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I am submitting herewith a dissertation written by Linda Moyer Rivers entitled "The Impact of Graphical Feedback on Teachers' Frequency of Use of Incidental Teaching." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Leadership and Learning.

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The Impact of Graphical Feedback on Teachers' Frequency of Use of Incidental Teaching

A Dissertation Presented for the
Doctor of Leadership and Learning
Degree
The University of Tennessee, Chattanooga

Linda Moyer Rivers
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DEDICATION

To my loving husband and best friend, Ken Rivers, who has always been there for me offering unwavering love and support for the past forty-three years.

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ABSTRACT

This study provided information on the impact of graphical feedback on teachers' frequency of use of a specific teaching strategy as a supervision method which might be used to measure a change in behavior. Graphical feedback allowed for a systematic application of support and mentoring to the teachers which was displayed as data in a quantitative, objective format. The researcher presented the teachers with graphical displays of the frequency of their behavior and verbal feedback to ensure their understanding.

Incidental teaching was the teaching strategy used for the study. This strategy elaborated on a child's engagement in the classroom. Teachers were able to use what the child was interested in and scaffold learning to expand the child's learning.

The study described the impact of graphical feedback on three preschool teachers in a developmentally appropriate room designed for 4 year old children, both with and without disabilities. After receiving information regarding incidental teaching, teachers were provided with a graph that displayed a representation of the frequency with which they used incidental teaching. The impact of the graphical feedback on the teachers' behavior was measured by using a multiple-baseline design. All three teachers demonstrated improvement in the frequency of incidental teaching during the intervention and maintenance phases.

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Chapter 1:

Introduction to the Study

Study Overview

With the rapid rise in the last ten years in the number of U. S. students diagnosed with disabilities (National Center for Educational Statistics, 2006), it is becoming increasingly important that teachers implement effective teaching strategies to address the complex needs of this diverse population. Professional development that trains teachers in specific instructional strategies one key to meeting the need for differentiated instruction, but often this training does not specifically address the teacher's behavior in employing these strategies successfully. In addition, research has indicated that post-professional development in the form of supervisory feedback is also an important factor in the successful application of appropriate and effective teaching methods (Mortensen & Witt, 1998; Noell, Witt, Gilbertson, Ranier & Freeland, 1997). One type of follow-up that has demonstrated success in improving teacher performance after training is graphical feedback (i.e., providing a graph or chart to show frequency, duration, rate, or intensity of either the child's or the teacher's target behaviors) which can be used to influence future performance of the teacher (Casey & McWilliam, 2008; Hemmeter, 2000).

Most studies on graphical feedback have been conducted in elementary education settings, but this study seeks to extend these findings by investigating whether the use of graphical feedback can be equally effective in increasing desired teaching behaviors with teachers of pre-school children with special needs. In this study, the desired teacher behavior to be increased is a promising practice known as incidental teaching, which is the use of instructional activities in

informal settings that aim at increasing desired student engagement by taking advantage of students' inherent interests and motivations (McGee, Daly, & Jacobs, 1994).

Background on the Problem

While feedback has been the subject of numerous articles about teaching and learning, there has been little evidence to suggest a systematic application that would both increase a target behavior and provide support and mentoring to the teacher. Graphical feedback provides the opportunity for both. It is a process that provides information on positive behavior, builds on past performance, and can increase the likelihood of continuing success. The focus of this study is to demonstrate the impact that graphical feedback has on a specific teaching strategy (incidental teaching).

Incidental teaching is one of a number of empirically validated teaching strategies that can expand a teacher's instruction, but results of studies by Tate, Thompson, and McKerchar (2005) and Yell and Drasgow (2009) have noted that there is a gap in the frequency of use of the strategy. Presumably this gap may be the result of a lack of research on effective teacher training programs that encourage teachers to incorporate best practice recommendations (Schepis, Reid, Ownbey, & Parsons, 2001). The gap between research and practice in education is of critical importance because research should be the foundation from which teaching and learning practices are developed and improved (Cochran-Smith, 2005).

Legal Mandates for Effective Special Education

With the current mandates for accountability in education and an emphasis on teacher effectiveness, it is important that teachers be given support and encouragement to try alternative means to be more proficient and to meet classroom objectives. Federal laws such as the

Individuals with Disabilities Education Act (1975) and subsequent amendments (P. L. 94-142: P. L. 99-457), and currently, the Individuals with Disabilities Education Improvement Act (2004) , known as IDEIA, provide for the education of *all* students. It is imperative that educators provide strategies that foster learning environments to meet this mandate.

Teachers are faced with diverse classes and situations and must demonstrate flexibility in their ability to utilize instructional techniques that meet the needs of all the children. If teachers are to meet the mandates of IDEIA, then multiple strategies must be used to provide professional development for teachers.

The Importance of Early Intervention

This study has intrinsic importance affecting young children and the way they learn. The recent focus on brain science and child development research has shown the importance of working with young children while the brain is malleable and in the formative stages (Siegel, 2003). There is strong experimental evidence, primarily from early childhood demonstration programs, that high-quality interventions beginning in the earliest years help children learn and achieve (Handleman & Harris, 2001). Although research has been done on the effectiveness and efficiency of instructional strategies, there has been limited investigation into the relevance of those strategies in early childhood settings. Research with younger children may make it possible to directly determine important questions regarding the best approach for aiding a child's development and to identify the skills that teachers may need in order to implement that approach.

Need for More Effective Instructional Strategies for Students with Special Needs

With an increasing number of children being diagnosed with a disability (Lewitt & Schuurman-Baker, 1996), one particular strategy, incidental teaching, has shown promise. Attributed to Hart and Risley (1975), incidental teaching is a strategy based on traditional principles of learning that are appropriate for all children and has a foundation in the developmental theories of Piaget and Vygotsky. The concept behind this approach is a combination of learning and engagement. Incidental teaching uses the interests of a child to encourage continued language and engagement. Preschool teachers have used "teachable moments" to increase learning in the past, but by using incidental teaching as a systematic strategy for expanding a child's interests, the technique becomes a purposeful tactic to encourage engagement and to increase language development and social development.

Incidental teaching is a technique that focuses on the interactions between a child and an adult that provide opportunities for extended learning and engagement. Moreover, it is a strategy that uses the child's interests as a catalyst to structure learning opportunities that occur in the context of the natural environment. While it has been most effectively used in the teaching of language, it can also be useful in the development of other skills (Hart & Risley, 1975). Teachers have successfully employed incidental teaching to expand upon a child's engagement and to increase his or her ability to generalize the skills in alternative contexts (Casey & McWilliam, 2008). McGee, Morrier, and Daly (1999) agree that planning for incidental teaching within the curriculum "offers the advantages of a technical grounding in applied behavior analysis (ABA) with the benefit that accrues from delivering intervention in the context of regular early childhood activities" (p.136). It is noteworthy that behavioral training has been

used to improve social skills of children with autism, but it is rarely presented in the literature as a procedure to support the development of other skills. Keogel, Sze, Mossman, Koegel, and Brookman-Fraizee (2006) posit that "outcome studies suggest that when children begin naturalistic, motivation-based types of intervention before the age of five years, approximately 85%-90% can successfully acquire some level of verbal communication" (p. 142), thereby enabling interaction with materials, teachers and peers.

Incidental teaching incorporates many of the proven early childhood concepts of learning. It provides an opportunity to capitalize on a child's interests and motivation while in a natural environment. The teacher can use classroom activities and routines to expand on the existing knowledge and skills and encourage and motivate the child to use a higher order of thinking. This *zone of proximal development* is a central premise of Vygotsky's cognitive-social learning theory and is the foundation of incidental teaching. By scaffolding the learning and providing opportunities for higher order of thinking within the natural setting, this strategy allows the teacher to individualize instruction.

Shortcomings of Current Professional Development

Information collected in a study by the National Staff Development Council (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009) found that, while teachers often attend professional development workshops and trainings, the topics addressed in these sessions are often disconnected from practice and rarely implemented. Presenting new information in such a manner does not allow for ongoing study of the subject, the opportunity to try it in a classroom situation, or the opportunity to reflect on the results. Typically, funding for such training is negligible, meaning that topics cannot be covered in depth because there is limited time available

away from the classroom. The Council found that the "intensity and duration of professional development offered to U.S. teachers is not at the level that research suggests is necessary to have noticeable impacts on instruction and student learning" (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009, p. 20).

Research Question

Because early intervention can ameliorate the effects of a disability and take advantage of the malleability of the brain in young children, it is important to identify an efficient method for teachers to implement effective strategies for working with children with disabilities. Providing graphical feedback to preschool teachers has been suggested as one major way to encourage and support their efforts as they work to increase a given behavior. The use of graphical feedback to encourage and support preschool teachers to increase the use of a target behavior can be significant.

This study will provide evidence about the use of graphical feedback (e.g., showing a teacher a chart of the frequency of use of some desired teaching behaviors) to increase the post-workshop use of incidental teaching strategies. The hypothesis, then, is that graphical feedback will affect teachers' frequency of use of incidental teaching. If the study fails to support the hypothesis, other follow-up strategies such as modeling, video-monitoring, and consultation must be considered for future research.

Significance of the Study

This study adds to the literature regarding the effectiveness of graphical feedback in a preschool setting since the majority of the previous research has occurred in elementary settings (Casey & McWilliam, 2008). It also addresses the need for early intervention by presenting a

more effective, targeted instructional strategy which extends evidence about whether a promising practice can make teacher training more effective.

Limitations

While this study to investigate the impact of graphical feedback can be replicated, there were several factors that may change the outcome. One of the most significant was the inherent limitations of a single-subject study. In addition, whole session reliability was biased rather than an exact agreement by event which limits the specificity. A second person was trained on incidental teaching and was used to review videotaped interactions and code the responses. Additional limitations include the following.

- This study was conducted in a single classroom. Using another classroom within the same program may have affected the results.
- The results may not be replicable because of the demographics of the target population used. Characteristics of culture, classroom enrollment, and socio-economic populations may skew the outcome.
- The primary goal of the study was to identify changes in teachers' behavior, but the outcomes may vary depending on the severity of the disabilities of the target child. Individual differences in kind or type of disability, as well as the extent to which the child can respond, may be factors in the success of future studies.
- The study used a sample of convenience. The availability of another program that meets the exact criteria of the study may not exist.

Delimitations

Although many variables were measured and controlled, there were some factors over which the researcher had no control. These include the following.

- The schedule of the classroom was established by the program and the researcher collected data whenever free play or center time was scheduled.
- No control over the attitude of participating teachers.

Definition of Terms

In order to understand completely the implications of this study, it is imperative that all pertinent terms be clarified. Misunderstandings or misinterpretations of terms could impact the conclusions that are drawn by the researcher. The following terms are germane to the current study.

Applied Behavior Analysis (ABA): "The process of applying and evaluating the effects of behavioral procedures." (Wolery, Bailey, & Sugai, 1988, p. 21).

Autism: "A qualitative impairment in social interaction, as manifested by failure to develop peer relationships appropriate to developmental level, a lack of social or emotional reciprocity and a lack of spontaneous seeking to share enjoyment with other people." (American Psychiatric Association, 2000, p. 70-71).

Autism spectrum disorders: "Developmental disabilities significantly affecting verbal and nonverbal communication and social interaction usually evident before age 3, which adversely affect a child's educational performance" (Gargiulo & Metcalf, 2010, p. 442).

Baseline data: "Basic information used and collected before implementation of an intervention or program to set realistic goals" (Gargiulo & Metcalf, 2010, p. 443).

Communication: The exchange of ideas, information, thoughts, and feelings that does not necessarily require speech or language (Gargiulo & Metcalf, 2010, p. 443).

Communication disorder: A term which encompasses a wide variety of problems in language, speech, and hearing. Speech and language impairments include articulation problems, voice disorders, fluency problems (such as stuttering), aphasia (difficulty in using words, usually as a result of a brain injury), and delays in speech and/or language. Speech and language delays may be due to many factors, including environmental factors or hearing loss (National Dissemination Center for Children with Disabilities, 2008).

Conditions: "phases of an intervention during which different approaches or techniques are used" (Alberto & Troutman, 1999, p.156).

Consultative model: A process of sharing expertise with a teacher to provide support.

Discrete Trial Training (DTT): A direct instruction method which repeatedly presents a prompt, correction and reinforcement for a specific number of times.

Embedded instruction: Teaching done in the context of ongoing classroom routines and activities. It is an approach which "allows teachers to use traditional early childhood activities such as dramatic play, art, nature walks, and water play to address specific goals and objectives across the developmental domains" (Allen & Cowdery, 2009, p. 20).

Embedded learning: An effective approach for providing additional practice of new skills within the context of a regular classroom activity (Allen & Cowdery, 2009, p. 521).

Engagement: The amount of time children spend interacting with their environment (adults, peers, and materials) in a developmentally and contextually appropriate manner (McWilliam & Bailey, 1992, as cited in McWilliam & Casey, 2008, p. 3).

Event Recording: The counting or documenting of a target behavior.

Feedback: Information provided that enables the person to understand where he or she is in their learning and the next steps that need to be taken (Brookhart, 2008).

Free-play: The time in the classroom schedule when children can randomly choose an activity or play area.

Generalizability: The idea that information learned in one situation can be used successfully in other situations.

Graphical feedback: Feedback and information about behavior that is displayed as data in a quantitative, objective format. For the purpose of this study, this term means that teachers not only "view graphical displays but are also provided with verbal feedback to ensure their understanding" (Casey & McWilliam, 2008, p. 252) of the graph.

Highly qualified teachers: Educators who meet the criteria as stated in the federal mandate, including a minimum of a Bachelor's degree from a college or university, full state teacher certification in the area in which they teach, and the ability to demonstrate subject matter competency in the core subject matter being taught (Yell & Drasgow, 2009).

Individuals with Disabilities Education Improvement Act (IDEIA)*:* The reauthorization and amendment of the Individuals with Disabilities Education Act provides for the education of persons ages three to twenty-one.

Incidental teaching: A method for elaborating on or expanding children's existing engagement (Hart & Risley, 1975 as cited in McWilliam & Casey, 2008) which utilizes unplanned time to increase a child's learning in an informal manner.

Inclusion: A practice characterized by the underlying principle that children belong together regardless of ability. “Inclusion is the movement toward, and the practice of, educating students with disabilities and other learners with exceptionalities in general education classrooms alongside their typical peers with appropriate supports and services provided as necessary” (Gargiulo & Metcalf, 2010, p. 446). While similar to mainstreaming and integration, inclusion is more comprehensive and all encompassing because it involves bringing support services to a child with special needs and having that child totally integrated into the classroom activities (Miller, 2009).

Intentional teaching: A method of establishing goals and objectives and a plan to organize learning experiences that will facilitate the student accomplishing them.

Lead Teacher: The person responsible for the planning and implementation of objectives and activities that are age and developmentally appropriate for the children in his or her care. It is his or her responsibility to supervise other adults in the classroom and to monitor records.

Least Restrictive Environment (LRE): “The setting where the child with disabilities has the most normal setting and can have the most contact with typically developing peers. The legal term is interpreted to mean that individuals with disabilities are to be educated in environments as close as possible to the general education classroom setting, which is a concept, not a place” (Gargiulo & Metcalf, 2010, p. 446).

