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An Anchor Action Research Study on Student Achievement Utilizing the Teacher-Intern-Professor Model

David Curlette

ACCEPTANCE

This dissertation, AN ANCHOR ACTION RESEARCH STUDY ON STUDENT ACHIEVEMENT UTILIZING THE TEACHER-INTERN-PROFESSOR MODEL, by DAVID CURLETTE, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree, Doctor of Education, in the College of Education and Human Development, Georgia State University.

The Dissertation Advisory Committee and the student's Department Chairperson, as representatives of the faculty, certify that this dissertation has met all standards of excellence and scholarship as determined by the faculty.

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AN ANCHOR ACTION RESEARCH STUDY ON STUDENT ACHIEVEMENT UTILIZING THE TEACHER-INTERN-PROFESSOR MODEL

by

DAVID CURLETTE

Under the Direction of Dr. Chris Oshima

ABSTRACT

Professional development schools (PDSs) refers to the partnership among universities and schools that is a collaboration often designed to improve student achievement and professional development by blending the pedagogical theories found in university coursework with the practicalities of classroom teaching. A review of the literature over the last twenty years revealed that the PDS approach failed to show consistent student achievement at the school level. Moreover, several quantitative studies showed limited improvement or any value-added from PDS collaboration. Consequently, there is a need for more in-depth research on the PDS instructional strategy that might describe the effectiveness of this approach on student achievement and teacher preparedness, which also has been noted by Tunks and Neapolitan (2007). To address this need, the Teacher-Intern-Professor (TIP) model, from the Collaboration and Resources for

Encouraging and Supporting Transformations in Education federal grant (CREST-Ed), provides one possible solution for showing student achievement with teacher interns in PDSs. This TIP model for student achievement was assessed by utilizing Yin's methodology, described in his 2014 Case Study Research book, for combining data from several sources. The data sources for this study came from resident interns' Anchor Action Research (AAR) projects and interviews with resident interns, school leaders, and university district coordinators. The eight AAR quasi-experimental studies were combined using a meta-analysis, which resulted in an overall effect size of 0.102, along with two single-subject AAR projects, which produced effect sizes of 0.47 and 0.33, respectively. These effect sizes suggest that the interns taught as well as the certified teachers who had at least three years' experience. Also, a focus group and individual interviews documented the perceptions of the stakeholders' experiences, revealing three major themes: supports, yearlong preservice experience, and benefits from a summer Anchor Action Research course. These themes complemented the meta-analysis findings to describe more fully the effectiveness of the TIP model for student achievement at the classroom level.

INDEX WORDS: Anchor Action Research (AAR), Collaboration and Resources for Encouraging and Supporting Transformations in Education (CREST-Ed), Instructional Leadership, Teacher-Intern-Professor (TIP), Student Achievement, Professional Development School, Meta-analysis

AN ANCHOR ACTION RESEARCH STUDY ON STUDENT ACHIEVEMENT UTILIZING THE TEACHER-INTERN-PROFESSOR MODEL

by

DAVID CURLETTE

A Dissertation

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DEDICATION

This dissertation is dedicated to my dear friends, family, and committee members. Their continual and unconditional encouragement motivated me to push through long days and nights to complete this dissertation. I can only hope that my daughter embraces the work employed to achieve this degree as an example that by hard work and determination she too can accomplish her dreams.

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Definition of Terms

Encouraging and Supporting Transformations in Education (CREST-Ed) grant:

(1) " The CREST-Ed "grant was developed to meet the challenges of preparing and retaining teachers for the specific demands of teaching critical subjects in high needs schools in urban and rural localities" ("About Us," n.d.).

(2) "CREST-Ed is a data driven initiative that offers resources to address the needs of our partners and learners by preparing high-quality teachers and bolstering the existing workforce through targeted professional development so that new teachers will enter school environments designed to help them perform to the best benefits of their students" ("About Us," n.d.).

(3) "The mission of the CREST-Ed (Collaboration and Resources for Encouraging and Supporting Transformations in Education) project is to increase the quality and number of highly qualified teachers who are committed to high need schools in urban and rural settings" ("A Closer Look," 2015).

Teacher-Intern-Professor (TIP) model:

> The Teacher-Intern-Professor model was developed as a PDSC [professional development schools and classrooms] approach to support teaching interns' experience while working to improve student achievement in the classroom. These interns are student teachers seeking to obtain a renewable teaching certificate through programs delivered at either an undergraduate or a master's degree level. The interns participate in TIP groups that have (a) a university faculty member to help design the research and (b) a classroom teacher to provide the setting and general support for the research effort" (Curlette & Ogletree, 2011, p. 119)

Professional Development Schools (PDSs):

(1) Professional Development Schools is a collaboration between k-12 schools and colleges or universities primarily focused on student achievement and professional development.

(2) "A professional development school (PDS) is a collaboration between a school (including its teachers, administration, staff, students, and supporting community), that school's system or districts, and a postsecondary teacher-preparation institution – a college or university providing pre-service and in-service training to individuals within the school" (Ogletree, 2011, p. 15).

