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# Exploring A Staff Training Model For Enhancing Post-Training Procedural Integrity And Staff Performance Outcomes When Working With Children Diagnosed With ASD

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Exploring A Staff Training Model For Enhancing Post-Training Procedural Integrity  
And Staff Performance Outcomes,  
When Working With Children Diagnosed With ASD

By

Lina Slim

Submitted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Department of Interprofessional Health Sciences and Health Administration

School of Health and Medical Sciences

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SETON HALL UNIVERSITY  
Department of Interprofessional Health Sciences and Health Administration  
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APPROVAL FOR SUCCESSFUL DEFENSE

Doctoral Candidate, Lina Slim, has successfully defended and made the required modifications to the text of the doctoral dissertation for the Ph.D. during this **Spring Semester 2015**.

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## ABSTRACT

**Background** The increased prevalence of Autism has generated higher special needs enrollment and requires teachers to acquire the skills to address Autistic children's unique needs. At the same time, however, budget cuts have generated a shortage of qualified professionals with expertise in autism interventions. More effective staff training may provide an avenue for addressing this shortage. This study investigated the impact that a Staff Training Procedure (STP), consisting of Video Self-Monitoring (VSM), Performance Feedback (PF) and Reflection (R) with and without Mentoring has on sustained and generalized teacher performance on two DVs – application of the Learn Unit (LU) and Rate of Effective Instruction (ROI). Practical and theoretical implications are discussed.

**Study Design** Exploratory Quasi-Experimental Approach

**Setting** Two private schools utilizing principles of Applied Behavior Analysis

**Participants** 10 female teachers instructing 3-5 year old autistic children

**Outcome Measures** Teacher performance outcomes on LU and ROI after: Phase 1 – a 2-hour workshop; Phase 2 – the addition of fixed period of Mentoring while engaging in the STP; and Phase 3 – after the formal STP and Mentoring period has ended.

**Results** The STP appeared to enhance teacher performance and sustainability of Procedural Integrity. The greatest improvement and most consistent performance was observed among teachers who received STP plus Mentoring as opposed to STP alone.

**Conclusion** Adding Mentoring to an existing STP appears to enhance teacher performance and Procedural Integrity with sustainable outcomes. The possibility of using VSM as a skill acquisition procedure is highlighted.

Key Words: Staff Training; Teacher Training; Mentoring; Video Self-Monitoring; Performance Feedback; Self-Evaluation; Reflection; Autism Spectrum Disorder; Learn Unit; Rate of Effective Instruction

## Chapter 1

### INTRODUCTION

As special educators and related service providers, most of us are aware of the need to adhere to evidence-based practice when servicing children with Autism Spectrum Disorders (ASD). Extensive research over the past 40 years has demonstrated the efficacy of using the principles of applied behavior analysis (ABA) in teaching children with ASD (Baer, Wolf & Risley, 1968; Cohen, Amerine-Dickens, Smith, 2006; Lord & McGee, 2001; Lovaas, 1987; McEachin, Smith, & Lovaas, 1993; Volkmar, Paul, Klin, & Cohen, 2005; Smith, Groen, & Wynn, 2000; American Academy of Pediatrics, 2006, 2007, updated 2010; Academies of Neurology, and NIMH). The increased prevalence of ASD and increased enrollment in the public schools have led parents of children with ASD to demand that public schools incorporate such ABA tools into their classroom instructions, especially given the complex behavioral characteristics associated with ASD (Croen, Najjar, Ray, Lotspeich, & Bernal, 2006). This demand has been difficult to meet as school budgets have often been frozen or reduced due to recent economic challenges. Additionally, there is a shortage of qualified higher level professionals (e.g., MA and PhD levels) who have expertise in ASDs and intensive early behavioral interventions. As a consequence, schools often have under-qualified individuals managing this challenging and specialized population (Love, Carr, Almason, & Petursdottir, 2009). Moreover, data derived from social validation measures have identified several program components required for successful educational programming for children with ASD that have not been rigorously and broadly implemented in public school systems (Callahan, Henson, & Cowan, 2008; & Johnson, Myers, & the Council on Children With Disabilities, 2007; Myers et al., 2007). These components fall into five functional areas:

1. The application of individualized programming
2. The application of evidence-based strategies
3. Data driven interventions
4. Active collaboration
5. A focuses on long-term outcomes

Additional concerns include variability and/or inconsistency in the application of behavioral interventions in public school settings. Therefore, the demand for teacher expertise in the behavior analytic intervention processes continues to grow, and such expertise can only be obtained through an extensive and specialized teacher training protocol.

The problems of under-qualified educators and cost can be addressed through the provision of effective staff training (Kates-McElrath & Axelrod, 2008). A critical component in the management of children with ASD is staff training (Kates-McElrath et al., 2008). Educators acknowledge the need to receive evidence-based comprehensive training to promote positive student performance outcomes. Currently, public school teaching staff receive training through a combination of traditional venues and modalities, namely, workshops (one to two per year), presentations (one to three per year) by guest speakers or on-staff professionals, professional conferences, professional journals and articles, periodic peer mentoring, monthly staff team meetings, and informal monthly consultations with the behavior analyst consultant. The teaching staff training model most commonly used in the public schools follows a consultation model with informal verbal or written feedback from the supervisor or behavior consultant, and minimal if any outcome performance feedback management (Love et al., 2009). Teaching staff training protocols/models and tactics provided in the public school are not standardized (e.g., consultant model; mentoring model; peer model; video model; performance feedback; reflection;

treatment packages). Reid, Parsons, Lattimore, Towery, & Reade (2005) discuss multiple concerns regarding the current state of teacher training. In particular, the authors mention:

1. Lack of consistent, efficient and effective application of technology in staff training
2. Ineffective supervisory feedback
3. Lack of adoption of research-based staff training protocols
4. Clinicians and teachers receiving minimal if any training on supervisory skills and no training in evidence-based supervisory approaches

According to Reid et al (2005), training is, in fact, so lacking that there is a lack of research on the impact of providing a thorough training and supervisory experience to teaching staff as reported by the authors.

A review of the literature reveals that the teaching staff training model most commonly used in the public schools follows a consultation model with informal and brief verbal and occasional written feedback from the supervisor or behavior consultant, and minimal if any outcome performance feedback management (Kates-McElrath et al., 2008; Love et al., 2009). Unfortunately, multiple authors have voiced their concern that schools too often have ineffective supervisory feedback and have failed to adopt research-based teaching staff training protocols, with clinicians and teachers receiving minimal (or no) training on supervisory skills and no training in evidence-based supervisory approaches (Davis, Smith, & Donahoe, 2002; Callahan et al., 2008; Croen et al., 2006; Reid et al., 2005).

Many teaching staff training protocols have been studied in the literature. Although a variety of strategies are described in the literature, there appears to be a lack of an established standardized staff-training model (Leblanc, Gravina, & Carr, 2009; Reid et al., 2005; & Reid & Parsons, 2007). The authors however point to the three critical components of a training protocol

that lead to an effective staff-training model. The following are the three critical components underlying effective staff-training models, which are also agreed upon by other authors in the literature. First, training should be quick, efficient, cost and time effective for both the trainers and trainees (Durlak, et al., 2008; Kates-McElrath et al., 2006; Hagermoser Sanetti, et al., 2009; Martens, et al., 1985; Martens B. K., Witt, J. C., Elliot, S. N., & Darveaux, D.X., 1985; Lerman, Tetrault, Hovanetz, Strobel, & Garro, 2008; & Reid et al. 2005, 2007). Labor-intensive training will not promote allegiance, adherence and commitment on the part of the trainee and educational institutions. Second, training should be friendly, socially valid and acceptable and well received by the trainees to promote willingness to participate and commitment to follow through (Hagermoser Sanetti, et al., 2009; Martens B. K., Witt, J. C., Elliot, S. N., & Darveaux, D.X., 1985; Lerman et al., 2008; Reid et al. 2005; Symes, Remington, Brown, & Hasting, 2006). Finally, training skill acquisition and competencies should be meaningful, generalized and maintained across settings and students ensuring functional validity and reliability (Bolton & Mayers, 2008; Leblanc et al., 2009; Plavnick et al, 2010; Reid et al. 2005). Training protocols that embrace these three elements will be valued and embraced by consumers of autism programming, namely, educational organizations, administrators, parents, teachers and learner alike (Callahan, K., Henson, R. K., Cowan, A. K., 2008; Leblanc, Ricciardi, & Luiselli, 2005). Hagermoser et al. (2009) also identified three major individual characteristics that need to be attended to in a training model, namely, adherence, competence and quality.

Furthermore, Durlak et al. (2008) identified six influencing factors to consider when implementing an intervention that will impact the establishment and maintenance of procedural integrity, which also touch upon Durlack's characteristics. These consist of community level factors (i.e., contextual factors), provider characteristics (i.e., individual/internal factors),



characteristics of innovations (i.e., compatibility and adaptability), factors relevant to prevention delivery system (i.e., organizational functions), specific practices and processes (i.e., organizational management), and factors related to the prevention support system (i.e., training and technical assistance). Relevant to this study are the influencing individual/internal factors, namely, perceived need for and benefit for implementing change, self-efficacy and self-proficiency, and factors relevant to the prevention support system, and mainly a teaching staff training model.

In addition, a review of the literature reveals a lack of established theoretical framework for a staff-training model (Culloty Y., Milne D. L., & Sheikh A. I., 2010). One study by Culloty et al. (2010) addresses a theoretical framework for an effective staff-training model. The authors conducted a pilot study evaluating the training of clinical supervisors using the Fidelity Framework. They point to five criteria required to implement effective staff training, which they called the “Fidelity Framework”. These five criteria consist of the following:

1. Design – Type of staff training procedure protocols is used
2. Training – Process that addresses the adherence to the procedural protocols implemented (such as VSM, SE, PF, R)
3. Delivery – How the intervention was manipulated (such as tools / feedback etc.)
4. Receipt – Learning or Procedural Integrity. That is whether the intervention did what it was intended to do.
5. Enactment – Clinical Practice Outcome, or functional outcome with sustained and generalized Procedural Integrity

The literature also talks about a Staff Training Model for learning called the 70.20.10 Learning and Development Model for skill development in leadership and organizations (Lombardo M. M., Eichinger, R. W., 1996). The model states that 10% of learning happens in formal instruction through lectures and readings, 20% through informal social discussions and practice, and 70% is actualized and retained by experiencing the skill and doing it while receiving feedback and mentorship. The implications of the 70.20.10 Learning and Development Model on the Staff training Model in this study will be explored.

### **Statement of the Problem**

Currently there is an increase in the prevalence of children with ASD entering the public school system. The intervention method that has received strong empirical evidence in effecting positive learning outcome in student with ASD is applied behavior analysis. Teaching staff are faced with lack of training and expertise in the behavioral technologies and skill set required to manage the complex educational and behavioral challenges of children with ASD. Currently, there is lack of effective, evidence-based and standardized training protocol in the public schools which compounded with the high cost of care and lack of adequate funding puts students with ASD at risk for appropriate learning. Although, several staff training tools and protocols have been successfully implemented in changing teacher performance in a variety of settings, limitations included small sample size, type of educational setting, the small set of skill set taught, inconsistent generalization and maintenance of acquired skills over time, and few follow-up studies. In addition, there is a lack of an established and standardized staff training framework and model that is noted in the literature. So this research study is significant, as it will contribute to the literature by exploring the possibility of an evidence-based model and standard for evaluation and feedback for professionals who work with and identify children with special

needs, and increasing predictability of performance outcome in teaching staff, to ensure that Procedural Integrity is sustained and generalized. This research study is also extending the literature by exploring the effectiveness of PTR in the form of Mentoring on teacher's performance outcome and Procedural Integrity.

Based on the literature, the conceptual frame states that adding Post-Training Reinforcement in the form of Mentoring to a STM consisting of the effective staff training procedures of VSM, SE/SM, PF and R, will lead to improved Procedural Integrity in TSP with sustained and generalized outcome.

### **Purpose of the Study**

The purposes of the study are threefold:

- To explore a *Staff Training Model* for enhancing Post-Training Procedural Integrity and Teaching Staff Performance (TSP) outcomes, when working with children diagnosed with ASD.
- To explore the effect of *Post-Training Reinforcement (PTR)*, in the form of *Mentoring*, on Teaching Staff Performance.
- To explore the long-term effects that *PTR/Mentoring* has on Procedural Integrity and teaching performance.

### **Research Questions**

The research questions are categorized within the three phases of the study.

#### **Phase 1 – Pre-Training (Workshop) Research Question and Hypotheses:**

*RQ1a:* Will the one-session presentation of Pre-Training and Video Training in Phase1 improve the teacher's accurate presentation of Learn Units (LU)?

*H1a:* The teacher's accuracy of LU presentation will increase after the one-session of Pre-Training and Video Training in Phase 1.

*RQ1b:* Will the one-session presentation of Pre-Training and Video Training in Phase 1 improve the teacher's Rate of Effective Instruction (ROI)?

*H1b:* The teacher's ROI will improve after presentation of the one-session of Pre-Training and Video Training in Phase 1.

**Phase 2 – Post-Training Reinforcement (Skill Acquisition) Research Question and Hypotheses.**

In Phase 2 the Dependent Variables (DV) will be measured against the Independent Variables of Time and PTR/Mentoring.

*RQ2a:* Will LU accuracy increase over Time?

*H2a:* LU will increase over Time

*RQ2b:* Will ROI increase over Time?

*H2b:* ROI will increase over Time

*RQ2c:* Will LU accuracy increase with PTR (Int. v C)?

*H2c:* LU accuracy will be higher with PTR than without PTR

*RQ2d:* Will ROI increase with PTR (Int. v C)?

*H2d:* ROI will be higher with PTR than without PTR

*RQ2e:* Will LU acc. increase over Time with PTR?

*H2e:* LU accuracy will be higher with over Time with PTR then without PTR

*RQ2f:* Will ROI increase over Time with PTR?

*H2f:* ROI will be higher over Time with PTR then without PTR

**Phase 3 – Follow-up (Sustainability) Research Question and Hypotheses**

In Phase 3 the Dependent Variables (DV) will be measured against the Independent Variables of Time and PTR/Mentoring.

*RQ3a:* Will Procedural Integrity of LU accuracy be maintained over Time?

*H3a:* Procedural Integrity of the LU will be maintained over Time

*RQ3b:* Will the Procedural Integrity of ROI be maintained over Time?

*H3b:* Procedural Integrity of ROI will be maintained over Time

*RQ3c:* Will Procedural Integrity of LU accuracy increase with PTR (Int. v C)?

*H3c:* Procedural Integrity of LU accuracy will be higher with PTR than without PTR

*RQ3d:* Will Procedural Integrity of ROI increase with PTR (Int. v C)?

*H3d:* Procedural Integrity of ROI will be higher with PTR than without PTR

*RQ3e:* Will Procedural Integrity of LU accuracy continue to increase with PTR over Time?

*H3e:* Procedural Integrity of LU accuracy will continue to increase over Time with PTR then without PTR

*RQ3f:* Will the Procedural Integrity of ROI continue to increase with PTR over Time?

*H3f:* Procedural Integrity of ROI will continue to increase over Time with PTR then without PTR

## **Chapter II**

### **Review of the Literature**

In the following section are definitions of effective research-based teaching staff training procedures, tools and strategies that were used in this research study. Subsequently, a review of the literature will address current research implementing these research-based teaching staff training procedures either in isolation or in combination that have been found to be effective in changing teaching staff behaviors in private, residential and organizational settings. There is very little research on their application in public school settings where the need for teaching staff training and expertise in behavior learning principles when working with children with ASD is paramount. In addition, definitions of key constructs will be presented to establish a common framework for discussing these concepts.

### **Operational Definitions**

In order to understand current tools used in teaching staff training in private and public educational settings, the following definitions of tools and strategies apply:

Video Self- Monitoring is an effective behavior change procedure targeting procedural integrity monitoring system. An individual creates a video tape of him/herself performing a target behavior or function then reviews it to analyze and rate performance on the application of behavioral guidelines objectives and procedural integrity (Pelletier, McNamara, Braga-Kenyon, & Ahearn, 2010).

Self-evaluation, a retrospective form of reflection (Krause & Stark, 2010), is defined as a self-regulated learning procedure that involves having an individual compare his/her performance against a standard or norm and making changes in his/her learning experience based on his/her informed perceptions of the quality of expected performance (Clearly & Zimmerman,

2001; Kitsantas, Reiser & Doster, 2004; and Kitsantas & Zimmerman, 2006). Self-evaluative remarks are related to achievement outcomes as well as to one's self-efficacy (Kitsantas et al., 2004; Zimmerman, 2000) and can enhance awareness of error patterns (Alvero & Austin, 2004).

Performance Feedback is a component of behavioral consultation defined as the process of monitoring target behaviors and providing feedback to the individual regarding these behaviors through a frequent, immediate and structured monitoring process. The process also involves analyzing treatment integrity data (e.g., visual graphic displays), providing performance contingencies, providing feedback for behavior outcome, responding to questions and addressing concerns, identifying needs for future training and supports, and ascertaining the participant's commitment to ongoing implementation of behavioral guidelines (Alvero, Bucklin & Austin, 2001; Austin, 2000; Coddling, Feinberg, Dunn, & Pace, 2005; Coddling, Livanis, Pace, & Vaca, 2008; Daniels & Daniels, 2004; Noell et al., 2005; Reid, & Parsons, 2006; & Wilkinson, 2007). Feedback is thought to support reflective thinking and enhance learning (Krause et al., 2010).

Reflection is defined as a problem-solving ability with three prerequisite attitudes: open-mindedness, responsibility, and wholeheartedness (Dewey 1933; Janssen, Hullu, & Tigelaar, 2008; and Stoddard, 2002). Reflection is a cognitive activity that allows learners to introspectively analyze their activities (Dewey, 1933; Hetzner, Gartmeier, Heid, & Gruber, 2010). Introspective reflective processes will be addressed in two different modalities: (1) journal writing providing the grounds for reflective, critical thinking and reasoning which is shared with the mentor/supervisor (Ross, 1990; Pedro, 2005); and (2) one-to-one conversations or interviews with the mentor/supervisor (Arco, 2008; Janssen et al., 2008).

With regard to the key concepts and variables that were addressed in this study, the operational definitions are provided below:

A learn unit is an instructional frame based on Skinner’s programmed instruction (1968). The learn unit is a fundamental measure of teaching and is the strongest predictor of effective teaching (Greer, 2002; Greer & McDonough, 1999; Greer & Ross, 2008; Ross, Wilson, Goodman, & Greer, 2007). The learn unit is an interlocking three-term contingency that consists of the teaching staff’s antecedent, the student’s response, and the consequence (Greer 2002; Greer et al., 1999). Namely, the learn unit consists of specific teaching staff and student interactions that result in student behavioral change. The learn unit is also a measure of instructional validity and its presence is critical for establishment of the reliability of an intervention (Greer, Yaun, Gautreaux, 2005). See figure 1 for a diagram of a sequence of LU/EC procedure formula. (Appendix J2)

*Sequence of LU/EC Procedure Formula*

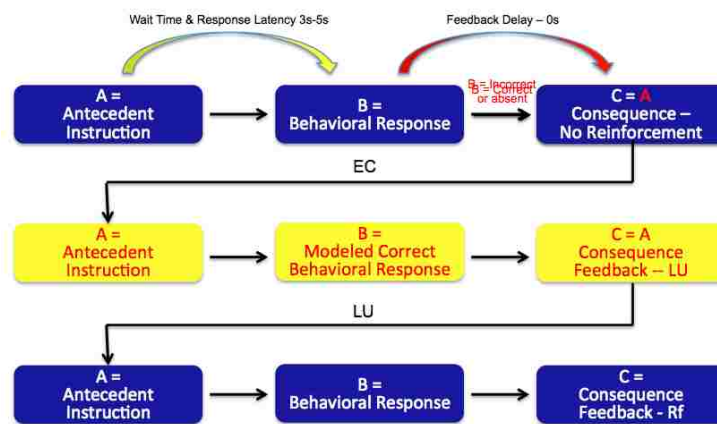


Figure 1. Diagram of a sequence of LU/EC procedure formula



Rate of Instruction (ROI), also referred to as “correct LU presentation,” is defined as the teacher’s rate of correct responses (Greer et al., 2002; & Ross et al., 2005). Correct LU presentation requires that both antecedents and consequences be presented accurately by the teacher (Ross et al, 2005). Research has shown that increased frequency and rate of LU presentation leads to an increase in correct student responding (Ingham et al., 1997; Greer et al, 1989), and an increase in objectives reached by students (Greer et al, 1989; Ingham et al., 1991). Rate of Effective Instruction in this study refers to both correct and incorrect LU presentation and reflects on the teacher’s effectiveness of instruction (Greenwood, Delquadri, & Hall, 1994; Greenwood, Horton, & Utley, 2002). A negative outcome indicates that there are more faulty LU presentations than correct LU presentations. A positive outcome indicates that there are more correct LU presentations than incorrect LU presentations. The Rate of Effective Instruction (ROI) is calculated in this study using the following formula:

$$\text{Rate of Effective Instruction} = \frac{\text{LU Correct} - \text{LU Errors}}{\text{Duration (minutes)}} = \text{Number of LU/minute}$$

The Teacher Performance Rate and Accuracy Scale (TPRA) developed by Greer, (1985) and implemented and analyzed in studies by Greer, McCorkle, and Williams (1989). The TPRA protocol measures the teacher’s accuracy and rate of presenting learn units to students (Ingham & Greer, 1992; & Keohane & Greer, 2005). The TPRA is based on empirical evidence demonstrating that both teaching staff and student response accuracy, increased with observation and feedback (Ingham & Greer, 1992; Greer et al., 1989; Selinski, Greer, & Lodhi, 1991; Ross, Singer-Dubek, & Greer, 2005). The TPRA is based on the premise that three factors observed in the teacher-student relationship influence teaching procedures, namely, (1) the application of the three-term contingency (Ingham et al., 1992), (2) the learner’s instructional history, and (3) the setting events and environmental stimuli that support the reinforcing operations implemented by the teaching staff. A disruption in any of the variables mentioned will lead to inadequate

instruction and learning. Data is collected on teacher and student responding and is converted into ratings of teacher and student behavior (Greer et al. 1989). The TPRA procedure has been implemented for over 10,000 observations of teaching staff by supervisors (Greer 1992; Selinski et al., 1991; Selinski et al. (1991) studied the use of the TPRA as a component in a teacher supervision package, over a period of 2-years, and found a functional relationship between its use and increased student responding. The instructional design the TPRA is based on allows for manipulation and establishment of ideal contextual and motivational conditions for learning, incorporates the advantages of incidental teaching, and allows for the presentation of increased number and rate of instructional opportunities that foster fluent responding (Greer et al., 1999). The TPRA is used to assess procedural integrity and fidelity. Reliability and validity of the TPRA has been assessed and ascertained through several studies (Ingham et al., 1992; Greer et al., 1989; Greer et al. 1992; Greer, 2002; Greer et al., 2008; Ross et al., 2005; & Selinski et al., 1991). (Appendix E)

Procedural Integrity refers to consistent and accurate implementation of an intervention as it is intended to (Cooper, Heron & Heward, 2007; Gresham, 1989). Hagermoser Sinetti & Kratochwill (2009) propose a more specific definition of procedural integrity addressing the complexity of the construct. They refer to it as “the extent to which essential intervention components are delivered in a comprehensive and consistent manner by an interventionist trained to deliver the intervention” (p. 448). The authors also add that Procedural Integrity is integral to an intervention program as it measures accuracy of implementation of procedures, allows the implementation of evidence-based practices, allows the identification of possible modifications of intervention, and allows the assessment and measurement of student outcome (Durlak et al., 2008; Hagermoser Sinetti et al., 2009; Plavnick et al., 2010). Maintaining Procedural Integrity is

a critical component in the management of children with ASD. Durlak et al. (2008) report at least 23 contextual factors that interfere with the implementation of Procedural Integrity. One aspect mentioned that is relevant to educators of children with ASD consists of the prevention support system (i.e., staff training).

The following is a review of the literature addressing current research implementing the research-based teaching staff training procedures of video self-feedback, self-monitoring, performance feedback and reflection on staff performance, either in isolation or in combination that have been found to be effective in changing teaching staff behaviors in private, residential and organizational settings, and the mediating effect that Procedural Integrity has on generalized and sustainable performance outcome. Furthermore, there is very little research on their application in public school settings where the need for teaching staff training and expertise in behavior learning principles when working with children with ASD is paramount.

The literature speaks to the importance of addressing procedural integrity as integral part of a staff training procedure. Maintaining procedural integrity, also referred to “treatment integrity” or “treatment fidelity”, is a critical component in the management of children with ASD. Procedural integrity refers to consistent and accurate implementation of an intervention as it is intended to (Belfiore, P. J., et al., 2008; Cooper, Heron & Heward, 2007; Gresham, 1989; & Noell, G. H., et al., 2005). Hagermoser Sinetti & Kratochwill (2009) propose a more specific definition of procedural integrity addressing the complexity of the construct. They refer to it as “the extent to which essential intervention components are delivered in a comprehensive and consistent manner by an interventionist trained to deliver the intervention” (Hagermoser Sinetti et al., 2009, p. 448). The authors also add that procedural integrity is integral to an intervention program as it measures accuracy of implementation of procedures, allows the implementation of

evidence-based practices, allows the identification of possible modifications of intervention, allows the assessment and measurement of student outcome and allows for replication of a study (Durlak et al., 2008; Hagermoser Sinetti et al., 2009; Plavnick et al., 2010; & Reid et al., 2005). Procedural Integrity is effective as it is achieved through effective evidence-based STM, Leads to improved staff performance and Ascertains generalized & maintained positive outcome (Belfiore et al., 2008; DiGennaro, F. D., Martens, B. K., & Kleinman, A. E., 2007; LeBlanc et al., 2005; Lerman et al., 2008; & Pelletier et al., 2010). Durlak et al. (2008) report at least 23 contextual factors that interfere with the implementation of Procedural integrity. One aspect mentioned that is relevant to educators of children with ASD consists of the prevention support system (i.e., staff training).

A variety of staff training protocols and tools has been studied in the literature (Leblanc et al., 2009, Reid et al., 2005; Weinkauff, Zeug, Anderson, & Ala'I Rosales, 2011). Several have investigated the effectiveness of training packages to train educators to use specialized skills required when teaching children with ASD (Kates-McElrath & Axelrod, 2008; Moore et al., 2002; Plavnick, Ferreri, & Maupin, 2010; Sarokoff & Sturmey, 2004). Research has shown that the use of teaching staff training packages that consist of live modeling, coaching, and in vivo performance feedback lead to inconsistent treatment integrity, require increased staff resources, and are costly (Macurik, O'Kane, Malanga, & Reid, D. H., 2008; Rosales, Stone, & Rehfeldt, 2009). By contrast, research indicates that video self-monitoring and evaluation, performance feedback and reflection have positive effects on changing teaching staff's performance (Clift, Houston, & Pugach, 1990; Pelletier et al., 2010; Petscher & Bailey, 2006; Reid, Parsons, Lattimore, Towery, & Reade, 2005; Rose & Ludwig, 2009). However, a key factor in ensuring these positive effects is procedural integrity. Procedural integrity refers to consistent and

accurate implementation of an intervention as it is intended (Cooper, Heron & Heward, 2007; Gresham, 1989). So, understanding how each of these interventions affects the ability of teaching staff to execute on instructional strategies, display procedural integrity over time and ultimately impact student performance is critical to effectively replicating the teacher training model.