Local Education Agency: Also referred to as the “lead” education agency, interpreted to mean the agency that has the responsibility for complying with federal mandates.

Milieu Teaching: A synonym for incidental teaching. Milieu teaching is a strategy for making the best use of teachable moments. The distinguishing feature is that it is child-initiated and delivered in naturalistic environments (Allen & Cowdery, 2009).

Naturalistic instruction/natural environment: Instruction at times and places that are in keeping with those common to young children, for instance, on the playground, with peers, in a childcare setting, and/or at a home are considered naturalistic and natural.

No Child Left Behind (NCLB): A federal law enacted in 2002 by President George W. Bush to improve reading and math in public schools and to reauthorize education reform using federal funds. NCLB requires states to develop accountability standards, increase teacher requirements, provide professional development standards and include family initiatives (Allen & Cowdrey, 2009).

Non-elaborative responses: Interactions by an adult that are in response to a child's initiation of an activity or behavior, but do not include attempts to elicit more sophisticated behavior from the child (McWilliam & Casey, 2004).

Non-responsive Directives: Interactions by an adult that instruct a child's behavior but are not contingent on the child's current behavior. These directives attempt to elicit behavior from the child that has nothing to do with the activity in which he or she was engaged (McWilliam & Casey, 2004).

Paraeducator: A person trained to work with a certified teacher as an assistant in dealing with children in the classroom. Other terms for this position include teaching assistant or paraprofessional.

Performance feedback: Feedback and information regarding the behavior, actions or activities that are being observed.

Preschoolers: Children aged three to five years that have not yet been enrolled in a kindergarten program.

Professional development: Educational training that will add to the competency of the individual and expand his or her understanding and knowledge. It is "... a way of renewing themselves, of being open to new ideas, and of trying out different strategies and approaches to learning" (Kluth, 2003, p. 50).

Sample of Convenience: The population of subjects for a study that is available at a given time.

Scaffolding: The linking of current skills and knowledge with new information or skills to be learned.

Single-subject study: A study that uses a sample size of one to determine if a behavior change in an individual is the result of an intervention.

Social Competence: Skills and competencies related to interactions that are appropriate for people and situations and may include empathy, social judgment, and communicative behavior.

Teachable moments: Unplanned classroom episodes that occur and offer the opportunity to enhance understanding and enhance the child's curiosity. This may occur, for example, when a child asks "why" or when a teacher deviates from planned activities to address a child's interests.

Zone of Proximal Development: The difference between the actual level of problem solving ability and the potential development of a higher level of learning.

Chapter 2:

Literature Review

Overview of the Literature

Performance feedback as a method of providing information and training to change behavior and promote maintenance of the behavior has been the subject of many studies (Alavosius & Sulzer-Azaroff, 1990; Alvero, Bucklin, & Austin, 2001; Casey & McWilliam, 2008; Codding & Smyth, 2008; Downs, Downs, & Rau, 2008; Hattie & Timperley, 2007; Ovando, 2005; Rose & Church, 1998). This literature review will include studies of past research that pertain to the hypothesis that graphical feedback will impact teachers' frequency of use of a target behavior. This review will further demonstrate the importance of recognizing the need for professional development strategies, and suggest a promising new strategy: incidental teaching.

Changing Professional Development Needs for Teachers and the Changing Face of American Education

The United States has been maintaining records on the number of children with disabilities for many years, and the statistics indicate that the number of children with disabilities is steadily increasing as found in Appendix K (statistical data on children with disabilities. The percent of student enrollment for speech or language impairment between school years 1993-1994 and 2003-2004 "rose from 2.3 percent to 3.0 percent and from 0.1 to 0.4 percent for children with autism and traumatic brain injury" (National Center for Educational Statistics, 2006, p. 1). Teachers encounter children with these needs in classrooms from preschool to high

school and must be creative and flexible in their instruction. As educators they must be proficient in using a wide variety of strategies in order to meet the diverse needs of all children.

As a result of the passage of early intervention mandates, more children are being identified as having a disability; and this identification often occurs earlier: "There is an urgent need for teachers today to develop new and creative emotional competence in order to cope with an increasingly complex, changing and diversified school environment" (Malm, 2009, p. 79). Brain research has shown that younger children's brains are more malleable, and as they develop, are ripe for the teaching of adaptive skills (Siegel, 2003). The best time frames for building language are between two to four years of age and efforts prove most successful when incorporating the target instruction within the child's normal activities (Siegel, 2003). Such naturalistic instruction "...can be thought to include all those micromanaged moments of opportunistic informal conversation and play" (Siegel, 2003, p. 455) throughout the day. This embedding of incidental teaching of skills, while seemingly obvious, is often overlooked by teachers.

Increasing Need for Professional Development to Address Special Needs

Professional development for educators often focuses on enhancing the knowledge and skills necessary for instructing children, but many teachers may not feel prepared for the diverse population of students in today's classrooms. This is especially true for instructors who deal with children with special needs. Inclusion, a model which integrates learners with a range of cognitive, physical, and emotional characteristics, has forced educators to consider alternative strategies in order to differentiate their instruction. There is strong experimental evidence, primarily from early childhood demonstration programs, that high-quality interventions

beginning in the earliest years help children learn and achieve at a typical rate (Handleman & Harris, Eds., 2001). It is paramount that educators have the opportunity for ongoing training and supervision by a professional with expertise. This is important because "…the content of what is being taught must be monitored to provide fidelity so that a program is not called one thing, but does another" (Siegel, 2003, p. 308).

There are several methods available for increasing the likelihood that a teaching strategy will be implemented correctly, since direct instruction alone may not lead to more effective teaching practices among workshop participants. Two of the most direct and successful methods include providing specific training in a workshop or seminar fashion, and the use of performance feedback that offers commentary on the implementation of the behavior. Presenting information that can be readily used in a classroom may be provided as training in a workshop but teachers may not have adequate skill to implement the material effectively. Performance feedback will support the instructors and enable them to successfully use training information.

Effective professional development addresses the concrete and everyday challenges of teaching and allows teachers the opportunity to share their insights as well as to garner new information. Development activities and strategies must be implemented to allow teachers the opportunity to develop a skill base that will address the needs of the children in their classroom. Invariably, with the rise in the number of children with special needs, teachers will be faced with situations that require ongoing training in order to provide appropriate learning opportunities to address the diversity of needs within the classroom: This view is summarized by Malm (2009): "There is an urgent need for teachers today to develop new and creative emotional competencies

in order to cope with an increasingly complex, changing and diversified school environment" (p. 79).

Effectiveness of Current Professional Development

Professional development is the process of providing instruction and practice to help teachers enhance their skills. Learning to teach is not as simple as acquiring a degree in education, but rather, it is a lifelong process: Teachers must be taught to teach and in turn, to mentor classroom assistants. Meaningful professional development is essential for both pre-service and working educators (Atay, 2008; Malm, 2009). Traditional professional development may include short-term workshops or seminars by "experts" who share information regarding aspects of teaching. This limits the applicability of the information since it is removed from the classroom setting and cannot be put into practice immediately (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009).

Traditional methods of professional development that are distinct from the classroom may fulfill a mandate for training but may not necessarily be transferred to the classroom and implemented with the children. The National Staff Development Council researched the status of professional development and learning and found that in 2003-04, 92% of teachers reported participating in some manner of professional development. They also found that the majority of the training specifically dealt with academics and much of that was superficial. Many of the teachers also reported that there were few workshops or little training on specific teaching strategies for working with children with special needs. The report concluded that "the intensity and duration of professional development offered to U.S. teachers is not at the level that research suggests is necessary to afford noticeable impact on instruction and student learning" (Darling-

Hammond, Wei, Andree, Richardson,& Orphanos, 2009, p. 20). Appendix K presents a table which represents the percentage of teachers that reported their participation in the various forms of traditional professional development. Teachers were surveyed using the federal Schools and Staffing Surveys that were prepared by the National Center for Education Statistics. In 2003-2004, 91% of teachers surveyed had attended workshops, conferences, or training sessions in the previous twelve months. Fewer teachers participated in any of the other forms of professional development such as university courses or observations at another school. Many teachers reported that professional development was limited and not specific to the subject they taught. Based on this information, it appears that a new approach to professional development must be explored and identified. Training on incidental teaching, which is synonymous with milieu teaching, can be used immediately. Incidental teaching is child-initiated and delivered in a naturalistic environment. While the literature related to incidental teaching has been largely focused on helping parents work with their children, it has the potential to prove effective in the classroom if it is combined with graphical feedback. Graphical feedback can enhance professional development and facilitate a teacher's use of information gained in workshops.

Research Findings on the Role of Feedback

Feedback involves providing information that enables a person to understand where he or she is in the learning process and discussing the next steps that need to be taken. It allows an observer to comment on behaviors or actions and to voice an opinion. Feedback is essentially information provided to a person that describes his or her performance or understanding.

Initially, praise or comment on a behavior may be successful as the subject reacts to the attention, but it does not expand the understanding of the expected appropriate behavior. The

recipient of feedback must be given information following a particular behavior (incidental teaching) and be told what was anticipated, the incidental teaching which was observed, and suggestions for improvement. The process thus becomes new instruction for performance rather than solely a comment about correctness (Hattie & Timperly, 2007). Feedback, therefore, allows an individual to change the behavior and to be successful. There are different kinds of feedback that have been utilized successfully in many venues. The format and context are factors which must be considered. Feedback can be delivered in a variety of ways depending on the time constraints, locations, or observers.

There are differing perceptions of feedback. These range from punitive comments regarding behavior to a method of noting positive behavior or as a source of neutral comments related to a person's performance. The concept of using feedback to change the accomplishment of a goal "was first used by rocket engineers in the 1940s and has been applied in many fields" (Ende, 1983, p. 777). Applying the concept of feedback in the social science arena "proceeds backwards from the performance and is able to change the general method and pattern of performance" (Ende, 1983, p. 777), which can be called learning (Ende, 1983). During an employee's annual evaluation, for instance, feedback can be perceived as negative comments regarding past performance. The terms "…feedback and evaluation are often used interchangeably" (Ende, 2003, p. 778) which may cause confusion.

Feedback is an integral part of a learning process because it presents information rather than judgment and encourages the person to reach a goal (Ende, 1983; Malm, 2009). It can be viewed as "a consequence of performance" (Hattie & Timperley, 2007, p. 81) rather than as an element for professional development. For feedback to be effective it must be delivered in a

timely manner to influence future behavior. It is an act of sharing information and involves comments from an outside source as well as personal perceptions of the behavior (Malm, 2009). Consequences of a person's actions may not be known until it is too late; therefore, for feedback to be most useful it there must be information about behavior and its consequences based on previous guidelines.

Methods of Feedback

Studies have been conducted to determine the efficacy of email as a method of feedback. Barton and Wolery (2007) evaluated the effect of e-mail feedback on the behavior of pre-service teachers. Although teachers can be provided with both written and verbal feedback outside the context of the classroom, this can often cause a disruption in activity flow. A possible alternative method is the use of e-mail to deliver performance feedback. This method eliminates the need to remove the teacher from the classroom or interrupt the class while providing an electronic record of the feedback as well as a method to create a dialogue with the supervisor. Barton and Wolery concluded that this form of feedback was in "…addition to, rather than a replacement for, other forms of performance feedback" (2007, p. 56).

Mortenson and Witt (1997) investigated the efficacy of performance feedback being delivered weekly rather than daily. From a practical standpoint, teachers, administrators, and supervisors do not have the time available for daily interaction because it takes away from instructional time. Their initial protocol had a consultant consistently present in the classroom and then lessened his or her presence over time. Performance feedback began after the teacher instituted the intervention and had no contact with the consultant. The weekly meetings included review of the intervention, presentation of data, praise for positive behavior, and discussion of

future implementation. The effects were immediate and demonstrated an increase in strategy implementation for each teacher that participated in the study. Additional results indicate that "a reduction in the intensity of performance feedback from daily to weekly still produces an effect, but the effects were not as large" (Mortenson & Witt, 1998, p. 8).

In an effort to increase the quality of interventions by general education teachers, a consultation model has been suggested in the literature. While increasing the knowledge base of the regular educator, the model has not shown to be effective in the long term. But with "implementation of daily performance feedback by a consultant, [it] markedly improved treatment integrity" (Noell, Witt, Gilbertson, Ranier & Freeland, 1997, p. 77). Training manuals, written instructions, and verbal directions alone are not adequate to affect teacher behavior. Results of several studies demonstrate that consultation that combined verbal comment as well as a graph detailing the performance, was more effective than verbal performance feedback alone in improving teaching strategies (Casey & McWilliam, 2008; Hagermoser-Sanetti, Luiselli, & Handler, 2007; Noell et al., 1997; Rathel, Drasgow, & Christle, 2008; Reinke, Lewis-Palmer & Martin, 2007). Modeling, hands-on demonstration, and performance feedback are the most effective techniques for providing feedback in a consultative model. A consultant can perform expected behavior and demonstrate the task. As the teacher tries the behavior with the consultant nearby, the behavior can be shown in the classroom setting. Once the teacher has used the strategy, performance feedback provides support and encouragement. A study by Noell, et al (1997) found that performance feedback can be effective in improving the treatment implementation by general education teachers. In their study, all the participating teachers showed an improvement in treatment integrity, but that progress faded after a few days. When

the data showed a static or downward trend, performance feedback was implemented. The consultant identified the incorrect behaviors, discussed the importance of consistency, praised correct behavior, and suggested ways to improve. With the return to performance feedback, there was an 80% increase in the teachers' implementation of the intervention (Noell, et al., 1997). While the results were inconsistent between the teachers in the study, there is enough data to suggest that there is a relationship between behavior change and performance feedback. Since the study involved consultants and not program administrators, it clearly "…demonstrates that performance feedback can increase intervention implementation in consultation and does not require the consultant to hold administrative authority over the teacher" (p. 85).

Applications of Feedback

In an article on learning to teach, Rose and Church (1998) reviewed forty-nine studies that provided data on pre-service and in-service training and its effects on teaching behaviors. They found that training packages that included performance feedback with classroom application were the most effective. Their research provided conflicting evidence regarding the value of modeling, role-play, and cueing systems in skills training (Rose & Church, 1998). Their conclusion was that more research is needed on the provision, maintenance and the role of performance feedback. Roscoe and Fisher reviewed efficient methods for training and found that to facilitate skill development, feedback was necessary (2008). Staff were videotaped to establish baseline information and then were provided with specific skill training. Prior to each subsequent session, the researcher discussed data from the previous session, and provided feedback as to the correctness of the target behavior (Roscoe and Fisher, 2003). The results

indicated that a training package could be developed in a single session as long as there was sufficient feedback, immediate application, and role-playing or modeling.