Anchor Action Research (AAR):

Anchor Action Research is concerned with changes in current policies and practices and includes three elements which allow researchers to anchor separate projects together into a potentially cohesive body of evidence. AAR projects are anchored (1) through commonalities among the studies in methodology, primarily quasi-experimental design, and (2) through the use of general construct underlying the outcome measures (which for education is typically defined as student academic achievement outcome variables) (Curlette & Ogletree, 2011, p. 120).

1 STUDENT ACHIEVEMENT UTILIZING THE TEACHER-INTERN-PROFESSOR MODEL

Over the past two decades, the professional development school (PDS) model, which is a collaboration between universities and k-12 schools, has not been able to show consistent student achievement results at the school level (Abdul-Haqq, 1998; Curlette, Hendrick, Ogletree, & Benson, 2014; Ogletree 2007; Ogletree, 2009). To address this issue, the units of analysis were defined as classrooms where professors work with mentor teachers and preservice teachers (intern resident teachers) for teaching a unit of instruction. More specifically, this group is called the Teacher-Intern-Professor (TIP) model for providing instruction. Much of the existing quantitative research on student achievement used the whole school or related grade levels as the unit of analysis. Each TIP group evaluates student achievement using a pre-posttest design with a comparison group in the same school (Curlette et al., 2014; Ogletree, 2009). This research design approach for the TIP model is called Anchor Action Research (AAR). The literature review provides more elaboration on TIP and AAR within the context of PDS. The PDS model involves a university or college student collaboration with a university professor and k-12 teacher to complete the teacher certification process. This process is known as student teaching. During this student teaching period, the college or university student completes a unit of instruction with the guidance from a certified classroom teacher and a university or college professor.

A particular PDS model, housed at Georgia State University, is the Teacher-Intern-Professor (TIP) model. The university students who are members of the TIP model are known as interns or intern residents. The interns student teach for an entire school year and conduct an Anchor Action Research project in the first semester and edTPA in the second semester. Anchor

Action Research (AAR) is the process of "anchoring" action research throughout teaching a unit of instruction. The AAR plans consist of action research sought to improve teaching and learning for possible student achievement gains (Ogletree, 2009). To evaluate the resident interns AAR plans and potential student achievement gains, a pretest and posttest compare a unit of instruction between the resident intern and a comparison certified teacher "by comparing the change from the pretest and posttest achievement means of the students in the TIP classroom(s) with the mean change of students in the comparison classroom(s)" (Curlette et al. 2014, p. 63). Data analysis from the pretest and posttest measures the student achievement gains. The resident interns assessing student achievement using a pre-posttest design with a comparison group summarizes the research design approach called Anchor Action Research (AAR). More elaboration of TIP and AAR within the context of PDS will be discussed in the literature review section.

The purpose of this study was to investigate the TIP with AAR approach using case study methodology. Perceptions were employed to study student learning documented through AAR utilizing instruction implemented by TIP residents within PDS middle and high school classes of local school instructional leaders, mentor teachers, TIP residents, and district coordinators. Through this case study method, it is expected that themes will emerge for making meaning about the training of the TIP residents and the instructional approaches employed by the TIP residents for student achievement.

This study provides additional qualitative data covering the implementation of the TIP model in PDS school(s) in middle and secondary classrooms for increasing student achievement through the TIP residents' Anchor Action Research (AAR) plans. Additionally, the study provides qualitative perception data of the stakeholders associated with the implementation of AAR plans in PDS high schools. Furthermore, additional research into PDS models is needed to see if

evidence can validate the use of the PDS model. Finally, conducting a quantitative study analyzing the pre-posttest scores adds credibility to this descriptive case study. This quantitative study employed meta-analysis to summarize the student achievement across the AAR studies.

This descriptive case study of the TIP model with AAR begins with research questions that influence the literature review, methodology, discussion, and results for this study. The review of the literature guided by the research questions provided the background for conducting this research. The literature review begins with an introduction of the need and purpose of this study followed by a description of the TIP model. The next two sections provide supporting literature on the history of PDSs, student achievement associated in PDSs, and participants in PDSs. The subsequent section gives a description of student teaching and its impact on the TIP model. The last part provides the leadership framework, instructional leadership, and its links these topics to the TIP model.

Guiding Questions

The research questions guiding this study are as follows:

1. How do local school instructional leaders, district coordinators, and TIP residents describe the influences on student achievement utilizing the TIP model?
2. How do the TIP interns describe the impact of their Anchor Action Research activities on student achievement?

Review

Student achievement is important to teacher educators, school leaders, and researchers who have initiatives for providing better outcomes in achievement between students from different class backgrounds and different races (Teitel, 2003). The implementation of the Professional

Development Schools (PDSs) model provides additional support to schools by instituting a system where a university professor works in collaboration with a k-12 school to improve student achievement through professional development support (Curlette et al., 2014; Ogletree, 2007; Teitel, 2003). This view was also reinforced by McDowell and Iorio (2015) who believed that the collaboration between the k-12 school and university was beneficial for student achievement and improvement of teaching practices. Moreover, Darling-Hammond (2005) observes that participants who completed teacher preparation in PDSs during their student teaching often became stronger teachers who provide rigorous learning for all students. For this reason, PDSs support the development of student teachers by providing the support of a university professor as well as a mentor teacher during their development for creating a classroom environment that supports productive student learning and advancement of student knowledge (Darling-Hammond, 2005, pg. ix).

