), and met mastery criteria after 5 sessions. At this point, Ms Brown was correctly implementing approximately 95% of the steps of least-to-most prompting. During the 30-day follow-up check, Ms. Brown was not provided with any on-the-job coaching or feedback, and taught the access skill Initiating Requests. She was implementing the steps of least-to-most prompting while teaching this skill at around 75%, evidencing an increasing trend across four follow-up sessions.

Ms. Parker provided instruction on Access Skill #11 (Manipulating Objects) using most-to-least prompting. She met mastery criteria after 5 sessions, and was implementing around 95% of steps correctly. Next, Ms. Parker provided instruction on Access Skills #4 (Associating Activities with Environmental Cues), and met mastery
Figure 2. Percentage of correctly implemented instructional steps
criteria after only three sessions, and then moved on to Access Skill #9 (Initiating Requests). This access skill required 5 sessions before mastery. Relatively few sessions before meeting mastery, and the high levels of implementation, suggest that Ms. Parker generalized use of most-to-least prompting across the three access skills.

Ms. Green began teaching Access Skill #9 (Initiating Requests) using time delay. Prior to training, Ms. Green did not know what time delay was, so correct implementation of time delay steps during post training observations increased significantly from baseline. Seven sessions were required for Ms. Green to meet mastery criteria. Across all teachers, seven sessions was the most required to meet mastery criteria. It is expected that because Ms. Green had no previous knowledge of time delay, more sessions of on-the-job training and feedback were required than other teachers who had at least some prior knowledge of the instructional strategy. In comparison to other teachers, Ms. Green also started the instructional observations at a lower level (about 65% of steps correctly implemented), but showed a steady increase in trend for the remaining instructional observations. Ms. Green taught Access Skill #11 (Manipulating Objects) using time delay at levels similar to the previous access skill, and required only three sessions to meet mastery. This suggests that Ms. Green was able to generalize use of time delay to a different access skill. No instructional observations took place for Access Skill #12 (Releasing Objects) due to time constraints.

Ms. Lane also used time delay to teach Access Skill #4 (Associating Activities with Environmental Cues) and Access Skill #3 (Demonstrate Cause and Effect). In both instances, only three sessions were required for Ms. Lane to meet mastery criteria. These data suggest that Ms. Lane was able to generalize use of time delay to different access
skills, and do so very quickly. No instructional observations took place for Access Skill #6 (Maintaining Eye Contact) due to time constraints. At the 30-day follow-up, Ms. Lane taught Associating Activities with Environmental Cues using time delay at levels slightly lower than previous instructional observations, but still at a satisfactory level (around 80%).

The data indicate that overall, the training package was effective in increasing the percentage of correct implementation of instructional steps. The data also indicate that teachers generalized correct use of the instructional strategy they learned to untrained access skills. Additionally, the follow-up data indicate that teachers were not only able to maintain their skills, but also perform the instructional strategy without on-the-job coaching and/or performance feedback.

**Percentage of Partially Correct and Omitted Steps**

Table 11 shows the mean percentage of partially completed and omitted instructional steps. That is, the data are reported for steps that were coded E (partially completed) and O (omitted). The mean percentage of partially implemented steps stayed consistent across baseline and instructional observations, while the mean percentage of omitted steps greatly reduced from baseline (81.64%) to instructional observations (4.57%).

**Student Behavior**

Figure 3 displays the percentage of independent responses elicited by student participants in response to their teacher’s instruction. Baseline levels were relatively low
across all four students, with Cason and Tara’s baselines displaying some variability. The variability may be explained by the teacher’s performance, in that instructions to