Performance feedback has been used in a variety of organizational settings for over 20 years. Alavosius and Sulzer-Azaroff (1990) studied the effects of feedback in the delivery of health-care routines. They "…systematically compared different values of the critical parameters of feedback contingencies" (Alavosius & Sulzer-Azaroff, 1990, p. 151) and specifically addressed "when" the feedback was administered. This procedure provided a simple and inexpensive system that did not interfere with care given to patients. They found that the most successful feedback allowed the recipient to try the new behavior immediately. However, the dense observations and feedback proved to be costly and intrusive. While spacing training over days, weeks, or months appeared to be more practical, the observed behaviors had a tendency to fade over time. Prolonged time lapses between feedback sessions had a tendency to minimize the generalization of the behavior. In discussing the results of the study, they determined that there was "…a functional relationship between improvements in behavior and individualized feedback" (Alavosius & Sulzer-Azaroff, 2003, p.159). The weakest relationship resulted between written instructions and short-lived workplace performance.

Similar studies have updated the literature about the essential characteristics of performance feedback in an organizational setting. Alvero, Bucklin, and Austin (1998) reviewed 68 discrete applications of feedback in 43 separate studies in applied organizational settings. Throughout the study, feedback was found to be inconsistent in improving performance and varied with the procedures used to deliver it. Their review focused on feedback characteristics that are associated with the most consistent effects (Alvero, Bucklin & Austin, 1998). Many of

the studies that were reviewed showed that feedback alone was the most frequently used strategy, but when used in combination with goal setting, written information, and consequences, it provided more consistent results. The overall comparison of findings by the Alvero, Bucklin and Austin study revealed that when graphs and written reviews were used, there were consistent effects in 86% of studies. They also concluded in the 1998 review that the combination of daily and weekly feedback was found to result in consistent effects for 80% of the studies (Alvero, Bucklin, & Austin, 1998). This review confirmed the finding that the characteristic of feedback that consistently improved behavior was the use of rewards, especially when delivered by a supervisor (Alvero, Bucklin & Austin, 1998). Even after years of practicing organizational behavior management, there have been minimal studies on its effectiveness in regard to training methods and the authors suggest that more studies are needed in order to provide additional information on more effective feedback (Alvero, Bucklin & Austin, 1998). While organizational or institutional settings have been the sites for the majority of studies of performance feedback in the past, few have been "conducted on the effectiveness of performance feedback to influence the behavior of teachers" (Mortenson & Witt, 1998, p. 614). Feedback is often used when discussing learning and teaching, but there is a limited amount of information on how it can be best used in the classroom (Hattie & Timperley, 2007). Within the last ten years, research into the effectiveness of performance feedback for ensuring adequate implementation of teaching and intervention strategies has increased dramatically (Codding, Feinberg, Dunn, & Pace, 2005; Hagermoser Sanetti, Luiselli, & Handler, 2007; Leach & Conto, 1999; Noell, Gresham, & Gansle, 2002; Noell et al., 2000; Noell, Witt, Gilbertson, Ranier, & Freeland, 1998; Ovando, 2005; Rathel, Drasgow, & Christle, 2008; Reinke, Lewis-Palmer, & Martin, 2007; Rose &

Church, 1998). It is noteworthy, however, that even with the plethora of research, few studies "…involved students in early childhood special education or in early childhood inclusive classrooms" (Barton & Wolery, 2007, p. 56). As the number of young children with disabilities needing services increases, it is important to identify instructional methods that facilitate tangible developmental and educational gains in this population. "Equally important is examining how to best train preschool educators to implement those instructional methods that have proven effective when used with children who have various developmental disabilities" (Downs, Downs, & Rau, 2007, p. 236).

A study by Downs, Downs, and Rau (2007) examined the effects of training and feedback on teacher performance using Discrete Trial Teaching (DTT) skills and support skills within a public school setting. While this study was focused on DTT, the results indicated that feedback can and does make a difference in instructors' use of the skills taught and contributes to an increase in the practitioner's efficacy. A training session for teachers on discrete trial teaching was provided and resulted in fair performance, but when "…additional supervision and oral and written feedback were provided, the instructors demonstrated 90% or above correct procedures" of the strategy (Downs, Downs, & Rau, 2007, p. 243). It is worth mentioning that student progress resulting from the increased use of DTT was generalizable to other situations.

Codding and Smyth (2008) studied the utilization of performance feedback to decrease classroom transition time and examine collateral effects on academic engagement. The premise was that feedback had been used to improve the performance of individuals, but they wanted to examine the effects on an entire class. The study included consultation and weekly interviews with the teachers to maintain the behavior change. Teachers were provided information on the

minutes of transition time while also being given management strategies that would decrease the time spent on the transitions. While the study was done in high school, the results were "…consistent with other research that suggests that performance feedback is useful for changing teacher behavior" (Codding & Smyth, 2008, p. 339).

Feedback as Supervision

Supervisory feedback for the teacher is often provided immediately after an observation in a directly verbatim fashion. Although it may influence change in the teacher's performance, there are many drawbacks. Time constraints, privacy issues, and misinterpretation may take place. In the case of written feedback, it may be difficult for the trainer or administrator to complete the written feedback and then meet with the teacher for discussion of the observation. Graphical feedback provides a visual picture of the frequency, duration, rate, or intensity of either the child's or the teacher's behavior which can be used to influence future performance. Often, graphical feedback is provided as a follow-up protocol to the introduction of a new teaching strategy (Casey & McWilliam, 2008). Graphical feedback displays objective, quantitative information that can be used as a focal point for demonstrating the increased frequency of the strategy, thus limiting the need for excessive verbal feedback. Minimal verbal feedback is necessary to explain the graph, point out success, and to encourage continual implementation of the strategy.

Studies by Mortensen and Witt (1998), as well as Noell, Witt, Gilbertson, Ranier and Freeland (1997) found that implementation of strategies without routine follow-up was poor. A structured meeting that included graphical information and praise resulted in providing a less time-consuming performance feedback with greater results. Additional research found that

"…feedback is more effective when it provides information on more correct rather than incorrect responses and when it builds on changes from previous trials" (Hattie & Timperly, 2007, p. 85).

Instructional leaders must develop a foundation of knowledge that allows them to provide positive, quality feedback that will guide teachers' professional development. By offering professional, constructive feedback to teachers, teaching and learning excellence can be achieved (Ovando, 2005). Tate, Thompson, and McKerchar (2005) suggest that specific training programs are necessary and that "clear instruction and feedback are critical components of teacher training" (p. 260). Graphical feedback is useful in consultation and training because, while giving general information about behavior, it also offers support and encouragement (Casey & McWilliam, 2008).

Findings on a Promising Practice: Incidental Teaching

Definition and overview. Incidental teaching involves following the child's lead and using the things that interest him or her to expand language and or skill. It is a successful strategy because it can be incorporated within the child's normal activities. Talking about something or doing something that the child is interested in promotes his or her development. This embedding or incidental teaching of skills, while seemingly obvious, is often overlooked by teachers. It uses the zone of proximal development to take the child from where he or she is to a higher level of thinking and engagement.

The use of the term, "incidental teaching", has been attributed to Hart and Risley (1975). This process is based on traditional principles of learning that are appropriate for all children. Preschool teachers have used "teachable moments" to increase learning in the past, but by using incidental teaching as a systematic strategy of expanding a child's interests, the technique

becomes a purposeful tactic to encourage engagement and to increase language development and social development. Incidental teaching is a technique that focuses on the interactions between a child and the adult, thereby providing opportunities for extended learning and engagement. Moreover, it is a strategy that uses the child's interest as a catalyst to scaffold learning opportunities that occur in the context of the natural environment.

Research. Research into incidental teaching as a teaching strategy has been a subject of interest since the early 1960s. Because it was often ill-defined, researchers struggled with determining whether the results of their studies were due to incidental versus intentional teaching or the mental capabilities of the subjects. Semmel and Williams (1968) discussed the findings of previous researchers and concluded that they were interested in the relationship between intentional and incidental learning from a theoretical and practical perspective (Semmel & Williams, 1968). While there was mention of the differences in verbal abilities of children with severe intellectual disabilities and those of high ability, it encouraged continuing research. While this study is clearly outdated in language and choices of subject groups, it did open the discussion of incidental teaching as a viable teaching strategy.

Pioneers in the advocacy of incidental teaching in preschools found that teachers were receptive to strategies that would help children learn (Hart & Risley, 1975). Incidental teaching can occur in unstructured, natural situations as well as those contrived by the teacher: "Unlike other procedures, incidental teaching is used *after* the child has produced a verbal, vocal, or gestural request" (Noonan & McCormack, 2006, p. 198).

Incidental teaching for communication. Used primarily for increasing verbal skills, incidental teaching has also found application with other skill sets, such as social interactions

with either adults or peers. In the case of a non-verbal child, reaching for an object, crying, or struggling with clothing or toys may be the opening for the adult to respond and expand the child's learning. Even though the primary practitioners of the strategy have been teachers, other people in a child's life could provide instruction. Hart and Risley (1975) conducted multiple studies that involved the increase in language skills of preschool children and concluded that the majority of language learning occurs incidentally by sharing an activity, talking about it, and having the teacher expand on the concepts, the teacher can facilitate the learning. These procedures are a means of scaffolding the learning and can be considered "…one of the most theoretically eclectic practices in early childhood education" (Casey & McWilliam, 2008, p. 69).

While incidental teaching has been most effectively used in the teaching of language, it can also be useful in the development of other skills (Hart & Risley, 1975). Teachers have successfully employed incidental teaching to expand upon a child's engagement (Casey & McWilliam, 2008) and to increase his or her ability to generalize the skills in alternative contexts (Casey & McWilliam, 2008). McGee, Morrier, and Daly (1999) agree that planning for incidental teaching within the curriculum "…offers the advantages of a technical grounding in applied behavior analysis (ABA) with the benefit that accrues from delivering intervention in the context of regular early childhood activities" (p. 136). It is noteworthy that social skills training for children with autism uses ABA but there are few studies that describe procedures for these children when they interact with typically developing peers (Sawyer, Luiselli, Ricciardi, & Gower, 2005). Keogel, Sze, Mossman, Koegel, and Brookman-Fraizee, (2006) found that "outcome studies suggest that when children begin naturalistic, motivation-based types of intervention before the age of five years, approximately 85%-90% can successfully acquire some

level of verbal communication" (p. 142) a level that enables interaction with materials, teachers and peers.

Incidental Teaching for Children with Autism. The Walden Program at Emory University in Atlanta, Georgia uses an incidental teaching approach to early intervention for toddlers with autism. It provides an inclusive setting where children with disabilities interact with typically developing peers. McGee, Morrier and Daly (1999) have been involved in studying the principles that govern the program. Incidental teaching is a core strategy that is used to teach language and social skills. In this method, teachers prompt for an elaboration from a child once the child shows an interest in a toy or activity. This approach allows for incidental teaching to take place throughout the day and in numerous situations. The program does, however, intentionally plan some situations that will involve incidental teaching. By setting up the environment to require a child to ask for a toy, the teacher has the opportunity to engage the child and expand on the interaction. McGee and her co-authors have written several articles on the Walden program and have reported successful outcomes for children.

Instruction in a natural setting during routine activities is not a traditional approach for teaching children with autism. Rote drill and teacher-initiated interventions are more the norm. Research found, however, that additional strategies were necessary. The aim of the Walden project "has been to help children with autism achieve fundamental changes toward social normalization by extending an incidental teaching approach to early autism intervention downward to the toddler years" (McGee et al., 1999, p. 137).

Incidental Teaching for Disadvantaged Children. Because incidental teaching is provided in a natural setting and builds on a child's existing knowledge and skills, it is a viable

strategy for children from a disadvantaged background or those without a grasp of the English language. Teachers can adapt incidental teaching to address deficits in cultural background and language skills in the same manner that it is used to increase language and engagement for children with disabilities. Using the concept of following the child's lead and building on his or her strengths, teachers can help to overcome difficulties in an informal manner that will not ostracize the child or impact the child's self-esteem.

Incidental Teaching for All Children. Incidental teaching is a promising teaching strategy based on traditional principles of learning that are appropriate for all children. Thus, for a young child with a disability, stimulation and intervention in a social context with typically developing peers may provide the most appropriate setting to maximize his or her potential. The infant's world of adult-child social experiences does not prepare him or her for participation in a peer group. These experiences require a different set of skills than those needed with adults (McConnell & Odom, 1999). Previous behavioral intervention methods, such as discrete trial training, did not facilitate the development of social skills and children "became passive recipients of communication primarily acting as responders to the communication initiations of others" (Watson, Lanter, McComish, & Poston-Roy, 2008, p. 1). Interventions to increase social skills have changed in the past ten to fifteen years and now include play and conversation skills that enable children to take part in the learning process (Scattone, 2007). Children with disabilities must be socially integrated into the peer group if an inclusive setting is to facilitate social competence (Frea, Craig-Unkefer, Odom, & Johnson, 1999). The formation of social relationships with peers is one of the milestones in the development of preschool children and results from positive interactions with peers (Frea, Craig-Unkefer, Odom, & Johnson, 1999).

Young children do not have the necessary social skills; they nevertheless want to interact with others (Scattone, 2007). Enrollment in an inclusive preschool setting may be an advantage, but mere proximity to typically developing children does not necessarily mean that the child with a disability will develop social skills. Impaired social functioning is one of the characteristics of many disabilities and as such should include a goal to develop and/or enhance social skills when planning the individualized education plan for atypically developing children. Many programs for children with disabilities focus only on academic skills that may "narrow the academic gap, but the social gap will likely widen if social skills interventions are excluded from the mix" (Scattone, 2007, p.717).

Summary of Background Literature

Much of the literature that is available on performance feedback deals with teacher feedback to students or in organizations that must teach a specific skill set. This review has concentrated on the impact of performance feedback for a teacher. It is clear from the dearth of information regarding this subject that more research needs to be conducted to determine the efficacy of the strategy as well as the type and manner in which it is presented. As has been shown, teachers must have the opportunity to increase their knowledge and skills to enable them to provide the best possible learning environment for children and to have the professional development necessary to achieve this goal. Performance feedback must be delivered in a way that does not take teachers away from the classroom for extended periods of time, enriches their knowledge, encourages them, and allows them the opportunity to put the newly acquired skills into practice.

Research has shown the importance of performance feedback and its benefits to enhance skill development. From organizational uses to the classroom, feedback has provided participants the opportunity to develop new skills as well as to improve on current skills. Graphical feedback provides an objective visual method to track behaviors. It can be used by supervisors to evaluate performance and can be used by individuals to self-monitor. Graphical feedback has shown promise as a tool to increase positive behavior.

Incidental teaching is not a new concept, but it is being reconsidered as a teaching strategy which can prove valuable for all children. Previous studies confirmed the effectiveness of incidental teaching for teaching language skills to children with disabilities, and new studies have begun that explore the implementation of incidental teaching use in any classroom. The incidence of children with special needs and learning deficits is growing, and more information is needed about ways to deal with differentiating instruction. Incidental teaching is a promising strategy that can be used to adapt lessons. It can be useful not only for children with disabilities but also with non-English speakers, disadvantaged children, and culturally diverse students. Combining the positive effects of incidental teaching and graphical feedback has potential for increasing the effectiveness of teachers' instruction. Research has shown the increase in positive behaviors when these strategies are used, and by combining them, the results could be substantial.