The Professional Development School model for student teaching supports the development of new and veteran teachers. According to Darling-Hammond (2005), veteran teachers expand their knowledge of the practice and theory of teaching from mentoring novice teachers. Conversely, student teachers can learn from mentor teachers who display instructional leadership behaviors for achieving mastery on aligning instruction practices, tasks, and challenges to the appropriate curricula and instructional standards (Glatthorn, Jailall, & Jailall, 2017; Mooney & Mausbach, 2008). Consequently, the shared instructional experiences between student teachers and their mentor teachers provide an opportunity in PDSs for improved student achievement.

Student teaching internships have been a part of the teaching certification process for many years (Darling-Hammond, 2005). This process consists of an intern working with a mentor

teacher for approximately one semester. A new model of student teaching called the Teacher-Intern-Professor (TIP) currently analyzed at Georgia State University under the CREST-Ed grant was previously analyzed under the NET-Q grant (Benson, 2015). The student teacher in this model is known as an "Intern" or TIP resident. Similarly, the "Teacher" term of the Teacher-Intern-Professor model refers to the mentor teacher assigned to work with the TIP resident at his or her appointed school. Finally, the "Professor" term in the Teacher-Intern-Professor model represents a university professor who collaborates approximately once a week with the TIP resident regarding instructional teaching methods and classroom management strategies.

The TIP model of student teaching places preservice teachers in schools for two semesters of teacher training. During the first half of student teaching, each TIP resident conducts an Anchor Action Research (AAR) project by implementing an instructional method to teach a unit of study, assessed with a unit test (Ogletree, 2007). This helps prepare the TIP residents for taking the Education Teachers-Performance Assessment (edTPA) in their second semester of student teaching. During the second half of student teaching, the TIP residents take the edTPA to complete the requirements needed for certification. The Georgia Professional Standards Commission requires passing the edTPA to become a certified teacher in Georgia (Ariel, 2015).

There is the need to describe the process more fully in Professional Development Schools that shows the collaboration between a university (or college) with a middle or high school results in greater student achievement than without the university involvement. A limited amount of published quantitative evidence exists for student achievement in PDS schools (McDowell & Iorio, 2015; Vescio, Ross, & Adams, 2008). The following case study addressed this need by investigating how TIP participants use their instructional methods in mathematics or science to influence student achievement.

Professional Development School research at the school level, using quantitative methods to show student achievement that acknowledges the collaboration of a university with a k-12 school, is either non-existent or does not demonstrate any substantial value-added from PDS partnership (Curlette et al., 2014). One professor going to a PDS one day a week is not enough intervention to change the instruction planned or delivered by numerous teachers in a school that may have thousands of students (Ogletree, 2007). The one professor (or even a small group of professors) does not have the expertise to advise teachers on the many different subject areas present in a k-12 school (Smith-D'Arezzo, 2011). Hence, the school-level student achievement scores did not show a change due to the inability of one professor, one day a week, to effect a change in student achievement for an entire school. Therefore, the unit of analysis needed to be modified to examine the student academic performance in TIP classrooms instead of the whole school. This literature review found that focusing on the TIP model evaluated through a quasi-experimental, pretest and posttest design with a comparison condition did show student achievement in PDS classrooms (Ogletree, 2009). Moreover, aggregating the classroom results using meta-analysis techniques provided more statistical power and potential for generalization of results (Curlette et. al, 2014).

This literature review addresses one aspect of clinical teaching, the Teacher-Intern-Professor (TIP) Model with Anchor Action Research (AAR) in Professional Development Schools (PDSs), and its relationship to instructional leadership. The TIP model in a PDS places the student intern for at least one semester teaching a unit of instruction whereby a student intern, a professor, and a mentor teacher design together. The student intern then teaches this lesson. More specifically, AAR is a form of action research that uses a pretest and posttest assessment for the

TIP group and a comparison group. In the next sections, this literature review provides background information on TIP with AAR, PDS, partnerships, PDS participants, and student teaching leading up to edTPA. It also presents links between instructional leadership and TIP.

Teacher-Intern-Professor Model.

The history of the Teacher-Intern-Professor (TIP) with Anchor Action Research (AAR) is part of a series of three larger grants on teacher quality from the U.S Department of Education to Georgia State University. The first grant, in 2004, was named *Professional Development School Partnerships Deliver Success* (PDS2). It had an initial approach to student achievement with a professor visiting a PDS one day a week to work with teachers. In Ogletree's 2007 dissertation, she investigated the academic student achievement in a large-scale study across 12 PDSs and 12 matched comparison schools. She concluded that the TIP model provided for a closer examination of student achievement in a TIP classroom for instruction focused on a particular topic.