Table 11

*Mean Percentages of Partially Correct and Omitted Instructional Steps*

<table>
<thead>
<tr>
<th>Teacher</th>
<th>E: Partially correct (Range)</th>
<th>O: Omitted (Range)</th>
<th>E: Partially correct (Range)</th>
<th>O: Omitted (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms. Brown</td>
<td>11.06% (0.00-24.22%)</td>
<td>80.51%</td>
<td>9.51% (1.11%-20.57%)</td>
<td>6.30% (0.00-17.03%)</td>
</tr>
<tr>
<td>Ms. Parker</td>
<td>13.13% (0.00-24.22%)</td>
<td>71.48% (45.10-100.00%)</td>
<td>9.28% (3.24-18.96%)</td>
<td>2.40% (0.00-10.61%)</td>
</tr>
<tr>
<td>Ms. Green</td>
<td>0.00%</td>
<td>100.00%</td>
<td>8.87% (2.68-15.13%)</td>
<td>7.62% (0.00-12.04%)</td>
</tr>
<tr>
<td>Ms. Lane</td>
<td>17.17% (6.42-36.49%)</td>
<td>74.59% (61.44-88.00%)</td>
<td>14.85% (5.42-24.58%)</td>
<td>1.96% (0.00-12.04%)</td>
</tr>
<tr>
<td>Mean</td>
<td>10.43%</td>
<td>81.64%</td>
<td>10.63%</td>
<td>4.57%</td>
</tr>
</tbody>
</table>

students during baseline were often different each session. Stable baseline levels were not set as a high priority in the case of student responding, because teacher behavior took precedence, in that when teachers had a stable baseline and/or met mastery criteria, they moved on to the next phase in order to meet time constraints. Although variability existed in the student data, levels of independent and correct responding are higher across all four students during instructional observations as compared to baseline.

Cason started with a low, variable baseline. During instructional observations (after his teacher had received on-the-job training on the instructional strategy and performance feedback), Cason was responding independently on around 70% of instructional observations, across all three access skills. Although Cason’s performance
Figure 3. Percentage of Correct and Independent Student Responses
on Access Skill #9 (Initiating Requests) varied from 50-90%, data trended upward from beginning to end. Follow-up data on this same skill were also above baseline levels, but generally occurred at a lower level (about 60-80%) than previous independent responding 30 days prior.

In comparison to the other four student’s baselines, Tara had the highest level of independent responding across sessions, and also the most variable, with independent responding occurring from 20-60%. However, during instructional training, all skills were performed slightly above the highest baseline point and ranged from 65-90%. Levels of independent responding were highest with Access Skill #9 (Initiating Requests), with an increasing trend across sessions.

Dana was not provided with the opportunity to respond, as her teacher did not provide any instruction during baseline sessions. Her performance in all instructional sessions was above 0% correct, and showed a gradual increase in level. Her highest level of independent responses occurred during instruction on Access Skill #11 (Manipulating Objects), ranging from 60-80% correct.

Gavin exhibited a low, stable baseline, with very little independent responding. Independent responding gradually increased across access skills and follow-up sessions, but still was lower overall compared to the other student participants. For Access Skill #4 (Associating Activities with Environmental Cues), his independent responding averaged approximately 40%; for Access Skill #3 (Demonstrating Cause and Effect), his independent responding averaged approximately 60%. The follow-up sessions began with a lower level of independent responding on Demonstrating Cause and Effect, but eventually increased to levels similar to instructional observations.
Overall, students’ independent responding increased from baseline sessions to instructional observations, with follow-up sessions (for Cason and Gavin) slightly lower than previous sessions. Although students were not eliciting independent responses at high levels (80-90%), they were still responding more independently than during baseline sessions, usually after only 3-4 sessions. It is expected that if more sessions were provided, students would have exhibited higher levels of independent responding.