Chapter 3:

Method

Overview of Method

This study's main research question was: Will the systematic application of graphical feedback about the use of incidental teaching change the behavior of teachers? The study provided information regarding teachers' behavior before the introduction of graphical feedback, during an intervention phase in which graphical feedback was present, and after the graphical feedback was discontinued. In addition, the study provided evidence regarding the use of graphical feedback (e.g., showing a teacher a chart of the frequency of use of incidental teaching) to increase the use of incidental teaching strategies. The hypothesis, then, was that graphical feedback would affect the teachers' frequency of use of incidental teaching.

Design

This study used a single-subject design, also known as a single-case experimental design (Gay & Arasian, 2003). Single-subject designs are useful in the field of early childhood intervention because the design can be used to study measurable events with an individual rather than comparing means in a group design. The type of single-subject design used in this study was a multiple-baseline design employed because multiple-baseline designs are used when it is not possible to withdraw a treatment and have performance return to baseline. With a multiple-baseline design " … data are collected on (1) several behaviors for one subject, (2) one behavior for several subjects, or (3) or one behavior and one subject in several settings" (Gay & Arasisan, 2003, p. 388). The strategy used in this study focused on one behavior with more than one subject.

Setting

The study took place in a private, inclusive preschool. For confidentiality, the school was referred to as the Children's Growth and Development Center (CGDC). CGDC was located in the downtown section of a medium sized city in the southeastern United States and drew children from the surrounding counties. The CGDC has acheived the state's highest quality rating for excellence in child care and was accredited by the National Association for the Education of Young Children (NAEYC).

This study was conducted in a developmentally-appropriate room designed for children three to four years of age with and without disabilities. Throughout the study, participating teachers were asked to interact with the same child during the designated observation times. Children were able to access all areas of the classroom. The routine schedule included a time for each child's choice of activity that could either be at a center or free play.

Seven interest centers were available throughout the day and afforded children the option of choosing from centers such as art, books, science, blocks, manipulative toys (including puzzles), housekeeping, or music. A sand/play dough table and a computer were available during specific times. The housekeeping area included a table and chairs, sink, refrigerator, toy food, and dress-up clothes. Other toys relevant to pretend play, such as a telephone, cash register, and dolls, were readily available on the shelves portioning this area from the block area.

Space for playing with blocks contained a rug with a printed design of a road, cars, road signs, and small figures. Castle blocks, wooden blocks and large cardboard blocks were in this area and extended into a larger open space. Children were also able to spend time in the science area and manipulate scales or watch the two guinea pigs. Adjacent to the science area was the

book corner. Cozy pillows and bean bag chairs allowed the children to relax as they read and looked at books.

The art and music areas were less obvious. Crayons, markers and paper were located on shelves beside the tables that were generally used for eating. When the children wanted to draw, they had to retrieve the art materials and take them to the table. Musical items were in plastic drawers near the blocks but were not visible to a stranger in the classroom. Manipulative items such as puzzles and bristle blocks were in the center of the room. Children were able to sit at a table and play with these items undisturbed. Small chairs and shelves established the perimeter of the area.

The room was large and bright. Children had an area for their belongings near the door. A separate office, closet, lavatory, and observation room afforded privacy and storage. Counter space and a sink provided an area for food distribution, messy art activities, and general classroom clean-up.

Participants

After securing approval for the study from the Institutional Review Board (IRB) at the University of Tennessee at Chattanooga and the Children's Growth and Development Center (CGDC), three preschool teachers and one preschool child were identified and solicited to participate in the study. The teachers were the primary participants. A child with a disability was selected as the target of the activities with the teachers.

Potential participants were identified by contacting the administrators at the CGDC. They were asked to identify those classrooms and teachers not presently involved in a research study so as not to overburden a particular classroom or staff members.

Teachers. Criteria for teacher participants included: (a) all were currently teaching in the same classroom; (b) all have taught in that classroom for two months or longer, and (c) all three teachers consented to be a part of the study (see Appendix A).

Once a suitable classroom was identified and three teachers agreed to participate, the researcher then met with interested teachers to share more detailed information and to obtain written consent for their participation. Teacher A was a 59-year old African-American woman who had taught for over eight years. She was attending the local community college and was taking Early Childhood Education classes. Teacher B was a 46-year old Caucasian woman who had been teaching for one year. She had a Bachelor's degree in English and was working on a Master's degree in Education. Teacher C was the lead instructor and had been teaching for three years. She was a 28-year old Caucasian woman and had both a Bachelor's degree in History and a Master's degree in Education. Teachers A and C had worked together for three years. The three teachers had only worked together for five months. During the study, the participating teachers were asked to engage a target child in order to allow the researcher to monitor the teachers' behavior during the data collection period.

Child. Permission was secured for the participation of the target child in this study. Permission from CGDC through the agency's internal review board was obtained before the researcher distributed CGDC approved information to the parents regarding the study. A parental information form was provided to the interested teachers and information was then sent home to parents to notify them of the study and its purpose.(see Appendix B). This letter informed the parents of the rationale of the study and notified them that: (a) a reseacher would be in the classroom collecting data during free play/center times, those times during the day that a

child can be encouraged to initiate interactions with teachers and peers; (b) the teacher would be the focus of the study; (c) the procedure could potentially help the teacher increase his or her use of a beneficial teaching strategy, and; (d) the researcher would not be coding the behavior of the child but rather would be focusing on the teachers' behavior with a child.

One child with a disability, chosen from the students in the classroom with disabilities, received a specific consent form (Appendix C). Parent permission was obtained before this child could participate in the study. A single target child was recruited to limit the instructional variables between the three teachers and to allow for the demonstration of an acquired skill. The type or severity of the disability of the child was not a factor for exclusion from the study. However, the target child in the chosen classroom was three years old, attended the program five days per week, had an individualized education plan (IEP), and demonstrated behavior that allowed him to follow the lead of the teacher but not intensive enough that it interfered with learning. He was developmentally delayed and speech and language impaired. His vocabulary was limited, and there were no physical abnormalities. If participation was denied for the target child, the researcher and the teachers would have identified another potential child and repeated the process of obtaining permission from the parents.

Instrumentation

Engagement Quality and Incidental Teaching for Improved Education (E-Qual-ITIE).The primary material for this study was the Engagement Quality and Incidental Teaching for Improved Education (E-Qual-ITIE) tool (McWilliam & Casey, 2004) developed at the Center for Child Development, Vanderbilt University Medical Center. The E-Qual-ITIE (2004) is a method for coding, in 15-minute segments, the types of interactions that occur with the specific

child. The four types of interactions are: (a) incidental teaching; (b) non-elaborative responses; (c) non-responsive directives, and; (d) other. Casey & McWilliam (2004) define incidental teaching as "an interaction consisting of either an initiation or a response by an adult related to the previous or existing engagement of the child" (p. 2). For instance, if the child says "red," then the teacher might say, "Yes, the car is red. Can you find something else that is red?" Non-elaborative responses are interactions by an adult that do not include attempts to engage the child in more sophisticated behavior. Responding to a child's question with a single word such as "yes" or commenting "good job" are two examples. Non-responsive directives are interactions by an adult that instruct a child's behavior but do not depend on child initiation or behavior: "Non-responsive directives attempt to elicit behavior from the child that has nothing to do with what he or she was already engaged in" (Casey & McWilliam, 2004, p. 2). Giving directions to line up or to wash hands are examples of non-responsive directives. Interactions classified as "other" consist of any teacher-child interactions that do not meet the criteria for one of the categories described above, such as a comment by the teacher to the entire class.

Data were recorded on a score sheet (Appendix D) that indicated the teaching behavior observed. While four behaviors were counted and graphed, only one (frequency of incidental teaching) was highlighted and explained to the teachers. A tally was kept for every event of these teaching categories and was coded for the first ten minutes of the 15-minute observations.

Incidental Teaching Checklist. An *Incidental Teaching Checklist* (McWilliam, 2005) (Appendix E) was used as a means of judging a teacher's use of incidental teaching. The checklist included ten items: 1) ensure that there were interesting things for the children to do or talk about; 2) plan developmentally appropriate activities; 3) rotate activities and vary materials;

4) initiate interactions based on what the child was doing; 5) allow the child to remain engaged in the activity of his or her choice, 6) elicit the child's elaboration of his or her engagement; 7) give the child no more than the amount of help he or she needed; 8) ensure the interaction or activity was interesting; 9) ensure the child was reinforced for improving his or her engagement; and 10) ensure that all children receive incidental teaching. Each of ten criteria was explained to the teachers in detail by the researcher during training prior to the intervention observations. The checklist was used during feedback as a reminder and review of the training on incidental teaching.

Procedural Fidelity Checklist. A checklist (Appendix F) designed by the researcher was used by the teachers to ensure that the researcher employed the appropriate procedure when delivering feedback. The checklist included items about the researcher's behavior towards the teacher, the positive nature of the interactions, provision of written information regarding the teacher's use of incidental teaching, and encouragement for the teacher to continue to increase the use of incidental teaching. Each of the items was intended to ensure that the researcher fulfilled the expectations that were explained to the teacher during initial provision of information regarding the study. The checklist included items that ensured the delivery of comprehensive graphical feedback from the researcher to the teacher. Teachers were asked to complete the checklist after delivery of feedback by the researcher. After the researcher left for the day, teachers individually rated procedural fidelity. It was anticipated that the researcher would complete all components of the feedback. The final results by all three teachers confirmed that the researcher followed appropriate procedures in all interactions. The goal for the

researcher was to demonstrate procedural fidelity for a minimum of 90% of the time. The researcher was rated at 100% by all teachers.

Study Procedures

Along with the researcher, an additional individual, Observer One, was recruited to assist in collecting data for this study. Observer One was recruited to code the videos of the teachers' use of incidental teaching and to compare results with the researcher. Observer 1 was an educator with experience with children ages two-five and knowledge of instruction in inclusive settings. Tapes were coded with consideration for personal time constraints and daily availability during observation. The researcher provided the necessary training and gave every fourth tape in the observation sequence to Observer One to code the frequency of incidental teaching.

Training. Training of Observer One began with written definitions of the behaviors that were to be observed. In addition, the researcher modeled each incidental teaching component and engaged Observer One in role playing activities to provide practice identifying specific behaviors. Next, the *Incidental Teaching Checklist* (McWilliam. 2005), found in Appendix E, was shared with Observer One Each item was explained in detail. Videos of other interactions that were used in the training of the researcher were shown to the observer. Every thirty seconds, the tape was stopped and the researcher and Observer One discussed the teaching interactions that were observed. Both then coded a 5-minute segment of tape independently and compared results.

An 85% criterion of inter-observer agreement on each code within a 2 second window in three 5-minute segments constituted the criterion for acceptable agreement during training. Inter-observer agreement on the number of observed instances of incidental teaching was

computed. That is, observers agreed on the number of times incidental teaching took place. There was an 85% inter-rater agreement, otherwise, a discussion and review of the behaviors took place. Observer One was encouraged to ask for clarification and to demonstrate his or her understanding of the strategy. When three 5-minute segments of tape were coded with 85% agreement on the incidental teaching behavior, the training was complete.

Inter-observer agreement for Teacher A ranged from 60% to 95.45% with a mean of 84.92% and a standard deviation of 12.34 for incidental teaching. For Teacher B, the Inter-observer agreement ranged from 71.42%-96.42% with a mean of 87.68% and a standard deviation of 10.43. For Teacher C the Inter-observer agreement ranged from 66.66%-92.85% with a mean of 83.60% and a standard deviation of 9.48.

Teacher A's Non-elaborative response data ranged from 70.31%-97.75% with a mean of 90.27% and a standard deviation of 9.64. For the non-responsive directive category, the inter-observer agreement ranged from 0-60.00% with a mean of 22.818% and a standard deviation of 21.466. The category of 'other' ranged from 25.00%-100% with a mean of 41.45% and a standard deviation of 38.52.

For Teacher B, Non-elaborative response data ranged from 73.84%-96.42% with a mean of 87.73% and a standard deviation of 9.26. For the non-responsive directive category, the inter-observer agreement ranged from 62.50-100% with a mean of 44.17% and a standard deviation of 43.00. The category of 'other' ranged from 50.00-87.50% with a mean of 73.94% and a standard deviation of 12.83.

Non-elaborative response data for Teacher C ranged from 60.00-97.14% with a mean of 86.36% and a standard deviation of 14.00. For the non-responsive directive category, the inter-

observer agreement ranged from 0-83.33% with a mean of 13.89% and a standard deviation of 34.02. The category of 'other' ranged from 40.00-95% with a mean of 53.04% and a standard deviation of 45.91.

Inter-observer agreement across conditions for non-elaborative responses ranged from 86.36-90.27% with a mean of 88.12% and a standard deviation of 1.98. For non-responsive directive category, the inter-observer agreement ranged from 28.95-83.33% with a mean of 63.19% and a standard deviation of 29.806. The 'other' category ranged from 58.03-79.56% with a mean of 66.34% and a standard deviation of 11.57.

Videotaping procedures. As the data collection began, each teacher was videotaped by the researcher using a hand-held camera. The scope of the taping included both the teacher and the target child. During each 15-minute observation, a minimum of 10 minutes of footage was taken. Disruptions in taping such as a fire drill or emergency situation necessitated rescheduling unless the observation was at least ten minutes in length. If a teacher was interacting with a child at the 15-minute mark, the teacher was allowed to complete the interaction before the researcher stopped the recording. The lapse-time counter on the camera established the length of time of the observation. The researcher downloaded and saved the video to a computer for coding.

Videotaping of interactions took place during free-play or center-time activities that occurred during the morning hours, generally beginning between 9:00 am and 9:30 am, depending on the classroom schedule. The afternoon schedule of free play/center time was only used if there was a disruption in the morning schedule. The target behavior of the teachers (use of incidental teaching) was documented during a 15-minute segment of that time.

Baseline data collection procedures. Directions to the teachers during the baseline phase were to remain within six feet of the target child during free-play and center times. Classroom routines and activities were to continue as usual, for the 15 minutes that the researcher recorded a video. Interactions between the teacher and the child during this time were the focus of the data collection, hence the need to retain the teacher and child in close proximity.

After 15 minutes, Teacher A was thanked and told that the time for her to be taped was complete. No feedback was given at this time. There was a minimum of a 5-minute break before the next teacher was asked to move within 6 feet of the target child. If all three teachers could not be observed, the researcher continued the taping rotation at the next opportunity, either in the afternoon or the next day.

The baseline phase continued until the data points showed a stable or downward trend with the first teacher (three data points, minimum). Each data point indicated the frequency of use of incidental teaching during an observation. Other teachers stayed in baseline phase until (a) they had stable or downward trends and (b) there were at least three data points beyond training for the previous teacher (see Appendix G, section A1). While observation length of time was not exactly the same for each teacher (as in the case in a typical classroom setting), the first 10 minutes were calculated to allow accurate comparison throughout the study.

Introduction to the intervention. The intervention consisted of the researcher providing the teacher with training about incidental teaching, graphing data points that indicate the frequency of use of incidental teaching during each observation, and providing graphical feedback as to the efficacy of the teachers' behavior. During this feedback, information was shared about the appropriate behavior, the opportunities that may have been missed, and encouragement was given to continue increasing the use of the incidental teaching. The initiation of the intervention was staggered across the three conditions (teachers).