The success of the PDS2 grant led to Georgia State University's College of Education being awarded a second grant in 2009 tilted the *Network for Enhancing Teacher Quality* (NET-Q). In this grant, the structural process of the TIP group was refined and improved, as was the data collection and analysis. The data were from only the classrooms of TIP and comparison teachers that administered teacher-made pretests and posttests; however, the meta-analysis did not include data from interns of special education classes using single subject research designs (Curlette et al., 2014; Ogletree, 2009). The analysis of this data was completed using meta-analysis. Because the sample size of each TIP with AAR was small, a meta-analysis was used to summarize the mean gain scores from eight TIP residents' and comparison classroom teachers' pretest and posttest means. The results of a meta-analysis on the TIP model in regular classrooms with eight

studies showed that the TIP model was successful in increasing student achievement beyond the student achievement of the comparison classroom teachers (Curlette et al., 2014).

The success of the NET-Q grant allowed for conducting further research in the instructional methods employed by AAR for student achievement ("A Closer Look," 2015). Also, the TIP with AAR approach in addition to a Critical Friends Group (CFG) developed at Georgia State University, led to the U.S. Department of Education funding a third grant named *Collaborations and Resources for Enhancing and Supporting Transformations in Education* (CREST-Ed) in 2014. CREST-Ed, is a federal grant from the Teacher Quality Partnership Grant (TQP) to "(a) Improve student achievement; (b) Improve the quality of prospective and new teachers; (c) Hold teacher perception programs accountable for preparing high-quality teachers and collaborating with high needs districts/schools; and (d) Recruiting and retaining highly qualified individuals with particular emphasis on high need/critical shortage areas" (Author, 2015, p. 3).

Research conducted in 2007 examined the TIP model for student achievement using a quasi-experimental design. In 2007, the TIP model received funding through the Professional Development School Partnerships Deliver Success (PDS2), which was the initial grant financing the TIP model. According to Ogletree's 2007 study, she measured student achievement in 12 high-needs schools in the southeastern United States. Ogletree's 2007 study used ANOVA to compare student achievement gains between Georgia Criterion-Referenced Competency Test (CRCT) scores in PDS schools and matched comparison schools. Through her quantitative data analysis, she concluded that there were no significant gains in mathematics and science means when comparing PDS schools with matched comparison schools. Ogletree further found that "beginning teachers (years 1-3) perform significantly worse than more experienced teachers and that new teachers go through an adjustment period where the art of teaching is learned" (p. 37).

The qualitative data in the 2007 study of the TIP model included the TIP resident interns, teachers, faculty and parent focus groups, report cards, journals, and portfolios from teachers and students (Ogletree, 2007). The qualitative data were used to determine "if particular PDS programs are successful or failures;" and found no statistical significance of closure (Ogletree, 2007, p. 93).

According to Ogletree's research in 2009, the TIP model focused on preparing interns for classroom level teaching and on student academic achievement. She goes on to say the preparation includes the discussion and collaboration with a mentor teacher and a university professor to meet the instructional needs of classroom students. The university professor's collaboration and discussion help to provide support to the TIP residents' implementation of their AAR plans on a unit of classroom instruction. The mentor teacher provides the classroom in which to conduct the study as well as regular daily support and encouragement (Ogletree, 2009).

Previous research in 2009 by Ogletree provides supporting research for conducting this study. Her 2009 mixed-methods research used both qualitative and quantitative data to "explore the effects on the TIP model on teaching intern experiences and student academic achievement" (p. 43). Her research used a quasi-experimental design of teacher-made pretests and posttests comparing the student achievement of only two TIP resident classrooms to only two comparison teacher classrooms using Bayesian statistics. The results of her study found that the "TIP group has higher achievement than the control group [the comparison classroom teachers]" (p. 76). This research expands on Ogletree's research by comparing eight TIP resident AAR plans with eight comparison classroom teachers. The analysis for this research study builds on the research conducted in 2014 by Curlette, Hendrick, Ogletree, and Benson. Their study used meta-analysis to analyze the pretest and posttest student achievement data.

Curlette et al., (2014) chose meta-analysis because “it takes into account the sample sizes in each action research study during the process of weighing each study in the summary across studies, which is reported in an overall effect size” (p. 64). Their study found an overall effect size of 0.387 to be statistically significant which provides “evidence for a PDS approach for improving student achievement” (p. 70). From their research and for this research, meta-analysis was used because it has shown to be a reliable and valid approach to summarize mean gain scores across the TIP residents AAR plans for showing student achievement gains (Curlette et al., 2014).

The qualitative data for Ogletree's 2009 study came from observations, interviews, and document analysis. Through her analysis, the qualitative data provided background and context to “teachers’ sense of self-efficacy” (p. 86). Four themes emerged from her data: “personal efficacy,” “teacher efficacy,” “collaboration,” and “experiences in teaching” (p.86). Two additional themes emerged from the discussions and meeting observations of the TIP residents, which are “relevance of learning” and “resilience of student teachers” (p. 104). Therefore, a total of six themes emerged from qualitative data analysis of the TIP residents with AAR in 2009. Ogletree's study did not utilize interviews with school leadership and their perceptions of impact when using the TIP model with AAR. Henceforth, this research adds to Ogletree's body of work by interviewing school leadership through the lens of instructional leadership constructs of Hallinger et al. (2016) and characteristics of Bradley (2004).