**Social Validity**

Table 12 displays the mean social validity ratings provided by teachers related to assessment and instructional training. Teacher rated the training on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). All seven teacher participants completed the assessment and general training sections of the questionnaire. The four teachers who participated in Phase 2, Ms. Brown, Ms. Parker, Ms. Green, and Ms. Lane, completed the entire questionnaire. The mean rating for all questions was 4.62 (range 1-5), favoring approval with the training. The ratings of 1 and 2 were provided on questions 17 (“I would have liked to receive this training on-line, so I could have viewed it at a time that was convenient for me”) and 18 (“This training would have been just as effective if it was presented in an on-line format”). This indicates that teachers valued the live, face-to-face training they received. Overall, teachers viewed the assessment and instructional training as worthwhile and useful.
<table>
<thead>
<tr>
<th>Question Topic</th>
<th>Mean Rating (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessment training questions (n=7)</strong></td>
<td></td>
</tr>
<tr>
<td>It was useful to learn how to assess preferences.</td>
<td>4.57 (4-5)</td>
</tr>
<tr>
<td>It was useful to learn how to assess controlled body movements.</td>
<td>4.71 (4-5)</td>
</tr>
<tr>
<td>It was useful to learn how to assess the 20 access skills.</td>
<td>5.00</td>
</tr>
<tr>
<td>The access skills were useful skills for my student to be assessed on and to learn.</td>
<td>4.86 (4-5)</td>
</tr>
<tr>
<td>The training I received helped me more accurately assess my student.</td>
<td>4.57 (4-5)</td>
</tr>
<tr>
<td>The results of the assessment are meaningful and can be used for instructional planning.</td>
<td>4.43 (4-5)</td>
</tr>
<tr>
<td>I plan to use the assessments I learned with other students in my class.</td>
<td>4.43 (4-5)</td>
</tr>
<tr>
<td><strong>Instructional Training Questions (n=4)</strong></td>
<td></td>
</tr>
<tr>
<td>The instructional strategy I learned was useful in teaching access skills.</td>
<td>4.50 (4-5)</td>
</tr>
<tr>
<td>The instructional strategy I learned was simple enough to use on a daily basis.</td>
<td>5.00</td>
</tr>
<tr>
<td>I plan to use the instructional strategy I learned to teacher other students in my classroom.</td>
<td>5.00</td>
</tr>
<tr>
<td>The instructional strategy I learned was effective in helping my student make more independent responses.</td>
<td>4.25 (4-5)</td>
</tr>
<tr>
<td>The data collection procedures I learned were simple and useful in measuring my student’s responses.</td>
<td>4.50 (4-5)</td>
</tr>
<tr>
<td><strong>General Training Questions (n=7)</strong></td>
<td></td>
</tr>
<tr>
<td>The live training/presentation was helpful in learning the skills I needed to learn.</td>
<td>4.29 (4-5)</td>
</tr>
<tr>
<td>The video models were helpful in learning the skills I needed to learn.</td>
<td>4.86 (4-5)</td>
</tr>
<tr>
<td>The feedback I received after I conducted assessments and/or instructional sessions was useful.</td>
<td>4.86 (4-5)</td>
</tr>
<tr>
<td>The amount of time the training took was reasonable.</td>
<td>4.00 (3-5)</td>
</tr>
<tr>
<td>I would have liked to receive this training on-line, so I could have viewed it at a time when it was convenient for me.</td>
<td>1.42 (1-2)</td>
</tr>
<tr>
<td>This training would have been just as effective if it was presented in an on-line format (i.e., no face-to-face training).</td>
<td>1.28 (1-2)</td>
</tr>
<tr>
<td>I would recommend this training to other teachers.</td>
<td>4.86 (4-5)</td>
</tr>
<tr>
<td>The training I received helped improve my classroom teaching.</td>
<td>4.14 (3-5)</td>
</tr>
<tr>
<td>I enjoyed participating in the training.</td>
<td>4.57 (4-5)</td>
</tr>
<tr>
<td>Overall, I found the training to be worthwhile and helpful.</td>
<td>4.86 (4-5)</td>
</tr>
</tbody>
</table>
The primary purpose of this study was to evaluate the effects of a multi-component training package on teachers’ correct implementation of assessment and instructional steps working with students who have multiple profound disabilities. A secondary purpose of this study was to evaluate the effects of this training on students’ independent and correct responding. In general, teachers increased the percentage of correctly implemented assessment and instructional steps, and students also increased their independent responding. That is, as teachers increased their skills in teaching students with multiple profound disabilities, students generally increased their skills as well. Discussion of various aspects of the study will be presented below.

The Multiple Component Teacher Training Package

The multiple component training package used to train teachers on assessment and instruction included the following components: (a) live interactive presentation of material, (b) viewing video models, (c) on-the-job coaching (only for instructional training) and (d) performance feedback. Results indicate that the package increased teacher performance across multiple skills. Because all these components were presented as a package, it is not possible to determine which components in the package were effective and/or necessary to increase teachers’ skills. However, results indicating cross-skill replication of effects begin to make a case for teaching teachers of students with multiple profound disabilities and lay the groundwork for systematic replication and
component analysis. Importantly, when each of four teachers received instruction, performance levels of students with multiple profound disabilities increased across different skills and generally maintained in 30-day follow-up probes. Although these findings are not unexpected in teacher education research, they “sound the alarm” for additional research examining effective and efficient teaching strategies for teachers working with students who have multiple profound disabilities.