Intervention step 1: Provision of information. The purpose of the training was to raise awareness of incidental teaching and to provide initial instruction on its use. Feedback was provided to the teachers soon after they were observed to improve implementation of the incidental teaching strategy. Providing this information established a context for the feedback. The researcher met with each teacher, one time only, for approximately thirty minutes at a time during nap time or after nap to provide an introduction to incidental teaching. Incidental teaching was explained to the teacher and examples of different types of teaching interactions were provided. Emphasis was placed on the differences between incidental teaching and non-elaborative responses to ensure understanding. The researcher modeled incidental teaching and engaged the teacher in role playing activities. The text *Engagement of Every Child in the Preschool Classroom* (McWilliam & Casey, 2008) was used to structure the training. A summary guideline (See Appendix H) that details incidental teaching and the rationale for why it is a valuable teaching strategy was given to the teacher. In addition, the Incidental Teaching Checklist (McWilliam & Casey, 2005) was shared with the teacher. Each item was explained in detail and the teacher was given a copy of the checklist to be used as a self-check.

Previously-created video exemplars and graphs were used to demonstrate to each teacher how the data collected on a teacher's use of incidental teaching can be shown in graphical format. This graphical format allowed the teacher to view an example of the information that will be shared after observing her behavior. Teachers were asked to demonstrate understanding of the process by reiterating their understanding of the process and the coding. This initial workshop constituted the introduction to incidental teaching. The feedback included review, definitions, and steps for incidental teaching in the hopes of refining and expanding the teacher's knowledge of the strategy. At the end of the workshop, the teacher was asked to immediately start using incidental teaching in the classroom with the target child.

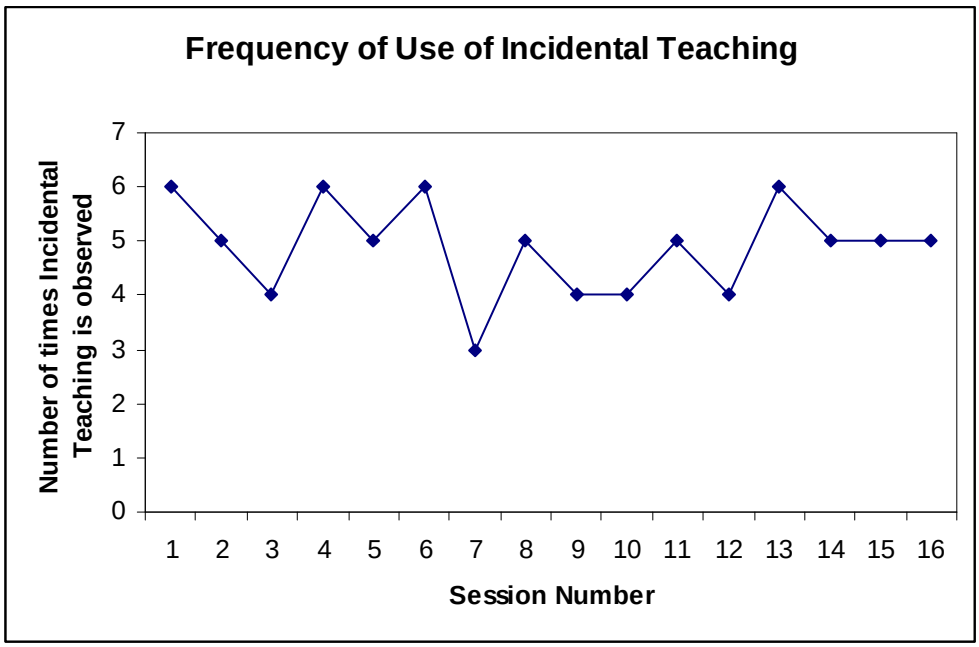
Although each teacher was observed each day, the order of observation followed a planned sequence each time (i.e., Teacher A, Teacher B, Teacher C; Teacher A, Teacher C, Teacher B; Teacher B, Teacher C, Teacher A, etc.). This carefully outlined rotation of teachers limited the possibility of performance changes based on the relationships between teachers, the order of video-taping, or other unknown variables.

Intervention step 2: Feedback. An operational definition of feedback is "information provided by an agent (e.g. teacher, peer, book, experience) regarding aspects of one's performance or understanding" (Hattie & Timperley, 2007, p.81). Feedback provides information regarding performance and changes from previous actions. Effective feedback answers three questions: (1) How is the subject doing? (2) What progress is being made towards a goal? and (3) What needs to be done to perform better? (Hattie & Timperley, 2007). Feedback can assume many formats of presentation. In this study, feedback was provided in graphical and verbal formats. This data-based format allowed for visual representation of the

frequency of behavior in conjunction with dialog concerning behaviors or actions, encouragement and support which became a learning opportunity.

The researcher showed the teacher the Excel-generated graph, such as the one in Figure 1, of his or her use of incidental teaching with the target child. This example of the graph was used at the end of the workshop to illustrate the fluctuation in the use of incidental teaching.

Figure 1: Graph Illustrating the Feedback Given to Teachers on the Frequency of Use of the Incidental Teaching Strategy



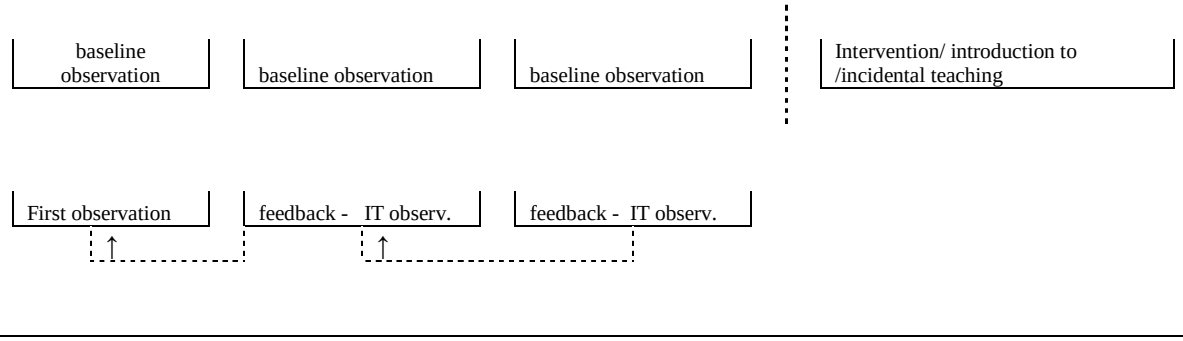
If the use of incidental teaching was increasing, the researcher praised the teacher and encouraged the continued use of the strategy with the target child. If the use of incidental teaching was stable or decreasing, the researcher provided suggestions for improving performance (i.e., reminding teacher of interaction opportunities and say, "You could have used incidental teaching during that interaction by….). A copy of the graph was left with the teacher

for review later in the day. This change in performance frequency provided a vehicle for discussing changes on the graph, missed opportunities, and praise for interactions done well. An example might be, "I like how you encouraged "X" by asking such a probing question, but if you had asked it earlier in the play, it might have led to even more interaction."

During the first intervention session for Teacher A, the researcher looked at the baseline graph, showed the teacher, and prompted her to increase the rate of incidental teaching. During all other intervention sessions, the focus was on the cumulative data points on the graph. The researcher explained the examples of incidental teaching that were observed and the opportunities that were missed. At the beginning of each observation the researcher drew aside the teacher who had been given the information, for a brief (two to three minute) consultation. At this time, the teacher was given feedback concerning the behavior recorded during the previous observation.

Figure 2 illustrates the sequence of observations, the intervention (which is the initial introduction to incidental teaching), and the subsequent observations. During the first observation after the training, the teacher received no feedback. At the beginning of the second session, the researcher began the session with comments concerning session one. Feedback on session two was offered at the beginning of session three, and so forth. During the feedback, the researcher reiterated the definition and components of incidental teaching as well as giving information on the teacher's performance of the strategy.

Figure 2*:* Sequence of Observations on Effects of Intervention



The *Incidental Teaching Checklist* (Appendix E) was shared with the teacher after the first observation following the workshop. Each category was explained to the teacher and the teacher was given suggestions for using them to improve her performance. The included items were discussed in the initial discussion of incidental teaching and served as a review and reminder of that information.

The directions to the teacher for the intervention phase were the same as during the baseline phase. She was directed to stay within 6 feet of the target child for 15 minutes and then the session for that day would be complete. If all three teachers could not be observed, the researcher continued the rotation at the next opportunity. Intervention continued until there were three consecutive observations with stable or increasing rates of incidental teaching (3 data point minimum).

Procedural fidelity. During the intervention, information about procedural fidelity was given by the teachers to the researcher. Using the Fidelity Checklist (Appendix F), the teachers monitored the researcher as feedback was provided and documented that the researcher had completed the elements that were discussed in training. The researcher was rated at 100% by all teachers.

Maintenance. Following completion of the intervention, a maintenance probe was done every 7 days. The teacher was directed to stay within 6 feet of the target child. No feedback was given and the interaction was taped for 15 minutes. Maintenance ended when Teacher C had 2 maintenance data points, which ended the study for all teachers at the same time.

Data Collection and Coding

After each of the daily observations was completed, the researcher reviewed the videos of the teacher's interactions. A tally mark was placed in a corresponding column on the data collection sheet each time the teacher engaged in incidental teaching. As noted previously, the first 10 minutes of each observation was used to obtain data for coding. All interactions were coded. Thirty seconds elapsed between like interactions even if the same prompt was used. If a second teacher was in the frame, that teacher's interactions were ignored. The number of tally marks for the occasions when the teacher used incidental teaching with the target child was counted and graphed so that the data could be shown to the teacher before the next observation. Although the other behaviors (non-responsive directives, non-elaborative directives and other) that have been described were graphed, only the incidental teaching behavior was highlighted on the graph. The graph served as a visual reference for feedback to the teacher on her frequency of performance.

At this point, a proportional calculation was used to determine inter-observer agreement. When inter-observer agreement fell below the required criterion of 85%, the researcher and the Observer One met to review the types of teaching interactions and to review the training on incidental teaching. In calculating the results of the study, general percentages of agreement could not be used because the study was based on frequency of incidental teaching and did not

include a time code for each response. Therefore, it was impossible to conclude that the researcher and Observer One were actually coding the same interaction. With the low frequency codes and the need to incorporate agreement on non-occurrence into the equation, all observed responses were used in the calculations. This determined the extent to which two sets of data are in agreement relative to the total number of observations. The relative percentage of each category data was computed for Observer One and the researcher. The number of incidental teaching responses coded by Observer One was divided by the total responses coded. The remainder of the responses was also divided by the total number of responses. This process was then done on the coded responses of the researcher. The smaller response (either the researcher or Observer One) was then divided by the larger percentage of non-occurrences. The resulting amounts were then added and divided by two to find the mean for agreement on occurrences and non-occurrences.

Data Analysis

The researcher was responsible for coding all observation tapes. The coding happened within 12 hours after each observation day for the three teachers. For each teacher, the number of times incidental teaching and the other behaviors were used were then graphed. The Y-axis represented the number of times incidental teaching was used and the X-axis reflected the session number. Information was an Excel-generated line graph that showed data points connected within each phase but not on either side of the phase change line. The break in the data line was a clear indication of a change of condition.

Data collected at multiple observations were charted on a graph. This repeated data collection helped the researcher to discriminate visually the data points and to determine trends.

While the frequencies of all four behaviors were graphed, only incidental teaching was considered for this study. The additional information may provide implications for the future. Baseline data were collected until a minimum of three data points showed a pattern of behavior that was either stable or decreasing. Once the intervention phase began, data were collected until a minimum of three data points indicated an upward trend. The data points between baseline and intervention were not connected as a means to clearly separate the two phases. A change in level of data was expected between baseline and the intervention condition. A rapid change indicated a strong functional relationship between the independent and dependent variables.

By using the same criteria for baseline and intervention phases across teachers, a comparison could be made regarding the impact of the intervention. Baseline information was gathered for all teachers to demonstrate their behavior before any intervention was introduced. Baseline continued for Teacher B and Teacher C when the data points for Teacher A had become stable or declined and the intervention phase began. It was anticipated that that the frequency of use of incidental teaching would increase for Teacher A. This enabled the researcher to compare the effects of the intervention on each of the teachers in turn (Appendix F). The intervention for Teacher B began when a minimum of three data points showed a pattern of behavior that was either stable or decreasing. Teacher C continued in baseline phase. The replication of the data collection and intervention phases at varying times across teachers allowed the researcher to determine the effect of the intervention and indicate whether the intervention (feedback) had an impact on each of them. Impact was determined by the evidence, recording of data, coding, graphing the data, and the visual inspection of the increased use of incidental teaching. It was assumed that the use of incidental teaching would increase after graphical feedback was

implemented, and hopefully be sustained when data-based feedback was removed. The researcher determined the trends and patterns of the incidental teaching as well as the other behaviors which may have future implications for incidental teaching.

Chapter 4:

Results of the Study

Study Overview

As stated in Chapter 1, the study reported here examined the impact of graphical feedback on the frequency of teachers' use of incidental teaching. Providing graphical feedback to preschool teachers was intended to encourage and support them in their efforts to implement an effective teaching strategy. This chapter focuses on the original hypothesis that graphical feedback does, indeed, affect the frequency with which teachers use incidental teaching and other teaching behaviors.