Expanding on action research, according to Vernon-Dotson and Floyd’s (2012) case study, teacher quality is a significant issue for schools and universities due to the gap between practice and research. Action research is one possible solution to this issue because the Teacher-

Intern-Professor (TIP) interns are implementing anchor action research while practicing to become teachers. At the same time, AAR provides new evidence that supplements the teaching of beginning and veteran classroom teachers.

Professional Development Schools and Student Achievement.

In 1920, when Henry W. Holmes was Dean of Harvard Graduate School, he "argued persuasively that 'the training of teachers is a highly significant part of the making of the nation'" (*The Holmes Partnership Trilogy*, 2007). Holmes believed that the teaching requirements for teachers needed improving by requiring all teachers to become "instructors" first and "professional teachers" second (*The Holmes Partnership Trilogy*, 2007, p. 15). According to Holmes, teachers having only bachelor's degrees in their particular fields could attain the designation of instructor teachers. Only after teachers obtained master's degrees in the subject in which they were teaching would they become professional teachers. Through this concept, as well as other ideas, Holmes developed the idea of universities being more involved in preparing their graduates for teaching. This is now known as professional development schools (*The Holmes Partnership Trilogy*, 2007).

In the mid-1980s, the Holmes Group and the National Network for Educational Renewal coined the name 'Professional Development Schools' (PDS) (McDowell & Iorio, 2015). Professional development schools (PDSs) refer to the partnership among universities and schools that is a collaboration often designed to improve student achievement and professional development by blending the pedagogical theories found in university coursework with the practicalities of classroom teaching (Basile, 2011; Byrd & McIntyre, 1999; Teitel, 2003). This involvement between the two institutions tries to build competencies that enhance the learning experience for preservice or student teachers. Expanding on this learning experience, Katherine Cunningham

(2014) and Glatthorn et al. (2017) articles confirm Abadl-Haqq's (1998) four goals or purposes for the shared responsibility between the college or university professor and a k-12 school: (a) to maximize student achievement, (b) to engage in continual inquiry for student achievement, (c) to engage in professional development, and (d) to prepare for new effectiveness.

The PDS model is being used to improve the equity of student learning between students of different class backgrounds (Teitel, 2003). The work of the Holmes Group, described in the book titled *Tomorrow's Schools* (1990), as well as the work document from NCREST (1993) in the PDS *Vision Statement of the National Center for Reconstructing Education, Schools, and Teaching,* advocates for the commitment of PDSs to "increase equality in U.S. society" (Teitel, 2003, p. 5). Katherine Cunningham's (2014) article confirms Teitel's conclusions, suggesting ways to sustain the PDS model for equality through (a) ensuring that the alignment of activities between the PDS schools and universities are clearly aligned, (b) searching for monies to support these activities and professional developments, (c) having an advisory committee to develop achievement plans for students of color, (d) providing public forums to discuss the PDS expense report and to discuss diversity concerns, (e) creating action research plans that align with work done by school faculty members and doctoral students, (f) developing critical friend groups, and (g) connecting potential teachers of color to university policy issues about recruitment and retention.

Gimbert and Nolan (2003) suggested that research was needed on the partnership between a university professor and preservice teachers regarding their "work on academic achievement" (p. 357). According to Darling-Hammond (2006), SAT scores and grade point averages traditionally measure academic achievement. However, the study conducted by Curlette et al.

(2014) provided evidence that using meta-analysis can summarize student achievement measures from teacher-made tests.

Partnerships Among PDS Participants.

The partnerships between schools and universities are successful when they include factors of trust between the universities and k-12 schools, common vision and goals, shared responsibilities and power, an emphasis on collaboration, continual communication between all stakeholders, and the ability to rethink traditional roles (Darling-Hammond, 2006; Lewison & Holliday, 1999). McDowell and Iorio (2015) state there are four primary missions of a PDS partnership: "(a) preparing new teachers, (b) developing new faculty and staff, (c) research directed at improvement of practice, and (d) enhancing student achievement" (pp. 49-50). The partnership between the university and k-12 schools seeks to contribute to the development and research of teaching as well as improve preservice teachers (Salsberry & Wetig, 2004). This partnership provides support to the preservice teachers by encouraging both stronger teaching and stronger teacher leaders (Salsberry & Wetig, 2004).

The partnership between public schools and universities provides collaborations mutually beneficial to develop preservice teachers (Robinson & Darling-Hammond, 1994; Siry, Ferrara, & Lang, 2014). In a successful partnership, according to Robinson and Darling-Hammond (1994), "all parties must recognize and utilize the talents and perspectives of each participant" (p. 2010). Furthermore, "open dialogue about issues of practice allows colleagues to recognize each other's strengths and needs so that professional collaboration can occur and supportive norms can be established" (Robinson & Darling-Hammond, 1994, p. 211).