In addition, there have been inconsistent reports regarding the effectiveness of in vivo staff training tools on improving teaching staff performance, and several contextual factors appear to influence the implementation and monitoring of procedural integrity (Durlak & DuPre, 2008). The use of written and verbal directions has been shown to be less effective in establishing procedural integrity than the training package of rehearsal, modeling, and performance feedback (Moore et al., 2002; Plavnick, Ferreri, & Maupin, 2010). Sarokoff et al. (2004) found similar results whereby the use of a teacher-training package consisting of instructions, feedback, rehearsal, and modeling resulted in significant improvements in the three teachers' implementation of discrete-trial instruction, in the home setting. The authors recruited three special education teachers, two of whom had 2-years experience using discrete trial teaching and one who had 5-months experience and was in the process of completing her master's degree. One 3-year old child participated in the study, which was conducted in the home setting. A multiple baseline design across subjects (i.e., teachers) was conducted. The dependent measure consisted of the 10 components identified in previous studies (Green, 1996; McClannahan & Krantz, 1993; Smith, 2001) measured over 10 consecutive trials. Results indicated an increase in accurate teacher responses, from 43%, 49%, and 43%, respectively, in baseline, to 97%, 98%, and 99%, respectively, in follow up training, in response to instruction, feedback, rehearsal, and modeling. Weinkauff et al. (2011) found that in vivo staff training using a comprehensive training package consisting of graduated sequence verbal instruction, modeling,

rehearsal and feedback (permanent product) was effective in teaching four instructors 125 skills required in behavioral interventions of children with ASD. In support, DiGennaro, Martens & MacIntyre (2005) and DiGennaro, Martens, & Kleinman (2007) found that a treatment package incorporating in vivo performance feedback with negative reinforcement schedule can lead to effective treatment integrity and further allows for a systematic thinning of the schedule of feedback with the consultant. DiGennaro et al. (2005) recruited four elementary school teachers working in a rural school district in NY and four students as participants for their study. The teachers were expected to implement a school-based 12-step intervention plan. Performance feedback was provided as an accuracy measure and incorporated negative reinforcement contingency. Specifically, the teachers were able to avoid meeting with the trainer/consultant to practice missed steps by achieving 100% integrity in implementation. The 12-step intervention plan was implemented over a 10-minute duration each day. Results indicated that treatment integrity increased for all teachers with a concomitant decrease in students' off-task behavior. In addition, the authors found that a high level of treatment integrity was also maintained when a systematic approach of thinning consultation exposure was implemented.

As stated above, there have been inconsistent reports regarding the effectiveness of in vivo staff training tools on improving teaching staff performance. There is however supportive empirical evidence in the effectiveness of video modeling as a teaching staff training tool. Video modeling has been shown to be a time and cost effective staff training tool and a relatively easy method to increase procedural integrity (Catania, Almeida, Liu-Constant, & DiGennaro-Reed, 2009; Macurik et al., 2008; Moore & Fisher, 2007). Moore et al. (2007) were in support and added that video modeling was most effective when a high number of therapist exemplars were included. The authors recruited three teachers who had no experience with the application of

functional analysis (Iwata et al., 2000). The dependent variable was the percentage of correct responses emitted by the teachers. The independent measure was the number of multiple exemplars used in the videotapes. A multiple baseline across subjects design was used. All videotaped models were simulated models derived from the actual functional analysis, using videotapes of “real” clients from Moore et al. (2002). Training tools consisted of lectures, written and verbal instruction, and complete and partial video modeling. Partial video modeling depicted only a percentage of the correct staff behavioral responses. The complete video modeling depicted 100% of the correct behavioral responses. The use of verbal and written instruction alone, or partial video modeling, resulted in a slight increase, below mastery criterion. The use of complete video modeling resulted in mastery (above 80%) in eight of nine implementations with the ninth reaching criterion after receiving feedback. Follow-up probe data indicated generalized skill acquisition to the natural setting with actual clients. The results of the study indicated that the use of written and verbal instruction alone is not an efficient training tool, however that the use of video modeling led to successful performance which was achieved in a timely fashion, was cost effective, manner, and generalizable to natural settings. The authors conclude that the use of video modeling depicting subsets of skills is an effective training tool that can be used during staff orientation and training sessions.

There is limited research on using self-monitoring alone as a teaching staff training tool. Richman, Riordan, Reiss, Pyles and Bailey (1988) found that the use of self-monitoring alone resulted in improvements in on-task behavior and adherence; however results were stronger when supervisor feedback was added to the training package. A multiple baseline design across groups of staff in two residential facilities was used. Participants consisted of 10 staff members, five in each residential facility, between the ages of 20 and 40, who had from one month to five

years experience working with students evidencing mental retardation. Target dependent measures included on-schedule behavior -- the participants were at their activity location with all materials ready at the time scheduled, and on-task behavior -- the participants were engaging in assigned activities. Results indicated minimal changes in staff responses to the in-service condition, with variability in performance to staff' on-schedule and on-task behaviors in response to self-monitoring condition, with the greatest increase in performance with maintained gains when a systematic feedback procedure was added to the training package. Some generalization effects were observed in the study but were not conclusive. The authors further stipulate that a self-monitoring procedure may promote the individual's engagement in an "observing response", and may add an element of awareness and responsibility that is not generally noted during a traditional supervisor-mentoring centered staff training protocols. Specifically, the individual is subject to the controlling environmental stimuli which set the occasion for the trainers to act as sources of positive reinforcement for accurate target performance.

There is evidence in the literature that Self-monitoring is an effective training tool to improve procedural integrity (Petscher and Bailey, 2006). This procedure is likely to be cost and staff effective as it would likely not require additional training staff, reducing problems in staff management and training. Petscher et al. (2006) studied the effect of self-monitoring on the implementation of a token economy system in the classroom. The study participants consisted of three female teaching assistants with less than one year experience in the current position who worked in a self-contained classroom of 11 children with severe behavior problems. A moving-treatments multiple baseline across behaviors design (Bailey & Burch, 2002) was used for the study. The independent variable was a treatment package that included prompting (i.e., using a



vibrating pager as a tactile prompt) which was systematically faded, a self-monitoring form consisting of three variables, and accuracy feedback. The dependent variables consisted of three behavioral responses (i.e., managing disruptive behavior, delivering bonus points and praise, and prompting appropriate behavior). The participants completed the self-monitoring form after each observation session and then attended a session where a supervisor provided accuracy feedback around the teachers' accuracy in completing the form compared to the supervisor's data recording. During maintenance, the session length increased from 10 to 60 minutes with data collection being done sporadically and discretely in order to eliminate reactivity effect. The results indicated significant improvement in the implementation of the token economy in response to the implementation of the treatment package, with some maintenance of performance over time (one participant demonstrated a slight decline in accuracy of responses when the prompt was removed). The authors suggest additional studies to assess the independent and interaction effects of self-monitoring when combined with the tactile prompts and self-monitoring. The authors also suggest evaluating the effect that an improvement in staff performance may have on student behavior.

Rose & Ludwig (2009) studied the effect of self-monitoring on procedural integrity. A treatment package consisting of self-monitoring, task clarification and performance feedback was implemented on cleaning behaviors of 9 lifeguards in three performance areas (i.e., vacuuming, equipment tidying and garbage disposal), at a community swimming complex. An ABA reversal design was used. After the provision of a task clarification script detailing the specific criteria for satisfactory completion of the targeted tasks, the lifeguards completed the self-monitoring closing behavior checklist by rating the percentage of the 13 end-of-shift closing targeted tasks completed by the end of the day. Performance feedback was provided daily by

managers who would independently rate the tasks and display both self-reported and manager scores on line graphs by the following day. The researchers monitored both scoring procedures to eliminate any bias or unreliability in scoring that may occur. Both lifeguards and managers were unaware of the researchers' monitoring. Study results revealed improved procedural integrity and performance from 45.1% accuracy during baseline to 76.9% during intervention. The increased rate of target behaviors was not maintained; however, accuracy returned to baseline once the intervention was removed and during the follow-up phase. The authors suggested that the intervention training package of task clarification, self-monitoring and visual feedback leads to increased target performance. Self-monitoring was beneficial in building awareness and clarification of the required tasks by providing the scripted expectations. Visual performance feedback was useful in providing an evaluative and comparative component of behavior performance change. As a consequence, this may have helped to improve self-monitoring skill.

The study by Plavnick et al. (2010) concurred with previous findings, demonstrating the efficacy of self-monitoring in improving procedural integrity in the implementation of a token economy system. The authors recruited three staff members and two students (i.e. a 4-year old diagnosed with autism; and a 3-year old diagnosed with Williams syndrome and specific language impairment) from the early childhood special education program. A multiple baseline design across students similar to DiGennaro et al. (2005) was used. A second multiple baseline design across students was used to assess the effect of staff change on student behavior. The researchers used a self-monitoring checklist to score the percent accuracy of implementation of the token economy. This checklist utilized a discrete categorization procedure to capture accuracy (Kazdin, 1982). The dependent measures were the percentage of 30-s whole intervals

students engaged in *appropriate sitting* and *appropriate vocalizing* simultaneously. Observations were 10 to 15 min. in duration, conducted two to three times a day. The results indicated that the self-monitoring procedure improved staff implementation of token economy consistent with the findings of Petscher et al. (2006), Rose et al. (2009) and DiGennaro et al. (2007). In addition, the students' academic readiness behaviors improved in response to accurate presentation of the token economy system. Some limitations to this study included variability in staff and student performance following the introduction of the self-monitoring procedure. The authors suggested addressing this limitation by isolating the components of the target task in order to assess collateral effects. Another limitation noted was a sudden, rapid increase in one of the staff's procedural integrity rates which may have been a result of practice effect or observer reactivity. The authors suggested addressing this limitation by examining the effects of observing accurate implementation of the token economy procedure and self-monitoring checklist on procedural integrity rates. In conclusion, the authors suggested considering self-management practices, such as self-monitoring procedures, as effective and efficient tools to improve the implementation of interventions in public schools.

A review of the literature shows us how effective each of these training components are, under what setting each has been applied, and their respective impact on teaching staff performance. Specifically studies concerning the effects of video self-monitoring and self-evaluation, performance feedback and reflection on staff performance will be reviewed. The following section considers the effects of Video Self-Monitoring, Self-Evaluation, Performance Feedback, and Reflection on staff performance.

The following section considers the effects of Video Self-Monitoring and Self-Evaluation on staff performance.

### **Effects of Video Self-Monitoring and Self-Evaluation on Staff Performance**

Pelletier et al. (2010) studied the use of a video self-monitoring treatment package as a possible means of improving the procedural integrity of behavioral guidelines implemented by staff. Staff providing treatment to one child diagnosed with ASD was monitored. The video self-monitoring intervention package consists of behavioral guidelines, a procedural integrity monitoring system and both visual and verbal feedback. Three staff members participated in the study and were selected because they had low procedural integrity scores. A multiple baseline design across participants was used. Participants completed a pre-training video scoring phase and received feedback on how to accurately score their own behavior using a procedural integrity self-monitoring form that showed the target behavioral guidelines. Participants then scored their own baseline behaviors using the video self-monitoring system. Participant and the experimenter scores were compared and verbal feedback provided to address disagreements in scores. Results revealed greatly improved procedural integrity in two of the three participants. The authors suggest that video self-monitoring may be a very cost-effective way to improve procedural integrity due to the lack of observer reactivity and time taken to implement the intervention. However, they question whether video self-monitoring alone was responsible for improved procedural integrity or observer effects was an influencing factor.

Research has shown that achieving high procedural integrity is typically time, staff and cost intensive (Pelletier et al., 2010; Rose et al., 2009); therefore, considerable research has gone into trying to reduce or limit the impact of these factors. For example, Belfiore, Fritts, & Herman (2008) have demonstrated that the use of self-monitoring and self-evaluation is an effective method for achieving procedural integrity in a timely fashion. The authors also showed that video-based self-monitoring was an effective strategy in promoting improved staff performance

in the implementation of discrete-trial instruction (DTI) to students enrolled in a classroom for children with autism. The DTI consisted of 5-steps (i.e., delivering a discriminative stimulus; wait time for student response; response-specific feedback; immediacy of specific feedback; and latency before delivering the next discriminative stimulus). Four teaching staff working in a state-approved private facility were recruited for the study. All staff were trained in the application of DTI but were not familiar with the five-step self-monitoring checklist. Participants received training on how to score the videotapes of their DTI delivery. The dependent measure was the accuracy of delivering the 5-steps. A multiple baseline design across staff was used. The results revealed improved application of DTI using video self-monitoring and self-evaluation. Specifically, staff considerably improved the accuracy with which they managing intertribal intervals. The authors suggested using this strategy when staff has limited supervision and/or peer mentorship opportunities.

The following section considers the effects of performance feedback on staff performance.

### **The Effect of Performance Feedback on Staff Performance**

Leblanc et al. (2005) reported that an abbreviated form of performance feedback consisting of scoring and reporting on a 10 DTI checklist, providing verbal corrective feedback (e.g., verbal redirections and clarifications), praising correct responding, and answering concerns and questions, resulted in improved target skill performance which was maintained over an 11 week period (Location: private Day school). Leblanc et al. (2005) evaluated the effect of incorporating an abbreviated performance feedback checklist on the application of discrete trial instruction (DTI) of children with autism. Three students between the ages of five and nine years, and three assistant teachers working at a private school for children with developmental

disabilities for less than 6 months, who correctly performed some of the DTI skills, participated in the study. A performance feedback checklist depicting 10 DTI steps was used to measure teacher accuracy, and multiple baseline design across assistant teachers was used. The researchers provided the teacher assistants with formal instruction on basic principles of applied behavior analysis, and administered a baseline measure of teacher accuracy. Following this, each assistant teacher worked with a student for 15 minutes, and a trainer provided each assistant teacher with immediate performance feedback using the abbreviated performance feedback checklist after the session. Praise and approval were provided by the trainer for correct application of the DTI and clarifications along with verbal directions were presented for incorrect application. No modeling, role play or practice of correct application was used. Training ended when the skill set was achieved to criterion of 90% accuracy over two consecutive sessions. Follow-up measures were conducted at 2, 4, 7 and 11 weeks, with no feedback provided. Results revealed improvement in assistant teacher implementation of DTI in response to the treatment. The assistant teachers saw the training form as a socially acceptable practice and performance was maintained at follow up without feedback.

This study extends research by Moore et al. (2002). Moore et al. (2003) in a similar study stated some limitations such as the assistant teachers' pre-baseline and intervention competence with the use of DTI and the need to investigate whether similar effects would be observed with novice teachers. Also, correct responding was not collected for student performance, therefore a relationship between improved staff performance and student performance gains could not be inferred. The authors recommend conducting generalization probes across students and across novel and varied educational learning programs to determine if the functional relationship between performance feedback and teaching staff performance validates more generally. The

authors note that this training procedure is a very practical and useful technique for educating novice teachers or improve teacher proficiency in the use of DTI. The researchers also recommend instituting performance observation as part of regularly scheduled and expected performance improvement plan to reduce perceptions that the procedure might be perceived as punitive.

This study results are in agreement with the work of several researchers who are in support of the effectiveness of providing performance feedback to increase teacher accurate responding (Greenberg, J. H., & Martinez, R. C., 1999; Greer, 2004 & 2002; Greer et al., 1989; Greer et al., 2008; Ingham et al., 1992). For example, the use of *Teacher Performance Rate and Accuracy Scale* (TPRA) is a performance feedback training tool that has been studied in the literature as a training tool to improve teacher and student accurate responding. Greer et al. (2002, 2004, 2008) and Ingham et al. (1992) stated that research-based individualized instruction incorporating performance feedback through scoring one's own performance or others', following objectively defined measures reliably, using the *Teacher Performance Rate and Accuracy Scale* (TPRA), is effective in teaching novel behavioral tactics (Greenberg, J. H., & Martinez, R. C., 1999; Greer, 2004 & 2002; Greer, 1989; Greer et al., 1989; Greer et al., 2008; Ingham et al., 1992). Moreover, Ross et al. (2005) introduced the TPRA as a teacher evaluation and training tool useful in identifying and analyzing instructional problems. The authors stipulated that the TPRA is a direct observational procedure that provides performance feedback on teacher and student performance and builds on the concept of academic engagement time by identifying the learn unit as the core measure of teaching. The learn unit is defined as a set of antecedents, behaviors and consequences for both the student and teacher in the context of an instructional session. The TPRA incorporates focuses on seven components of the learning unit:

the target student, target instructional program, operational definitions of the target program and prompts associated with it, reinforcement schedules meeting the individualized needs of the target student, antecedents and consequences or postcedents, instructional conditions facilitating emission of target behavior, and prerequisites skills the students should possess after the instructional session. The TPRA is time based and provides reasonably objective performance data which is immediately reviewed by the supervisor/mentor at the end of each session. This tool is used to assess every unit of measurement with suggestions for future applications. Objective scores are obtained using algebraic calculations to determine the rate of correct and incorrect responses for the teacher and student. Notably, the rate of learn unit instruction has been identified in the literature as being highly positively correlated with accurate student responding and academic engagement time. Additionally, and this approach builds on opportunity-to-respond frequency which has been shown to impact academic learning (Greer, 1997; Ingham et al. 1992). TPRA scores can be visually and graphically displayed and function as a gauge for procedural integrity and teacher and supervisor accountability measures. The authors stated that improved TPRA scores are an indication of shorter latency periods between learn unit presentation. This shorter latency period is indicative of greater amounts of instruction, more fluency of teacher presentation of instruction, and increased contingency-shaped behavior (as opposed to rule-governed behaviors) -- indicative of teachers' fluency with the teaching and behavior construct. The authors report an estimated 300,000 TPRA observations successfully and effectively completed across 20 schools and 500 teachers. They conclude that the TPRA is a useful, reliable and valid direct observational tool that can be effectively used during teacher training and evaluation procedures and suggest that further research be conducted



to assess teacher-student interactions at the teacher level and across different settings and programs.

In support of using performance feedback to improve procedural integrity and staff performance, Reid et al. (2005) found that the use of an outcome management approach implementing performance- and competency-based training along with on-the-job supportive and corrective feedback (e.g. vocal and written instruction, and modeling) resulted in improved and maintained staff performance (Location: adult working facilities). The authors conducted two studies in which three clinicians in two different settings were selected. These clinicians were selected because they had no formal supervision training, supervised at least one staff member and were willing to participate in the study. The clinicians were instructed on the use of a six-step, systematic and data driven outcome management process. The clinician gained proficiency in the application of this process. Proficiency was defined as the ability to identify the consumer and the goals to be attained, the ability to develop and implement the performance tracking system, developing a training protocol for the targeted performance area, and providing supportive and corrective feedback regarding performance adequacy and accuracy.

The intervention occurred at small publishing company that employed five ASD workers as part-time employees. Three residential, direct support staff job coaches who work with the supported workers participated in the study. The senior job coach was selected as the trained clinician. A multiple probe design across the prompting behavior of the three staff was used. Follow-up observations were conducted at 7, 11, and 15 weeks. A questionnaire assessing the acceptability of this approach revealed favorable responses. Additionally, findings indicated that the procedure yielded improved work performance that was maintained over time. The authors state that the behavioral supervisory technology used to improve staff performance in this study

(although available) is not used in many direct service delivery systems and agencies. They stress the need for supervisory training in evidence-based behavioral management technologies. They also recommend extending this technology across different areas of staff performance and further identifying the variables that promote generalization.

Arco (2008) conducted an extensive review of observational studies that assessed the effects of different types of feedback on staff performance in behavioral treatment programs. The authors provided specific, recommended steps for providing feedback that will maximize the opportunity to yield successful behavioral change for clinical or educational professionals who are implementing behavioral treatment programs with individuals having cognitive, developmental or psychiatric disorders. Namely, the authors reported that providing specific and immediate process and outcome feedback prior to training, followed by consistent supervisor feedback on-the-job which is supplemented by staff self-generated outcome feedback until competency is achieved ensured proper staff and client interactions. Additionally, however, the author noted that post-training, regular self-generated feedback combined with ongoing social validity measurement ensured the maintenance of these staff and client interactions.

Work by Petscher et al. (2006) supported and extended these results. This study demonstrated that the use of accuracy feedback resulted in significant staff performance improvements in managing problem behaviors (Location: self-contained classroom in a public school). This study was an extension of the early work of Richman, Riordan, Reiss, Pyles, & Bailey (1988) who found substantial benefits associated with staff self-monitoring in a residential facility.

Another study (Lerman et al., 2008) evaluated the effects of a brief, intensive teacher-training model on teacher performance working with children with autism. Participants were

nine special education public school teachers with work experience ranging from 1 to 14 years, and 16 students ranging in age from 3 to 18 years with learning abilities ranging from poor to good. All students displayed problem behaviors during instruction, typically aggression. The dependent variables were percentage of accuracy implementing skill components in two main areas -- preference assessment and direct teaching. A multiple baseline design across teachers was used. In-class training consisted of skill practice with modeling and practice with feedback and ran for two hours across four consecutive days. Six skill areas were taught sequentially. Follow-up probes were conducted at one to three months post training. Results indicated teacher improvement in the application of the six skill areas in response to performance feedback with generalization and maintenance of the skills across settings (except for one teacher). This study did have some key limitations, however. Specifically, training practice time across teachers did vary substantially and teachers were allowed to select their skill assessments during maintenance probes, so the amount and type of data gathered from the maintenance probes varied across teachers. In conclusion, the authors found that performance-based feedback is an effective strategy for changing teacher performance on direct instruction and preference assessment tasks. This improvement generalized to the classroom setting and the improvement was maintained with brief feedback provision.

Codding et al. (2008) and Noell et al. (2005) obtained similar findings adding that performance feedback improved procedural integrity and child behavioral outcomes in a public school classroom setting. Codding et al. (2008) systematically replicated the 2005 study by investigating the effects of observer reactivity when implementing a direct observation method for procedural integrity. Participants included three teachers (i.e., one with no teaching experience, one with three years and one with nine years of teaching experience) working in a

self-contained special education. The students were all public school seventh graders ages from 12 to 14 years who had been diagnosed as emotionally disturbed. A multiple baseline design across staff members with alternating treatments was used. Teachers were observed two to three times a week for 44 minutes by observer-present (50% of the time) and by observer-absent (behind a one-way mirror, 50% of the time) over a four month period. Observer conditions were randomly selected to reduce reactivity and predictability effect on the part of the teacher. This study replicated the results of prior research, showing a functional relationship between the use of performance feedback and improved procedural integrity in the implementation of a multiple component behavior plan. No observer reactivity was detected. This study adds to the literature addressing the positive effect of performance feedback follow-up procedures that promote the model of behavioral consultation and lead to improved treatment integrity (Noell et al., 2005). Limitations noted included that observer-present and observer-absent were not independent, the teachers were not blind to the purpose of the study, and student behaviors were not assessed concurrently with the implementation of the behavior plan.

Symes et al. (2006) conducted a qualitative study trying to understand the factors interfering with quality of therapist performance, one being training and supervision. Nineteen therapists were interviewed. The researchers identified a number of factors that, according to therapists, impacted therapist performance, improved intervention effectiveness, quality of service, and perceived self-efficacy. These included:

1. Therapist-child characteristics
2. Pre-training
3. Training in instructional and behavioral intervention techniques
4. The nature of the skill targets

5. Ongoing supervision
6. Observing other experienced therapists implement the tactics
7. Provision of performance feedback and clarifications about the strategies used

The authors also suggest the therapists' self-perceptions, beliefs, and confidence are factors influencing procedural integrity.

Weinkauf, Zeug, Anderson, & Ala'I Rosales (2011) implemented a comprehensive teaching staff training package that involved graduated sequence of teaching 125 skills needed in behavioral interventions for children with autism. The researchers used an in-vivo training approach that included formal instruction, modeling, rehearsal and feedback using a checklist. Four ABA instructors received the training. Results of the study indicated an increase in correct application of the skills accompanied by a decrease in incorrect application. This treatment also had positive social validity. Instructors required from 20 and 32.5 hours to reach mastery criterion. The authors found that all instructors reached mastery criterion in applying the behavioral intervention skills (Location: non-profit autism treatment program).

DiGennaro-Reed, Coddington, Catania, & Mahire (2010) implemented a package consisting of video modeling and performance feedback to establish and maintain procedural integrity in the treatment of problem behavior. The authors recruited three newly hired teachers, working in a setting that provides educational and residential services for individuals with autism and other developmental disorders. A concurrent multiple baseline design across participants was used to assess the effect of individualized video modeling (IVM) and individualized video modeling with performance feedback (IVM+PF) on the treatment integrity of a behavioral intervention plan. Each teacher observed an individualized instructional video depicting a model performing the exact steps in intervention plan with a student. They found that the use of objectively defined

task objectives, as part of performance feedback system, delivered through a basic skills training combined with self-recording and followed by performance feedback from the consultant improved treatment integrity.

Rosales, Stone, & Rehfeldt, (2009) found similar findings on the effectiveness of using a treatment package consisting of video modeling, written and verbal instructions, modeling, rehearsal, and feedback. Three novice teachers acquired functional application of the first three phases of picture exchange communication system (PECS) in a relatively short period of time. Nabeyama & Sturmey's (2010) study found similar positive outcome. The authors found that a staff training package consisting of self-recording and BST was effective in teaching basic skills in guarding responses to facilitate ambulation in disabled individuals. They added that social validity measures revealed that staff members accepted the training.

The next section considers the effects of reflection on staff performance.

### **The Effect of Reflection on Staff Performance**

Reflection, according to John Dewey's concept of reflective thinking, is defined as a problem-solving ability with three prerequisite attitudes: open-mindedness, responsibility, and wholeheartedness (Janssen et al., 2008; and Stoddard, 2002). Reflection allows learners to conduct introspective analysis of activities they engaged in and performed (Dewey, 1933; Hetzner, Gartmeier, Heid, & Gruber, 2010). Introspective reflective processes are typically studied via two modalities: (1) journal writing to provide teachers with the opportunity to practice critical thinking and reasoning, and while also providing the mentor/supervisor with information to discuss the learner's thinking (Ross, 1990); and (2) one-to-one conversations or interviews with the mentor/supervisor (Stoddard, 2002).

The literature on reflection indicates that individual factors such as error orientation (e.g., learning from errors and error competence) and contextual factors such as perceived psychological safety are significant predictors of a person's frequency in reflecting (Gartmeier, Kipfmüller, & Heid, 2008; Hetzner et al., 2010; Pedro, 2005).

Pedro (2005) conducted a qualitative, interpretive study exploring those factors. The author specifically explored how teachers' meanings of reflective practice affect informed practice. Dewey (1933) defines the construct of reflective practice as "the act of active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of grounds that support it, and the consequence to which it leads" (Pedro, 2005, p. 50). Five graduate pre-service teachers ranging in age from 22 to 42 participated in the study. A descriptive and interpretive design was used. Three individual, in-depth interviews and examination of the pre-service teachers' reflection journals were used to evaluate the frequency and content of reflections. Additionally, the researchers verified facts stated in the journals and interviews by reviewing recordings of teaching practices. Participants were interviewed after completing the final teaching practice and submitting the ten-week reflection journals. Results indicated that participants initially needed to define reflection to themselves such as "simply looking back on action" (i.e. two participants), and "about changes that could be made (i.e., three participants). Over time, subjects showed an increase in questioning when reflecting on different issues and that they enjoyed engaging in opportunities for reflection that were provided in their classes. Finally, it appeared that they began to see reflection as a means to share their uniqueness to others, look back at their actions, think about current actions, and develop ideas on next steps to change. Results also revealed that engaging in reflective processes allowed for discovery, synthesis of and understanding of material and personal growth.

Krause et al. (2010) found that the provision of elaborate feedback, reflection prompts, and cooperative learning and reflection with complex tasks promoted reflective activities. The author's first study investigated the effectiveness of reflective prompts as a learning tool. Fifty-seven college education students were recruited to solve simple correlation tasks. Results indicated that three of five reflective prompts were effective in promoting learning for complex tasks. These included the categories of self-monitoring (i.e. observing the process of learning and understanding), self-regulation (i.e. planned and regulated actions), and epistemological aspects (i.e. indicated beliefs about learning and knowledge). Positive and negative motivation/emotion did not appear to have a significant effect on learning outcome. Krause et al.'s second study tested the effectiveness of feedback intervention and cooperative learning on promoting reflective processes and learning outcomes. 137 college education students were recruited to solve statistical math related problems. Participants were requested to rate their own reflection in the learning process. Specifically, they were asked to describe what they thought of and how they processed the information presented to come up with an answer to the problem. Results supported the effectiveness of a didactic approach to learning with substantial improved learning outcomes noted in complex tasks when feedback was provided. However, feedback did not have an effect on perceived reflection. Cooperative learning was not found to enhance learning outcomes; however, it was more effective when feedback was added. The same reflective prompt categories used by the learner were noted which required higher attention and deeper processing functions. The authors concluded that both reflection prompts and feedback enhanced reflective processes which, in turn, enhanced learning outcomes.