Organization of Results

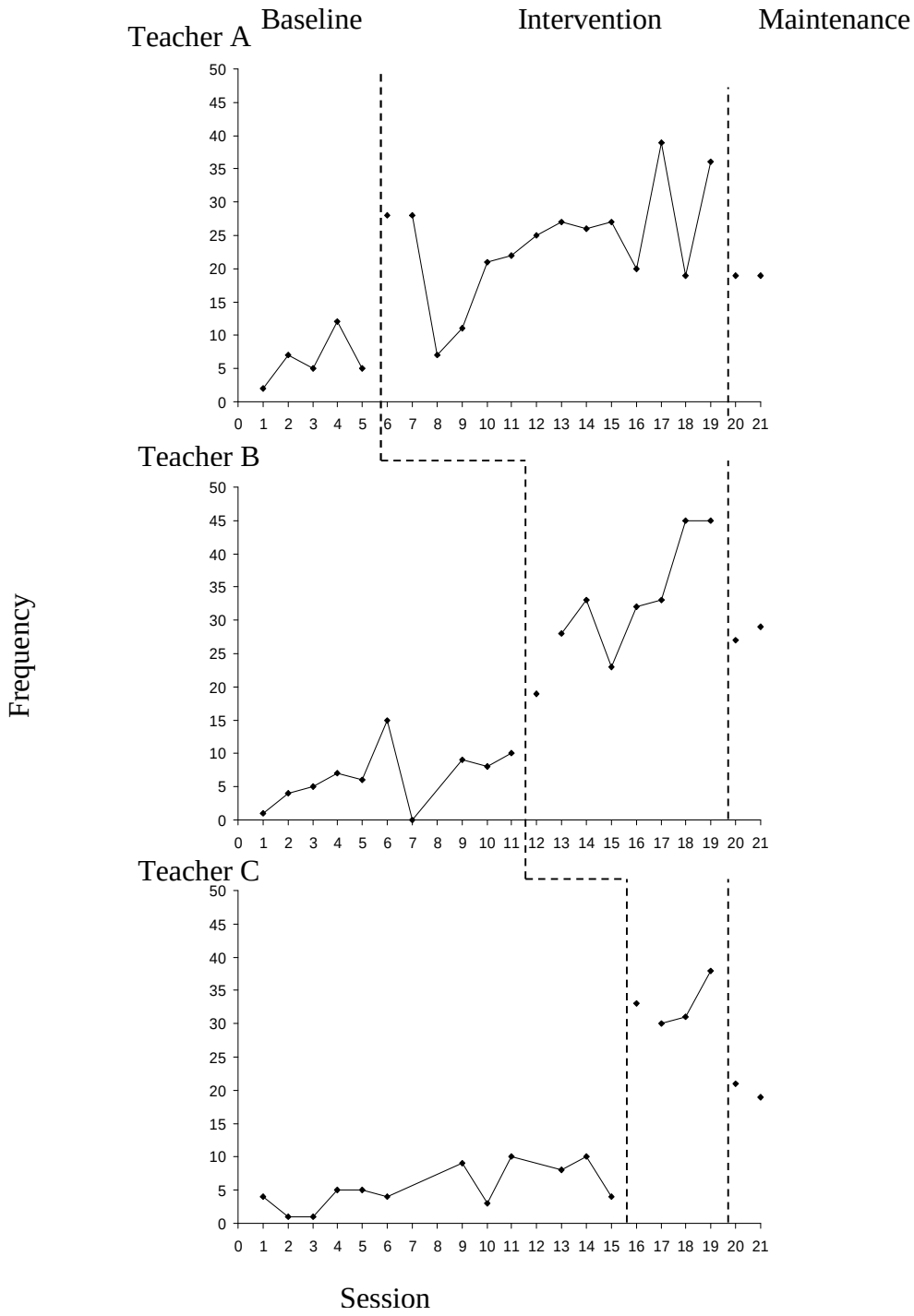
A multiple-baseline design across subjects was used to provide information on a single intervention introduced to three preschool teachers within the same classroom. The results for each teacher illustrated the changes in behavior during the study. The initial section includs a focus on the impact of the graphical feedback on teachers' use of incidental teaching. The following section discusses the frequency changes in the other responses that were observed and coded.

Incidental teaching results. Data indicated that for all three teachers, graphical feedback increased teachers' use of incidental teaching. Figure 3 displays the data on the number of incidental teaching responses coded for the teachers during a 10-minute segment of free play with the target child. Baseline data for all teachers were below 20 instances of incidental teaching per 10-minute segment. During intervention, the number of instances ranged from 19 to 40 instances per observation. The data points immediately after the intervention line

indicated teachers' response when provided with information about incidental teaching (i.e., when graphical feedback was not provided). This illustrated a change in behavior based on the information that was shared regarding incidental teaching. The data point for that day was separated from the others to differentiate between the teachers' response to the workshop and the response to the graphical feedback intervention. Data indicated an upward trend as the graphical feedback was provided.

The change in teachers' use of incidental teaching appeared to have been affected by the introduction of the graphical feedback intervention. Experimental control was demonstrated because the introduction of the graphical feedback intervention consistently caused a change in the frequency of incidental teaching across teachers. Of primary importance were the data points immediately preceding the interventions for Teacher B and C. Visual inspection illustrated that Teacher B's behavior was not influenced by the intervention being used with the previous teacher, Teacher A, and Teacher C's behavior was not swayed as a result of the intervention with Teacher B.

Figure 3: Illustrates the Frequency of Incidental Teaching for All Three Participants



Teacher A. Baseline data were collected until a stable trend in behavior was established. Visual analysis of the graph illustrated an immediate increase in the frequency of the use of incidental teaching immediately following the participation in the workshop. Incidental teaching increases continued after the initiation of the intervention. While there was a fluctuation on day 8, it may have been affected by the behavior of the target child on that day as well as the absence of the other two regular teachers. Increases continued back to roughly the level of the first two sessions after intervention began. Taking that specific circumstance into consideration, Teacher A's overall behavior was in an upward trend. Variability may have been due to the influence of the circumstances within the classroom and with the target child. Comparison of frequencies before and after intervention demonstrated the reaction to the intervention which resulted in an increase in the frequency of use of incidental teaching. Maintenance points indicated that use of incidental teaching declined after feedback was terminated but was observed more frequently than during baseline.

Teacher B. After Teacher B demonstrated stability in baseline, intervention was initiated. Baseline data indicated a low frequency of incidental teaching. Days seven, eight, nine, and ten demonstrated that Teacher B's behavior was not influenced by intervention being delivered to Teacher A. Immediately following the informational session on incidental teaching, the frequency of incidental teaching increased. Data indicated that the graphical feedback that was administered after the workshop continued to influence Teacher B's behavior. After the intervention, the frequency of incidental teaching remained consistently higher than baseline levels. Data collected during maintenance showed that Teacher B maintained use of incidental teaching at intervention levels.

Teacher C. Baseline data indicated a low frequency of incidental teaching. The teacher suggested that the inherent responsibilities of the lead teacher position required more overall supervision of the room and interaction with parents and other adults. The frequency of incidental teaching increased after the workshop on incidental teaching. It did not remain at that level for the next two days but eventually increased. The rate of incidental teaching did not continue to increase but declined during the maintenance phase when graphical feedback was not given. Inter-observer agreement ranged from 66.66%-92.85% with a mean of 83.598% and a standard deviation of 9.480.

Non-incidental Teaching Behaviors

In this study, the use of non-elaborative responses was the predominant behavior of the teachers. It was speculated that with the increase in frequency of incidental teaching there would be a decrease in non-elaborative responses. This, however, was not the case. While data collection on this behavior was not the focus of the study, it was interesting to note that the majority of the responses to the target child were acknowledgements and comments on his or her engagement with an activity rather than an attempt to solicit a higher level of learning. Non-elaborative responses remained high throughout the study while non-responsive directives stayed low. For Teachers A and B, the "other" responses stayed stable. Teacher C's "other" responses decreased significantly when the graphical feedback intervention was introduced.

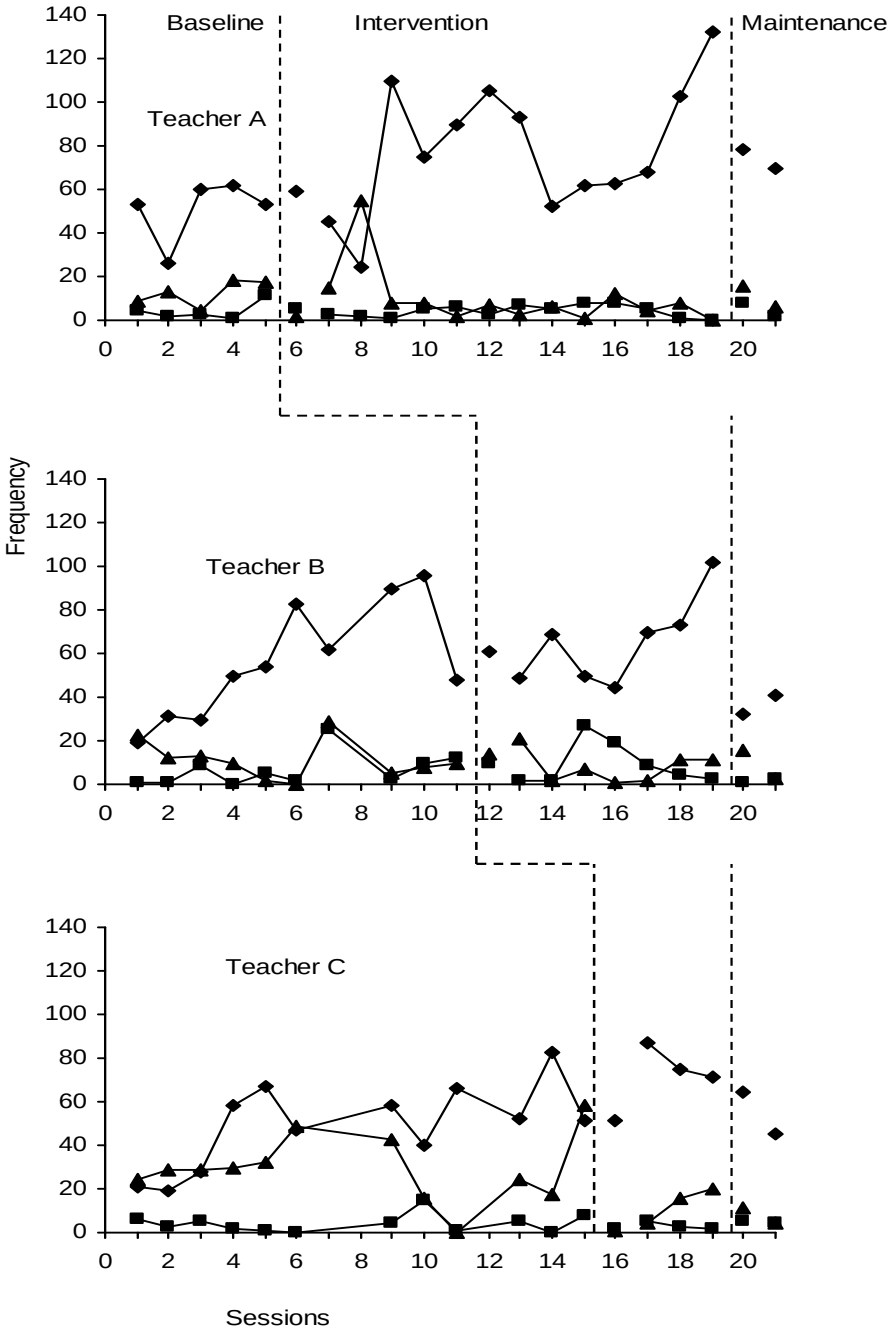


Figure 4: Displays the Data Points that Illustrate the Frequency of Non-Elaborative Responses, Non-Responsive behaviors

Teacher A. Teacher A exhibited an increase in non-elaborative responses after the graphical feedback on incidental teaching began. Non-responsive directives and "other" categories for Teacher A remained stable throughout the study except for a spike on day eight, in the "other" category, and a decrease in non-elaborative directives, when there was only one teacher in the classroom. Non-responsive directives remained at the same levels during baseline and intervention. "Other" responses decreased slightly during the intervention phase but increased slightly during maintenance.

Teacher B. Non-elaborative responses increased for Teacher B when Teacher A began intervention and then stabilized. During intervention, the responses were tempered by the use of the incidental teaching strategy. Non-responsive directives declined as incidental teaching increased. Teacher B primarily used a non-elaborative style of interaction with the children before the intervention of the graphical feedback. It was also interesting to note that in baseline the non-elaborative responses increased dramatically once the observations began. Non-responsive directives increased when Teacher A began intervention then returned to a decreased level until intervention began with Teacher C when there was another spike before leveling off again. Data for "other" responses indicated a decrease in frequency during intervention phase.

Teacher C. Teacher C's frequent use of "other" responses was high in the baseline but decreased during intervention and maintenance. Non-responsive directives for Teacher C were consistently high throughout the study.

Teacher C's frequency of non-elaborative responses looked similar in both baseline and intervention phases. Teacher C, as the lead person in the classroom, demonstrated a much more directive approach to responding to the target child and others. This teacher's perception of his

or her responsibilities for overall management of the classroom may explain why the category of "other" is so high. The high rate of non-elaborative responses may also be a consequence of that perception. After intervention, the rate of non-elaborative responses declined, although not below baseline, as the frequency of incidental teaching increased. Non-responsive directives remained low and the "other" category continued in an upward trend. It was interesting to note that the non-elaborate responses and the 'other' category are used most often.

Non-elaborative response data ranged from 60.00-97.14% with a mean of 86.355% and a standard deviation of 14.00. For the non-responsive directive category, the inter-observer agreement ranged from 0-83.33% with a mean of 13.888% and a standard deviation of 34.019. The category of 'other' ranged from 40.00-95% with a mean of 53.041% and a standard deviation of 45.906.

Inter-observer agreement across conditions for non-elaborative responses ranged from 86.36-90.27% with a mean of 88.12% and a standard deviation of 1.9842. For non-responsive directive category, the inter-observer agreement ranged from 28.95-83.33% with a mean of 63.19% and a standard deviation of 29.806. The 'other' category ranged from 58.03-79.56% with a mean of 66.34% and a standard deviation of 11.572.

Summary

Graphical feedback increased the frequency with which the teachers implemented incidental teaching. The graph which presents data on the three teachers illustrated a similar increase for each instructor. Lines indicating the start of the intervention phase for each teacher demonstrated that there were no changes in behavior for the subsequent teacher. The workshop and intervention for one teacher did not influence the other teachers. This replication of results

demonstrated the functional relationship between graphical feedback and increased frequency of use of incidental teaching. All other variables remained constant and allowed the researcher to conclude that graphical feedback had a positive impact on the frequency of incidental teaching.

Chapter 5:

Discussion and Conclusions

The purpose of this study was to investigate the impact of graphical feedback on teachers' use of incidental teaching. Results of this study, combined with previous research on performance feedback, indicate that follow-up to professional development in the form of supervisory feedback is an important factor (Mortensen & Witt, 1998; Noell, Witt, Gilbertson, Ranier & Freeland, 1997). One type of follow-up that has demonstrated success in improving teacher performance after training is graphical feedback, which involves providing a graph or chart to show frequency, duration, rate, or intensity of either the child's or the teacher's target behaviors, (Casey & McWilliam, 2008; Hemmeter, 2000). This study contributes to the literature by describing the application of graphical feedback in a preschool setting. Results of the study suggest that graphical feedback was successful in increasing the teachers' frequency of use of incidental teaching. Analysis of participant data revealed an immediate increase in frequency between baseline and intervention phases.

In this chapter, results are discussed relative to the foundational assertion that the gap between research and practice in education is of critical importance (Cochran-Smith, 2005) and that graphical feedback is a procedure that could strengthen that assertion. Strengths and limitations of the current study are also provided. Finally, conclusions and implications for future research and suggestions for further consideration are offered.

Interpretation of Findings

The findings in this study support the concepts found in the literature review that "suggests that performance feedback is useful for changing teacher behavior" (Codding & Smyth, 2008, p. 339). Like Codding and Smyth, this study involved behavioral changes for three teachers. Their investigation provided evidence of the efficacy of performance feedback to alter the behavior of classroom teachers. In addition, this graphical information provided the researcher a concrete way to deliver feedback on the teacher's behavior. Leach and Conto (1999) also found that providing feedback such as monitoring and positive reinforcement leads to teacher awareness and changes in behavior. This study found data to support the Leach and Conto findings. The graphical data in this study illustrate that all three teachers' behavior changed after the introduction of the feedback intervention. Each teacher demonstrated an increase in the frequency of use of incidental teaching immediately at the initiation of the intervention. Although all four categories of behaviors were graphed, only the incidental teaching line was highlighted when the graph was given to the teacher. This afforded an intentional focus on the specific teaching technique that was the target of the study. The graphing of the feedback data and sharing it with the teachers before the next observation provided progress monitoring of their behavior. The graph provided a visual means by which the teachers could assess their own behavior.