Research conducted in 1990 by Zimpher and others confirmed that PDSs provide an environment for teachers to collaborate on team teaching, instruction, and school issues; thus, encouraging shared decision-making (Darling-Hammon 2006; Mooney & Mausbach, 2008; Vernon-Dotson & Floyd 2012). Vernon-Dotson and Floyd (2012) assert, "With this collaboration, partners focus on shared decision making, shared problems solving, and continuous feedback for improvement" (p. 38). Additionally, the collaboration of the university professor and the preservice teacher focuses on facilitating lessons, student engagement, and student learning (Gimbert & Nolan Jr., 2003). An example of this collaborative method is through preservice teachers' anchor action research projects (Curlette et al., 2014).

The impact of the university professor working at a k-12 school is essential for providing much-needed support for preservice teachers (Vernon-Dotson & Floyd, 2012). Gimbert and Nolan (2003) say, "The influence of a specific student teaching context on the role of the university supervisor has been relatively unexamined in the literature on student teaching" (p. 355). The case study results of Gimbert and Nolan's (2003) research showed the university professor provided critical support to the preservice teachers when they struggled with understanding conceptual knowledge of the classroom students.

Preservice teachers benefit from PDS programs by having increased confidence, knowledge, and readiness to teach; a more genuine and structured learning experience; opportunities to act as professional colleagues; and a more consistent feedback from the mentor teacher (Darling-Hammond, 2010; Edwards, Tsu, & Simpson, 2009; Hunt, 2014). Likewise, they also concluded that schools benefit from PDS programs due to possible gains in student performance, higher teacher retention, and improved veteran teaching practices (Hunt, 2014). Thus, a potential and likely benefit to the preservice teachers and school improvement is well supported;

however, there is a lack of research on "how principals from Professional Development Schools and the wider research on new teacher induction can be used in concert to more fully support novice teachers in their first year" (Hunt, 2014, p. 36).

Student Teaching Leading up to edTPA.

During the early 1900s, Horace Mann was influential in creating more structure for k-12 schools. Even with Mann's formation of "normal schools," state institutions conducted little educational training for teacher educators (Schneider, 2011). For example, schools in rural districts may have teachers who had not previously attended school, and, thus had no formal teacher training (Schneider, 2011). On the other hand, in larger urban school districts, such as New York City, teachers did attend grade school before teaching; hence, they organized teacher training programs that extended into the 1930s (Schneider, 2011). Unfortunately, there is not much literature regarding teachers assessing student achievement for a unit of instruction for the next 30 years of teacher training programs until 1960.

The focus for teacher training from the 1960s to the 1980s was for new teachers having the "right skills" that would help to improve student achievement (Caires, Almeida, & Vieria, 2012, p. 163). These skills were to guarantee the expertise of classroom teachers having the right technical skills for student achievement and application (Caires et al., 2012). In the 1980s, a new paradigm in student teaching focused on defining the role and responsibilities of university supervision and describing the strategies employed during student teacher training (Caires et al., 2012; Ogletree, 2011). By late 1980s, another reform emphasized classroom teachers attending to the needs of their students while teaching classroom lessons such as their cognitive processes and interactions with the teachings, while implementing the course curricula (Bullough &

Stokes, 1994; Calderhead, 1984, 1987; Doyle, 1979; Hollingsworth, 1989; Perterson & Clark, 1978; Caires et al., 2012).

Student achievement research has been a large focus for researchers since 1996 with an emphasis on the assessment and identification of the student teachers' perceptions and feelings and regarding their practice of teaching and their professional development (Caires, 2001, 2003; Caires & Almeida, 2005, 2007; Caires, Almeida, & Martins, 2010; Caires, Almeida, & Vieira, 2010; Caires et al., 2012, p.166). Caires (2012) states, "More recently, emerging institutional concerns regarding intervention have led to a gradual refinement of an instrument that could allow a quick and accurate screening of the main areas of need, achievement and difficulty amongst student teachers" (p. 166).

The newest trend in student teaching is to have the student teacher evaluated by education Teacher Performance Assessment (edTPA) (Ariel, 2015). According to an article titled *National Launch of edTPA,* a Stanford University professor in collaboration with classroom teachers developed an instrument to assess student teachers, which is named edTPA (Author, 2013). This article goes on to list skills that student teacher interns should have which are: "(1) Planning around student learning standards; (2) Designing instruction for students based on their specific needs; (3) Teaching a series of lessons and adapting them to respond to student learning; (4) Assessing student work; (5) Developing academic language; (6) Evaluating student learning; and (7) Analyzing teaching through reflecting on how to improve student outcomes" (Author, 2013, p. 51). As of July this year, according to Ariel (2015), Georgia State University interns in student teaching will need to submit an electronic portfolio regarding student teaching with full evidence of k-12 academic achievement (e.g. lesson videos, reflections, and artifacts) to Pearson Corporation to obtain teacher certification in Georgia.

While there have been great strides in the development of student teaching throughout the years, there is evidence that not enough is being done. Athanases et al. (2008) say that the United States teacher induction programs for mentoring preservice teachers do not live up to their potential despite the great strides in goals and enthusiasm for these programs. Furthermore, these induction programs fail to train adequately preservice teachers on knowledge and skills needed to teach students (Athanases et al., 2008; Feiman-Nemser, Schwille, Carver, & Yusko, 1999). Therefore, there has been a growing interest in teacher induction programs ("A Closer Look," 2015); which by inference supports investigating approaches such as the TIP model in k-12 schools.