Jansen et al. (2008) conducted an exploratory study comparing outcomes of reflecting on difficult tasks and problems versus reflecting on positive successful experiences. The study



focuses on three outcome areas, namely, the content of the teachers' resolutions after reflection, their underlying motivation to act, and the emotions they experienced during reflection. Sixteen student biology teachers who held a Master's degree were recruited for the study. Participants had, on average, two months of teaching experience and were familiar with the concept of reflection as it applies to learning from prior problem solving experiences. A variety of rating scales, questionnaires and interviews were used. Results indicated a difference in outcomes when reflecting on different experiences. Specifically, reflecting on problematic experiences lead to direct instruction resolutions, decreased motivation that may be attributed to a low value-factor to resolution, and with possibly negative feelings and emotions related to a person's beliefs and wants; however, a specific positive feeling incurred when the meaningfulness of the problematic experience was deduces. On the other hand, reflecting on positive experiences leads to innovative resolutions with higher motivation and positive emotions, which may be attributed to the value and success-expectancy and a person's beliefs and wants, with confidence playing an influencing factor.

However, these findings were not substantiated by Gartmeier et al. (2008). The authors conducted an exploratory study investigating the role of reflective activities in the development of competence. Participants consisted of 44 nurses working in a care institution for the elderly. Questionnaires were distributed to all nurses who voluntarily completed them. The study was based on three interconnected basic assumptions. The first assumption considers reflection an activity-oriented concept with underlying social perspectives rather than an individualized cognitive process. The second assumption considers reflection as not only an instrumental activity but also one that implies a critical perspective whereby increased awareness of environmental conditions shapes the individual's work environment and learning. The third

assumption considers the act of reflection on errors as a dynamic process that is crucial for individual learning and professional development which may be the prerequisite for professional competence. The latter involves the three tasks or phases of cause analysis, development of new ideas and strategies, and experimentation with and implementation of the new action. Results of the study revealed a strong relationship between reflection, thinking about errors and interest in change, sharing knowledge and initiative and acceptance of responsibility, self-efficacy and sharing knowledge, and how these elements support the development and maintenance of professional competence when faced with new requirements. The authors concluded that reflection as a tool is effective when the duality between productivity and personal development are addressed.

Different underlying strategies for reflection have been studied (Gartmeier et al., 2008; Krause et al., 2010; Pedro, 2005; Ross, 1990; Stoddard, 2002). These may consist of journal writing, verbal one-on-one dialogue with the mentor/supervisor, experimentation, the use of reflection prompts, pre-servicing on reflective processes, internal personal learner characteristics (e.g., values, beliefs, emotions, motivation), external context, and content of reflective practice.

### **Theoretical Discussion**

#### **Bandura's Social Learning Theory**

The theoretical basis for using video self-monitoring and self-evaluation and reflection is provided by Bandura's (1969) Human Behavior Model, specifically Observational Learning, Social learning theory and Cognitive Behavior Theory. He clarifies that self-satisfaction involves either satisfaction or dissatisfaction with performance outcomes, and involves attribution. People who are satisfied about their performance will continue pursuing the target task, whereas, people who are dissatisfied with their outcomes, or have negative affect regarding

ability rather than strategy used, will not pursue a target task (Bandura, 1997; Zimmerman & Kitsantas, 1999).

Bandura's social learning theory, also referred to as social-cognitive theory, stipulates that observational learning accounts for most human behavior learning. The theory is based on three assumptions:

First, people can learn through observation. Bandura further categorizes observational learning under three models. These consist of (1) a live model, which involves observing an individual in action or performing a behavior. The Staff Training Model in this study addresses this component by introducing video self-monitoring; (2) a verbal instruction model, which involves a descriptive presentation of the target behavior. The Staff Training Model in this study addresses this component by standard norms performance criteria against which target behaviors are measured; and (3) a symbolic model, which involves a role-play situation depicting the target behavior. The Staff Training Model in this study addresses this component by utilizing self-evaluation and reflective processes.

Second, that people create a mental code of the observation to be used on later occasions serving as a guide for demonstrating a new behavior, and that learning does not automatically lead to behavior change. The Staff Training Model in this study adopts this assumption by using the video-feedback system along with self-monitoring.

Third, that learning does not necessarily lead to behavioral change. Although new learning is acquired through observational learning actual behavioral change may not be demonstrated. The Staff Training Model in this study adopts this assumption by using video-feedback and self-monitoring and tags the self-evaluation.

According to Bandura (1977), in order to build on those assumptions and ensure successful social learning and observable behavioral change four components in observational learning must be met: (1) Attention and focus to the novel situation. The learner will need to filter out internal and external distractions in order to capture all the elements of observational learning; (2) Retention of the information and the ability to retrieve the learned information at a later time to demonstrate behavioral change; (3) Reproduction of the new behavior attended to and retained. The learner will be required to perform repeated practice, which will lead to behavioral skill acquisition, improved performance, and mastery; and (4) Motivation to attend to, retain and desire to learn the new observed behavior. The contingencies of reinforcement and punishment will influence the learner's motivation and hence attention, retention and performance outcome. Establishing effective motivators will lead to successful learning and behavioral change.

Bandura's self-efficacy theory is rooted in his social learning theory, and provides an explanation for subsequent behavior change, in terms of initiation and maintenance, as a result of one's perceptions and expectations (Bandura, 1977). Self-efficacy is defined as "the conviction that one can successfully execute the behavior required to produce outcome" (Bandura, 1977a, p. 193). Bandura postulates that increased self-efficacy is influenced by several factors, namely, the person observing live models, verbal persuasion and self-instruction. These factors are inherent in the Staff Training Model in this study through the strategies of visual feedback, self-monitoring and reflection. Bandura (1997) reflecting on his self-efficacy model also noted the advantage of viewing oneself successfully performing a task as it "provides clear information on how best to perform skills" and "strengthens beliefs in one's capability" (p. 94).

### **Skinner's Operant Theory**

The theoretical basis for using performance feedback and reflection is provided by Bandura's social-cognitive model and Skinner's (1953) operant theory. Both theoretical models emphasize the reactive effects of cognitive factors (e.g., awareness, discrimination) and behavioral factors (e.g., observable actions, and consequences) on learning new skills. The selection of video self-modeling as a strategy used to discriminate behaviors with positive or negative consequences is supported by Skinner's (1953) operant behavior theory.

Skinner's operant theory stipulates that one can only explain a behavior through external observable causes of human behavior. Skinner refers to an *operant* as "active behavior that operates upon the environment to generate consequences" (1953). Based on this definition, Skinner's operant theory explains how new learning and behavioral change occur by studying and manipulating the external environmental contingencies capitalizing on the concepts of reinforcement and punishment. The Staff Training Model in this study incorporates Skinner's operant theory into the components of self-evaluation and self-monitoring whereby target behaviors and skills are observed, measured, and evaluated in relation to standard objective guidelines for behavioral skill acquisition. The reinforcement contingencies will be addressed by providing productive constructive and descriptive performance feedback with mentoring and reflective processes considered to address internal processes. A permanent product will provide a visual display of performance outcome, which will provide feedback across observational sessions and act as an impetus for subsequent sessions. Moreover, observing and experiencing positive changes in the student's behaviors over successive observational sessions will increase the learner's motivation to work toward the acquisition and mastery of the new behavioral skills.

**Dewey's Constructivist Theory – Negative Knowledge Theory**

A cognitive learning theory with a constructivist approach incorporates the elements of knowledge acquisition, with assessment methodologies that determine instructional outcome and content. Specifically, a constructivist approach to learning assumes the processes of information gathering, interpretation, analysis with comparison with existing knowledge and beliefs, reorganizing and shaping the information for new learning in a socially mediated venue. These elements are accomplished through reflective processes (Gartmeier et al. 2008). Albert Bandura (1997) has theorized that a learner's perceived efficacy is shaped through reflective processes by incorporating all learning experiences acquired from a variety of sources of information. John Dewey (1933) contends that reflection is essential to all learning experiences forcing the learner to make deliberate and intentional changes in thinking and behaviors. Dewey stresses the importance of reflecting upon consequences of actions and stated five steps necessary during reflective processes to promote learning. These consist of the act of suggestion whereby the learner provides possible solutions for problematic situations, reasoning whereby the learner engages in analysis and synthesis in the processes of idea generation, hypothesis whereby the learner generates the new ideas which direct new observations and learning, and hypothesis testing whereby the learner subjects the idea to experimentation and evaluation, intellectualization whereby the learner converts the problem from an emotional level to an intellectual process, and hypothesis. The Staff Training Model in this study addresses these components to reflective processes as the teaching staff engage in verbal and written reflection didactically in a socially mediated format with the trainer-mentor. This process is supported by the underpinnings of the cognitive learning theory, which stipulates that knowledge is an

individually and socially mediated process (Vygotsky, 1978), and is organized into schemas and models (Herman, Aschbacher, & Winters, 1992).

Negative knowledge theory is a substrate of cognitive learning theory and was shown to promote detailed reflective processes as it engages the learner to revisit prior and episodic knowledge (Gartmeier et al. 2008; Hetzner et al., 2010). Negative knowledge theory emphasizes new learning and behavioral change as a consequence of reflection engaging the learner in the processes of re-evaluation and appraisal of experiences, recalling and discerning inappropriate or errors from non-errors, and decision analysis processes to avoid errors and engage in desirable actions in future similar situations. This error-related learning model promotes professional development and expertise, and therefore fostering improved competence (Boud, 1999; Gartmeier et al. 2008). As such, negative knowledge theory stipulates learning from error episodes a theory that is in support of the concept of experiential learning. As knowledge is learned from error analysis, the learner develops a strong error-prevention capacity which is characterized by the development of a competent judgment capacity for early identification of precursors for errors in future similar episodes, and selection of appropriate strategies to avoid them, improving performance outcome (Gartmeier et al., 2008). Dewey (1933) defines errors as episodes that constitute deviations from the common, and factors that prompt and foster reflective processes. Cannon & Edmondson (2005) define errors as deviations from expected and desired outcome. The Staff Training Model in this study adopts both error labels when engaging and analyzing reflections, and engaged the learner in developing competence and expertise in error-prevention capacity through reflection.

### Summary of Literature Review

The following is what is known in the literature about the four staff training procedures. See figure 2 for the formula depicting what is known in the literature:

- VSM leads to increased TSP and improved Procedural Integrity (DiGennaro-Reed, F. D., Coddington, R., Catania, C. N., & Mahire, H., 2010; & (Pelletier et al., 2010).
- VSM + SE, PF, and R improve TSP (Pelletier et al., 2010; Reid et al, 2005)
- SM improves staff performance, Procedural Integrity and is cost/staff effective (Petscher, E. S. & Bailey, J. S., 2006).
- PF with BST leads to increased performance outcome and increased awareness of expected behavior guidelines (DiGennaro et al., 2010).
- PF is effective in changing teacher performance, is socially acceptable practice and performance maintained at follow up (LeBlanc et al. 2005; & Lerman et al., 2008).
- Reflective processes lead to behavioral changes as they increase awareness of errors and the need for change through Reflective processes lead to behavioral changes as they increase awareness of errors and the need for change, generation of new ideas and strategies, and experimentation (Gartmeier et al., 2008; Jansen et al., 2008; & Pedro 2005).
- R improves Self-Efficacy and Professional Competency and addresses productivity and personal development (Gartmeier et al., 2008; & Pedro 2005).
- Evidence-Based in support of ABA in the management of children with ASD (AAP 2010; Kates McElrath et al., 2006).



$$\mathbf{VSM} + \mathbf{SE} + \mathbf{PF} + \mathbf{R} = \text{Effective} + \hat{\uparrow}\text{TSP}$$

$$\mathbf{VSM} \rightarrow \hat{\uparrow}\text{TSP} + \text{Procedural Integrity}$$

$$\mathbf{PF} \rightarrow \hat{\uparrow}\text{TSP}$$

$$\mathbf{R} \rightarrow \hat{\uparrow}\text{Self-Efficacy} + \text{Professional Competence}$$

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$$\mathbf{VSM} + \mathbf{SE} + \mathbf{PF} + \mathbf{R} = \text{Effective}$$

*Figure 2.* Formula summarizing what is known in the literature

An analysis of the literature reviewed reveals several challenges and problems in the selection of and application of STP and Models. So despite the effectiveness of using the STP mentioned above in improving TSP and increasing Procedural Integrity the following are limitations and gaps found in the literature. There has been a disparity in the settings that have been used to implement the strategies of video self-monitoring and self-evaluation, performance feedback and reflection, namely, private, public and organizational settings. It is critical and necessary to identify and utilize only those training tools that are evidence-based in order to ensure that effective and efficient outcome is produced. Training procedures and models, and implementation methodologies are not standardized and uniform across studies. Few studies conducted component analyses for training packages. The identification of a standardized training strategy will ascertain effective implementation, procedural integrity, and behavioral change sustainability. Sample sizes used in the studies are small, and follow-up measures are not consistent. In order to infer, derive some generality, and make assumptions about the outcome of a study, the sample size needs to be large enough commensurate with power analysis. Public schools' ability to and acceptability of implementing video technologies and rigorous training packages have not yet been assessed. There is an abundance of evidence supporting the

implementation of the principles behind the science of applied behavior analysis in the management of children with ASD. There is a discrepancy between the high demand for expertise in the skill set required for the application of these principles and teacher/staff availability. A highly skilled set of expertise is required when working with the ASD population. The literature points to the importance for teachers/staff to gain basic knowledge and working experience in the application of behavior learning principles in order to ensure effective and successful student outcome and avoid incurred harm and behavioral regression in children with ASD. There is a discrepancy between the different teacher/staff training models currently used in the public schools. Identifying an effective evidence-based teacher/staff training model to implement is hence necessary to ensure successful and positive behavioral outcome on the part of the teachers/staff and students. Finally, As such and as stated by Reid et al. (2005) there is a dire need to identify and implement evidence-based standardized STM in support of a Framework for successfully implementing behavior analytic strategies when teaching children with ASD in order to meet their unique behavior challenges and improve their performance.

This investigation utilized a Staff Training Framework (STF) by exploring a Staff Training Model (STM) for enhancing Post-Training Procedural Integrity and staff performance outcomes, when working with children diagnosed with ASD. What has not been determined or consistently documented in the literature is the first research question of whether there is a directed predicted influence of a *Staff Training Protocol* (STP) that consists of combining *Formal Didactic Training* using lectures, reading and instruction in combination (i.e., Phase 1 – Pre-Training – Workshop), with an *Informal Interactive Training* using video modeling, rehearsal, feedback and reflection, to *Teaching Staff Performance* (TSP) (i.e., Phase 2 – Post-Training Reinforcement – Skill Acquisition). What that means is that whether learning that

happens in a formal instruction manner, that is NOT on-the-job training, leads to learning that is actualized and retained on the job.

This leads us to the second research question of whether Experiential Training Acquisition consisting of Performance Feedback (PF), Video Self-Monitoring (VSM), Self-Evaluation (SE), Reflection (R), and Mentoring has a directed predicted influence on Teaching Staff Performance (TSP) (i.e., Phase 2 – Post-Training Reinforcement – Skill Acquisition). What that means is whether on-the-job training, feedback and mentoring is needed to lead to learning that is actualized and applied in on the job. In addition, whether Post-Training Reinforcement (PTR), in the form of *Mentoring* has an effect on Teaching Staff Performance. A review of the literature has revealed a gap in that area pointing to the need for additional research.

The literature also points to the presence of segmented relationships between STP, Procedural Integrity, and TSP, and states the critical role that Procedural Integrity plays in the intervention and management of children with ASD. The second and third research questions are integral in addressing this problem as they will determine if there is a directed predicted influence between the implementation of a PTR component of a STM, in the form of Mentoring, on TSP and most importantly whether Procedural Integrity is sustained over time. In other words, does providing on-the-job training, feedback and mentoring lead to sustained retained accurate application of the learning. This question is significant as it will determine the amount and quality of training, resources and support services an organization will need to provide its staff over time (i.e., Phase 3 – Follow-up - Sustainability). The assumption is that retained, actualized and sustained learning and accurate staff performance will lead to a decrease in the need for overall resource allocation (i.e., budget and personnel) for training purposes over time.

The literature states that a critical component in the intervention and management of children with ASD is staff training (Kates-McElrath & Axelrod, 2008). In addition, educators acknowledge the need to receive evidence-based comprehensive training to promote positive student performance outcomes. Furthermore, Reid et al. (2005) stresses on the need to identify and implement evidence-based standardized STM in support of a Framework. However, as discussed in this literature review there is a gap in the literature when it comes to identifying evidence-based staff training models and standard for evaluation and feedback for professionals who work with and identify children with special needs. It is on that premise that this study was undertaken and its significance highlighted.

### **Chapter III**

## **METHODS**

### **Participants**

A non-probability convenience sampling procedure was used (Portney and Watkins, 200, p.154). A convenience sampling procedure was conducted given that the teaching staff was selected from the educational settings that approved the research study. The age and gender selection criteria of the teachers was based on the current hiring status of teachers and teaching assistants in the two educational settings that work with children with ASD (Appendix I, J). An eligibility form was given to each participant to facilitate the screening (Appendix H).

Ten female teachers and teacher assistants between the ages of 21 years and 51 years, proficient in the English language, working with children diagnosed with Autism, were recruited from two private educational facilities that use the principles of Applied Behavior Analysis (ABA) in their intervention approaches and curriculum with learners with ASD ages 3 years to 7 years. These private educational facilities are located in Northern-Central New Jersey.

### **Participant Recruitment Process**

Following Seton Hall University IRB approval of the study the Principal Investigator (PI) spoke with the director of special services at the educational facilities regarding the nature and purpose of the research study, the procedure for implementing the study, and to determine the best days and hours for the study to be conducted and to ask for their assistance in identifying possible teachers for her study. The names of the 3 Research Assistants (RA) that were used during the study were also identified to the director. The RAs were trained on how to operate the videotape device in order to videotape the teachers for the duration of 3-minute and transfer the

video via a USB port unto the PI's laptop so that it could be sent to the off-site independent TPRA scorer. The RAs did not interact with the teachers in any way. The RAs exited the classrooms as soon as all videotaping was complete.

The PI provided the school secretary with the Teaching Staff Solicitation Letter explaining the research study and its content and the Teaching Staff Consent Form to be handed out to the teaching staff. In accordance with the educational facility policy and procedures, the school secretary presented the information to each classroom lead teacher who presented it to the teaching staff. The teachers were informed of the purpose of the informed consent and were asked to review the letter of solicitation and informed consent form (Appendix A1, A2).

Teacher eligibility was self-determined based on their review of the inclusion/exclusion criteria and consent was achieved by their signing of the consent form. Concurrently, given that the video depicts teacher-student interactions, letters of consent to videotaping the student were sent to the parents and/or legal guardians of the children working with the teaching staff, by the PI, describing the study (Appendix B1, B2, D). If parent/guardian response was "No" to their child's participation, child assent was automatically assumed to be "No" due to the protected nature of children with ASD and the role of the parent/Guardian acting in the best interest of the child. If parent/guardian indicated, "Yes" to their child participation, child assent was sought by having the teacher present the form to the student (Appendix C).

Protection and confidentiality was maintained throughout the duration of the research project. No personal identifying information was collected from teachers.

### **Inclusion and Exclusion Criteria**

The inclusion criteria for the teaching staff were as follows (Appendix H):

1. Teachers: All teachers full time or part-time employed at the two participant organizations were eligible to participate
2. Consent: Teacher consent to participate obtained
3. Contingency: All teachers were screened using the scoring of the Teacher Performance Rating Accuracy Scale (TPRA). Teachers who scored at  $\geq 80\%$  accuracy over two consecutive sessions in Phase 1 on Inter-Observer Agreement (IOA) were eligible to participate

The exclusion criteria for the participants were as follows (Appendix H):

1. Teacher: Not employed at one of the two educational facilities
2. Consent: Teacher consent to participate not obtained
4. Contingency: All teachers were screened using the scoring of the Teacher Performance Rating Accuracy Scale (TPRA). Teachers who did not score at  $\geq 80\%$  accuracy over two consecutive sessions in Phase 1 on Inter-Observer Agreement (IOA) were not eligible to participate

### **Design and Variables**

The study was an exploratory quasi-experimental design for data collection (Mayers, 2013; Portney and Watkins, 2009; Tabachnick and Fidell, 2007).

Figure 8 illustrates the study design and data analysis statistics used to test each research hypotheses for each of the three Phases of the study.

**Phase 1 – Pre-Training (Workshop) Research Question and Hypotheses:**

*RQ1a:* Will the one-session presentation of Pre-Training and Video Training in Phase1 improve the teacher’s accurate presentation of Learn Units (LU)?

With a directed hypothesis:

*H1a:* The teacher’s accuracy of LU presentation will increase after the one-session of Pre-Training and Video Training in Phase 1.

*RQ1b:* Will the one-session presentation of Pre-Training and Video Training in Phase 1 improve the teacher’s Rate of Effective Instruction (ROI)?

With a directed hypothesis:

*H1b:* The teacher’s ROI will improve after presentation of the one-session of Pre-Training and Video Training in Phase 1.

Phase 1 data were analyzed using a paired *t*-test (pre-posttest) and single-subject analyses. Data analysis consisted of a paired *t*-test, 1 IV (Workshop), 1 group, 2 DV (LU and ROI) (Mayers, 2013; Portney and Watkins, 2009; Tabachnick and Fidell, 2007).

**Phase 2: Post-Training Reinforcement (Skill Acquisition) Research Question and Hypotheses:**

In Phase 2 the Dependent Variables (DV) were measured against the Independent Variables of Time and PTR/Mentoring.

*RQ2a:* Will LU accuracy increase over Time?

With a directed hypothesis:

*H2a:* LU will increase over Time



*RQ2b:* Will ROI increase over Time?

With a directed hypothesis:

*H2b:* ROI will increase over Time

*RQ2c:* Will LU accuracy increase with PTR (Int. v C)?

With a directed hypothesis:

*H2c:* LU accuracy will be higher with PTR than without PTR

*RQ2d:* Will ROI increase with PTR (Int. v C)?

With a directed hypothesis:

*H2d:* ROI will be higher with PTR than without PTR

*RQ2e:* Will LU acc. increase over Time with PTR?

*H2e:* LU accuracy will be higher with over Time with PTR then without PTR

*RQ2f:* Will ROI increase over Time with PTR?

With a directed hypothesis:

*H2f:* ROI will be higher over Time with PTR then without PTR

Phase 2 data were analyzed using mixed between-within subjects ANOVA and single-subject analyses were used. Data analysis consisted of a 2x2 mixed between-within subjects ANOVA, 2 IV (Times [2x] and PTR [Control and Intervention]), 2 DV (LU and ROI); and will be used to determine directionality of effect of Mentoring (PTR) on LU and ROI (Mayers, 2013; Portney and Watkins, 2009; Tabachnick and Fidell, 2007).

### **Phase 3 – Follow-up (Sustainability) Research Question and Hypotheses:**

In Phase 3 the Dependent Variables (DV) were measured against the Independent Variables of Time and PTR/Mentoring.

*RQ3a:* Will Procedural Integrity of LU accuracy be maintained over Time?

*H3a:* Procedural Integrity of the LU will be maintained over Time

*RQ3b:* Will the Procedural Integrity of ROI be maintained over Time?

*H3b:* Procedural Integrity of ROI will be maintained over Time

*RQ3c:* Will Procedural Integrity of LU accuracy increase with PTR (Int. v C)?

With a directed hypothesis:

*H3c:* Procedural Integrity of LU accuracy will be higher with PTR than without PTR

*RQ3d:* Will Procedural Integrity of ROI increase with PTR (Int. v C)?

With a directed hypothesis:

*H3d:* Procedural Integrity of ROI will be higher with PTR than without PTR

*RQ3e:* Will Procedural Integrity of LU accuracy continue to increase with PTR over Time?

With a directed hypothesis:

*H3e:* Procedural Integrity of LU accuracy will continue to increase over Time with PTR then without PTR

With a directed hypothesis:

*RQ3f:* Will the Procedural Integrity of ROI continue to increase with PTR over Time?

*H3f:* Procedural Integrity of ROI will continue to increase over Time with PTR then without PTR

Phase 3 data were analyzed using a mixed between-within subjects ANOVA and single-subject analyses were used. Data Analysis consisted of a 2x5 mixed between-within subjects ANOVA, 2 IV (Time [5x] and PTR [Control and Intervention]), 2 DV (LU and ROI); used to determine directionality of effect of Mentoring (PTR) on Procedural Integrity (Mayers, 2013; Portney and Watkins, 2009; Tabachnick and Fidell, 2007).

## **Variables**

The following were the research study variables for each of the three phases:

### **Phase 1: Pre-Training (Workshop)**

The independent variable was the workshop (IV = Pre-Training), and the dependent variables were the LU and ROI (DV = LU / ROI).

### **Phase 2: Post-Training Reinforcement (Skill Acquisition)**

The independent variable were Time and Post-Training Reinforcement (IV = TIME, PTR), and the dependent variables were the LU and ROI (DV = LU / ROI)

### **Phase 3: Follow-Up (Sustainability)**

The independent variable were Time and Post-Training Reinforcement (IV = TIME, PTR), and the dependent variables were the LU and ROI (DV = LU / ROI)

## **Procedure**

The sequence of the study procedure is described in the following paragraphs and illustrated in Figure 7. Prior to arriving at the educational facilities sites the PI engaged in two functions.

Figure 3 illustrates the beginning procedure for IRB approval and baseline measurement:

1. Permission was obtained from the educational facilities' Board of Directors who signed site approval letters (Appendix I, J, K). Then, the study research proposal was approved from the Institutional Review Board (IRB) of Seton Hall University, and the Research Assistants (RA) completed the National Institutes of Health Protection of Human Subjects Training Module.

Certificates of the Committee Dissertation Members and Principal PI are also included (Appendix L).

2. The PI used a coding system to identify each teaching staff that did not include personal names and other personal identifying information. Instead, the teacher was referred to in the research study document by assigning her a unique or random number code that does not represent initials. The last number code determined the placement of the teacher in either the experimental or control group. Specifically, when the last number was even then the teacher was assigned to the experimental group and if the last number was odd the teacher was assigned to the control group. In addition, the PI did not share the teacher's name and other personal information, preserving anonymity. The teacher's name was wiped out and any identifying facial features on the videos were blurred out using photo-editing software. The videos were only used for research purposes. This process ensured a *randomized sampling procedure* was in effect.
3. Prior to the start of Phase 1, three to five 1 to 5-minute videotapes of the teachers engaging in an instructional teaching unit were collected for each teaching staff in the student's classroom at various hours during the school day. No programmed consequences were delivered, and the videotapes were used during Phase 1 as training material and baseline measures (i.e., T1) for learning how to score using the *Teacher Performance Rate and Accuracy Scale or Form* (TPRA). These videotaped sessions were scored by an independent expert rater/observer and the scores served as the pretest measures for Phase 1 addressing research question 1.



Figure 3. Diagram of the beginning procedure for IRB approval

- Once approved, the PI contacted the school secretary to schedule a meeting with the teachers who were interested in participating in the study, to answer any questions they may have had, and sign the Consent Forms if they agreed and wished to participate.

At the start of the study, the PI arrived at each of the educational facilities and met the teachers who had signed the Consent Form indicating that they wished to participate in the study, in a designated area to conduct Phase 1 of the proposed study. Figure 4 illustrates the steps in Phase 1 of the study.