The graphical results also served as a discussion point for the researcher to review the importance of incidental teaching. That allowed the researcher to discuss the increase or decrease in frequency as well as to point out missed opportunities for incidental teaching and encouragement for those incidences that were implemented well. The data depicted the

fluctuations in the frequency of incidental teaching when conditions in the classroom or with the target child changed. The behavior change of the teachers supports the finding of Rathel, Drasgow, and Christle (2008), which asserts that through specific performance feedback teachers become aware of their behavior and are able to reflect on their impact in the classroom in an objective manner. It is interesting, however, that as the incidental teaching behavior increased, the non-elaborative responses did not decrease. This may have been because the focus of the graphed information was on incidental teaching. By not displaying the other behaviors, the teachers were not aware of any changes. Non-elaborative responses remained high throughout the study. The non-responsive directive behavior decreased slightly as did the category of "other."

Implications for Practice

One of the primary goals of professional development is to increase the effectiveness of teachers through continuing education. Research has shown that meaningful professional development is essential for both pre-service and practicing educators (Atay, 2008; Malm, 2009). Traditional professional development has included short-term workshops or seminars by "experts" who share information regarding aspects of teaching. This limits the applicability of the information since it is removed from the classroom setting and cannot be put into practice immediately (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009). Traditional methods of professional development that are distinct from the classroom may fulfill a mandate for training, but they may not necessarily be implemented with the children.

Research has indicated that mentoring, consultation, and performance feedback are effective means of insuring the application of skills and techniques after training. Using a

graphical feedback model allows a teacher to use the new information immediately and to receive feedback about correct implementation as well as to monitor changes in his or her own behavior. A study by Roscoe and Fisher (1998) provided information that indicated that a training package could be developed in a single session as long as there was sufficient feedback, immediate application, and role-playing or modeling. This information would allow supervisors to devise professional development opportunities that would not only benefit the teachers in an on-going manner but also result in more effective teaching with the children in their care. Training ideas that can be incorporated into classroom activities and routines can help to expand on the existing knowledge and skill of the teachers. These concepts may encourage them to try new things and to encourage and motivate the children to a higher order of thinking. Graphical feedback provides not only the opportunity for teachers to use information immediately in their classroom but also with the observer's input; the teacher receives a review of the technique and encouragement to continue improving.

Administrators can use graphical feedback in a way that not only provides supervision for teachers but also provides necessary support and mentoring. By offering professional and constructive feedback to teachers, teaching and learning excellence can be achieved (Ovando, 2005). Focusing on the frequency of a behavior is only a part of graphical feedback. If done correctly, graphical feedback provides the foundation for the supervisor to encourage teachers to continue in their efforts, acknowledges their successes, and provides an opportunity to explain corrective actions as necessary.

Limitations

Because the researcher delivered the training on incidental teaching and was also the coder of the data, the objectivity of the data may have been compromised. As a guard against such bias, the videotapes were viewed and coded by a second independent observer who was not present in the classroom during the sessions. This eliminated the possibility of subjectivity and residual memory on the part of the researcher influencing the coding.

An additional consideration is whether or not the teachers' behavior changed merely by having an observer in the room with a video recorder. Behavior during the baseline phase may have been affected. It is virtually impossible to determine if the same behaviors would have occurred if the researcher had not been there. Nevertheless, there was still a change in behavior between conditions. Viewing from an observation room would eliminate that possibility but would also limit the close scrutiny of the interactions between the teacher and the target child.

While the teachers responded positively to the graphs that were given to them daily during the intervention phase, there is no way to determine if the graph alone motivated them or if it was a combination of the graph and the encouraging comments by the researcher. Copies of the incidental teaching checklist and summary sheet were given to the teachers during the workshop which may or may not have affected their behavior during the study.

The preschool setting itself has confines that cannot be dismissed. It is apparent that the classroom schedule plays an important role in the availability of teachers for a study. Each day in a preschool classroom is full of situations that require the staff to be flexible. The researcher, too, must be flexible in the time for the taping that does not interfere with the classroom routines. Many classroom schedules do not provide for a time for free play that can accommodate taping

of three teachers sequentially. Even once a time is agreed upon, taping teachers becomes difficult. While the teachers were most accommodating, exceptions had to be made for therapists, parents, visitors, and organizational events.

Agreement on a scheduled time between researcher and staff was not necessarily the best time for the target child. While free play was an appropriate time to observe incidental teaching, the target child may not have been consistently responsive or interactive during that time.

In order to provide quality training on incidental teaching the researcher needs a private area that is conducive to sharing information with one teacher at a time. Not only can this be difficult within the classroom but an additional consideration is staff coverage if one of the teachers is removed from the classroom. A room separate from the classroom would be best as would a substitute or other adult in the classroom to maintain the child to staff ratio.

Equipment is a consideration in getting the optimum results. Some dialog was missed because of the equipment used. While using a FLIP video was unobtrusive, other children were so loud that the teacher and target child were unable to be heard. The use of a personal microphone would allow clarity in focus on the teacher being observed.

A major limitation to this study was the lack of data for procedural fidelity. Engaging a second observer to scrutinize the feedback that the researcher gave to the teachers was difficult. Because of the changes in the taping schedule, an observer was not available. While the procedural fidelity form was given to the teachers, it cannot be considered a valid representation of the actual feedback because of the relationship that was developed with the researcher.

Implications for Future Research

Future research should address the limitation of teaching one child in one classroom. In order to provide definitive results, future research should include a larger sample. Using multiple classrooms in a single facility could provide formative assessment data for program policies.

Additional research could provide information regarding incidental teaching as a systematic strategy to change behaviors of children as well as teachers. One example might be to expand a child's time-on-task behavior. This study was limited to a preschool setting and interaction with a three-year old child. Using incidental teaching with an older child may produce alternative results. While the technique of providing graphical feedback to teachers becomes a purposeful tactic to encourage a teacher's engagement with children, it may be of interest to apply it to an alternative teaching technique. Results may be different if the focus of the study is on other teaching techniques such as redirection or distraction.

Although research has been done on the effectiveness and efficiency of instructional strategies, there has been limited investigation into the relevance of those strategies in early childhood settings. Preschool teachers need professional development that allows them to use the information from research with younger children and to incorporate it in their classrooms. They also need the encouragement and motivation to work with a diverse population.

More research into the efficacy of graphical feedback would be useful if it included consideration of additional variables such as age of teachers, experience of teachers, time of day for taping, and differences in the severity of disabilities of the children within the classroom. Another variable that could provide important insight would be comparing the teacher's

frequency of use of incidental teaching with typically-developing children versus children with special needs. The teachers may be more likely to continue scaffolding information when there is a response from the child. Not only will this interactive communication build upon the child's understanding, but it will also serve as an incentive for the teacher to continue.

For categories of non-elaborative responses, non-responsive directives and "others", there are marked differences between the lead teacher and the assistants. Further study on this phenomenon could prove informative in structuring the staffing patterns within a classroom. By virtue of her position, the lead teacher in this study assumed a leadership role in dealing with therapists, parents and visitors to the classroom. This directly affects the frequency of "other" and non-responsive directives. On the other hand, the assistants were relegated to specific tasks (e.g., cleaning after snack time) that may have interfered with their ability to engage in incidental teaching. While not all classrooms delineate job responsibilities, further study could prove informative in structuring the staffing patterns within a classroom.

Additional studies are needed to support the use of graphical feedback as a method of progress monitoring for teachers. Graphical feedback could also be a technique used with older students. It could be effective when observing positive and negative communication skills, the frequency of a specific teaching technique, or peer interactions.

Finally, consideration for additional study could include a workshop on graphical feedback, a study on a workshop and verbal feedback only, and a replication of this study using a workshop and graphical feedback. These three studies could then be compared to determine the most effective. By providing data that illustrated the results, the study could help determine which aspects of the intervention were the most successful or whether the full package

(workshop plus feedback) was essential for successful changes in teacher behavior. Knowing this may lead to a more effective way to deliver performance feedback and to provide professional development opportunities.

Summary of Study Discussion

Future studies with more teachers, more classrooms, children with different disabilities, and some comparative studies would be enlightening. The positive results of this study indicate that many of the previous studies involving feedback are also applicable to preschool settings. With research providing information on the importance of early childhood education, it is incumbent on teachers to be more knowledgeable. Teachers of young children are educators as well as caregivers. They need training that is applicable to young children with and without disabilities. The professional development opportunities should be relative to their classrooms and able to be implemented shortly after the training. This study on graphical feedback provided a process to inform teachers of a successful, research based teaching technique that can be used immediately. Incidental teaching is unobtrusive and easily done within the natural environment of the classroom and is initiated by the child. By involving the teacher with the child's activity, incidental teaching provided a vehicle to establish a teaching venue that did not involve additional materials. It provided an opportunity for teachers to practice the technique with the target child and to see data that reflected their efforts.

This study also provided a beginning point for other researchers to investigate the multiple uses of graphical feedback as a supervisory tool. Graphical feedback presents information rather than a judgment of behavior. Supervisors may find this more effective in evaluating performance. The graphs may serve as the initial point of discussion that can lead to

expectations for continued improvement. This method of graphical feedback is inexpensive and less time-consuming than previous evaluations and can be ongoing. The supervisor can provide feedback on the changes in the data and offer concrete suggestions and encouragement. Allowing the teacher to keep a copy of the graph might also influence future behavior.

The idea of performance feedback is not new. Graphical feedback is a method of providing performance feedback that has potential for success in many situations. The data from this study demonstrated the impact that graphical feedback had on the teaching behaviors of three preschool teachers. Graphical feedback is a promising practice that can provide the opportunity for professional development. Changes in early childhood education and the inclusion of children with special needs in preschool classrooms have necessitated the development of ways to support and train teachers. The potential for skill building using this method is clear.

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APPENDICES

APPENDIX A

Teacher Consent Form

Dear Teacher,

I am a doctoral student under the direction of Dr. Linda Johnston, and Dr. Valerie Rutledge, at the University of Tennessee at Chattanooga and Dr. R.A. McWilliam and Dr. Amy Casey at Siskin. I am conducting a research study to examine whether the implementation of an incidental teaching strategy can be effected and increased by providing graphical feedback to you. This is a unique opportunity to document the effectiveness of this strategy.

If you choose to participate in this study, I will ask you to schedule a 30-minute meeting with me in order for me to explain the process. Next, I will start visiting your classroom 5 times per week to videotape a 15-minute observation. You will be able to suggest times for the observations and will know the observation schedule in advance. While in your classroom, I will observe only and will not interact with children or do anything to disrupt classroom activities. After I have collected data for a few days, I will schedule a meeting to explain how to use incidental teaching. The meeting will involve a verbal presentation that addresses the description, importance, and procedures associated with the intervention. Handouts will also be available. After the meeting, you will be asked to implement the incidental teaching strategy.

I will continue to visit your classroom 5 days per week to videotape 15-minute observations. After the training, however, I will pull you aside for a brief 2-3 minute consultation before each observation. During the consultation I will show you the graph of your implementation of the incidental teaching strategy during previous observations. Once there is a rise in the frequency of implementation for three consecutive observations, the data collection will change but will not automatically discontinue the intervention.

Observations will take place over the next few weeks and include observations and video-taping during activities in the classroom. Any information that is obtained will remain confidential and will be destroyed after the study is completed and presented during my dissertation defense. Prior to that, all information will be kept in a locked drawer in a locked office to provide maximum confidentiality. Only Dr. McWilliam, Dr. Casey, and I will have a key to the research office. Video tapes and electronic data will be password-protected. All data will be destroyed after six years.

Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. If at any time during the study you have questions about your rights as research subject, you may contact Dr. M. D. Roblyer, Chair the UTC Institutional Review Board (IRB) at (423) 425-5567. The results of the study may be published, but your name will not be used. This research has been approved by the UTC IRB and the Siskin Research Review Board.

The possible benefit of your participation will enable teachers, caregivers, and family members to understand the significance of an incidental teaching strategy. If you have any questions concerning this research study or your participation in the study, please call me at 425-5603 or Dr. Johnston at 425-4122 (Linda-Johnston@utc.edu) or email me at linda-rivers@utc.edu.

Sincerely,
Linda Rivers

Video Recording of Study Activities

Sound and voice responses may be recorded using video devices to assist with the accuracy of the data collection. You have the right to refuse the video recording. Please select one of the following options:

I consent to video recording: Yes _____ No _____

Audio Recording of Study Activities

Sound and voice responses may be recording using audio recording to assist with the accuracy of the data collection. You have the right to refuse the audio recording. Please select one of the following options:

I consent to audio recording: Yes _____ No _____

____ I agree to participate in the Incidental Teaching study.

____ I prefer not to participate in the Incidental Teaching Study

_____
Teacher's Name (please print)

_____ _____
Teacher's Signature Date

If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact Dr. M. D. Roblyer, Chair of the Human Subjects Committee, Institutional Review Board at 423-425-5567. Additional contact information is available at www.utc.edu/irb.

APPENDIX B

Parental (or Guardian) Notification

Does Graphical Feedback Impact the Teachers' Frequency of Use of Incidental Teaching?

Dear Parent/Guardian,

I am a graduate student under the direction of Dr. Linda Johnston and Dr. Valerie Rutledge, at the University of Tennessee at Chattanooga and Dr. R.A. McWilliam and Dr. Amy Casey at Siskin. I am conducting a research study to examine the possibility that the implementation of an incidental teaching strategy can be effected and increased by providing graphical feedback to the teachers. This is a unique opportunity to document the effectiveness of this strategy.

Observations will take place over the next few weeks and include observations during activities in the classroom. There are no risks to your child/children; your child is not involved in the study. All observations and data will be taken as unobtrusively as possible. The videotaping that is done will focus on the teacher and the teaching partners. This research has been approved by the UTC Institutional Review Board and the Research Review Board of the Siskin Children's Institute.

APPENDIX C

Parental (or Guardian) Consent

Dear Parent/Guardian,

I am a graduate student under the direction of Dr. Linda Johnston and Dr. Valerie Rutledge from the University of Tennessee at Chattanooga and Dr. R.A. McWilliam and Dr. Amy Casey at Siskin. I am conducting a research study to examine the possibility that the implementation of an incidental teaching strategy is a means to improve social engagement and socialization skills for children with special needs. This is a unique opportunity to document how well children respond to this technique.

There are no risks to your child/children. All observations and data will be taken as unobtrusively as possible. The only involvement of your child/children will be as they are observed during their daily classroom routines. The focus of the study will be the teacher and your child. I will be the videographer. Observations will take place over the next few weeks and include observations during activities in the classroom. Any information that is obtained will remain confidential and the video will be destroyed after the study is completed and presented during my dissertation defense. Prior to that, all information will be kept in a locked drawer in a locked office to provide maximum confidentiality. Your participation, as well as that of your child, in this study is voluntary. If you or your child chooses not to participate or to withdraw from the study at any time, there will be no penalty (it will not affect your child's care or development.) The results of the study may be published, but your child's name will not be used. This research has been approved by the University Institutional Review Board and the Siskin Research Review Board.