Instructional Leadership and Links to PDS.

The framework for this study draws on instructional leadership using the views of Bradley and Hallinger and begins with a brief overview of instructional leadership. Hollis Caswell, an authority in instructional leadership, devised instruction as a field of study focused on performance. His approach emphasized an increase of teacher involvement regarding the decisions of teaching, which are instructional design, instructional learning objectives, and measured instructional outcomes (Beauchamp, 1975; Caswell, 1952; DeMatthews, 2014; Yeager, 1996).

There are many definitions of instructional leadership; a viable one for this study is "the exercise of those functions that enable school systems and the schools to achieve their goal of ensuring quality in what students learn" (Glatthorn et al., 2017, p. 63). Hallinger's and others (2016) instructional leadership constructs for managing instructional programs complement Glatthorn's, Jailall's, and Jaillall's definition for ensuring students receive a quality education that can make a difference. The constructs under Hallinger's managing instructional programs are as

follows: constructs supervision and instruction evaluation, curriculum coordination, and monitoring of student progress. From their instructional leadership model, Hallinger et al. (2016) see the principal in the role of overseeing the teaching and learning activities in the school. In particular, Hallinger et al. (2016) and Bradley (2004) state the principal's responsibility is to coordinate, monitor, and develop the school's instructional program (Bradley, 2004; Hallinger et al., 2016). The following paragraphs describe the implications of instructional leadership to this research. More specifically, they show how Hallinger's and Bradley's instructional leadership interpretations link to the evaluation of the TIP model for student achievement.

Instructional leadership is not always led or driven by the principal of a school; instead, assistant principals or even teachers can be instructional leaders within the school building. They make informed instructional decisions for actions rather than making immediate decisions, as observed by Bradley's case study research in 2004. These school building instructional leaders motivate and inspire others to perform at high levels in order to promote student academic achievement (Wallin & Newton, 2013). In addition, instructional leaders must monitor and evaluate these expectations through instruction and program evaluations (Hallinger et al., 2016; Şişman, 2016; Wallin & Newton, 2013). Moreover, Bradley (2004) says instructional leadership likely comes from more than one person in an organizational position; it is an activity shared among various people who are involved with instructional practices.

Instructional leadership supports the PDS model partnership between the university and school by enabling instruction to prepare students for future success (Mullen, 2007; Perry, 2013). In this way, a PDS relationship builds a pre-service program and helps develop instructional practices that can improve student achievement. One way to improve student achievement ac-

cording to Curlette and Ogletree's research in 2011 is through Anchor Action Research. The instructional leaders support these plans by making informed instructional decisions with the guidance of a professor and mentor teachers who assist the resident intern's teaching strategies ("A Closer Look," 2015; Curlette & Ogletree, 2011; Bradley 2004).

Instructional leaders also assist by monitoring student achievement for all students in their respective schools (Bradley, 2004; DeMatthews, 2014; Hallinger et al., 2016; Şişman, 2016; Wallin & Newton, 2013; Wiles, 2009). The TIP model, with anchor action research, monitors student achievement by comparing the pretest and posttest means from the residents and the comparison classroom teachers (Bradley, 2004; Curlette & Ogletree, 2011; Hallinger et al., 2016; Ogletree, 2009). Bradley and Hallinger share the idea that evaluation is an important tool of an instructional leader. Bradley describes evaluation as a leader's ability to analyze both quantitative and qualitative data from school programs and evaluations, which implies that instructional leaders are reflective (from the data) rather than subjective, while Hallinger describes evaluation as a construct for managing a program. In either case, their ideas link to this research, supporting the evaluation of pretest and posttest scores of the resident interns of the TIP model. These test scores provide evidence for evaluating the instructional practices of the interns as well as assessing the academic achievement of their students. Therefore, the instructional leaders in PDSs with TIP residents have a research design with the potential to show student achievement.

In summary, Wiles (2009) advocates for instruction that he had previously described as "a set of desired goals or values that are activated through a development process and culminate in successful learning experiences for students" (p. 2). This description aligns the TIP with AAR.

The implementation of the CREST-Ed Grant student teacher program in PDSs (more specifically, the TIP model with AAR), is an instructional decision for principals of the schools (Glatthorn et al., 2017; Hallinger et al., 2016; Harris, Lowery-Moore, & Farrow, 2008). The implementation of the TIP model with AAR, Ogletree's 2009 research, as well as Curlette et al.'s 2014 research, showed successful results for academic student achievement. Nevertheless, future research is needed to provide additional understanding of the comparison classrooms, TIP summary on mathematics and/or science, perceptions of resident interns regarding the TIP model, and research of the residents through their experience with AAR. Communication about the results of TIP with AAR in a school is a function of a school-based instructional leader.