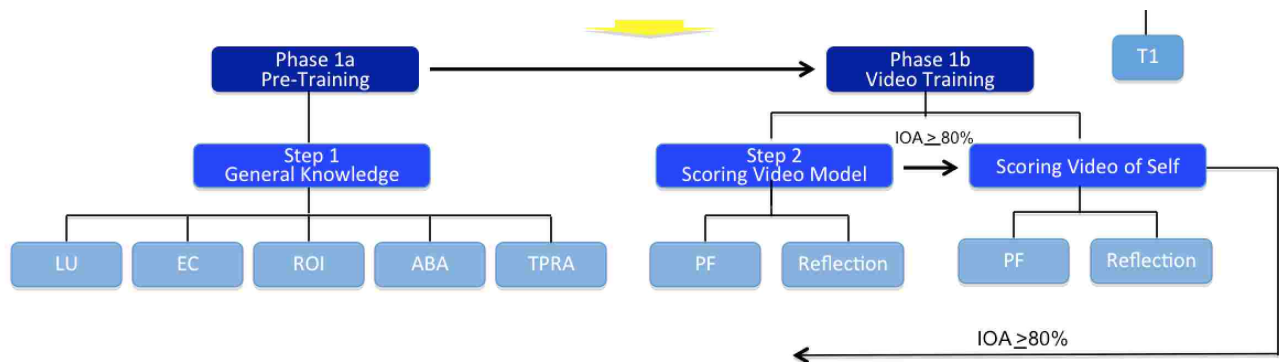


Figure 4. Diagram of Phase 1 – Pre-Training (Workshop)

**Phase 1 – Pre-Teaching Phase (Workshop) – Corresponds to the *Formal Didactic Training and Informal Interactive Training or Video Training Phase.***

The following steps were followed by the all participants (Appendix G, G1):

- Attending a two-hour workshop on the principles of ABA, definitions of the Learn Unit (LU), Error Correction (EC) and Rate of Effective Instruction (ROI) and the TPRA
- Learning how to score their own teaching performance using the TPRA form
- Attending video training phase whereby the teachers observed pre-recorder video models of unknown teachers engaging in teaching a child with autism, and learned to score the application of the target teaching procedure using the TPRA form
- Then, the teachers observed their own-videotaped sessions teaching a student an academic task (collected during baseline measures), and learned how to score their own application of the target teaching procedure using the TPRA form
- The PI provided instruction and feedback on the scoring procedure and answered any questions the teachers had
- Then the teachers completed a brief Reflection journal responding to three written prompts, at the completion of Phase 1

**Phase 2 – Post-Training Reinforcement Phase (PTR) (Skill Acquisition) – Corresponds to the *Experiential Phase.* Figure 5 illustrates the steps of Phase 2. The participants were divided into a Control Group and an Intervention Group.**

The following steps were followed by the Intervention Group:

- Each teacher's teaching procedure was videotaped for three minutes by the research assistant

- The instruction occurred in the natural environment of the teaching setting, without disrupting the flow of the daily academic schedule in the classroom
- Each videotaped session was transferred via USB cord onto the PI's laptop for analysis by the independent expert rater/observer
- Then on the same day of the videotaped session, the teachers viewed their own-videotaped performance, scored and rated their teaching performance using the TPRA form as they were taught in Phase 1. This process of scoring represents the Performance Feedback form.
- The teachers' scoring happened in the presence of the PI who provided feedback on the performance outcome following a predetermined formal script (Appendix G2, G3)
- Strengths and Recommendations were identified by both the teachers and the PI and written down
- After the Performance Feedback session, the teachers completed a brief written Reflection journal responding to three written prompts
- Phase 2 took approximately 15 minute per teacher per day and was repeated over four consecutive days

The following steps were followed by the Control Group:

- Each teacher's teaching procedure was videotaped for three minutes by the research assistant
- The instruction occurred in the natural environment of the teaching setting, without disrupting the flow of the daily academic schedule in the classroom

- Each videotaped session was transferred via USB cord onto the PI’s laptop for analysis by the independent expert rater/observer
- Then on the same day of the videotaped session, the teachers viewed their own-videotaped performance, scored and rated their teaching performance using the TPRA form as they were taught in Phase 1. This process represents the Performance Feedback form.
- The teachers’ scoring happened in the absence of the PI, and hence did NOT receive Performance Feedback on the performance outcome by the PI
- Strengths and Recommendations were identified by the teacher ALONE and written down by the teachers ONLY, following a predetermined script
- After the Performance Feedback session, the teachers completed a brief written Reflection journal responding to three written prompts (Appendix H)
- Phase 2 took approximately 15 minutes per teacher per day and was be repeated over four consecutive days

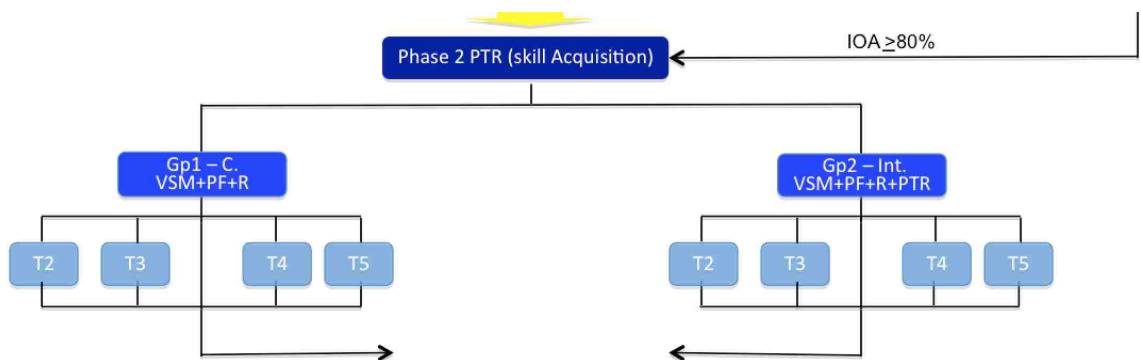


Figure 5. Diagram of Phase 2 – Post-Training Reinforcement (Skill Acquisition)



### Phase 3 – Follow-up Phase (Sustainability)

Figure 6 illustrates the steps in Phase 3. The participants were grouped into one group.

The following steps were followed by the all participants:

- All participants were videotaped by the PI for a 3-minute teacher-student interaction once every four days
- The independent rater/observer scored the teachers' teaching performance
- The teachers were NOT required to score their performance and did NOT complete a Reflection journal

*Note: All research study material and paper data forms and videotapes for each teacher were collected and stored in sealed envelope and tracked using a checklist.*

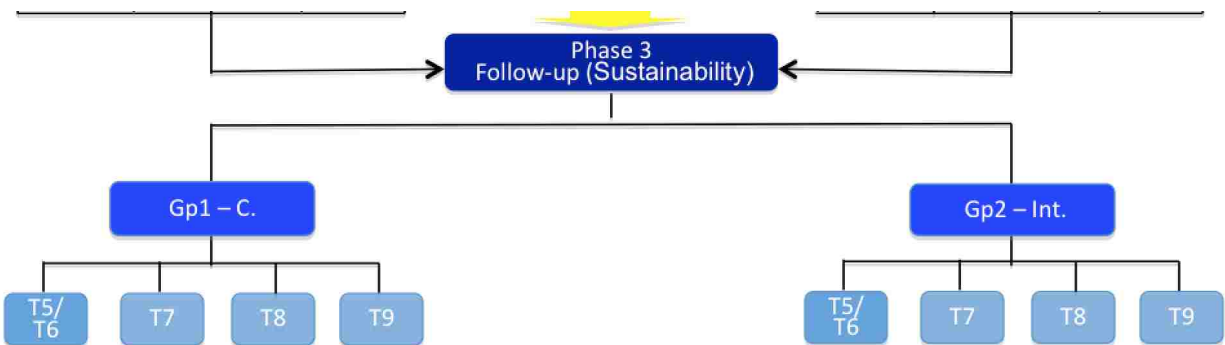


Figure 6. Diagram of Phase 3 – Follow-up (Sustainability)



Figure 7. Diagram of data collection procedure – Phase 2

### Data Analysis

As soon as the PI collected all scored TPRAs and collected all the data for LU accuracy and ROI, the data was entered into the SPSS Version 20.0 (SPSS, 2013) and stored on a memory key. The PI securely locked the completed surveys and the memory key in a filing cabinet in her office. The data was analyzed using both descriptive and inferential statistics, using SPSS Version 20.0 (SPSS, 2013).

Demographic characteristics were presented in tabular form using descriptive statistics. The research hypotheses were tested using parametric statistics. Figure 8 summarized the design and analysis for the research study.

Parametric statistics met all assumptions for a mixed between-within subjects ANOVA analysis (Mayers, 2013; Portney and Watkins, 2009; Tabachnick and Fidell, 2007):

- The population from which samples are drawn shares characteristics
- The samples are drawn under certain conditions

- Normality of the Samples: Satisfied with Shapiro-Wilk Test
- Between-Group Independent Variable: Categorical Variable (PTR)
- Within-Group Independent Variable: Time
- Dependent Variables: Continuous (LU & ROI)
- Sphericity: Satisfied using Mauchly's Test in Phase 3 (>2 Time Measures)
- Homogeneity of Variance Between-Group: Satisfied with Levine's Test of Equality of Error Variances
- Homogeneity of Covariance Between-Group of Independent Variable: Satisfied using Box's M Test of equality of variance-covariance matrices ( $> .001$ )

For the demographic characteristics collected (Appendix H), the following descriptive statistics were reported: means, standard deviation, frequencies, and percentages. Table 1 depicts the sample demographics.

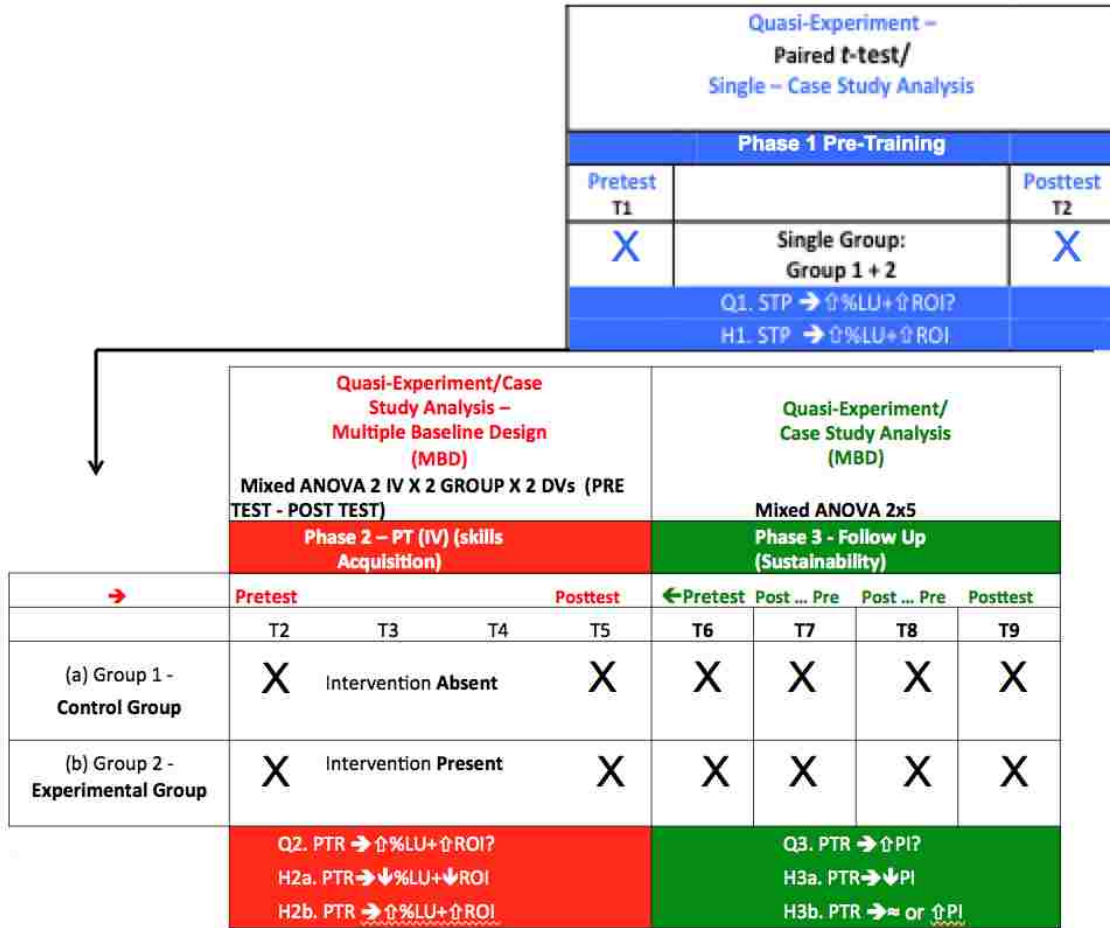


Figure 8. Diagram of design and analysis for the research study

## Chapter IV

### RESULTS

#### Demographic Profile

Demographic characteristics were presented in tabular form using descriptive statistics (see Table 1). Ten female teachers and teacher assistants between the ages of 21 years and 51 years, proficient in the English language for over 5 years, working with children diagnosed with Autism, were recruited from two private educational facilities that use the principles of Applied Behavior Analysis (ABA) in their intervention approaches and curriculum. Additionally, the teachers' and teacher assistants' (TA) educational background consisted of the following: one TA had completed a high school education, six TAs had a bachelor's degree, one teacher had a master's degree and two teachers were pursuing their post-graduate education. The private educational facilities whereby the teachers and TAs were recruited from were located in Northern-Central New Jersey area (Appendix F).

Table 1

*Demographics of participants*

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Post-Training Reinforcement	10	1	0	1	.50	.53
Educational Institution	10	1	1	2	1.40	.52
Gender	10	0	1	1	1.00	.00
Age	10	28	23	51	35.60	8.83
Education Degree	10	3	1	4	2.40	.97
Work Experience	10	12.00	1.00	13.00	7.30	4.24
English Speaker >5years	10	0	1	1	1.00	.00

**Quantitative Data Analysis**

**Findings from Phase 1 – Pre-Training (Workshop) Research Question and**

**Hypotheses:**

A Pair t-test was conducted to determine if there was a significant change from Time 1 (pretest) corresponding to the one-session 2-hour workshop presentation and Time 2 (posttest) on the teacher’s accurate presentation of the LU and ROI. An analysis of the data indicated that there was no significant change from Time 1 to Time 2 on the accurate presentation of the LU, with  $t(9) = -.190$ ;  $p = .85$ . For these data the mean difference (SD) for percent effective performance of LU accuracy was -1.5 (15.05). Also there was no significant correlation between Time 1 & Time 2. Table 2 depicts the findings for RQ1a and H1a. The data indicate that there was no significant increase in the teacher’s accurate presentation of Learn Units after one-session workshop presentation of Pre-Training and Video Training.

Table 2

*Phase 1 Pre-Training Phase – Paired samples t-test comparing time 1 and time 2 on accurate presentation of LU*

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference				
Pair					Mean	Std. Deviation	Std. Error	Lower	Upper
1	Time 1 – LU	-1.51	25.05	7.92	-19.42	16.41	-.190	9	.85
	Time 2 – LU								

An analysis of the data indicated that there was no significant change from Time 1 to Time 2 on the rate of effective instruction (ROI), with  $t(9) = -.103$ ;  $p = .920$ . For these data the mean difference (SD) for ROI was 0.09 (2.85). Also there was no significant correlation between

Time 1 & Time 2. Table 3 depicts the findings for RQ1b and H1b. The data indicate that there was no significant increase in the teacher's Rate of Effective of Instruction (ROI) after one-session workshop presentation of Pre-Training and Video Training.

Table 3

*Phase 1 Pre-Training Phase – Paired samples t-test comparing time 1 and time 2 on ROI*

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference				
Pair					Lower	Upper			
1	Time 1 – ROI	-	2.85	.90	-2.13	1.95	-.103	9	.920
	Time 2 – ROI	.09292							

**Findings form Phase 2 – Post-Training Reinforcement (Skill Acquisition) Results for Research Question 2 and Hypotheses 2:**

Table 4 shows the mean and standard deviation statistics of the participants at the beginning at end of Phase 2. It appears that the control group had a higher mean value for the LU (73.87) as well as the ROI (1.87) initially then the intervention group LU (59.21) and ROI (1.75).

At baseline there were smaller deviations for the control group then in the intervention group, with the five participants in the control group showing more consistency then those in the intervention group.

After intervention at the end of phase 2, it appeared that there was more variability in the control group then in the intervention group as observed by the standard deviation (SD) scores. The data also indicated large Standard Deviations (SD), accounting for the large variations (range) in scores within each group.

Table 4

*Phase 2 Post-Training Reinforcement – Skill Acquisition Phase – Descriptive Statistics for Percent Effective Performance and Rate of Effective Instruction for Control and Intervention Group at time 2 and time 5*

	Post-Training Reinforcement	Mean	Std. Deviation	N
Time 2 – LU	PTR Absent	73.87	15.78	5
	PTR Present	59.21	29.51	5
	Total	66.54	23.61	10
Time 5 – LU	PTR Absent	68.72	34.56	5
	PTR Present	88.53	10.90	5
	Total	78.63	26.32	10
Time 2 – ROI	PTR Absent	1.87	1.45	5
	PTR Present	1.12	1.93	5
	Total	1.49	1.66	10
Time 5 – ROI	PTR Absent	1.75	2.30	5
	PTR Present	2.68	1.25	5
	Total	2.22	1.81	10

A 2x2 mixed *between-within subjects* ANOVA, was conducted to test if there was a significant change from Time 2 to Time 5, significant difference within each group, and a main effect for time, and to determine directionality of the effect of Time on LU accuracy and ROI in phase 2. An analysis of the data indicated that there was no significant increase in the teacher's accurate presentation of LU over Time (4 DAYS), with the following data for LU (Time):  $F(1,1,8)=2.214; p=.175$ ; Partial Eta Square=.22; Power=.259. Table 5 depicts the findings for RQ2a and H2a.



Table 5

*Phase 2 – Mixed ANOVA Within-Subjects Test for LU, comparing time 2 and time 5, across control and intervention groups on Time and Time by PTR interaction*

Source (Phase 2)	Type III		Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
	Sum of Squares	df						
Time	729.91	1	729.91	2.21	.175	.22	2.21	.259
Time * PTR	1484.67	1	1484.67	4.50	.067	.36	4.50	.463

a. Computed using alpha = .05

An analysis of the data indicated that there was no significant increase in the teacher’s ROI over Time (4 DAYS), with the following data for ROI (Time):  $F(1,1,8)=1.230;p=.300$ ; Partial Eta Square=.133; Power=.165. Table 6 depicts the findings for RQ2b and H2b.

Table 6

*Phase 2 – Mixed ANOVA Within-Subjects Test for ROI, comparing time 2 and time 5, across control and intervention groups on Time and Time by PTR interaction*

Source (Phase 2)		Type III		Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
		Sum of Squares	df						
Time	Sphericity Assumed	2.61	1	2.61	1.23	.300	.133	1.23	.165
Time* PTR	Sphericity Assumed	3.48	1	3.48	1.64	.236	.170	1.64	.204

a. Computed using alpha = .05

Table 6 Phase 2 – Mixed ANOVA Within-Subjects Test for ROI, comparing time 2 and time 5, across control and intervention groups on Time and Time by PTR interaction

A 2x2 mixed *between-within subjects* ANOVA, was conducted to test if there was a significant change from Time 2 to Time 5, a significant difference between control group and intervention group, a main effect of PTR or Mentoring for monitoring means, and to determine directionality of the effect of Mentoring (PTR) on LU accuracy and ROI in phase 2. An analysis of the data indicated that there was no significant increase in the teacher's accurate presentation of LU with PTR/Mentoring (4 DAYS), with the following data for LU (PTR):  $F(1,1,8)=.037$ ;  $p=.852$ ; Partial Eta Square=.937; Power=.053. Across the Mixed ANOVA model there were no main effects, as seen by the non-significant F tests. Table 7 depicts the findings for RQ2c and H2c.

Table 7

*Phase 2 – Tests of Between-Subjects Effects comparing time 2 and time 5 across control and intervention groups for LU with PTR*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
Intercept	52684.14	1	52684.14	118.81	.000	.937	118.81	1.000
PTR	16.56	1	16.56	.04	.852	.005	.04	.053
Error	3547.39	8	443.42					

a. Computed using alpha = .05

An analysis using a 2x2 mixed *between-within subjects* ANOVA indicated that there was no significant increase in the teacher's ROI over PTR/Mentoring (4 DAYS), with the following data for ROI (PTR):  $F(1,1,8)=.009$ ;  $p=.926$ ; Partial Eta Square=.001; Power=.051. Across the Mixed ANOVA model there were no main effects, as seen by the non-significant F tests. Table 8 depicts the findings for RQ2d and H2d.

Table 8

*Phase 2 – Tests of Between-Subjects Effects comparing time 2 and time 5 across control and intervention groups for ROI with PTR/Mentoring*

Source (Phase 2)	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
Intercept	68.78	1	68.77	16.30	.004	.67	16.302	.941
PTR	.04	1	.04	.01	.926	.00	.009	.051
Error	33.75	8	4.22					

a. Computed using alpha = .05

A 2x2 mixed *between-within subjects* ANOVA, was conducted to test if there is a significant change from Time 2 to Time 5, significant difference between control group and intervention group, and significant interaction effect of Time with PTR/Mentoring in Phase 2.

An analysis of the data indicated that the teachers in the intervention group did not show significantly higher scores of LU accuracy compared with the control groups with PTR/Mentoring over Time (4 days), with the following data for LU (Time x PTR):  $F(1,1,8)=4.504$ ;  $p=.067$ ; Partial Eta Square=.36; Power=.463. Table 9 depicts the findings for RQ2e and H2e.

Table 9

*Phase 2 – Mixed ANOVA Within-Subjects Test for LU, comparing time 2 and time 5, across control and intervention groups on Time and Time by PTR interaction*

Source (Phase 2)	Type III		Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
	Sum of Squares	df						
Time	729.91	1	729.91	2.21	.175	.22	2.21	.259
Time * PTR	1484.67	1	1484.67	4.50	.067	.36	4.50	.463

a. Computed using alpha = .05

An analysis of the data indicated that the teachers in the intervention group did not show significantly higher scores of ROI compared with the control groups with PTR/Mentoring over Time (4 days), with the following data for ROI (Time x PTR):  $F(1,1,8)=1.639$ ;  $p=.236$ ; Partial Eta Square=.164; Power=.204. Table 10 depicts the findings for RQ2f and H2f.

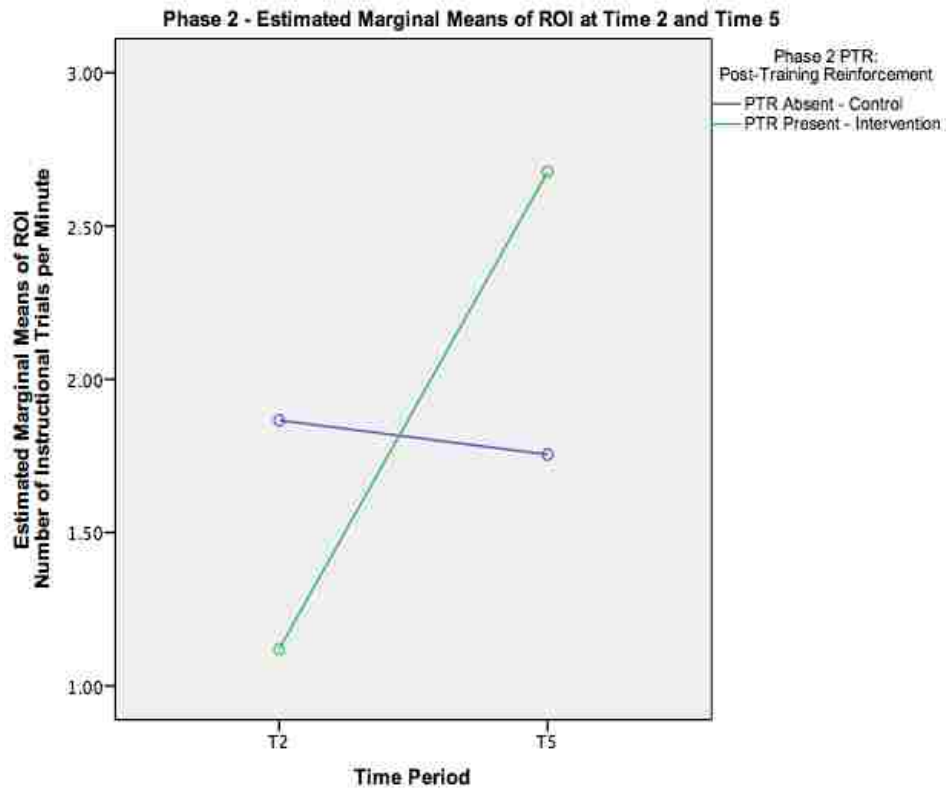
Table 10

*Phase 2 – Mixed ANOVA Within-Subjects Test for ROI, comparing time 2 and time 5, across control and intervention groups on Time and Time by PTR interaction*

Source (Phase 2)		Type III		Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
		Sum of Squares	df						
Time	Sphericity Assumed	2.61	1	2.61	1.23	.300	.133	1.23	.165
Time* PTR	Sphericity Assumed	3.48	1	3.48	1.64	.236	.170	1.64	.204

a. Computed using alpha = .05

Across the Mixed ANOVA model there were no interactions as seen by the non-significant F tests, although the graphs show an interaction (see *Figures 9 and 10*).



*Figure 9.* Phase 2 – Line graph comparing ROI at time 2 and time 5 for control and intervention groups.

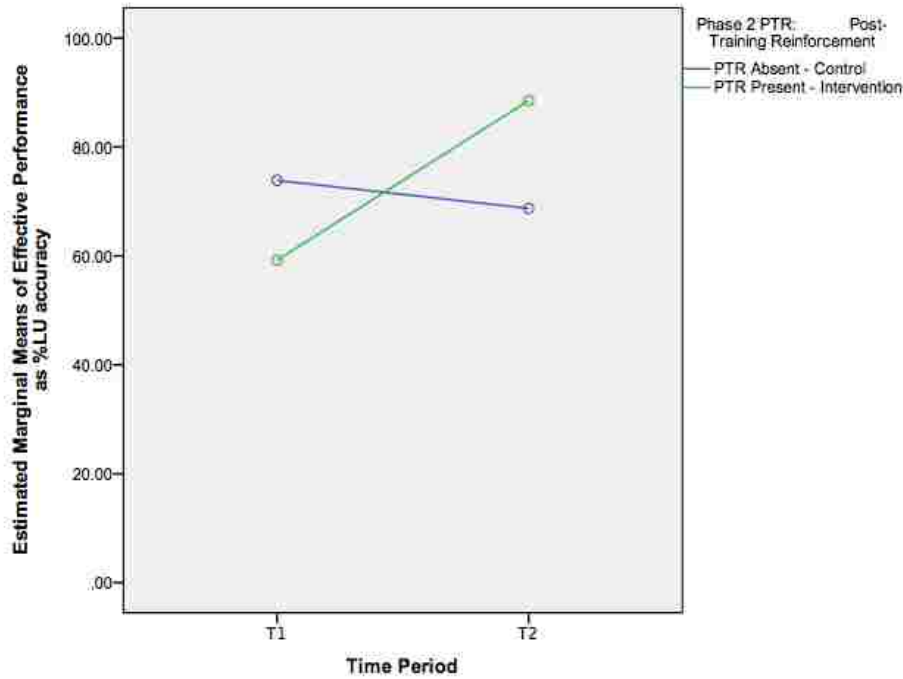


Figure 10. Phase 2 – Line graph comparing percent effective performance of LU accuracy at time 2 and time 5 for control and intervention groups.

**Findings from Phase 3 – Follow-up (Sustainability) Results for Research Question 3 and Hypotheses 3:**

Table 11 shows the mean and standard deviation statistics of the all participants for effective performance percent LU and ROI across time Namely, at Time 5, the beginning, through Time 9, the end of Phase 3.

It appeared that the mean values of LU accuracy and ROI in the intervention group were consistently higher than those in the control group. In addition, the data showed large standard deviations, accounting for the large variations (range) in scores within each group.

Table 11

*Phase 3 – Descriptive Statistics for effective performance percent LU and ROI at time 5 through time 9*

	Post-Training Reinforcement	Std.		N
		Mean	Deviation	
Time 5 – LU	PTR Absent	68.72	34.56	5
	PTR Present	88.53	10.89	5
	Total	78.63	26.32	10
Time 6 – LU	PTR Absent	70.61	21.52	5
	PTR Present	88.64	10.61	5
	Total	79.62	18.61	10
Time 7 – LU	PTR Absent	76.69	9.74	5
	PTR Present	91.28	10.43	5
	Total	83.99	12.23	10
Time 8 – LU	PTR Absent	86.14	10.28	5
	PTR Present	88.03	16.92	5
	Total	87.09	13.24	10
Time 9 – LU	PTR Absent	73.79	16.81	5
	PTR Present	86.57	13.44	5
	Total	80.18	15.85	10
Time 5 – ROI	PTR Absent	1.75	2.30	5
	PTR Present	2.68	1.25	5
	Total	2.22	1.81	10
Time 6 – ROI	PTR Absent	1.51	1.81	5
	PTR Present	2.57	.85	5
	Total	2.04	1.45	10
Time 7 – ROI	PTR Absent	2.20	1.26	5
	PTR Present	3.67	.99	5
	Total	2.93	1.32	10
Time 8 – ROI	PTR Absent	3.40	1.55	5
	PTR Present	3.17	1.63	5
	Total	3.28	1.50	10
Time 9 – ROI	PTR Absent	1.77	1.06	5
	PTR Present	2.96	1.08	5
	Total	2.37	1.19	10

The follow-up Phase 3 was testing whether Procedural Integrity reliability of teacher’s performance would either be maintained or increased over time (i.e., 21 days), whether there was a significant difference within each group, and a main effect for time, and to determine directionality of the effect of Time, PTR/Mentoring and Time x PTR, on LU accuracy and ROI in phase 3 between the control and intervention groups.