On-the-job coaching was the component that varied the most across teacher participants, because the teacher initiated it. That is, on-the-job coaching was provided if the teacher asked a question during instructional observations, if the teacher asked for a model or demonstration, or if the teacher was practicing errors. If none of these occurred, then on-the-job coaching was not provided; however, performance feedback was still provided after instructional observations. Specifically, Ms. Brown and Ms. Parker occasionally asked questions during instructional observations, but neither one asked for models or demonstrations of how to implement any portion of the instructional strategies. Ms. Green asked many questions at the onset of instructional observations, but faded over time, and Ms. Lane asked for multiple demonstrations during beginning instructional observations, but these requests also faded over time.

The length of training time varied significantly for each teacher. For example, the total training time for all three assessments for Teacher 4 was 320 min, while the total training time for all three assessments for Teacher 6 was 155 min. Differences in total training time were not associated with different levels of correctly implemented assessment steps in the post-test for these or other teachers. This variance in training time was due to the individualized nature of the training. The training was provided
individually in a one-on-one format, and was tailored to each teacher’s specific needs. Although the investigator used a specific script for training each teacher, some teachers asked more questions or needed instruction on pre-requisite skills before instruction could take place. For example, before training on least-to-most prompting could be provided, teachers needed to have an understanding of what the different prompts were (i.e., verbal prompts, gestural prompt, model prompt, and physical prompt). In some instances teachers were familiar with these prompts, in other instances they were not, and therefore required additional training. The individualized nature of the training had advantages, but often resulted in longer amounts of time being spent during training.

Finding time for training during teacher’s busy schedules was also a challenge. Teachers often had a difficult time freeing themselves from their classroom responsibilities in order to attend training during school hours; therefore, some teachers were using their prep-hours and time before and after school to participate in training. This type of training may be best presented at a district-wide in-service day when students are not at school, this way the training can be presented all at one time, rather than on multiple days, and teacher can immediately implement the skills they have learned in their classrooms after the one day training session. Although the time required to train and coach teachers varied, the amount of time invested in training on assessments or instructional strategies may be considered time efficient. For example, for Teacher 1 during Phase 1, approximately three and a half hours were required for training on all three assessments, which included live presentations for each assessment and role-playing opportunities for each assessment. Only three and a half hours of training produced a substantial increase in Teacher 1’s skills on all three assessments. Initial
training provided at a district-wide level with periodic on-the job coaching and performance feedback sessions might result in similar gains in teacher skill levels in a time efficient manner.

**Participants**

**Teacher Participants**

Finding teacher participants who met the inclusion criteria for the study presented great difficulty, as many teachers working with students with multiple profound disabilities, particularly in rural areas, were certified to teach other populations of students (i.e., teachers held mild/moderate special education teaching certificates rather then severe). Initially, the inclusion criteria was set for teachers to be included only if they had a severe endorsement; however, this criterion was changed to requiring teaching to have a special education teaching certificate in general, in order to get large enough number of teacher participants. It was expected that teachers with severe teaching endorsements would have a greater knowledge base of assessment and instruction for students with profound multiple disabilities, as instruction and assessment of this population of students would most likely be part of teacher’s repertoires. However, this was not the case. Of the seven teachers in Phase 1 of the study, three teachers had mild/moderate teaching certificates, and four teachers had severe teaching certificates, and there was no noticeable difference in terms of pre-training levels between the two groups. In other words, teachers who had a severe endorsement did not show increased levels of pre-training performance in comparison to teachers who did not have a severe endorsement.
The four teachers in Phase 2, although they were randomly selected, coincidentally were the four teachers who had severe endorsements. Similar to pre-training assessment sessions, teachers generally performed at low levels during baseline sessions. The three instructional strategies implemented by teachers in Phase 2, were evidence-based prompting strategies, and were thought to be basic prompting strategies that severe teachers would implement in their classrooms. As evident by the low baselines, these prompting strategies were not commonplace for these teachers, not even for Ms. Green, who held a Masters Degree in special education and an undergraduate degree in special education with an emphasis in severe disabilities. She did not correctly define time delay or describe how to implement any of the steps. Other teachers had heard of the instructional strategies they were being asked to use, but did not use them in their regular teaching day, and did not describe how to fully implement the strategies. To this researcher, extremely low baseline levels were surprising, and focus attention on an issue of pre-service and in-service training provided to teachers of students with multiple profound disabilities. These basic prompting strategies are effective with a variety of students, not only students with multiple profound disabilities, and may need to be points of emphasis in pre-service and in-service training.