Although there may be no direct benefit to your child, the possible benefit of your child's participation will enable teachers, caregivers, and family members to understand the significance of an incidental teaching strategy on the development of social skills and to utilize that strategy to facilitate children's development.

If you have any questions concerning this research study or your child's participation in the study, please call me at 309-5889 or Dr. Johnston at 425-4122. (Linda-Johnston@utc.edu) or email me at linda-rivers@utc.edu.

Sincerely,

Linda Rivers

I give consent for my child _____to participate in the above study.

_____ _____

Parent/Guardian signature Date

If you have any questions about your rights as a subject/participant in this research, or if you feel you or your child have been placed at risk, you can contact Dr. M.D. Roblyer, Chair of the Human Subjects Committee, Institutional Review Board at 423/425-5567. Additional contact information is available at www.utc.edu/irb.

APPENDIX D

Data Collection Form

Teacher _____ Date:				
Time	Incidental Teaching	Non-elaborate responses	Non-responsive Directive	Other

APPENDIX E

Incidental Teaching Checklist

Instructions: Complete the checklist for one routine per day, five days per week. Observe any adults interacting with the target children. If the rate of interaction is too low to judge the use of incidental teaching, do not complete.

DID THE TEACHER……

DATE					
1. Ensure that there were interesting things					
2. Plan developmentally appropriate activities?					
3. Rotate activities and vary materials?					
4. Initiate interactions based on what the child was doing?					
5. Allow the child to remain engaged in the activity of his or her choice (i.e., not redirect the child to a new activity)?					
6. Elicit the child's elaboration of his or her engagement?					
7. Give the child no more than the amount of help he or she needed?					
8. Ensure the interaction or activity was interesting?					
9. Ensure the child was reinforced (naturally or by the teacher) for improving his or her engagement?					
10. Ensure that all children receive incidental teaching?					

(McWilliam, 2005)

Codes

\+ = completed well

± = completed to an extent

0 = not completed or completed inadequately

APPENDIX F

Fidelity Checklist

Instructions: Complete the checklist as the researcher is providing graphical feedback to the teacher.

DID THE RESEARCHER……..

DATE					
1. Ensure that there were positive remarks made about the teacher's behavior?					
2. Provide graphical information to demonstrate the rate of behavior?					
3. Encourage the teacher to continue her behavior using incidental teaching?					
4. Discuss missed opportunities for incidental teaching?					
5. Allow the teacher to ask questions?					
6. Answer the questions in a professional manner?					
7. Avoid lengthy discussion that caused classroom disruption?					
8. Behave in a positive and affirming manner?					

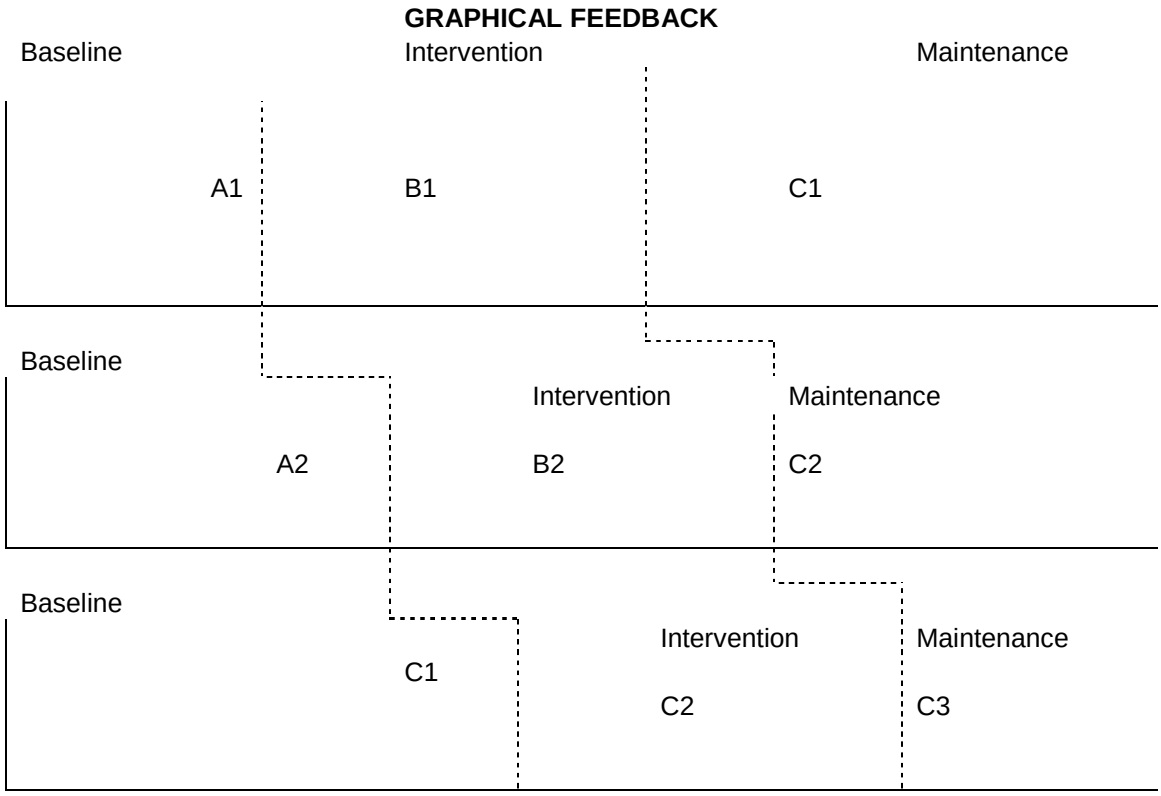
(L. Rivers, 2009)

Codes

\+ = completed well
± = completed to an extent
0 = not completed or completed inadequately

APPENDIX G

Graphical Feedback



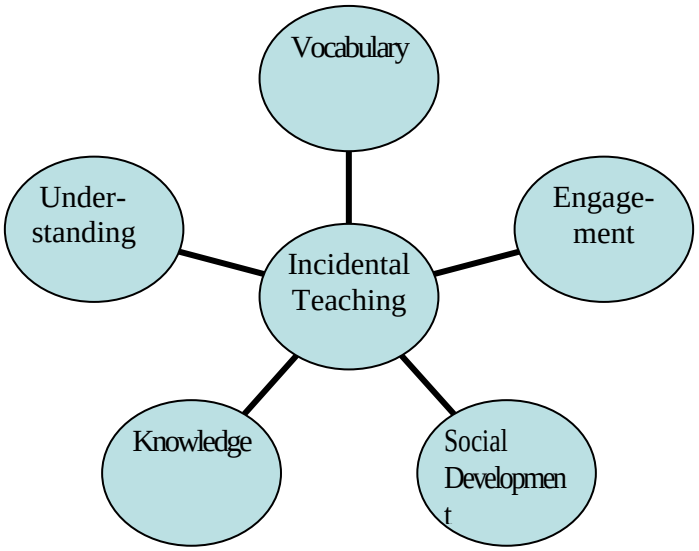
APPENDIX H

Incidental Teaching Review Sheet

Operational Definition: "Incidental teaching is operationally defined as an interaction consisting of either an initiation or a response by an adult related to the previous or existing engagement of the child" (Casey & McWilliam, 2004, p. 2).
Example: if the child says "red," then the teacher might say, "Yes, the car is red. Can you find something else that is red"? Ask pertinent questions, get involved in the play and encourage dialog with teacher and peers.
Informal Definition: Using a child's interests and activities to expand their knowledge, understanding and vocabulary about the object or activity.

Value of Incidental Teaching

- Promotes social development
- Increases vocabulary
- Encourages engagement and higher order thinking
- Increases time on task
- Provides additional knowledge
- Supports comprehension and understanding



Environmental Factors

- Provide interesting things to do or talk about
- Plan developmentally appropriate activities
- Rotate activities and materials
- Proximity to child and elicit child's elaboration of his or her engagement
- Allow child to remain engaged

How to use the Incidental Teaching Checklist

- Review of workshop information
- Self-check

APPENDIX I

Institutional Review Board Approval

THE UNIVERSITY of TENNESSEE CHATTANOOGA

Institutional Review Board
Dept. 4905
615 McCallie Avenue
Chattanooga, TN 37403-2598
Phone: (423) 425-4443

MEMORANDUM

TO: Linda Rivers
Dr. Valerie Rutledge

IRB # 09-173

FROM: Lindsay Pardue, Director of Research Integrity
M. D. Roblyer, IRB Committee Chair

DATE: November 16, 2009

SUBJECT: IRB # 09-173: The Impact of Graphical Feedback on the Teacher's Frequency of Use of Incidental Teaching

The Institutional Review Board has reviewed and approved your application and assigned you the IRB number listed above. You must include the following approval statement on research materials seen by participants and used in research reports:

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project # 09-173.

Please remember that you must complete Form C when the project is completed or provide an annual report if the project takes over one year to complete. The IRB Committee will make every effort to remind you prior to your anniversary date; however, it is your responsibility to ensure that this additional step is satisfied.

Please remember to contact the IRB Committee immediately and submit a new project proposal for review if significant changes occur in your research design or in any instruments used in conducting the study. You should also contact the IRB Committee immediately if you encounter any adverse effects during your project that pose a risk to your subjects.

For any additional information, please consult our web page http://www.utc.edu/irb or email instrb@utc.edu

Best wishes for a successful research project.

APPENDIX J

Siskin Research Review Committee Approval

Dear Linda,

Thank you for submitting your research proposal to the Research Review Committee at Siskin Children's Institute. I am pleased to report that all five committee members who reviewed your proposal were intrigued by your research questions and suggested that we allow you to conduct the proposed study within the Institute. As of today, approval is officially extended for the study entitled *Does Graphical Feedback Affect Teachers' Frequency of Use of Incidental Teaching?*

As you know, the approval of the Research Review Committee does not take the place of Institutional Review Board approval. Approval of the Research Review Committee means that Siskin Children's Institute agrees to participate in the study by allowing you to recruit participants and collect data in the Siskin Early Learning Centers.

If you have any questions, please feel free to contact meat (423) 648-1791 or amy.casey@siskin.org. Good luck with your research!

Yours sincerely,

Amy M. Casey, Ph.D., BCBA
Chair, Research Review Committee

Appendix K

Statistical data on children with disabilities from National Center for Education Statistics

Type of Disability	1976-1977	1980-1981	1990-1991	1993-1994	1999-2000	2002-2003	2003-2004	% of total enrollment
								2003-04
All disabilities	3,694	4,144	4,710	5,216	6,190	6,523	6,634	13.7
Specific learning disabilities	796	1,462	2,129	2,408	2,830	2,848	2,831	5.8
Speech or language impairments	1,302	1,168	985	1,014	1,078	1,412	1,441	3
Mental retardation	961	830	534	536	600	602	593	1.2
Emotional Disturbance	283	347	389	414	468	485	489	1
Hearing Impairment	88	79	58	64	70	78	79	0.2
Orthopedic Impairments	87	58	49	56	71	83	77	0
Other Health Impairments	141	98	55	82	254	403	464	1
Visual Impairments	38	31	23	24	29	28	28	0
Multiple disabilities	-	68	96	108	111	138	140	0
Deaf-Blindness	-	3	1	1	2	2	2	
Autism and Traumatic Brain Injury	-	-	-	24	60	159	186	0
Developmental delay	-	-	-	-	19	283	305	
Preschool disabled[1]	-	390	486	582		†	†	

- Not available.

† Not applicable.

[1]Includes preschool children 3-5 years served under Chapter I and IDEA, Part B. Prior to 1987-88, these students were included in the counts by disability condition. Beginning in 1987-88, states were no longer required to report preschool children (0-5 years) by disability condition. Beginning in 2002-03, preschool children were again identified by disability condition.

[2]Based on the total enrollment in public schools, prekindergarten through 12th grade.

NOTE: Includes students served under Chapter I and Individuals with Disabilities Education Act (IDEA), formerly the Education of the Handicapped Act. Prior to October 1994, children and youth with disabilities were served under the Individuals with Disabilities Education Act, Part B, and Chapter 1 of the Elementary and Secondary Education Act. In October 1994, Congress passed the Improving America's Schools Act, in which funding for children and youth with disabilities was consolidated under IDEA, Part B. Data reported in this table for years prior to 1993-94 include children ages 0-21 served under Chapter 1. Counts are based on reports from the 50 states and the District of Columbia only (i.e., figures from outlying areas are not included). Increases since 1987-88 are due in part to new legislation enacted in fall 1986, which mandates public school special education services for all disabled children ages 3 through 5, in addition to age groups previously mandated. Some data have been revised from previously published figures. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics (2006). *Digest of Education Statistics, 2005* (NCES 2006-030), Table 50.

Appendix L: Learning in the Learning Profession

Participation in Traditional Professional Development (percentage of teachers reporting participation in traditional professional development during the previous 12 months, 1999-2000 and 2003-2004		
Types of traditional professional development	Percentage of Teachers: 1999-2000	Percentage of Teachers: 2003-2004
University Courses for recertification or Advanced certification	31.6	
University courses in the main assignment field	23.4	
University courses related to teaching		35.5
Observational visits to other schools	34.4	22.4
Workshops, conferences, or training sessions (not a presenter)	94.8	91.5
Presenter at workshops, conferences, or training sessions	22.3	25.1

Appendix M:

Overall Comparison of Findings

	Balcazar et al (1985)		**Present Review by Alvero, Bucklin & Austin (2001)**	
Feedback	Most frequently used	Highest consistency effects	Most frequently used	Highest consistency effects
Combination	Feedback alone	FB & consequences (52% FB GS (53%)	Feedback alone	Feedback and antecedents (100%)
Source	Supervisor/manager	Supervisor/manager (50%)	Supervisor/manager	Supervisor & researcher (86%
Participants	Individual	Group (48%)	Individual	Group (71%)
Privacy	Public	No difference	Private	Public & private (80%)
Content	Individual performance	Individual & standard individual (100%)	Group Individual & standard Individual	Group (71%) Indiv.& stand. (75%) Individual (75%)
Medium	Graph	Graph (54%)	Written	Written & graph (86%)
Frequency	Daily	Daily (42%) Weekly (41%)	Weekly	Daily (71%) Monthly (80%) Daily and Weekly (80%)

* Alvero, A. M., Bucklin, B. R., Austin, J., 2001, p. 23.

VITA

Linda Rivers was born in Pittsburgh, Pennsylvania to the parents of Jane and Albert Moyer. She attended a one-room school during the elementary years and graduated from a Catholic high school for girls. Her college experience began at Duquesne University for her undergraduate work and included Mansfield State College and Elmira College for her Master's Degree. While her degrees are in education, Linda has also added certifications for birth through kindergarten and preschool special education. She has taught in situations involving students from infants to geriatrics and worked in public and private institutions. She has served in state level positions representing young children and continues to advocate for children with special needs.