A 2x5 mixed *between-within subjects* ANOVA, was conducted to test if there was a significant change across Time 5 through Time 9, testing for main effects of time for monitoring the means of LU accuracy and ROI, after removal of the intervention of the staff training procedures and PTR/Mentoring.

An analysis of the data indicated that the teachers’ Procedural Integrity for accurate presentation of LU was maintained over Time (21 days). There was no change due to Time, with the following data for LU (Time):  $F(1,1,8)=.48;p=.749$ ; Partial Eta Square=.06; Power=.149. Table 12 depicts the findings for RQ3a and H3a. Figure 11 shows that a main effect was observed.

Table 12

*Phase 3 –Mixed MANOVA Within-Subjects, comparing time 5 through time 9, across control and intervention groups for LU on time, and time by PTR interaction*

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
Time	Sphericity Assumed	501.73	4	125.43	.48	.749	.06	1.93	.149
Time*PTR	Sphericity Assumed	492.39	4	123.09	.47	.756	.06	1.89	.15

a. Computed using alpha = .05

An analysis of the data indicated that the teachers’ Procedural Integrity of ROI was maintained over Time (21 days). There was no change due to Time, with the following data for ROI (Time):  $F(1,1,8)=1.73;p=.167$ ; Partial Eta Square=.18; Power=.470. Table 13 depicts the findings for RQ3b and H3b. Figure 12 shows that a main effect was observed.



Table 13

*Phase 3 – Mixed ANOVA Within-Subjects Effects for ROI, comparing time 5 through time 9, across control and intervention groups on time, and time by PTR interaction*

Source (Phase 3)		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Time	Sphericity Assumed	10.88	4	2.72	1.73	.167	.18
Time*PTR	Sphericity Assumed	4.28	4	1.07	.681	.610	.08

A 2x5 mixed *between-within subjects* ANOVA, was conducted to test if there was a significant change from Time 5 through Time 9, testing for main effects of PTR/Mentoring for monitoring the means of LU accuracy and ROI, after removal of the intervention of the staff training procedures and PTR/Mentoring.

An analysis of the data indicated that the teachers' Procedural Integrity of accurate LU presentation was not significantly higher with PTR/Mentoring than without PTR/Mentoring within-subjects groups. There was no statistically significant difference between the group that received PTR/Mentoring and the one that did not. There was no change due to PTR/Mentoring, with the following data for LU (PTR):  $F(1,1,8)=5.21$ ;  $p=.052$ ; Partial Eta Square=.40; Power=.519. Table 14 depicts the findings for RQ3c and H3c. Figure 11 shows that even though the group that received PTR/Mentoring appeared to have higher mean values of LU than the control group, the difference was not statistically significant.

Table 14

*Phase 3 – Follow-up Phase – Mixed ANOVA Test of Between-subjects effects tests comparing time 5 through time 9 across control and intervention groups for LU separately with PTR*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
Intercept	67078.78	1	67078.79	777.25	.000	.990	777.25	1.00
PTR	450.02	1	450.02	5.21	.052	.395	5.24	.52
Error	690.43	8	86.30					

a. Computed using alpha = .05

An analysis of the data indicated that the teachers' Procedural Integrity of ROI was not significantly higher with PTR/mentoring than without PTR/mentoring within-subjects group. There was no statistically significant difference between the group that received PTR/Mentoring and the one that did not. There was no change due to PTR/Mentoring, with the following data for ROI (PTR):  $F(1,1,8)=2.37$ ;  $p=.162$ ; Partial Eta Square=.23; Power=.274. Table 15 depicts the findings for RQ3d and H3d. Figure 12 shows that even though the group that received PTR/Mentoring appeared to have higher mean values of ROI than the control group, the difference was not statistically significant.

Table 15

*Phase 3 – Follow-up Phase – MIXED ANOVA Test of Between-subjects effects tests comparing time 5 through time 9 across control and intervention groups for ROI separately with PTR*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	65.88	1	65.88	80.23	.00	.91
PTR	1.95	1	1.95	2.37	.16	.23
Error	6.57	8	.82			

A 2x5 mixed *between-within subjects* ANOVA, was conducted to test if there was a significant change from Time 5 through Time 9, testing for Interaction effects of Time with PTR/Mentoring for monitoring the means of LU accuracy and ROI, after removal of the intervention of the staff training procedures and PTR/Mentoring.

An analysis of the data indicated that the teachers' Procedural Integrity of accurate LU presentation did not continue to increase over Time (21 days) with or without PTR/mentoring for both groups. There was no statistically significant change in the mean scores over Time with or without PTR/Mentoring, with the following data for LU (Time x PTR):  $F(1,1,8)=4.72;p=.756$ ; Partial Eta Square=.056; Power=.15. Table 16 depicts the findings for RQ3e and H3e.

While the data revealed no statistically significant results for Time, PTR and the effect of PTR over Time on Procedural Integrity, the profile plot (Figure 11) showed that the intervention group had higher mean scores in this period that seemed to remain constant over time, whereas the control group showed greater variability in their mean scores, starting with lower mean scores and then varying up then declining over time. But there was not a significant difference in scores at Time 5 between the groups.

Table 16

*Phase 3 – Mixed ANOVA Within-Subjects Effects for LU, comparing time 5 through time 9, across control and intervention groups on time, and time by PTR interaction*

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
Time	Sphericity Assumed	501.73	4	125.43	.48	.749	.06	1.93	.149
Time*PTR	Sphericity Assumed	492.39	4	123.09	.47	.756	.06	1.89	.15

a. Computed using alpha = .05

An analysis of the data indicated that the teachers' Procedural Integrity of ROI did not continue to increase over Time (21 days) with or without PTR/mentoring for both groups. There was no statistically significant change in the mean scores over Time with or without PTR/Mentoring, with the following data for ROI (Time\*PTR):  $F(1,1,8)=.681$ ;  $p=.610$ ; Partial Eta Square=.078; Power=.197. Table 17 depicts the findings for RQ3 and H3f.

Table 17

*Phase 3 – Mixed ANOVA Within-Subjects Effects for ROI, comparing time 5 through time 9, across control and intervention groups on time, and time by PTR interaction*

Source (Phase 3)		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Time	Sphericity Assumed	10.88	4	2.72	1.73	.167	.178
Time*PTR	Sphericity Assumed	4.28	4	1.07	.68	.610	.078

While the data revealed no significant results for Time, PTR and the effect of PTR over Time on Procedural Integrity, the profile plot (Figure 12) showed that the intervention group had higher mean scores in this period with the mean scores slightly increasing over time. Although a similar trend was observed in the control group with a drop in the means scores between Time 8 and Time 9 over time, the control group showed greater variability in their mean scores, and the intervention group was at or above the expected level of presenting effective instruction per minute, specifically at 3 ITs/min. (Instructional Trails/minute), which is the minimal benchmark expected Rate of Effective Instruction (ROI) (Greer et al., 2000).

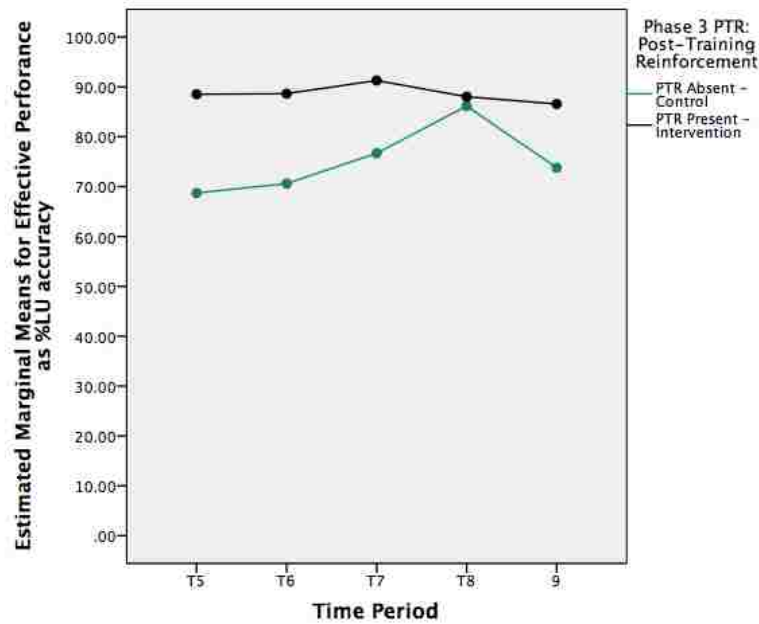


Figure 11. Phase 3 – Follow-up period. Effective Performance as percent LU accuracy at time 5 through time 9 for control and intervention groups.

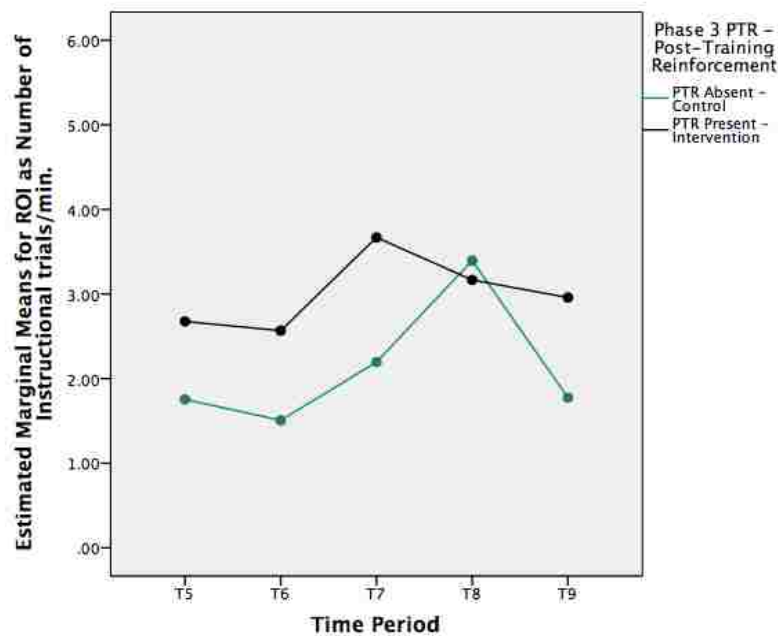


Figure 12. Phase 3 – Follow-up period. ROI at time 5 through time 9 for control and intervention groups.

### **Teacher's Perceptions of the Staff Training Model**

As part of the Staff Training Procedure participants were required to complete a Reflection Journal answering three open ended prompts to provide information on the participants' perceptions of their own performance and about the Staff Training Model implemented in this study (Appendix H). Specifically, the Reflection Journal prompted the participants to reflect upon areas of improvements, behavioral changes to be entertained in future intervention sessions with their students, and their perception about the Staff Training Model. As such, the participants engaged in reflective processes during the intervention phase, Phase 2.

The participants' comments were analyzed to identify any common theme or thread. Table 18 provides a sample of teachers' comments, grouped per category based on four different themes. Namely, the comments fell into categories pertaining to the study variables, the LU and ROI, and to the staff training venue used in this study, specifically, the quality and effectiveness of the study's Staff Training Model, Procedures, and Mentoring process. All the comments gathered by all participants over the four days in Phase 2 of the intervention phase were positive, addressing error prevention processes, processes whereby the participants felt they were guiding their performance over time, and pointing to the quality and effectiveness of the Staff Training Model and Mentoring process.

Table 18

*Examples of Participants' Comments on the Study Staff Training Model*

<p><b>Learn Unit (LU)</b></p> <p><i>“Improve on what response should be expected from the learner”</i></p> <p><i>“Make expectations more clear”</i></p> <p><i>“Ensure the child is attending before providing instruction”</i></p> <p><i>“Give a variety of praise for correct mastered targets”</i></p> <p><i>“Implement the error correction procedure when the child errs”</i></p>
<p><b>Rate of Effective Instruction (ROI)</b></p> <p><i>“Increase rate of correct error correction procedure”</i></p> <p><i>“Increase pacing to allow less time for student to engage in stereotypy”</i></p> <p><i>“ Be more aware of pace of Instruction ”</i></p> <p><i>“Change the pace of my instruction”</i></p>
<p><b>Mentoring</b></p> <p><i>“Helpful to review together for insight &amp; feedback”</i></p> <p><i>“Thought and opinions given by mentor were professional &amp; helpful”</i></p> <p><i>“Good to have a non-team member review your work”</i></p>
<p><b>Video</b></p> <p><i>“Helpful to point out areas to be improved &amp; corrected”</i></p> <p><i>“Shows what we do vs. what we think we do”</i></p> <p><i>“Makes my sessions more effective”</i></p>
<p><b>Staff Training Model</b></p> <p><i>“A quality one, based on my observations of positive results in the child's responses &amp; my instruction”</i></p> <p><i>“Able to be implemented across any environment, task, instructor or learner”</i></p> <p><i>“Offers me an opportunity to be accountable for my behavior and room for improvement “</i></p> <p><i>“Performance feedback was well received”</i></p> <p><i>“Very Inspiring, Insightful and Rewarding”</i></p> <p><i>“Effective”</i></p>

**Single-Subject Analysis**

The data collected from each individual participant in this study allowed for the opportunity to further analyze the data using single-subject design. Single-subject analysis was used to explore the teachers' performance at the individual participant level and explain the trends and data paths observed in the graphs mentioned above. This process added clarity to data and aided in explaining the results obtained through the quantitative analysis, as it provided information on each individual's behaviors and performance in response to the Staff Training Model and Mentoring. Moreover, given that a small sample size leads to the possibility of a Type



2 error (failure to detect a significant change when it might be present), consideration for using a serial single-subject analysis design approach was in line with the literature due to limitations in sample size. Furthermore, the use of serial single-subject analysis design approach was in line with the behavior analytic literature when studying the ASD population.

The following were the findings derived from data obtained from the 10 participants and analyzed using a multiple baseline single-subject design. The first five participants discussed are the control group and the next five are the intervention group. As part of the Staff Training Model in this study, there was a three-day break between Phase 1 and Phase 2, and a four-day break between Phase 2 and Phase 3, and between all five follow-up time periods in Phase 3. To maintain and ascertain anonymity of the participants, the names assigned to each teacher are fictitious in nature and do not reflect and reveal their true identity.

Figure 13 illustrates Dona's instructional performance on LU presentation and ROI across all phases of the Staff Training Model. Dona was a control group participant. Results showed that during baseline, Dona was on average 56% acc. in the presentation of the LU and presented on average 0.5 IT/min. After the Phase 1 Pre-Training and workshop presentation, Dona showed a slight improvement on her accurate presentation of the LU achieving 60% acc. An analysis of Phase 2 data showed that Dona learned the new skills over four consecutive days of engaging in the Staff Training Procedures of VSM, SE, PF and R without Mentoring. Specifically, Dona's effective performance improved reaching an average score of 70%acc. on LU presentation a 12% increase over baseline score, and a ROI average score of 1.74 IT/min. a 35% increase over baseline score. At the start of Phase 3 the data showed that Dona experienced a regression in her performance on LU and ROI then resumed improvement above Phase 2 score levels at an average score of 75% acc. for LU presentation, an 11% improvement from Phase 2,

and an average score of 2.7 IT/min. for ROI, a 16% improvement from Phase 2. The observed initial regression in performance was attributed to the natural learning outcome observed a few days after a new skill is learned. Overall, Dona showed learning over time, as a result in engaging in the STP and when STP were removed she maintained her new learning and even demonstrated continued improvement in her skill set over 21 days at follow-up. Furthermore Figure 13 shows that Dona’s comments and perceptions of the Staff Training Model were positive, with corrective measures suggested on future performance, and alluding to the effectiveness of the Staff Training Model used.

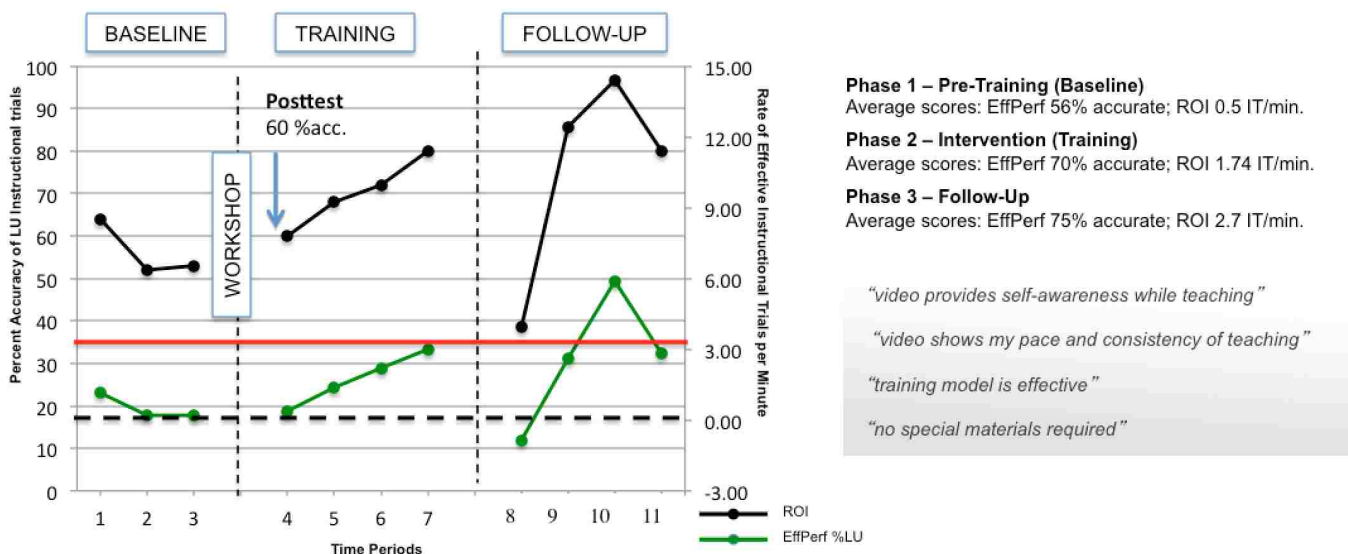


Figure 13. Teacher Dona – Instructional Performance (Control Group)

Figure 14 illustrates Jane’s instructional performance on LU presentation and ROI across all phases of the Staff Training Model. Jane was a control group participant. The graph indicated that Jane started with low scores at baseline, with average scores at 60% acc. in LU presentation and 1 IT/min. in ROI. After the Phase 1 Pre-Training and workshop presentation, Jane showed

improved instructional performance with 88%acc. in LU presentation and close to 3 IT/min. in ROI. An analysis of Phase 2 data showed that Jane learned the new skills over four consecutive days of engaging in the Staff Training Procedures of VSM, SE, PF and R without Mentoring. Specifically, Jane’s effective performance improved reaching an average score of 88% acc. on LU presentation, close to a 15% increase over baseline, and a ROI average score of 2.2 IT/min. a 22% increase over baseline. An analysis of the data during Phase 3 at follow-up revealed that Jane demonstrated variability in performance although maintained her high scores an average of 81% acc. on LU presentation and a ROI average score of 1.6 IT/min. Overall, scores at follow-up were observed to be higher than the baseline indicating that learning was in effect over time. Furthermore Figure 14 shows that Jane’s comments and perceptions of the Staff Training Model were positive, with insightful remarks guiding her future practice, and alluding to the value of the Staff Training Model and procedure.

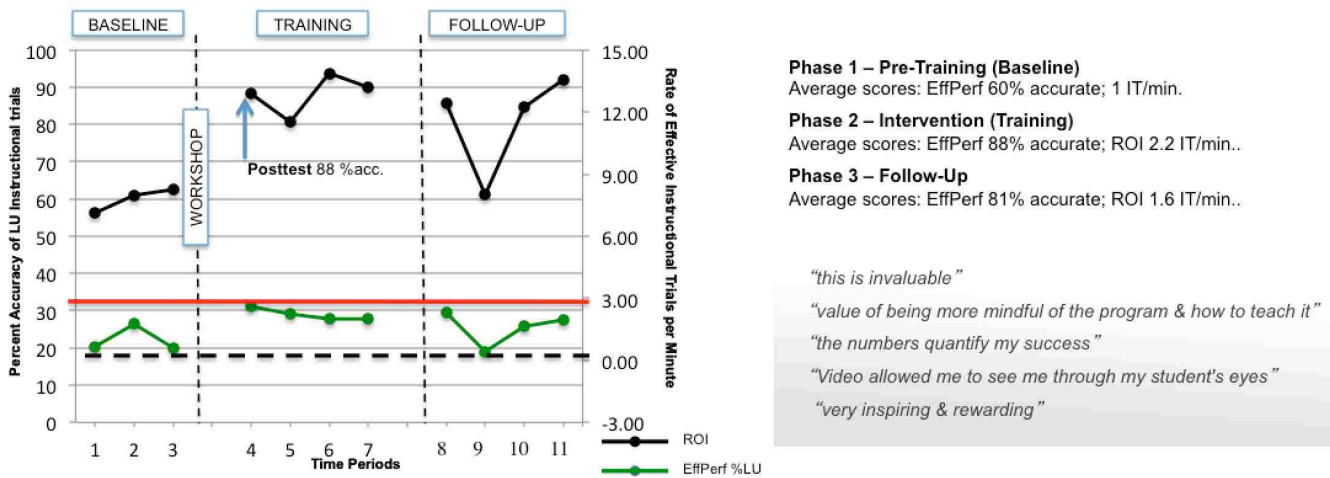


Figure 14. Teacher Jane – Instructional Performance (Control Group)

Figure 15 illustrates Mary’s instructional performance on LU presentation and ROI across all phases of the Staff Training Model. Mary was a control group participant. The graph

indicated that Mary started with low scores at baseline, with average scores at 48% acc. in LU presentation and 1.4 IT/min. in ROI. After the Phase 1 Pre-Training and workshop presentation, Mary showed improved instructional performance with 54.7% acc. in LU presentation but showed a decrease in performance in ROI with an average score of 0.1 IT/min. An analysis of Phase 2 data showed that Mary demonstrated great variability in performance, over four consecutive days of engaging in the Staff Training Procedures of VSM, SE, PF and R without Mentoring. This variability might be attributed to a natural learning process when being taught a new skill as the individual engages in trial and error processes toward mastering the new skill. Consequently, Phase 2 data showed that Mary's effective performance did not improve on average with score remaining the same at 49% acc. on LU presentation and an observable decrease in ROI performance with an average score of 0.1 IT/min. a 14% decrease from baseline. An analysis of the data during Phase 3 at follow-up revealed that Mary demonstrated variability in her instructional performance with a significant drop in her scores at 21 days follow-up. Although variability was noted in Phase 3, Mary demonstrated overall improved instructional performance on average with an average of 70% acc. on LU presentation an improvement of 14% from Phase 2 and baseline, and a ROI average score of 2.8 IT/min. with an improvement of 28% from Phase 2 and 20% from baseline. Overall, Mary's scores at follow-up were observed to be higher than both Phase 2 and baseline, indicating that learning was in effect over time. Furthermore Figure 15 shows that Mary's comments and perceptions of the Staff Training Model were positive, alluding to the effectiveness of the Staff Training Model and procedure.

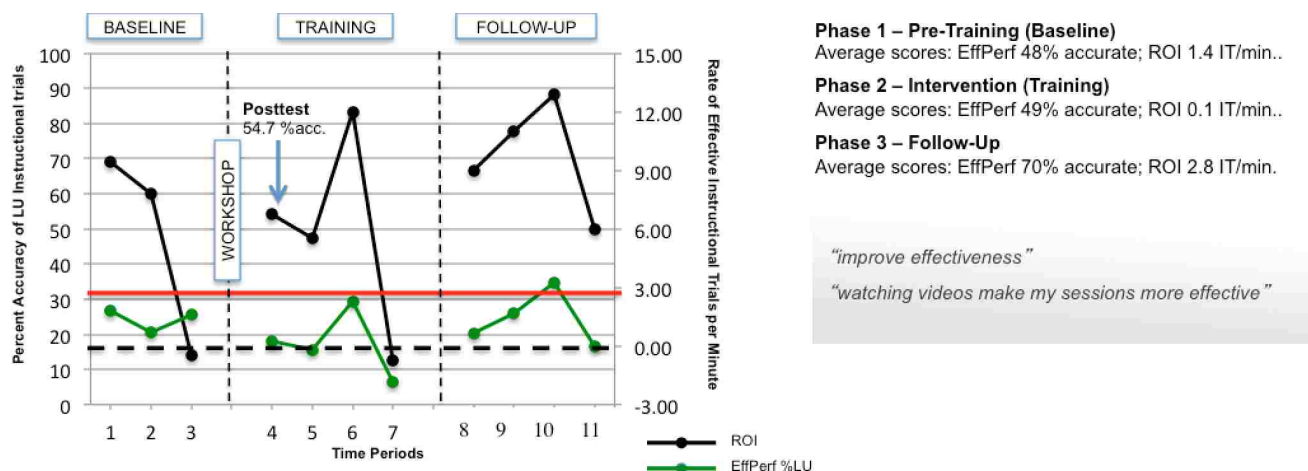


Figure 15. Teacher Mary – Instructional Performance (Control Group)

Figure 16 illustrates Cindy’s instructional performance on LU presentation and ROI across all phases of the Staff Training Model. Cindy is a control group participant. The graph indicated that Cindy started with high scores at baseline, with average scores at 73% acc. in LU presentation and 1.1 IT/min. in ROI. The higher baseline scores may be attributed to the individual’s learning history and established prerequisite skill set. After the Phase 1 Pre-Training and workshop presentation, Cindy showed improved instructional performance with 80% acc. in LU presentation, an 11% increase from baseline, and above benchmark level in performance in ROI with an average score of 3.1 IT/min., a 28% increase over baseline. An analysis of Phase 2 data showed that Cindy demonstrated great variability in performance, over four consecutive days of engaging in the Staff Training Procedures of VSM, SE, PF and R without Mentoring. This variability might be attributed to a natural learning process when being taught a new skill as the individual engages in trial and error processes toward mastering the new skill. Consequently, Phase 2 data showed that Cindy’s effective performance on average decreased with an average score of 61% acc. on LU presentation, a 13% decrease from baseline, while she maintained the same average performance in ROI performance with a score of 1.1 IT/min. An analysis of the

data during Phase 3 at follow-up revealed that Cindy demonstrated variability in her instructional performance with a decreasing trend from at follow-up from Time 9 to Time 11 at 21 days. Although variability was noted in Phase 3, Cindy improved in her overall instructional performance at an average of 71% acc. on LU presentation an 11.6% improvement from Phase 2, but maintained a similar score from baseline. Conversely, Cindy’s ROI improved in Phase 3 with an average score of 2.4 IT/min., a 22% increase from Phase 2 and baseline. Overall, Cindy’s scores at follow-up were observed to be higher than Phase 2. Furthermore Figure 16 shows that Cindy’s comments and perceptions of the Staff Training Model were positive, alluding to the effectiveness of the Staff Training Model and procedure.