**Student Participants**

Research involving students with multiple profound disabilities is scarce for several reasons, two of which include: (a) the medical fragileness often associated with students with multiple profound disabilities, and (b) the difficulty in determining which movements students make that are meaningful in response to instruction. Six of the
seven teachers in the study stated they frequently had difficulty determining whether a student’s response was “on purpose” or if it was an involuntary movement. This caused problems with assessment, instruction, data collection, and so forth.

The medical needs of students with multiple profound disabilities often results in many absences from school. When students do attend school, they often require time away from instruction in order to take care of medical issues (e.g., seizure management, tube feeding). With so many absences and time away from instruction, it is often difficult for teachers to make progress with students, because they seem to be “starting over” so frequently in order to compensate for regression in skills due to absences. Although student absences and time away from instruction due to medical needs were an issue in this study, all four student participants made progress in terms of independent responding. As teacher’s improved their performance in correctly implementing instructional strategies, students also improved their correct and independent responding. When teachers provided good instruction to students, students generally provided more independent responses, even with irregular attendance and inconsistent instructional sessions. These results suggest that teachers of students with profound multiple disabilities can and should provide high-quality instruction to their students, because as this instruction is provided, even if it does take place in a sporadic manner, students with profound multiple disabilities respond as expected. This progress; however, is dependent on teachers initiative to provide high-quality instruction to students with multiple profound disabilities. These results point to maintaining standards for teachers of students with multiple profound disabilities and making teacher training opportunities available.
The controlled body movement assessment was developed in response to the second challenge of working with students with multiple profound disabilities. This assessment was used to help teachers learn which body movements students can controllably and reliably elicit; and therefore, be more certain when a student made a response if it was purposeful. This is not to say that students may have meaningfully responded using a different body movement other than the one identified in the body movement assessment, but it provided teachers with a more accurate and consistent measure of recording student responding. Individuals with profound multiple disabilities are a difficult population to research; however, researchers need to continue to include them (and their teachers) in research studies and develop methods of compensating for these difficulties.

**Dependent Variables**

**Assessment and Instructional Checklists**

The checklists used in both Phase 1 and 2 included task analyses of the steps required to correctly implement an assessment or instructional strategy. Each checklist included a different number of steps, and some of the steps in the checklist were repetitive, meaning that after a sequence of steps was completed, it would be repeated in the exact same manner with different stimuli or in a different trial. For example, in the preference assessment checklist, the sequence of steps was the exact same for the first item, and then it was repeated for the second item and so on. The instructional checklists were also similar in that they required a sequence of steps for the first trial that was the same as the sequence of steps in other trials. Because of the repetitive nature of all the
checklists (except the access skill checklist) teachers were more likely to perform at low levels during baseline, simply because they typically did not repeat the sequence of steps, as they were trained to do for instructional observations. Because the checklists included so many steps (e.g., 274 steps in the most-to-least prompting checklist), the repetitive steps were marked as not applicable, in order to get a more accurate baseline measure. For example, during the preference assessment baseline sessions, teachers were instructed to assess preferences on eight items; typically teachers would assess each of the eight items, but not assess each item multiple times. In these instances, the repetitive steps were marked as not applicable in order get a more accurate baseline measure.