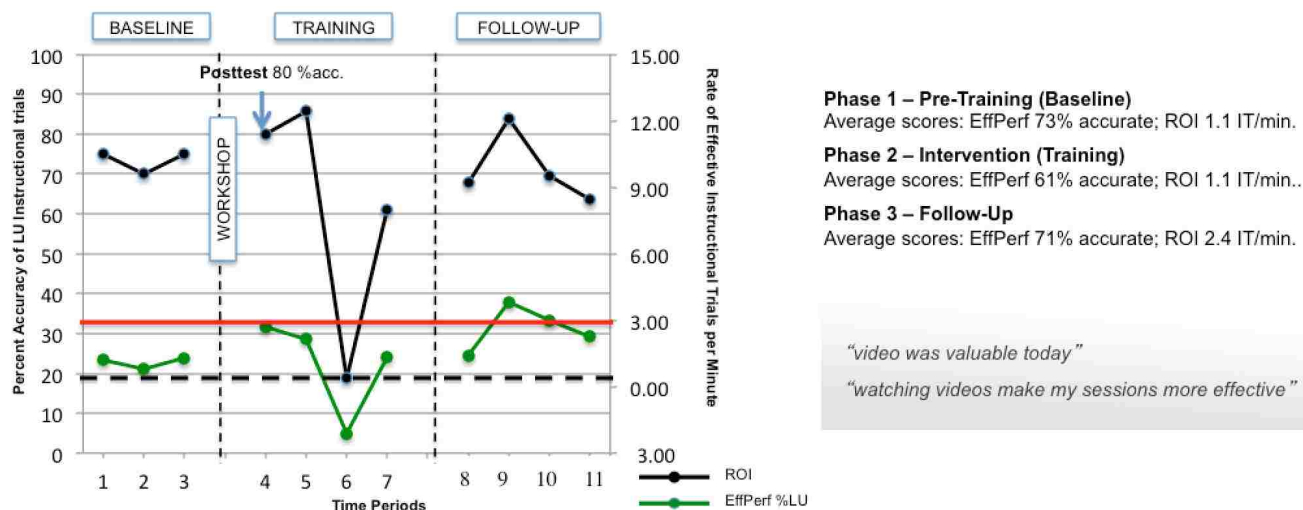


Figure 16. Teacher Cindy – Instructional Performance (Control Group)

Figure 17 illustrates Sam’s instructional performance on LU presentation and ROI across all phases of the Staff Training Model. Sam is a control group participant. The graph indicated that Sam started with high scores at baseline, with average scores at 80% acc. in LU presentation, an 11% increase over baseline, and no change in ROI scores maintained at 2.8

IT/min. The higher baseline scores might be attributed to the individual's learning history and established prerequisite skill set. After the Phase 1 Pre-Training and workshop presentation, Sam showed improved instructional performance with 87% acc. in LU presentation and above benchmark level in performance in ROI with an average score of 3.2 IT/min. An analysis of Phase 2 data showed that Sam demonstrated variability in performance, over four consecutive days of engaging in the Staff Training Procedures of VSM, SE, PF and R without Mentoring. Variability in performance might be attributed to a natural learning process when being taught a new skill as the individual engages in trial and error processes toward mastering the new skill. However, the variability was across higher scores over the baseline maintaining a high average score of 88% acc. on LU presentation, an 11% increase over baseline. A similar trend was noted with ROI with an average high score of 3.2 IT/min. a score above the literature-based benchmark, n 11% increase over baseline. An analysis of the data during Phase 3 at follow-up revealed that Sam demonstrated variability in her instructional performance within the high score range and with a slight improved instructional performance averaging 86% acc. on LU presentation, an 11% increase over baseline. Sam appeared to have maintained high ROI scores at follow-up with an average score of 2.9 IT/min. Overall, Sam's scores at follow-up were observed to be maintained in the higher range over time. Furthermore Figure 17 shows that Sam's comments and perceptions of the Staff Training Model were positive, insightful, and alluding to the value and effectiveness of the Staff Training Model and procedure.

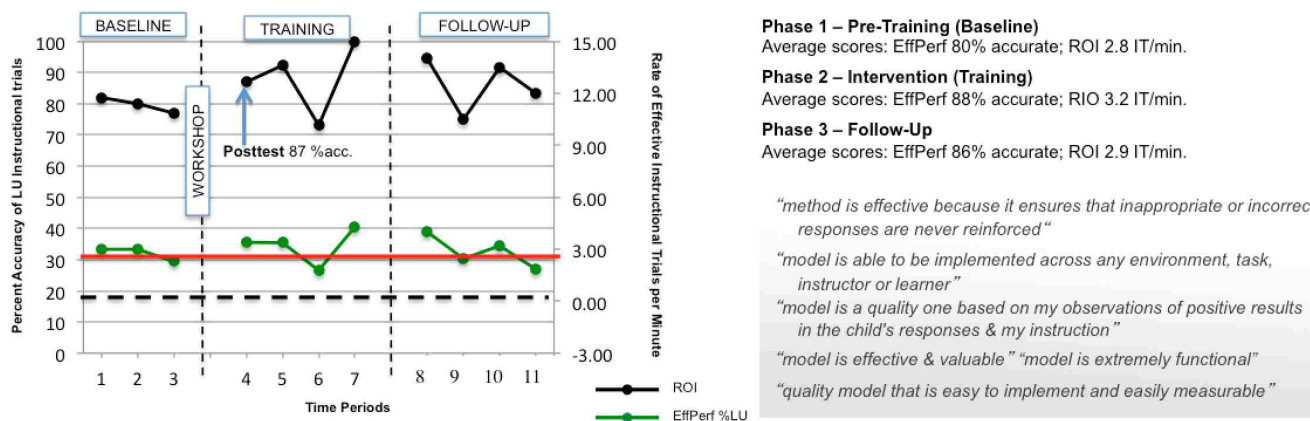


Figure 17. Teacher Sam – Instructional Performance (Control Group)

Figure 18 illustrates Colette’s instructional performance on LU presentation and ROI across all phases of the Staff Training Model. Colette is an intervention group participant. The graph indicated that Colette started with high scores at baseline, with average scores at 79% acc. in LU presentation and 1.5 IT/min. in ROI. The higher baseline scores may be attributed to the individual’s learning history and established prerequisite skill set. After the Phase 1 Pre-Training and workshop presentation, Colette showed a significant improvement in her instructional performance with 100% acc. in LU presentation, a 13% increase over baseline measure. Similarly, data showed above benchmark level in performance in ROI with an average score of 3.7 IT/min., a 25% increase over baseline measures. An analysis of Phase 2 data showed that although Colette demonstrated variability in performance, over four consecutive days when engaging in the Staff Training Procedures of VSM, SE, PF and R with Mentoring, learning the new skills over four consecutive days was observed. Variability in performance might be attributed to a natural learning process when being taught a new skill as the individual engages in trial and error processes toward mastering the new skill. Performance improvement was noted in Colette’s average score for effective performance of 83% acc. on LU presentation, an 11%



increase over baseline, and a ROI average score of 2.3 IT/min., a 15% increase over baseline. Moreover, the variability was noted to be across higher scores range over the baseline maintaining a high average score of 83% acc. on LU presentation. A similar trend was noted with ROI with an average high score of 2.3 IT/min. An analysis of the data during Phase 3 at follow-up revealed that Colette demonstrated improved and maintained high scores in her instructional performance over time, averaging 96% acc. on LU presentation, a 12% improvement from Phase 2 and baseline. The same was observed in Colette’s ROI attaining and maintained a high average score above the benchmark level at 3.5 IT/min., a 15% increase over Phase 2 measures and 23% increase over baseline. Overall, Colette’s performance scores at follow-up were maintained in the higher range over time in support of sustaining Procedural Integrity of the skill application. Furthermore Figure 18 shows that Colette’s comments and perceptions of the Staff Training Model were positive, insightful, and alluding to the value and effectiveness of the Staff Training Model and Mentoring.

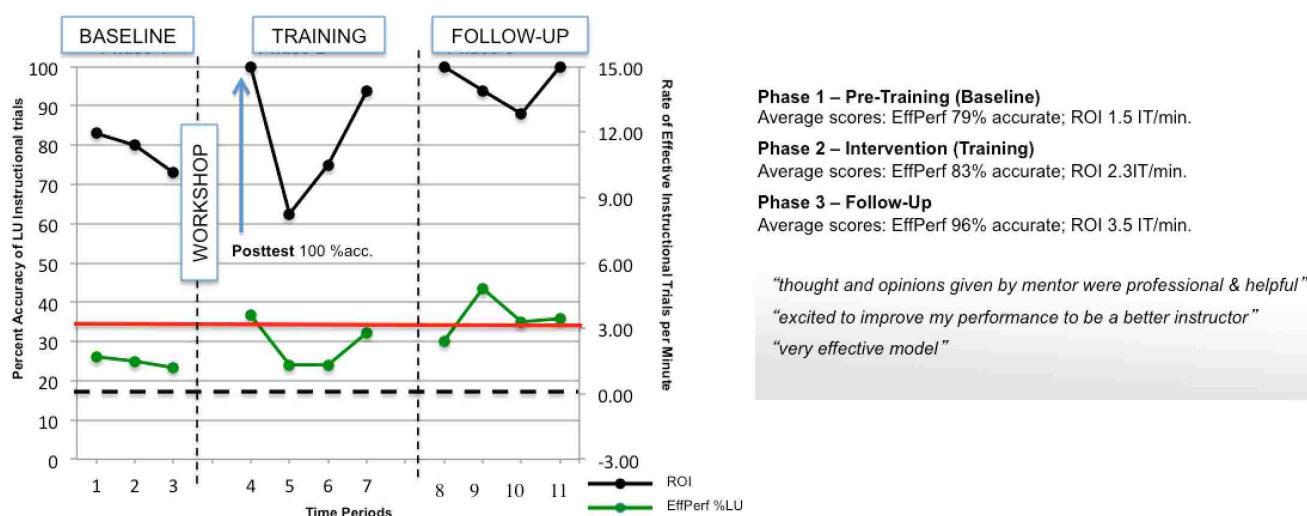


Figure 18. Teacher Colette – Instructional Performance (Intervention Group)

Figure 19 illustrates Sue's instructional performance on LU presentation and ROI across all phases of the Staff Training Model. Sue is an intervention group participant. The graph indicated that Sue started with average scores at baseline, scoring 69% acc. in LU presentation and 2.4 IT/min. in ROI. The relatively high baseline scores might be attributed to the individual's learning history and established prerequisite skill set. After the Phase 1 Pre-Training and workshop presentation, Sue showed a drop in her instructional performance with 53.8% acc. in LU presentation, a 13% decrease over baseline measure. Similarly, a drop in performance was observed in the ROI at 0.5 IT/min., a 48% decrease over baseline measures. This regression is considered a natural learning, memory and cognitive response when a time period elapses between learning a skill and the application of the skill taught (Pashler, H., Rohrer, D., Cepeda, N. J., & Carpenter, S. K., 2007; & Runquist, W., 1983; & Thalheimer, W., 2010). An analysis of Phase 2 data showed that although Sue demonstrated improved performance, over four consecutive days when engaging in the Staff Training Procedures of VSM, SE, PF and R with Mentoring, pointing to the process of learning new skills over four consecutive days was observed. However, Colette's scores on average remained at the baseline level with 69% acc. on LU presentation and a decrease in ROI scores to an average of 1.4 IT/min. An analysis of the data during Phase 3 at follow-up revealed that although variability in her performance was noted, Sue showed a significant improvement in her average scores and maintained higher scores in her instructional performance over time, averaging 81% acc. on LU presentation, a 12% improvement from Phase 2 and baseline. The same was observed in Sue's ROI scores averaging 2.9 IT/min. and reaching above the benchmark level at Time 9 and Time 11 (21 days), a 21% increase over Phase 2 measures and 12% increase over baseline. Overall, Sue's performance scores at follow-up although variable were maintained within the higher range. Furthermore

Figure 19 shows that Sue’s comments and perceptions of the Staff Training Model were positive, noting the positive effect on the learner, and alluding to the effectiveness of the Staff Training Model and Mentoring.

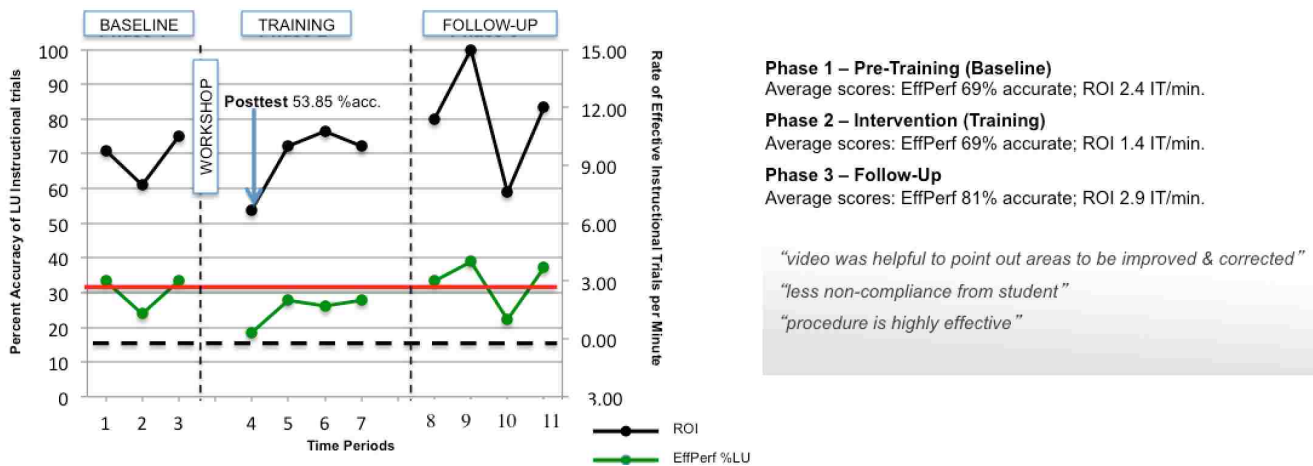


Figure 19. Teacher Sue – Instructional Performance (Intervention Group)

Figure 20 illustrates Kate’s instructional performance on LU presentation and ROI across all phases of the Staff Training Model. Kate is an intervention group participant. The graph indicated that Kate started with high scores at baseline, with average scores at 72% acc. in LU presentation and 1.8 IT/min. in ROI. The higher baseline scores may be attributed to the individual’s learning history and established prerequisite skill set. After the Phase 1 Pre-Training and workshop presentation, Kate showed a drop in her instructional performance with 50% acc. in LU presentation, a 14% decrease over baseline measure. Similarly, a drop in performance was observed in the ROI at 0.5 IT/min., a 36% decrease over baseline measures. This regression is considered to be a natural learning, memory and cognitive response when a time period elapses between learning a skill and the application of the skill taught (Pashler, H., et al., 2007; Runquist, W., 1983; & Talheimer, W., 2010). An analysis of Phase 2 data showed that although Kate

demonstrated steady and significant improvement in instructional performance, over four consecutive days when engaging in the Staff Training Procedures of VSM, SE, PF and R WITH Mentoring, pointing to the learning process with support. This was noted in her improved average score for effective performance of 79% acc. on LU presentation, an 11% increase over baseline, and a ROI average score of 2.5 IT/min., a 14% increase over baseline. An analysis of the data during Phase 3 at follow-up revealed that Kate showed improved and maintained high scores in her instructional performance over time, averaging 89% acc. on LU presentation, an 12% increase over Phase 2 and baseline measures. Similar results were attained for ROI whereby Kate’s achieved and maintained high scores above benchmark level at an average of 4.2 IT/min., a 17% increase over Phase 2 measures and 23% increase over baseline. Overall, Colette’s performance scores at follow-up were maintained in the higher range over time in support of sustaining Procedural Integrity of the skill application when Mentoring was provided. Furthermore Figure 20 shows that Kate’s comments and perceptions of the Staff Training Model were positive, alluding to the value and effectiveness of the Staff Training Model and Mentoring.

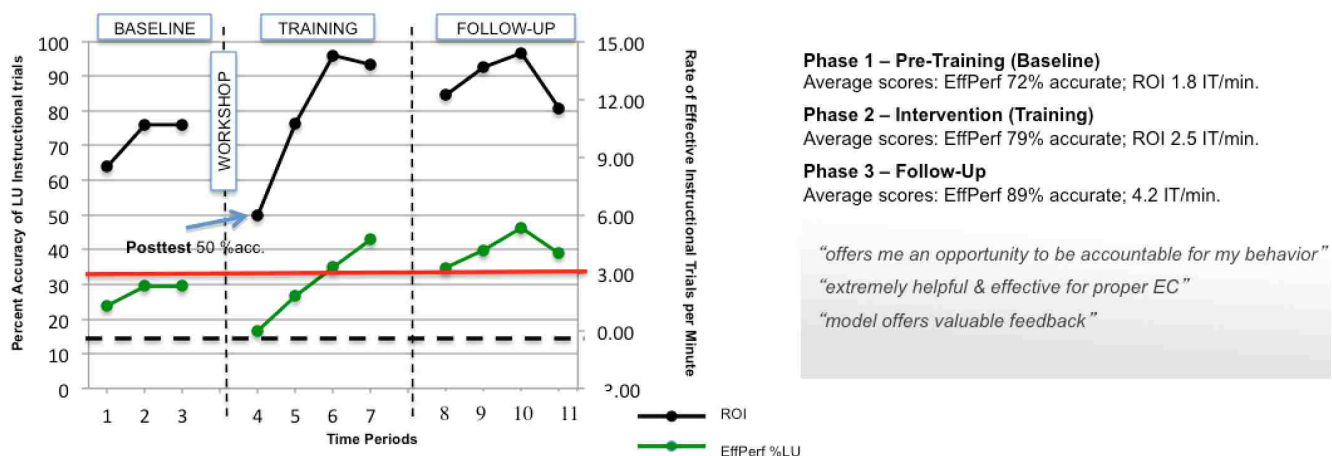


Figure 20. Teacher Kate – Instructional Performance (Intervention Group)

Figure 21 illustrates Bea's instructional performance on LU presentation and ROI across all phases of the Staff Training Model. Bea is an intervention group participant. The graph indicated that Bea started with very low scores at baseline, with average scores at 26% acc. in LU presentation and -4 IT/min. in ROI. The low baseline scores may be attributed to the individual's learning history and lack of established prerequisite skill set. Also, a negative integer for ROI is indicative of faulty instruction. So although the ROI score is high in number (i.e. 4) the negative value indicates that this teacher was presenting high rate of faulty and ineffective instruction. After the Phase 1 Pre-Training and workshop presentation, Bea showed a significant improvement in her instructional performance with 72% acc. in LU presentation, a 28% increase over baseline measure. This was also observed in ROI scores whereby Bea significantly improved her ROI achieving benchmark level with a score of 3 IT/min., a 43% increase over baseline measures. An analysis of Phase 2 data showed that although Bea demonstrated great variability in her performance over the four training days, when engaging in the Staff Training Procedures of VSM, SE, PF and R WITH Mentoring, significant improvement in her instructional performance was observed and scores varied in the high range levels. This data attest to the established learning process and positive behavioral response to the support provided and Mentoring. Variability in performance might be attributed to a natural learning process when being taught a new skill as the individual engages in trial and error processes toward mastering the new skill. Bea achieved high average levels for effective performance at 79% acc. on LU presentation, a 31% increase over baseline, and a ROI average score of 2.1 IT/min., a 35% increase over baseline. An analysis of the data during Phase 3 at follow-up revealed that Bea showed continued improvement in her performance for LU presentation and ROI, with high scores maintained over time. Bea was effective in the presentation of LU on

averaged 85% acc., an 11% increase over Phase 2 and baseline measures. Similar results were attained for ROI whereby Bea’s achieved and maintained high scores close to benchmark level at an average of 2.6 IT/min., a 12% increase over Phase 2 measures and 39% increase over baseline. Overall, Bea’s performance scores at follow-up were maintained in the higher range over time in support of sustaining Procedural Integrity of the skill application when support and Mentoring was provided. Furthermore Figure 21 shows that Bea’s comments and perceptions of the Staff Training Model were positive, alluding to the functionality, generalizability and effectiveness of the Staff Training Model and Mentoring.

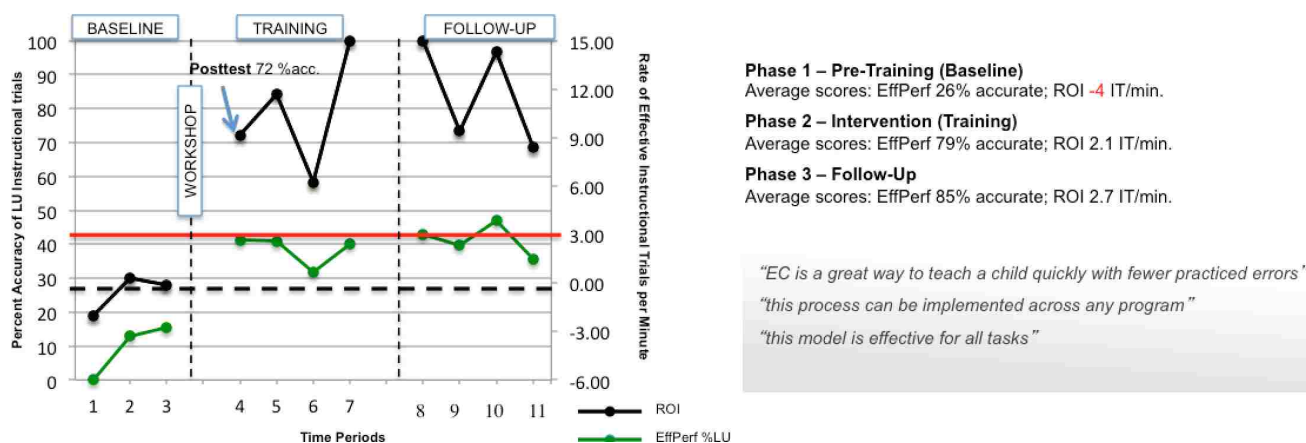


Figure 21. Teacher Bea – Instructional Performance (Intervention Group)

Figure 22 illustrates Leyla’s instructional performance on LU presentation and ROI across all phases of the Staff Training Model. Leyla is an intervention group participant. The graph indicates that Leyla started with very low scores at baseline, with average scores at 36% acc. in LU presentation and -1.3 IT/min. in ROI. The low baseline scores might be attributed to the individual’s learning history and lack of established prerequisite skill set. Also, a negative integer for ROI is indicative of faulty instruction. As such, Leyla’s score of -1.5 IT/min. meant

that she was presenting faulty and ineffective instruction 1.5 times per minute. After the Phase 1 Pre-Training and workshop presentation, we observed a decline in Leyla's instructional performance; her accuracy in LU presentation dropped to 20% acc. an 18% decrease over baseline measure. This regression is considered to be a natural learning, memory and cognitive response when a time period elapses between learning a skill and the application of the skill taught (Pashler, H., et al., 2007; Runquist, W., 1983; & Talheimer, W., 2010). Conversely, ROI slightly improved but remained in the negative value close to zero. An analysis of Phase 2 data showed that Leyla demonstrated a steady improvement in her instructional performance over the four training days, but, when engaging in the Staff Training Procedures of VSM, SE, PF and R WITH Mentoring, she maintained very high scores throughout Phase 2. The data attest to impact of the established learning process and positive behavioral response to the support provided and Mentoring. Leyla achieved high scores in Phase 2 however the average score was pulled down by the first low post-phase 1 score to 66% acc. on LU presentation, a 18% increase over baseline, and a ROI average score of 1 IT/min. An analysis of the data during Phase 3 (follow-up) revealed that Leyla showed continued improvement in her performance for LU presentation and ROI, with high scores maintained over time. Leyla was very effective in the presentation of LU with an average of 94% acc. -- a 14% increase over Phase 2 and 26% over baseline measures. Similar results were attained for ROI where Leyla's achieved and maintained higher scores at an average of 2.2 IT/min., a 22% increase over Phase 2 measures and 16% increase over baseline, reaching benchmark level at Time period 9 (at 9 days follow-up). Overall, Leyla's performance scores at follow-up were maintained in the higher range over time demonstrating strong Procedural Integrity in skill application when support and Mentoring was provided. Furthermore

Figure 22 shows that Leyla’s comments and perceptions of the Staff Training Model were positive, alluding to the effectiveness of the Staff Training Model and Mentoring.

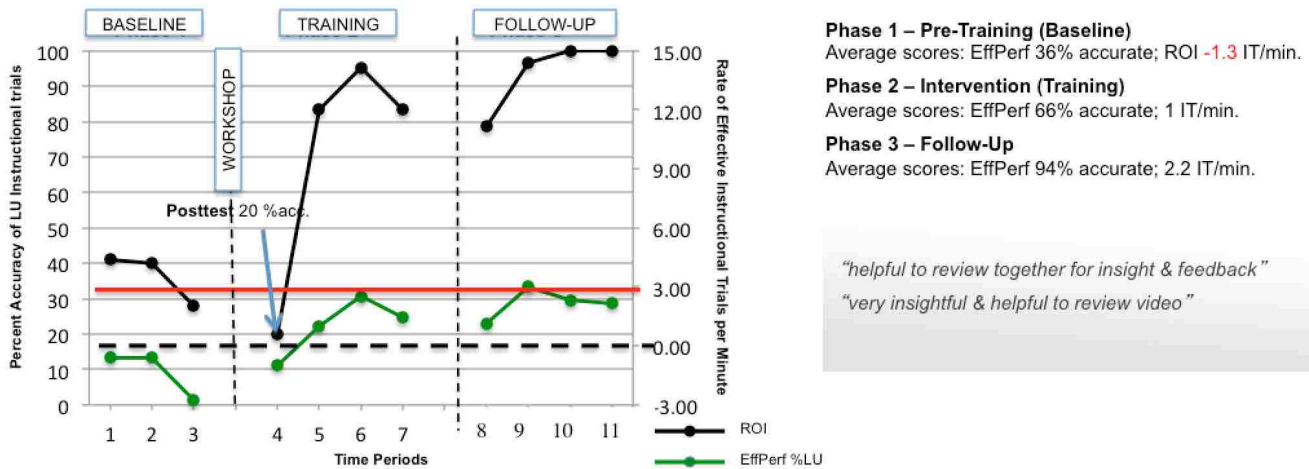


Figure 22. Teacher Leyla – Instructional Performance (Intervention Group)

The following observations were made from the single case analysis: some improvement was noted after the one-session 2-hour workshop was presented. By learning on your own using an STP consisting of VSM, SE< PF, and R, a person does show improvement in learning over baseline scores, but with greater variability than if that person had received *Mentoring*. Additionally, although greater learning was observed when engaging in the STP alone after the workshop, the greatest improvement in performance outcomes was noted when *Mentoring* was added to the Staff Training Procedure.

These observations suggest that when people learn, we can easily track their learning by monitoring their procedural integrity. Early performance in learning providing effective LUs is characterized by variability with declines and improvements in measures as trial and error learning progresses. By contrast, “True” learning, as evidenced by established and maintained skill acquisition process over time, occurs after a few days. At this point, the procedural integrity begins to stabilize, allowing us to infer that the subject has acquired or learned the skill in



question. Moreover, Procedural Integrity allows us to infer that the skill has been truly learned as a result of *Mentoring*.

## Chapter V

### DISCUSSION

The purpose of the study was to assess the effectiveness of adding PTR in the form of Mentoring to the Staff Training Procedure of VSM, SE/SM, PF and R, to enhance a teacher's performance and Procedural Integrity when working with children with ASD. The following is an integrative analysis of the findings from the quasi-experimental and serial case study analysis along with some exploratory discussions for each of the different phases.

#### **Phase 1 – Pre-Training (Workshop ONLY):**

Data from parametric statistics indicate that there was no statistically significant difference in teacher performance in the presentation of LU and ROI after a single, 2-hour pre-teaching workshop in Phase 1; however, the single-subject analysis showed some variability in the performance outcome after this workshop. Some participants showed a decrease in their scores while others showed some improvement. The findings in the single – case study lend some support for the *70-20-10 Learning and Development Model* (Michael M. Lombardo and Robert W. Eichinger, Center for Creative Leadership 2014). Namely, that the 1-2 hour workshops and lectures lead to some learning (within the 30% range). However, this study did not assess long term Procedural Integrity of the Pre-Training Staff Training Modality. As such, Pre-Teaching modality in the form of Workshop might or might not be the most effective mode to train staff and ensure skill acquisition with sustainable and generalizable outcomes. Further research and investigation would be required to establish the effectiveness of a simply “Workshop only” intervention.

**Phase 2 – Post-Training Reinforcement (Skill Acquisition)**

There was no statistically significant change in the teacher's mean scores of accurate presentation of Learn Unit (LU) and Rate of Effective Instruction (ROI) in Phase 2 when PTR/Mentoring was present vs. when Mentoring was absent as noted in the parametric statistics (possibly due to the very low power of this study).

By contrast, results from the single-subject analysis support previous research (Belfiore et al. 2008, LeBlanc et al., 2009), demonstrating that Mentoring is effective in promoting skill acquisition for LU presentation and improves ROI. Furthermore, this study demonstrated that adding Mentoring to staff training enhances and promotes greater learning. Specifically, four of the five teachers who received Mentoring increased their scores to above 80%acc. and maintained it higher at a higher level than two of the five teachers who did not receive Mentoring. Additionally, the current findings lend further support to the results observed in Belfiore et al. (2008), who found that three of the three teachers improved their scores on discrete trial instruction implementation to above 80%acc. and maintained this performance level up to 11 weeks follow-up in response to a four to five session training. These findings also support research by Lerman et al. (2008) who that found that nine of nine teachers improved their scores after implementing preference assessment and direct teaching to above 80%acc after receiving a brief five-day intensive training program with PF/Mentoring.

Phase 2 results also suggest that there is value considering adding Performance Feedback in the form of Mentoring in promoting effective skill acquisition and enhancing learning. This inference is supported by the observations that LU presentation ROI improvements were shown in Phase 2 when Mentoring was added to the STP. Specifically, while LU growth in the control group was 22% during the skill acquisition phase, the intervention group experiences an average

of 33% growth in the same phase. Regarding ROI, the control group experienced an average of 15% growth while the intervention group experienced an average of 25% growth.

### **Phase 3 – Follow-up (Sustainability)**

When we examined the sustainability of skill retention, statistical analysis showed that the Procedural Integrity of teacher's accurate presentation of LU and ROI in Phase 3 improved over Time with PTR/Mentoring. This study extends the body of the literature on the effectiveness of PTR/Mentoring on long term Procedural Integrity and improved performance (Belfiore et al. 2008, LeBlanc et al., 2009; Lerman et al. 2008; Pelletier et al., 2010; Reid et al., 2005) as the average growth score data in Phase 3 indicate that Procedural Integrity of accurate presentation of LU was higher when Mentoring was added to the STP. This study found that five out of five teachers in the Intervention Group who engaged in the STP *with PTR/Mentoring* improved and then maintained high scores above 80% acc. while only three out of five teachers from the control group who engaged in the STP *without PTR/Mentoring* were able to achieve a similar level of proficiency. This finding provides additional evidence for the research advanced by Pelletier et al. who found that three out of three teachers who engaged in VSM with Mentoring improved their scores to above 80% acc. and maintained high scores at 1 month follow-up. Furthermore, the findings in this study extend the research of Lerman et al.'s (2008) study that found that six out of nine teachers maintained and generalized skills at 2-month follow-up. The authors also noted that minimal feedback was required to help the other three teachers bring their scores back up to above 80% accuracy.

Review of the single case analysis and participants' performance highlights the differences observed in each participant, particularly with regard to baseline measures. The differences observed in baseline measures across the participants, point to the idiosyncratic

nature of each participant’s learning style, critical thinking skills, learning history, and skill set repertoire. What is interesting to note is that “we all start in very different places or at different levels” and “where” each participant starts is very important to consider as a possible influencing factor in determining the course and type of staff training and mentoring to be selected. Due to the fact that each participant did start at a different baseline levels, it would be interesting to assess whether the STP used in this study, consisting of VSM, SE, PF and R, may be more beneficial for participants who start at a lower baseline when mentoring is not available. While the current study did not test for individual participant characteristics at baseline (i.e., skill set repertoire, learning style and critical thinking skills), it would be interesting to revisit the study and assess potentially individuating learner characteristics and ascertain whether some of the characteristics (i.e., critical thinking skills) might lead to differential performance over time (Figure 23). Such findings might allow researchers and practitioners to use individual learner’s characteristics to design more effective STM that meets all learners needs.

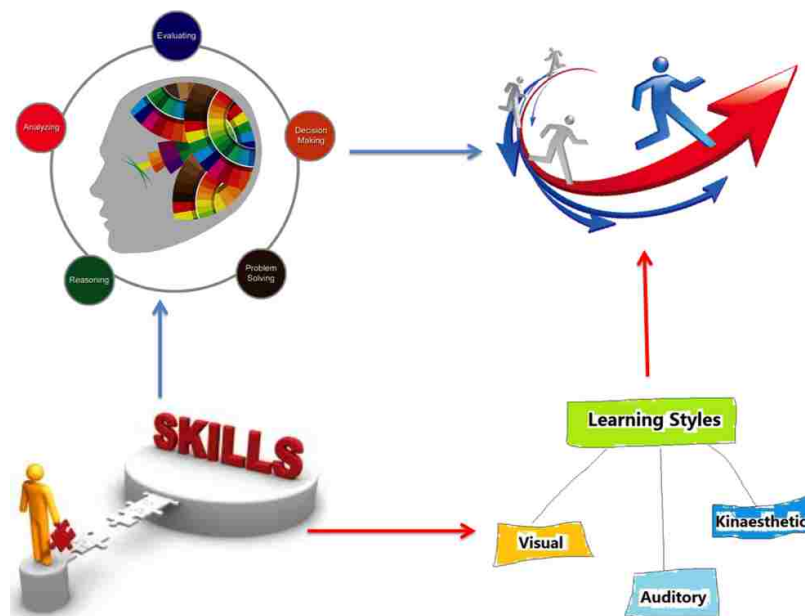


Figure 23. Internal individual factors and performance outcomes

The current study has yielded a number of useful observations. First, participants who received the Mentoring consistently had higher scores than those who did not, and maintained their scores at higher levels over time (21 days). Second, participants who did not receive Mentoring showed greater variability in their performance although learning was observed while engaging in the STP. Third, participants who received the Mentoring achieved higher levels of procedural integrity and maintained that procedural integrity over 21 days.

These observations are highly relevant to educators and learners alike. As this study demonstrates, appropriate supervision, coaching and Mentoring can promote and enhance continuing education, personal development to the ultimate benefit of our students. Consequently, the Mentoring should be considered highly beneficial for individuals who would benefit from greater consistency in their procedural integrity. This additional attention would very well provide the needed support to teachers who are not as effective while also enhancing the skills of those who are already effective.

## Chapter VI

### CONCLUSIONS

While *Staff Training Procedure (STP)* consisting of Video Self-Monitoring (VSM), Performance Feedback, Reflection *enhance* teacher performance and sustainability of *Procedural Integrity*, when working with children diagnosed with Autism, the presence or absence of Mentoring, demonstrably provides the opportunity to measurably improve performance and drive greater *consistency of performance*. These findings lend support to the benefits of adding Mentoring to an existing Staff Training Procedure to *enhance teacher performance and Procedural Integrity with sustainable outcomes*.

While some aspects of this study shared common methodologies with other studies in the literature, the current study takes some unique approaches to the staff training process. Specifically, it is interesting to note that the single–case study analysis added some information from a methodological point of view lending some support to the benefits of adding PTR in the form of Mentoring to an existing STP in leading to improved teacher performance and improved Procedural Integrity with sustainable outcome. Furthermore, Video Self-Monitoring as a “Skill Acquisition” procedure has not been thoroughly studied in the applied behavior analytic field. This study adds information to the possible benefits of using VSM, as a skill acquisition procedure.

#### **Practical / Clinical Implications**

The study results have several practical and clinical implications that impact the level of teacher training, qualifications, and expertise, which in turn impact the student learning and educational experiences. Specifically:

- This study points to the critical need to provide the teachers with support, using *effective* staff training procedures and *Mentoring*, as it will promote improved performance, *self-efficacy* and *competency* all of have been proven to drive improved *Staff Retention*.
- *Mentoring* provides assistance, emotional support and technical tools to support the teachers in *learning better ways to deal with the challenging experiences inherent in their roles as teachers children diagnosed with ASD*.
- Improving teacher training and support will most likely *benefit the students' performance* and enhance their experience and learning.
- Investing in effective staff training early on enhances staff retention, which will lead to effective cost, time, and resource allocations.

### **Limitations**

The current research possesses several limitations. Primarily the following are highlighted;

#### **Sampling methods:**

Participants were recruited using a “Convenience Sampling” method where access was granted to two private educational settings that were geographically accessible to the researcher. Also, the teachers working at these educational facilities volunteered to participate in the study. It is the nature of these kinds of studies to recruit from naturalistic settings to maximize external validity. Therefore, the sample of participants was obtained and studied in the natural physical locations of the educational settings.

Small sample size was an additional sampling limitation. While there was an attempt to build a larger sample pool derived from both public and private settings, the Principal Investigator was faced with significant attrition, losing a significant number of participants,



which resulted in small sample size. This attrition was driven by teacher and parent responses indicating a refusal to participate and/or allow their children to participate in the study and low teacher response rate. While participant attrition is a common side effect of using naturalistic environments, the resulting small sample size restricts the generalizability of the current research. The problem of attrition may be addressed differently in future studies by scheduling personal meetings and conversations with the teachers and parents to introduce the researcher, the topic, and answer any questions and concerns they may have. Future research is necessary to assess the effect of mentoring on performance outcome and procedural integrity for the accurate presentation of the LU and ROI.

**The possibility of participants' observer reactivity:**

The presence of the Research Assistant videotaping the teacher-student interactions may have influenced the participant behavior. This bias may be somewhat mitigated in future studies by having the participants blind to the videotaping procedure, by hiding the camera and placing the videotape behind a one-way mirror. That said, by virtue of volunteering for the study, teachers will know that they are being observed though more surreptitious taping wouldn't make this quite so apparent.

**Treatment package used:**

This study used a treatment package consisting of the staff training procedures of VSM, SE, PF, R and Mentoring, which might have acted as an interfering limiting variable. Although mentoring was independently manipulated, a component analysis of the staff training procedures, specifically the reflective process involved, was not manipulated and isolated across experimental conditions. Hence, the current study could not distinguish between subjects involved in Reflective process separate from Mentoring. The mere fact that a teacher might

engage in reflective processes without mentoring, might lead to an improvement in performance. The question remains how much of an improvement would the provision of Mentoring generate compared to merely engaging in reflective processes. Future studies will need to conduct component analysis to address such questions.

**Duration of mentorship:**

The duration of the mentoring provision might have been an interfering limiting factor. The current study provided teachers in the intervention group with four consecutive days of mentoring. The literature does not address the question of what might be the most effective duration for receiving mentoring. The question remains as to whether more than four consecutive days might lead to better performance outcome. Future research is needed to control for the variable of duration of mentoring.

**Duration of follow-up phase:**

The duration of follow-up phase might have been an interfering limiting factor. The current study's 21 days follow up period may be insufficient to provide a true representation of the long-term impact of Mentoring on Procedural Integrity. In the literature, the duration of follow-up phases ranges from 1 week to 6 months. Future studies should address long-term effects in a more consistent manner.

**Future Directions**

The study provides a platform for future studies to investigate more impactful way to tailor functional staff training for teacher of children with ASD. Clearly the current study had definite concern that may have skewed the results therefore similar studies should be undertaken to ascertain whether results obtained here would be generalizable to other populations. Additionally, however, this study points to several areas of research that have been insufficiently

investigated. Specifically, the impact of teacher individual differences and characteristics on the optimal learning strategy for staff training, demographics and their potential impact on staff training, the effect of workshop presentation as a staff training procedure on procedural integrity, and the potential role of VSM as a training tool.

First, replication studies are needed to assess the validity of the current outcome data, the reliability of the measurement systems and procedures, and procedural integrity of skill acquisition by extending follow-up measures over three to six months. Second, the sampling procedure needs to be modified to include a randomized control study with a larger sample size. A larger sample size will lead to great effect sizes and larger power to draw conclusive remarks from the data and allow for making statements of generalizability to other populations. The sample size can also be addressed by extending the study to multiple settings, including public educational settings, and multiple geographical areas. It would be first interesting to identify whether a larger sample size will lead to similar results, and if significant results are obtained, whether they compare to the findings in this study. Third, demographics characteristics need to be assessed to explore their differential effects on the degree and type performance outcome and procedural integrity. Fourth, Video Self-Monitoring as a skill acquisition procedure needs to be further investigated to extend the results found in the current study. The current study only studied the teacher behaviors and more research is needed to further explore the relationship between teacher performance and student behaviors. Such information is critical as the ultimate goal is to enhance and enrich the student's learning and experiences. Last, the current study did not assess for individual learner characteristics at baseline, in terms of skill set repertoire, learning style and critical thinking skills. Due to the fact that each participant did start at a different baseline levels, it would be interesting to ask the question, "Does Critical Thinking

influence the way the participants engage in learning?” and “Does the participant’s Learning Style influence their learning behaviors?” and to what extent do these individual factor influence the performance outcome. Obtaining such information in future research will help in determining the type and amount of Mentoring needed for these individuals, which in turn might be helpful in designing an effective STM that fits different types of learners, and to identify those individual that might need additional support.

Finally, the theoretical frame for the Staff Training Model developed for this research should be applied to a variety of populations, stimuli and settings in order to ascertain the efficacy of the model and to further develop more efficacious and sustainable outcomes. It is critical to consider the internal and external factors of the organization and the individuals when developing strategies and interventions to address the components for an effective Staff Training Model. The well being, health and education of our future generation depends on the ability of our educators and mentors to implement evidence-based intervention approaches and strategies to address health and behavioral problems even as our educational systems deals with economic adversity.

**APPENDICES**

## Appendix A1

## Teaching Staff Letter of Solicitation

Dear Teacher,

I am conducting a study for my doctoral dissertation relating to using video self-monitoring during teacher training. This research study will add valuable information regarding how best to evaluate teacher's instructional methods when working with student with autism. The researcher will also examine any response differences between teachers being mentored from those who are not mentored.

As a working professional in the field of education working with children with autism, your experiences and participation are of great importance to the successful completion of the study.

I am requesting your assistance by agreeing to participate in the training. The training consists of 4 Phases. Phases 1 and 2 consist of a 1-hour in-service covering topic of autism, teaching methods and how to use the scoring form. Phase 3 consists of a 3-minute videotape of the teacher working with a student on an academic task, over four consecutive days, followed by the teacher scoring her/his own teaching method. Scoring will take 10-15 minutes to complete. Phase 4 consists of four 3-minute videotapes of the teacher working with a student on an academic task, without scoring. At the end of the study, the teacher will complete a questionnaire providing the researcher with feedback on his/her experience with the use of video self-monitoring as a teacher-training tool.

There are no known physical or psychological risks associated with participating in the study, although it is possible that you will not like the idea of being videotaped and critiqued. If this happens please let us know and we will stop the training procedure if that is your wish.

No personally identifiable information will be associated with your responses in any published and reported results of the study. All videotapes will be coded to assure anonymity.

Your participation is voluntary. You may request that videotaping be stopped at any time.

I would greatly appreciate if you would let me know if you wish to participate in the study within a week of receiving this letter, by informing your school secretary, who will relay that information to me. I will follow up with the school secretary 1 week after you receive this letter.

If you have any questions about this study please don't hesitate to contact me via email at [lina.slimtopdjian@student.shu.edu](mailto:lina.slimtopdjian@student.shu.edu) or via phone at (908) 313-5235.

Thank you very much for your assistance.  
Sincerely,

Lina Slim, MA, CCC-SLP, CBBA / Researcher

## Appendix A2

## Teaching Staff Consent Form

***Study Title: Exploring A Staff Training Model For Enhancing Post-Training Procedural Integrity And Staff Performance Outcomes, When Working With Children Diagnosed With ASD.***

***Affiliation:***

The researcher of this study is Lina Slim, MA, CCC-SLP, BCBA, a doctoral student of the School of Health & Medical Sciences at Seton Hall University.

***Purpose of the Study:***

The purpose of the study is to investigate the relationship, which may exist between a staff-training model and the teacher's application of instructional strategies when working with children diagnosed with Autism.

***Procedure:***

The teacher training consists of 4 Phases. Phases 1 and 2 consist of a 1-hour in-service covering topic of autism, teaching methods and how to use the scoring form. Phase 3 consists of a 3-minute videotape of the teacher working with a student on an academic task, over four consecutive days, followed by the teacher scoring her/his own teaching method. After scoring, the teacher will complete a Reflection journal answering three questions about his or her experience with the video self-monitoring tool. Scoring and Reflection time will take 10-15 minutes to complete. Phase 4 consists of four 3-minute videotapes of the teacher working with a student on an academic task, without scoring. At the end of the study, the teacher will complete a questionnaire providing the researcher with feedback on his/her experience with the use of video self-monitoring as a teacher-training tool.

***Voluntary Participation:***

The teacher's participation is voluntary and may request that videotaping be stopped at any time.

***Anonymity:***

The teacher's participation, identity and information provided will be kept anonymous. All videotapes will be coded to assure anonymity. The teacher's name will be wiped out and any identifying facial features on the videos will be blurred out. The videos will only be used for research purposes only.

***Confidentiality:***

Protection and confidentiality will be maintained throughout the duration of the research project. Similarly, all electronic data will be stored on a USB memory key with access to the file protected by use of a password only known to the researcher and only shared with you, the researcher and her dissertation committee. The data and videos will also remain in a secured filing cabinet for three years, then destroyed.

***Potential Risks:***

There are no known physical or psychological risks associated with participating in the study, although it is possible that you will not like the idea of being videotaped and critiqued. If this happens please let us know and we will stop the training procedure if that is your wish.

***Potential Benefits:***

By participating in the study you will add valuable information in support of better assessment of teaching methods when working with student with autism.

***Alternative Interventions:***

The alternative to the teacher participating in this study is to not participate in this study. This is not a treatment study and therefore does not affect any current treatment procedures that the teacher may be involved in.

The teacher will be given a copy of this signed and dated Consent Form stating that his or her permission was given for you to participate in the study.

***Contact Information:***

If you have any questions or concerns about this study please contact the Principal Investigator (Lina M. Slim) through the office of Dr. DeLuca, Dissertation Chair, Department of Graduate Programs in Health Sciences at (973) 275-2076, 400 South Orange Avenue, South Orange, NJ 07079, or the Seton Hall Institutional Review Board at (973) 313-6314, or by email at [lina.slimtopdjian@student.shu.edu](mailto:lina.slimtopdjian@student.shu.edu) or via phone at (908) 313-5235.

**Teaching Staff Consent Form**

I agree to participate in the study.

Teaching Staff Name (please print) \_\_\_\_\_

Teaching Staff Signature \_\_\_\_\_

Date \_\_\_\_\_



## Appendix B1

## Parental/Legal Guardian Letter of Solicitation

Dear Parents,

I am a doctoral student of the School of Health & Medical Sciences at Seton Hall University, conducting a study for my dissertation relating to using video self-monitoring during teacher training, as an assessment tool to evaluate a teacher's teaching method.

I am writing you this letter to get your permission for me to ask your child to take part in my study. The purpose of my study is to find the best strategy to help teachers improve their teaching method when working with a child with autism.

The teacher will be videotaped working with your child, for 3-minutes for 4 days, then once a week, for 4 weeks.

Your child's part in this study is voluntary and he or she can stop the videotaping at any time.

Although your child may or may not be in the video, your child is NOT involved in the study, and your child's behavior is NOT being evaluated. It is ONLY the teachers that are being trained and evaluated.

All personal information about your child will be kept confidential and will not be shared. On the videos your child will not be recognizable. The videos will only be used for research purposes only.

All information and videos will be stored and protected by a password that is only shared with the researcher and you, and her doctoral committee. The information and videos will also remain in a secured filing cabinet for three years, then destroyed.

No pain or discomfort will come to your child by being in the video, and if you child is ever unhappy we will stop the video.

This study will help identify better training methods that will support teachers when working with children with Autism.

You and your child may see the videotape or ask the tape to be destroyed at any time.

If you agree, please sign the Consent Form given to you.

If you have any questions about this study please don't hesitate to contact me via email at [lina.slimtopdjian@student.shu.edu](mailto:lina.slimtopdjian@student.shu.edu) or via phone at (908) 313-5235.

Thank you very much for your assistance.

Sincerely,

Lina Slim, MA, CCC-SLP, BCBA / Researcher

## Appendix B2

## Parent/Legal Guardian Consent Form

***Study Title: Exploring A Staff Training Model For Enhancing Post-Training Procedural Integrity And Staff Performance Outcomes, When Working With Children Diagnosed With ASD.***

***Affiliation:***

The researcher, Lina Slim, MA, CCC-SLP, BCBA, is a doctoral student of the School of Health & Medical Sciences at Seton Hall University.

***Purpose of the Study:***

The researcher is writing this letter to ask the parent's permission to ask their child to participate in the study. The purpose of my study is to find the best strategy to help teachers improve their teaching method when working with a child with autism.

***Procedure:***

It is possible that the child is in the video while the teacher is being trained, however, the child is NOT the subject of the study and the child's behavior is NOT being evaluated. It is the teacher that is being trained and evaluated. If the parent gives permission to ask their child to participate in the study then they will sign the consent form and return it to the school secretary who will place it in an envelope, which is then sealed and handed over to the researcher. The researcher will contact the school secretary 1 week after parents receive the consent forms to collect the forms that have been signed. Then the researcher will contact the teachers and request of them to ask the child for permission to be videotaped by presenting the child the Child Assent Script. Once the Child Assent Script is signed and approval is received, the child will then be able to participate in the study.

The teaching staff will be videotaped working with the child, for the duration of 3-minutes, over a period of 4 days, then once per week for the following 4 weeks.

***Voluntary Participation:***

The child's participation in this study is voluntary. The parent and/or the child have the right to stop the videotaping at any time, without any questions asked with no penalty or loss of benefits to which the parent or the child are otherwise entitled.

***Anonymity:***

All information about this study will be kept secret and will be coded. All personal identifiable information about the child will be kept confidential and will not be shared. The child's name will be wiped out and any identifying facial features on the videos will be blurred out. The videos will only be used for research purposes only.

***Confidentiality:***

Protection and confidentiality will be maintained throughout the duration of the study. No personal identifying information will be collected from the child, and any information will be kept confidential. All information will be kept in a locked filing cabinet in the Researcher's home for three years after which time all data will be destroyed. Similarly, all electronic data will be stored on a USB memory key with access to the file protected by use of a password only known to the researcher and only shared with the parent, the researcher and her dissertation committee. The memory key will also remain in a secured filing cabinet for three years, upon which time the data will be destroyed.

***Potential Risks:***

No pain or discomfort will come to the child by being in the video, and if the child is ever unhappy videotaping will stop.

***Potential Benefits:***

The child's participation in this study will help identify better teacher training methods that will support teachers when working with children with autism.

***Alternative Interventions:***

The alternative to the child participating in this study is to not participate in this study. This is not a treatment study and therefore does not affect any current treatment procedures that the child may be involved in.

The parent will be given a copy of this signed and dated Consent Form stating that they give permission for their child to be asked to participate in the study.

***Contact Information:***

If you have any questions or concerns about this study please contact the Principal Investigator (Lina M. Slim) through the office of Dr. DeLuca, Dissertation Chair, Department of Graduate Programs in Health Sciences at (973) 275-2076, 400 South Orange Avenue, South Orange, NJ 07079, or the Seton Hall Institutional Review Board at (973) 313-6314, or by email at [lina.slimtopdjian@student.shu.edu](mailto:lina.slimtopdjian@student.shu.edu) or via phone at (908) 313-5235.

Appendix B2

Parent/Legal Guardian Consent Form

I give permission for my child to be asked to participate in the study.

Parent/Legal Guardian's Name (please print) \_\_\_\_\_

Parent/Legal Guardian's Signature \_\_\_\_\_

Date \_\_\_\_\_

Appendix C

Child/Student Letter of Solicitation

Dear Friend,

My name is Lina Slim and I am going to take a picture of your teacher. Sometimes you are in the picture too. And guess what? Only your mommy, your daddy and your teacher can see your picture.

Do you want me to take a picture of you?

If you say yes, please color the green circle.

If you say no, please color the red circle.

You can tell me what you want, or ask your mommy and daddy to tell me.

My phone number is (908) 313-5235.

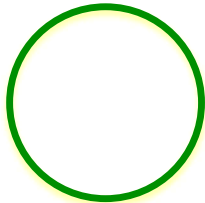
Thank you so much for being such a big helper!

Your Friend,

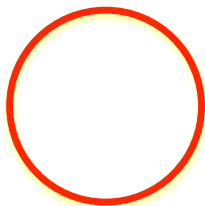
Lina Slim, MA, CCC-SLP, BCBA

Researcher

Child Assent Script



Yes, you can take a picture of me



No, you cannot take a picture of me

Child/Student Name \_\_\_\_\_

Date \_\_\_\_\_

## Appendix D

## The Learn Unit and TPRA Definitions

1. **The Learn Unit (LU)**

**Learn Units** measure the behavior of the teacher, teaching device, and the responses of the student.

The **Learn Unit** is comprised of:

1. The behavior of the teacher:  
Which includes gaining the attention of the student and the subsequent presentation of the antecedent stimulus
2. The student's behavior:  
The student's opportunity to respond to the antecedent stimulus presented
3. Immediate feedback provided by the teacher:  
Reinforcement for a correct response or Error Correction Procedure for an incorrect response

**Learn Units** are described as two or more interlocking three-term contingencies between the teacher and the student that are present during effective instruction (Albers & Greer, 1991; Bahadourian, Tam, Greer, & Rousseau, 2006; Diamond, 1992; Emurian, 2004; Greer, 1994; Greer, McCorkle, & Williams, 1989; Greer & McDonough, 1999; Greer & Ross, 2008; Hugin, 1996).

One of the main characteristics of the CABAS programs is that all instruction is designed, provided and recorded as learn units. A **Learn Unit** (Greer & McDonough, 1999; Bahadourian, 2000; Greer, 2002) is a basic unit of teaching identified to measure the behavior of a teacher or a teaching device and the student response. It was described as the interlocking three-term contingencies of teacher and learner, with at least two contingencies for the teacher and a potential one for the student (Greer & Ross, 2008).

The **Learn Unit** definition was based on Skinner's programmed instruction frames (Skinner, 1968) and was developed including findings from the applied research about academic engaged time (Greenwood, Horton, & Utley, 2002), corrections (Skinner, 1968) opportunity-to respond (Cooper, Heron, & Heward, 1984) and computer-based instruction (Kulik & Kulik, 1991).

The **Learn Unit** was defined as an accurate predictor of educational outcomes in the classroom and at home (Bahadourian & Greer, 2005; Bahadourian, Tam, Greer & Rousseau, 2006) and, according to Greer & Ross (2008) "is necessary, if not sufficient, for teaching new operants". In CABAS, **Learn Units** are basic behavior principles of teaching and analysis of the learn unit in context is the main analytic tool and a fundamental component of the analysis of instruction (Greer, 2002; Perini & Casarini, 2009). Stimulus-stimulus pairings are prominent tactics also, particularly for developmental interventions. In addition verbal behavior developmental

interventions are key components of the model. As a principle of pedagogy, Learn Units were identified as what Skinner (1953) defined frames in programmed instruction and later isolated as a natural dimension or “fracture” of the science of teaching. In other words, they were found to be the *least divisible component of instruction* that, including both student and teacher, *represents the reciprocal teaching-learning interaction that predicts new stimulus control for the student* (Greer, 1994; Greer, 2002). Before they were identified as the key unit of effective teaching (Albers & Greer, 1991), p. 134

## 2. **Teacher Performance Rate and Accuracy Scale (TPRA)**

The Teacher’s Performance Rate and Accuracy Scale (**TPRA**) is a tactic designed to increase correct student responses and correct teacher Learn Unit presentations. Ingham and Greer (1992) and Ross, Singer-Dudek, & Greer (2005) demonstrated the **TPRA** as an effective observational tool for *measuring intact, accurate, and fast rates of learn unit presentations*. Faster rates of intact, accurate learn units result in better student performance. A supervisor conducts **TPRA’s** while a teacher conducts a program with one or more students. The supervisor *records data for the antecedent, behavior, and consequence for the teacher and the student for each Learn Unit presentation*. While the supervisor is observing the presentation of each Learn Unit and recording data for the antecedent, behavior, and consequences, the teacher’s rate is also being conducted. A timer is utilized to record the presentation of the program in its entirety to determine how quickly the Learn Units are presented.

Appendix E

TEACHER PERFORMANCE RATE AND ACCURACY SCALE (TPRA) – *Abbreviated Version*

**Observer/Rater:** \_\_\_\_\_ **Student Initials:** \_\_\_\_\_ **Materials Ready:** Yes / No  
**Teacher Code#:** \_\_\_\_\_ **Program(s):** \_\_\_\_\_  
**Date:** \_\_\_\_\_ **Duration:** 3 minutes including →  $\geq 3$  error opportunities observed

Record a (✓) for accurate teacher Antecedent & student Behavior. **Circle a (✓)**  
 For incorrect or absent teacher A & student Behavior.

Record **R** for accurate Reinforcement consequence. **Circle error**  
 or absent **C** behaviors.

Record **C** for accurate error Correction procedure consequence. **Circle error**  
 or absent **C** behaviors.

Record a (+) for accurate Learn Unit and Error Correction presentation. **Record a (-)**  
 For incorrect LU and EC presentation.