Social Validity

Teachers completed the social validity questionnaire to assess the acceptability and usefulness of the training. In addition to the responses provided there, teachers sent e-mails to the investigator asking if they could share the information they learned with other teachers, asked if they could have copies of the video models for reference and to train paraprofessionals in their classrooms on the instructional strategies, asked to keep data sheets, and share data sheets with other teachers. Additionally, Ms. Brown, Ms. Parker, and Ms. Lane all taught in classrooms where all the students in their class had multiple profound disabilities (referred to as “medically fragile” or “wheelchair units”), and these teachers stated that they would use the information they learned with other students in their classroom. Ms. Green, who taught students with a variety of disabilities, also stated that she planned to use the instructional strategy she learned with other students in her classroom, even though they did not have multiple profound disabilities.
Results of the social validity data indicate that teachers viewed the video models and the performance feedback as slightly more important than the live presentation, but whether or not each of these components is necessary to produce meaningful outcomes should be addressed in future research. The idea of on-line training was presented to teachers, and they responded negatively as indicated in the social validity ratings. Because the teachers in the study received so little training involving students with multiple profound disabilities, it seemed that they preferred the live interaction. However, future researchers may consider incorporating some on-line training components with live training components to address the time constraint issues involved in the training.

Limitations and Future Research Directions

Although the multi component training package was effective in increasing the percentage of correctly implemented assessment and instructional steps, it is uncertain as to which components are necessary to achieve these results. Future researchers should conduct component analysis research of the training package. By doing this, trainers may be more efficient in providing this type of training to teachers. Additionally, future researchers should explore the possibility of incorporating some on-line components into the training in order to provide training more time efficiently and consider providing on-the-job coaching and performance feedback on thinner schedules.

Phase 1 did not include a true experimental design because of the very low incidence of teachers of students with profound multiple disabilities. Future researchers may wish to examine the assessment portion of the study within an experimental design
with sufficient N, perhaps in a large urban setting or one with access to numerous teachers. Additionally, follow-up data were limited to only two participants because of time constraints; however, future researchers should continue to research the generalization and maintenance of teacher’s skills in assessing and instructing students with multiple profound disabilities.

The mastery criteria set for role playing (80%) may be considered relatively low, particularly because conditions in the role playing setting were optimal (i.e., not student behaviors, interruptions, seizures, etc.). With optimal conditions, it may be more appropriate to set mastery criteria at a higher level (90-100%). Previous research varied in terms of mastery criteria levels during role-play situations. An 80% mastery criterion was established for the current study because teachers were receiving additional training components (e.g., on-the-job coaching and performance feedback) after role-playing was complete. If theses additional training components were not in place after role-playing, and role-playing was the end of training, it would be more crucial to set mastery criteria at a higher level.

**Implications**

As indicated by low baseline levels across all teacher participants, teachers were not equipped with the skills to assess and instruct their students with profound multiple disabilities prior to training. In general, teachers did not receive training and/or support related to assessment and instruction for students with profound multiple disabilities. This lack of training and support specific to students with profound multiple disabilities is problematic, particularly for teachers who only teach individuals with profound
multiple disabilities. Teacher’s lack of skills in terms of assessment and instruction for students with profound multiple disabilities focus attention on issues related to pre-service, in-service, and accountability in school systems. Institutions of Higher Education need to ensure that teachers who are receiving licenses to teach individuals with significant disabilities are equipped with the skills necessary to assess and instruct individuals on the extreme lower end of the continuum. School districts also need to ensure that teachers of students with profound multiple disabilities are provided with training that is specific to this population, and coordinators and directors need to be monitoring teachers’ performance in classrooms to determine that teachers need support and training in this area.

Results from this study suggest that teachers of students with profound multiple disabilities are in need of training opportunities and support. With this training need at the forefront, it becomes necessary to think about how this training can best be provided. It is possible that school districts should provide training, or perhaps training at the state level would be most effective. Providing this type of training may be necessary to address issues related to Adequate Yearly Progress (AYP) for students with profound multiple disabilities on state-mandated assessments. If teachers of student with profound multiple disabilities are not trained on how to adequately assess and use assessment results to guide instruction, students will not make progress on their IEP goals or objectives, nor will they contribute to the percentage of students making AYP. Training teachers of students with profound multiple disabilities has been determined as a need, and combined efforts from institutes of higher education, school districts, and state education departments should collaborate to fulfill this training need.
REFERENCES