Objectives LU	Learn Unit					Error Correction						Comments	
	A	B	R/C	LU-R	LU-C	A <sup>2</sup>	PB	No-R	D	NewLU	EC		
1.													<u>Recommendations:</u>
2.													
3.													
4.													
5.													
6.													
7.													
8.													<u>Strengths:</u>
9.													
10.													
11.													
12.													
13.													
14.													
15.													
Correct #													Average ROI Corr. LU Per Minute (LU-R+LU-C) / min.
Error#													Average ROI Error LU Per Minute (LU-R+LU-C) / min.
% Correct													Average % LU Accuracy Per Minute Avg. ROI Corr. LU Per Minute / (Avg. ROI Corr. LU Per Minute + Avg. ROI Err. LU Per Minute) = %
% Error													

LU = Learn Unit / IT = Instructional Trial / A = Antecedent / B = Student Behavior / + = Correct / - = Error or Absence / R = Reinforcement / C = Correction / PB = Prompted Behavior / D = Distractor(s)



## Appendix F

## Eligibility to Participate in the Research Study

The principal investigator (Lina Slim) is conducting a study to investigate the relationship between a staff training model and the application of an instructional unit and the error correction procedure when working with children diagnosed with Autism. Participation in this study requires that individuals be between the ages of 18 and 55 years old, women or men, and fluent English speakers for more than 5 years.

Please answer the following questions by checking the box next to the answer that best describes you:

Name: \_\_\_\_\_ Date \_\_\_\_\_ Code#: \_\_\_\_\_

1- Gender:  Woman  Man

2- Age: \_\_\_yrs.  18 yrs.– 22 yrs.  23 yrs.– 30 yrs.  30 yrs.– 40 yrs.  40 yrs.– 55 yrs.

3- Fluent English speaker for more than 5 years:  Yes  No

4- Education:

Associates Degree  High School  Baccalaureate Degree

Graduate Degree  Post-Graduate Degree

5- Work Experience with children diagnosed with Autism: \_\_\_\_\_yrs.

Less than 1 year  1year to 3 years  3 years to 5 years

5 year to 10 years  More than 10 years

6- Familiarity with the Principal Investigator's background:

Very Familiar  Familiar  Somewhat  Minimally  Not at all

Please return the completed form to the Principal Investigator of the study.

Thank you for completing this brief questionnaire.

Lina Slim, MA, CCC-SLP, BCBA

Principal Investigator

## Appendix G

### Script for Phases 1 of the Study

The attached power point presentation will be used during the in-service presentation of Phase 1 and 2 of the study. The ppt. will have embedded in it video clip scenarios to be used for the video training Phase 2 of the study.

The Principal Investigator will conduct Phases 1 and 2 of the study consisting of the formal in-service using the ppt. presentation and video clip scenarios for video training.

The verbal instruction will be based on the written script in the ppt.

Teachers who complete Phase 1 & 2 of the staff training protocol will be included in the study and will have the opportunity to participate in the study if that is what they wish.

Appendix G1

Video Training Module – Staff Training Model

*Exploring A Staff Training Model  
For Enhancing Post-Training Procedural Integrity  
And Staff Performance Outcomes;  
When Working With Children Diagnosed With ASD –  
Video Training Module*

By  
Lina Slim  
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Chair – Dr. D. DeLuca  
Dr. T. Cahill  
Dr. G. Zipp

*What You Will Learn*

- Define Basics in Applied Behavior Analysis
- Define the Learn Unit
- Define the Principles of Errorless Learning
- Define Error Correction Procedure
- Define Instructional Program Administration
- Define and Describe Teacher Pacing
- Define and Describe the TPRA

*What You Will Learn*

- Define Basics in Applied Behavior Analysis

*Applied Behavior Analysis –  
Definition*

ABA = The science in which procedures:

- Are derived from the principles of behavior
- Are systematically applied to
- Improve socially significant behavior to a meaningful degree and
- Demonstrate experimentally that the procedures employed were responsible for the improvement in behavior

*Dimensions of ABA  
(Baer, Wolf, & Risley, 1968, 1987)*

1. **Applied** – socially significant, meaningful to individual, or important to change
2. **Behavioral** – observable & measurable behavior
3. **Analytic** – demonstrate “functional” relationship between environmental events and the behavior. Causal not correlational
4. **Technological** – procedures are completely identified & precisely described
5. **Conceptually Systematic** – procedures are based on the principles of behavior
6. **Effective** – techniques must improve behavior to a practical degree
7. **Generality** – lasts over time, appears in non-training environment, or spreads to other behaviors not directly trained

*REVIEW*

Appendix G1


Video Training Module – Staff Training Model (Continued)

*What is ABA?*

Science of \_\_\_\_\_ applied to  
s\_\_\_\_\_ s\_\_\_\_\_ behavior

*Learning is...*


Change in \_\_\_\_\_ due to experience.  
Science of Behavior = Science of \_\_\_\_\_



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*The 7 ABA characteristics*

- **A** \_\_\_\_\_
- **B** \_\_\_\_\_
- **A** \_\_\_\_\_
- **T** \_\_\_\_\_
- **C** \_\_\_\_\_
- **S** \_\_\_\_\_
- **E** \_\_\_\_\_
- **G** \_\_\_\_\_




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*The 4 Basic Principles of Behavior*

1. Behavior is strengthened or weakened by its consequences
2. Behavior ultimately responds better to positive consequences
3. Reinforcement & Punishment are defined by their effects on behavior
4. Behavior is largely a product of its immediate environment


Cooper, J. D., Heron, T. E., & Neeward, W. L. (2006). *Applied Behavior Analysis*. Columbus, OH: Merrill.  
Latham, G. I. (1994). *The Power of Positive Parenting*. Logan, UT: P & T Inc.



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*ABC = "Three-Term Contingency"*  
*Operational Definitions*

- **A-Antecedent:**
  - All that happens prior to a Behavior – what gets the behavior going
  - The situation, setting, environment, or presence of a specific cue or signal
  - Discriminative Stimulus  $\Delta^D$
- **B-Behavior:**
  - A response – Anything the organism says or does
  - The act of "doing" under a particular situation/setting.
  - Which results in a change in the setting
- **C-Consequence:**
  - Whatever happens after the behavior – What keeps the behavior going
  - Feedback or outcome
  - The consequence will make the likelihood of performing that specific action or behavior again stronger or weaker



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*Operant Conditioning Types*


1. **Reinforcement** – Arranging consequences to **Increase** Target Behavior or will increase the probability of a target behavior to increase in future events.
2. **Punishment** – Arranging Consequences that **Decrease** Target Behavior or which will increase the probability of similar behaviors to decrease in future events.



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The consequence or stimulus that increases that behavior in the future is called a **Reinforcer**

The consequence or stimulus that weakens that behavior in the future is called a **Punisher**



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Appendix G1

Video Training Module – Staff Training Model (Continued)

**REVIEW**




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*What does ABC mean?*

**A** \_\_\_\_\_

**B** \_\_\_\_\_


**C** \_\_\_\_\_



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*Basic Principles of Behavior*

1. Behavior is s \_\_\_\_\_ or  
w \_\_\_\_\_ by its c \_\_\_\_\_.
2. Behavior ultimately responds better  
to \_\_\_\_\_ c \_\_\_\_\_.
3. Reinforcement and punishment are defined by  
their \_\_\_\_\_ on \_\_\_\_\_.
4. Behavior is a product of its \_\_\_\_\_  
\_\_\_\_\_.



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*Basic Principles of Behavior*

The procedure that *strengthens* behavior is...  
→ R \_\_\_\_\_.


The procedure that *weakens* behavior is...  
→ P \_\_\_\_\_.

Reinforcers & punishers are *relative!!*

What one person perceives as a r \_\_\_\_\_ may not be liked  
by the next person.

When Using Negative Consequences to Manage Behavior:  
Results are → s \_\_\_\_\_-l \_\_\_\_\_.


Possible unwanted → l \_\_\_\_\_-t \_\_\_\_\_ s \_\_\_\_\_-e \_\_\_\_\_.



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*What You Will Learn*


- Define Basics in Applied Behavior Analysis
- Define the Learn Unit



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*Learn Unit - LU*

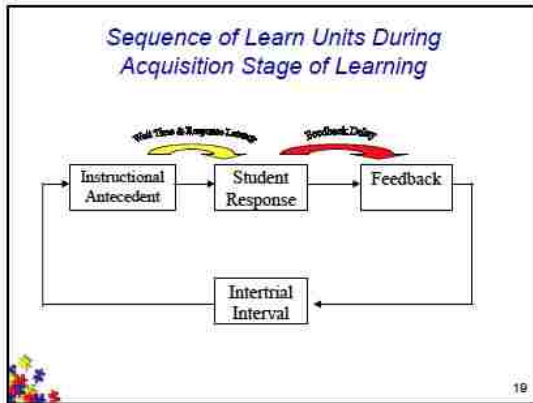
- An instructional frame based on Skinner's programmed instruction (1968)
- A fundamental measure of teaching and the strongest predictor of effective teaching (Greer, 2002; Greer & McDonough, 1999; Greer & Ross, 2008)
- An interlocking three-term contingency that consists of the teaching staff's antecedent, the student's response, and the consequence (Greer 2002; Greer et al., 1999);
  - Consists of specific teaching staff and student interactions that result in student behavioral change (Greer, Yaun, & Gautreaux, 2005)
- A measure of instructional validity and its presence is critical for the establishment of the reliability of an intervention



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Appendix G1

Video Training Module – Staff Training Model (Continued)



**TEXT BOX 2.4**  
*Presenting Learn Units*

Basic student teacher interactions are called learn units and consist of the following steps:

- 1: Obtain the student's Attention before presenting the antecedent.
- 2: Present flawless Antecedents, including written or vocal stimuli.
- 3: Wait three to five seconds for the student to initiate a Response.
- 4: For correct responses, immediately present Reinforcement.
- 5: For incorrect responses, immediately give a Correction by presenting the antecedent again, modeling the correct response, and ensuring that students emit the correct response. DO NOT REINFORCE the corrected response; rather, *introduce the next Learn Unit*
- 6: Move quickly to the next learn unit. Continue this sequence until a predetermined number of learn units (usually 20 for each response) is presented.

Greer, D. R., & Niss, D. E. (2008). Verbal Behavior Analysis: Inducing and expanding New Verbal Capabilities in Children with Language Delays. Pearson Education Inc.

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*Appendix J4 –  
Performance Feedback Script &  
Score Form for LU-EC*

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*What You Will Learn*

- > Define Basics in Applied Behavior Analysis
- > Define Behavioral Terminologies
- > Define the Learn Unit
- > Define the Principles of Errorless Learning
- > Define Error Correction Procedure

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*Principles of Errorless Learning*

- > Gaining **Stimulus Control**
- > **Most-to-Least Prompting**
- > **Accountability** of the instructor
- > **Performance Measure** for instructor

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Appendix G1

Video Training Module – Staff Training Model (Continued)

### Errorless Learning – Principles

1. Involves presenting instruction
2. Using prompts, so the child responds correctly
3. Systematically fading the prompts as the child completes the task more & more independently

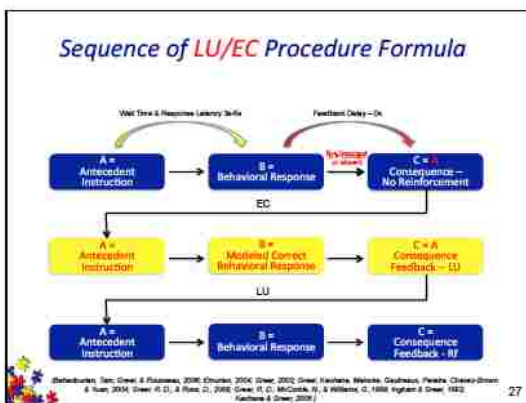
➤ *Errorless Teaching* based on the theory that children with autism do not learn as successfully from their mistakes as typical children may, but instead continue to repeat them.

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### Error Correction Procedure - EC

- An *EC* Procedure is based on the principles of *Errorless Learning* whereby efforts are made to minimize opportunities of error-learning and increase opportunities of correct learning.
- An *EC* procedure involves the implementation of a correction procedure immediately following an incorrect response and it follows a *three-term contingency*.

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### EC Procedure – Using Textual Prompt

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### EC Procedure – Using Gestural Prompt

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### EC Procedure – Using Textual Prompt

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Appendix G1

Video Training Module – Staff Training Model (Continued)

*Appendix J4 –  
Performance Feedback Script &  
Score Form for LU-EC*



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*Learn Unit –  
Using Gestural Prompt Fading*




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*What You Will Learn*

- Define Basics in Applied Behavior Analysis
- Define Behavioral Terminologies
- Define the Learn Unit
- Define the Principles of Errorless Learning
- Define Error Correction Procedure
- **Define Instructional Program Administration**




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*Instructional Program Administration*

Procedures for Working with Children 1:1 and Delivering Instruction:


- *Be Prepared*
- *Choices*
- *Seating*
- *Organize* – Table should only have teaching material
- *Attention of Learner*
- *Prompt Selection*
- *Learn Units*



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*What You Will Learn*


- Define Basics in Applied Behavior Analysis
- Define Behavioral Terminologies
- Define the Learn Unit
- Define the Principles of Errorless Learning
- Define Error Correction Procedure
- Define and Describe the Teaching Procedure
- Define Instructional Program Administration
- **Describe Teacher Pacing/Rate of Instruction**



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*Pacing of Instruction*

- **Teacher Pacing or Rate of Instruction (ROI):** The speed with which a teacher delivers instruction.
  - Measured by the rate or duration by which a teacher conducts instructional learn units
- **Teacher Pacing:** *Teacher-controlled variable* with potential effects on:
  - ROI (e.g., response opportunities per min, LU per min)
  - Student Performance during instruction (e.g., total academic response rate, correct rate, off-task behavior)
  - Student Learning (e.g., acquisition, maintenance, and generalization of lesson objectives)



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Appendix G1

Video Training Module – Staff Training Model (Continued)

### Myth Regarding Instructional Pacing

- **Myth#1:**  
Students with disabilities can learn, but they learn more slowly. Therefore, instruction should be conducted at a slower pace and the students given extra time.  
✓ *slowing down the pace of instruction makes things worse, not better!*
- **Myth#2:**  
Rapid pacing means that teachers should hurry their presentation
- **Myth#3:**  
Teachers should rush students in terms of the time they are given to respond
- **Myth#4:**  
Teachers should rush or eliminate praise and/or corrective feedback to students after they respond  
✓ *A rapid presentation pace DOES mean → reducing the time between instructional Learn Units*

Tincani, Emsberger, Harrison, & Heward (2005) found that fast paced teaching differentially increased 4 preschool students' rate of responding and rate of correct responding and decreased off-task behavior.

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### What Contributes to Slow Teaching?

- Insufficient Preparation Prior To Lesson
- Unnecessary Transition And Management Time
- Long Inter-Trial Time (ITT)
- Time-Consuming Error Correction Procedure

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### Ways to Increase Teaching Pace

- Preparing and Practicing the Lesson Beforehand
- Developing a System of Cues – to mark your place during lessons, providing needed details, or indicating next steps
- Limiting Transition Time – during lesson
- Using Short Inter-Trial Time
- Correcting Students' Errors:
  - ✓ Directly
  - ✓ Efficiently
  - ✓ Correctly


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### Fast Paced Instruction – GP



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### Rapid Tacting



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### Learn Unit – Using Script Fading

SJ– 10:19



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Appendix G1

Video Training Module – Staff Training Model (Continued)

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Appendix G1

Video Training Module – Staff Training Model (Continued)

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## Appendix G2

## Performance Feedback Script and Score Form for LU/EC

Answer with Yes or No to the following questions:

1. Did you obtain the student's Attention before presenting the antecedent  Yes  No
2. Did you present flawless Antecedents, including written or vocal stimuli  Yes  No
3. Did you wait 3 seconds for the student to initiate a response  Yes  No
4. Did you immediately present Reinforcement after correct responses  Yes  No
5. Did you follow the Error Correction procedure after incorrect responses  Yes  No
  - 1) Did you immediately give a Correction by presenting the Antecedent again, modeling the correct response, and ensuring that students emit the correct response  Yes  No
  - 2) Did you abstain from reinforcing the corrected response  Yes  No
  - 3) Did you immediately introduce the next Learn Unit after the modeled corrected response  Yes  No
6. Did you move quickly to the next Learn Unit  Yes  No
7. Did you continue this sequence until the predetermined number of LU is presented  Yes  No

**Performance Feedback Score:**

**Total:** \_\_\_\_\_ / 10 = \_\_\_\_\_ % acc.

## Appendix G3

## Video Performance Feedback

## Sample List of Strengths and Needs For Improvement Strengths

**Sample List of Strengths:**

1. Fast-Paced Instruction
2. High Energy and Momentum
3. High and Appropriate Praise
4. Social Praise
5. Behavior-Specific Praise
6. Interspersal of Instructional Trials and Learn Units
7. Preference Choice Assessment
8. Use of Manding with Autoclitics
9. Increased Incidental Learning Opportunities

**Improvements Opportunities:**

1. Establish attending prior to presenting antecedent in order to avoid unnecessary repetitions of antecedents
2. Apply the Error Correction procedure across settings and programs (Learn Units and Incidentals)
3. Data collection needs to be ongoing
4. Intersperse mastered when implementing the Error Correction procedure
5. Use behavior-specific praise
6. Avoid subjective praise such as “Good boy” or “You’re so smart” etc.
7. Identify the prompt levels for each program and fade within the session
8. Use time delay to foster independence
9. Use full sentences to match the learner’s verbal behavior
10. Praise incidental requests (i.e., “look...”)
11. Avoid non-verbal gestures of discontent when the incorrect response is provided.

## Appendix G3

## Sample List of Strengths and Needs For Improvement Strengths (Continued)

12. Limit the number of material present in the learner's visual field to target items.
13. Using a reinforce book or a board stating the reinforcer to be earned after a certain number of Instructional trials or time period may promote expanding is community of reinforcers.
14. Use of polite responses: "Yes please" "No Thank you"; "Give me a bead **please**"  

You may also incorporate: "[**name** of therapist/teacher] give me **the** [item] **please**" followed by "**Thank you**"
15. Provide a variety of verbal behavior that effects a similar outcome: "May I have ----." Or "Can I have the ---- please", "I want the ---- please"
16. When Learner mands independently follow by natural verbal responding "sure! Here you go" followed by having him reciprocate with "Thank you"
17. Instead of tapping your index finger on your nose prompting Learner to look at you either interrupt his activity by gently placing your hand on his hands and waiting or combine with a static GP to your eyes.
18. Limit the number of items in an activity in order to teach appropriate play sequence and do so using either a forward, backward or total task approach (i.e., stringing beads, stacking rings/blocks, puzzles, placing items in a container etc.)
19. Identify your own verbal behavior when teaching the learner in order not to create confusion: instead of "Give me string" followed by "Give me beads" followed by "Give me all the beads" chose one verbal statement you would like him to learn, understand and use such as "May I have the beads, please". You can teach the quantity concept "All" in parallel but under a structured task.
20. Learner has verbal behavior that allows him to start a reading program and using textual prompts in conjunction with verbal prompts.
21. When he asks for a reinforcer select it (i.e. puppet)
22. When Learner emits vocal stereotypy in the form of non-contextual laughter apply Planned Ignoring and Redirecting instead of gaining attention to the behavior by stating, "You need to be quiet" (step back and assess the function of his behavior, and identify the intervention tactics).

## Appendix G3

## Sample List of Strengths and Needs For Improvement Strengths (Continued)

23. Avoid negative responses such as “No, you don’t put it in your mouth” “Don’t put it in your face” (zoom ball) and instead demonstrate visually and verbally what you would do with the object at hand and praise appropriate manipulation (i.e. black putty)
24. The S<sup>D</sup>”Look at me” needs to be immediately followed by appropriate responding “eye contact” if not implement the EC procedure by using manual prompts (on the side of the face NOT under the chin lead)
25. During an expressive picture identification program the pictures used have the label on the back (no need to turn the photo to recognize the picture)



Appendix H  
Reflection Prompts

**Name:** \_\_\_\_\_ **Code#:** \_\_\_\_\_ **Date:** \_\_\_\_\_

Please answer the following questions as truthfully as possible:

1. Based on your video observations and analysis of your performance, your self-evaluation and answers in Appendix B, and the Performance Feedback you received from the supervisor/mentor, what were the identified areas for improvement?
2. Based on your video observations and analysis of your performance, your self-evaluation and your answers in Appendix B and the Performance Feedback you received from the supervisor/mentor, what are the changes in your behavior that you will make for the next session?
3. Based on your observation and analysis of your performance, your self-evaluation and your answers in Appendix B, and the Performance Feedback you received from the supervisor/mentor, please *reflect* by providing your thoughts and opinions on the quality, effectiveness, value/meaningfulness, and functionality of this Staff-Training Model?

Appendix I

Site Approval Letter

**SEARCH Consulting**

**Principal Investigator/Student:** Lina Slim, MA, CCC-SLP, BCBA

**Education Affiliation:** Seton Hall University  
School of Health & Medical Sciences  
400 South Orange Avenue  
South Orange, NJ 07079

**Dissertation Research Study Title:** Exploring A Staff Training Model For Enhancing Post-Training Procedural Integrity And Staff Performance Outcomes, When Working With Children Diagnosed With ASD.

**Research Site:** Research will be conducted at the following site, located at:

SEARCH Consulting  
1028 Springfield Avenue  
Mountainside, NJ 07092

Effective Date: April, 2014 – December, 2015

Appendix J

Site Approval Letter

**ABA4U**

**Principal Investigator/Student:** Lina Slim, MA, CCC-SLP, BCBA

**Education Affiliation:** Seton Hall University  
School of Health & Medical Sciences  
400 South Orange Avenue  
South Orange, NJ 07079

**Dissertation Research Study Title:** Exploring A Staff Training Model For Enhancing Post-Training Procedural Integrity And Staff Performance Outcomes, When Working With Children Diagnosed With ASD.

**Research Site:** Research will be conducted at the following site, located at:

ABA4U

1000 Galloping Road Suite 301

Union, NJ 07083

Effective Date: April, 2014 – December, 2105

## Appendix K

## Recruitment Flyer for Educational Facility Administration

***Study Title: Exploring A Staff Training Model For Enhancing Post-Training Procedural Integrity And Staff Performance Outcomes, When Working With Children Diagnosed With ASD.***

***Investigator of the Research Study and Affiliation:***

My name is Lina Slim, MA, CCC-SLP, BCBA and I am a doctoral student of the School of Health & Medical Sciences at Seton Hall University.

I am the Principal Investigator of the study “Exploring A Staff Training Model For Enhancing Post-Training Procedural Integrity And Staff Performance Outcomes, When Working With Children Diagnosed With ASD.”

***Purpose of the Study:***

The purpose of the study is to investigate the relationship between a staff-training model and the teacher’s application of an instructional Learn Unit and the Error Correction procedure and Rate of instruction when working with children diagnosed with Autism.

***Procedure:***

Consent forms will be presented to teaching staff and sent out to parents giving permission to participate in the study. Once approval and all consent forms from teaching staff and parents are received, they will then be considered a participant in the study. The principal investigator will assign you a number code to protect their identity.

The study will commence by first taking three to five 1-minute videotapes of teaching staff presenting instructional units. Then, they will attend an in-service that would take about 2 hours. During the in-service the teaching staff will learn about behavior learning principles, watch videos of how a learn unit is implemented, learn how to score it using a scoring form, watch themselves presenting instruction and learn how to score their own application of a learn unit during instruction using the scoring form. After completion of the in-service, the teaching staff will receive one week of on-site staff training, whereby they will be videotaped everyday for a 1 min. of instruction time, then according to their daily schedule meet with the principal investigator to review the videotape and score their own performance on the application of the instructional unit. The principal investigator will be their mentor providing them with feedback and answering questions they might have. After scoring the teaching staff will complete a brief *Reflection* journal, answering three questions about their experience with the video training procedure. The *Reflection* is private and will not be discussed with the principal investigator. The

written *Reflection* will be collected by the principal investigator at each meeting and will be placed in an envelope sealed until the end of the study. The estimated time spent with the mentor is 15 minutes.

After one week of mentoring, the principal investigator will videotape the teaching staff instructional unit for the duration of one minute, every Monday over the next four weeks. The teaching staff will not be asked to view, score or meet with the principal investigator during this period of time.

At the end of the study, the teaching staff will complete a questionnaire giving the principal investigator feedback on their experience with the staff-training model implemented in this study.

***Voluntary Participation:***

The teaching staff and student participation is voluntary and they will have the right to discontinue participation at any time without any questions asked and with no penalty or loss of benefits to which you are otherwise entitled.

***Anonymity:***

The teaching staff and student participation, identity and information provided will be kept anonymous. This is accomplished by using a coding system to identify each teaching staff and will not include personal names, Social Security numbers, addresses, or other personal identifying information. Instead, they will be referred to in the research study document by assigning them a unique or random number code that does not represent your initials. In addition, the principal investigator will not share their name and other personal information pertaining to them, preserving their anonymity. Their names will be wiped out and any identifying facial features on the videos will be blurred out using a photo editing software.

***Confidentiality:***

Protection and confidentiality will be maintained throughout the duration of the research project. No personal identifying information will be collected from participants. However, upon completion of the study, the paper data will be kept in a locked filing cabinet in the Principal Investigator's home for three years after which time all data will be destroyed. Similarly, all electronic data will be stored on a USB memory key with access to the file protected by use of a password only known to the Principal Investigator and only shared with you, the Principal Investigator and her dissertation committee. The memory key will also remain in a secured filing cabinet for three years, upon which time the data will be destroyed.

***Potential Risks:***

The teaching staff or student will not incur any pain or physical discomfort by participating in the study, although it is possible that they will not like the idea of being videotaped and critiqued. If this happens please let us know and we will stop the training procedure if that is your wish.

***Potential Benefits:***

By participating in the study the teaching staff will learn effective instructional strategies that will have a direct benefit to the students they work with. The teaching staff's participation will also help us better develop effective staff training models to implement for teaching staff when working with children with Autism.

***Alternative Interventions:***

The alternative to the teaching staff and student participating in this study is to not participate in this study. This is not a treatment study and therefore does not affect any current treatment procedures that they may be involved in.

***Videotape:***

The teaching staff and student will have the right to request to view the tape and may request the tape to be destroyed at any time. All videotapes will be coded to assure anonymity. All videotapes will be destroyed at the end of the three-year period.

***Voluntary Nature of the Study:***

Participation in this study is completely voluntary. The teaching staff and student may refuse participation or withdraw permission at any time without penalty. If they do not participate, they may request that videotaping be stopped at any time.

***Contact Information:***

If you have any questions or concerns about this study please contact the Principal Investigator (Lina M. Slim) through the office of Dr. DeLuca, Dissertation Chair, Department of Graduate Programs in Health Sciences at (973) 275-2076, 400 South Orange Avenue, South Orange, NJ 07079, or the Seton Hall Institutional Review Board at (973) 313-6314, or by email at [lina.slimtopdjjan@student.shu.edu](mailto:lina.slimtopdjjan@student.shu.edu).

Thank you.

Lina Slim, MA, CCC-SLP, BCBA / Principal Investigator

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**SETON HALL UNIVERSITY**  
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September 24, 2014

Lina Slim-Topdjian  
33 Joss Way  
Millington, NJ 07946

Dear Ms. Slim-Topdjian,

The Seton Hall University Institutional Review Board has reviewed the information you have submitted addressing the concerns for your proposal entitled "Exploring a Staff Training Model for Enhancing Post-Training Procedural Integrity and Staff Performance Outcomes, When Working with Children Diagnosed with ASD." Your research protocol is hereby approved as revised.

Enclosed for your records are the signed Request for Approval form, the stamped original Consent Form, and the stamped original Assent Form. Make copies only of these stamped forms.

The Institutional Review Board approval of your research is valid for a one-year period from the date of this letter. During this time, any changes to the research protocol must be reviewed and approved by the IRB prior to their implementation.

According to federal regulations, continuing review of already approved research is mandated to take place at least 12 months after this initial approval. You will receive communication from the IRB Office for this several months before the anniversary date of your initial approval.

Thank you for your cooperation.

*In harmony with federal regulations, none of the investigators or research staff involved in the study took part in the final discussion and the vote.*

Sincerely,



Mary F. Ruzicka, Ph.D.  
Professor  
Director, Institutional Review Board

cc: Dr. Deborah DeLuca  
Dr. Terrence Cahill

**Office of Institutional Review Board**

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