In addition to the gaps stated throughout the review of the literature, it also revealed gaps regarding assessing student achievement in PDSs using the TIP with AAR model. First, there were only group mean difference studies conducted with the TIP groups. Although some of the interns worked with special education students and used single subject designs these were not included in the meta-analysis. Second, the descriptions of the comparison group classes lacked in details. Third, the interviews of the TIP interns and stakeholders were not incorporated in a formal case study methods design to inform the TIP with AAR research. These three gaps revealed in the literature provide directions for future research.

Summary of the Literature.

In summary, PDS research at the school level using quantitative methods to show k-12 student achievement is either limited or does not demonstrate any value-added from PDS collaboration. One professor going to a PDS school one day a week is not enough intervention to change the instruction planned or delivered by numerous teachers in that school and thousands of students (Ogletree, 2007). The one professor (or even a small group of professors) does not have

the expertise to advise teachers on the many different subject areas present in a k-12 school (Smith-D'Arezzo, 2011). This literature review found that focusing on the classroom level with a TIP with AAR research design and accumulating studies with a meta-analysis did show student achievement (Curlette et al., 2014).

Additionally, there is limited evidence of positive effects using quantitative methods within PDSs on student achievement (Vescio, Ross, & Adams, 2008; Curlette et al. 2014). McDowell and Iorio (2015) state that PDS research on examining the impact of learning outcomes for P-12 students is scarce. Furthermore, few PDS studies have addressed student learning and even less than those few have addressed student achievement (McDowell & Iorio, 2015). As a result, there is a need for more in-depth research how the PDS-supported instruction would show effectiveness regarding the achievement of students and the preparedness of teachers (Tunks & Neapolitan, 2007).

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2 ANCHOR ACTION RESEARCH ON STUDENT ACHIEVEMENT UTILIZING THE TEACHER-INTERN-PROFESSOR MODEL

The primary purpose of this study is to elicit perceptions of local school instructional leaders, district coordinators, and TIP residents, regarding teaching and learning accomplished through the Teacher-Intern-Professor (TIP) model within PDS high school math classes. More specifically, using a case study approach this research allowed themes to emerge for making meaning about the instructional methods employed by the TIP residents for teaching and learning for student academic achievement.

This study addresses the need for additional qualitative data for investigating the implementation of the TIP model in PDS school(s) in math classrooms for increasing student achievement. Additionally, the study provides qualitative perception data of the stakeholders previously mentioned associated with the implementation of AAR plans in PDS high schools. Furthermore, additional research into PDS models is needed to see if evidence can validate the use of the PDS model. Finally, conducting a quantitative study analyzing the pre-posttest scores added credibility to this descriptive case study. One aspect of the case study is quantitative data from a meta-analysis of student academic achievement data from the TIP model.

The literature for this study addresses one aspect of clinical teaching; that is, the Teacher-Intern-Professor (TIP) Model with Anchor Action Research (AAR) in Professional Development Schools (PDSs), and its relationship to instructional leadership. The TIP model in a PDS places the student intern for at least one semester where the intern teaches a unit of instruction designed by a student intern, a professor, and a mentor teacher working together. The student intern then teaches this lesson. Furthermore, AAR is a form of action research that uses a pretest and posttest assessment for the TIP group and a comparison group. The definition of TIP with AAR refers to

assessing student achievement for a unit of instruction (Ogletree, 2011). A brief review of the literature from Chapter 1 presents background information on TIP with AAR, history of PDS, collaboration and partnership among participants in PDS, student teaching leading up to edTPA, and links between instructional leadership and TIP.

The history of the Teacher-Intern-Professor (TIP) with Anchor Action Research (AAR) is part of a series of three large grants on teacher quality from the U.S Department of Education to Georgia State University. The first grant, in 2004, which was named *Professional Development School Partnerships Deliver Success* (PDS2), had an initial approach to student achievement with a professor visiting a PDS once a week to work with teachers. The success of the original PDS2 grant led to Georgia State University's, College of Education being awarded a second grant in 2009 that was titled *Network for Enhancing Teacher Quality* (NET-Q). The success of the NET-Q grant allowed further research in the instructional methods employed by AAR for student achievement ("A Closer Look," 2015). The TIP with AAR approach in addition to a Critical Friends Group (CFG) approach developed at Georgia State University named CCLC, led to the U.S. Department of Education funding a third grant named *Collaborations and Resources for Enhancing and Supporting Transformations in Education* (CREST-Ed) in 2014. CREST-Ed, is a federal grant from the Teacher Quality Partnership Grant (TQP) to "(a) Improve student achievement; (b) Improve the quality of prospective and new teachers; (c) Hold teacher perception programs accountable for preparing high-quality teachers and collaborating with high needs districts/schools; and (d) Recruiting and retain highly qualified individuals with particular emphasis on high need/critical shortage areas" (Author, 2015, p. 3).

Research conducted in 2007 examined the TIP model for student achievement using a quasi-experimental design. In 2007, the TIP model funding was through the Professional Development School Partnerships Deliver Success (PDS2), which was the initial grant financing for the TIP model. In Ogletree's 2007 study, she measured student achievement in 12 high-needs schools in the southeastern United States. Ogletree's 2007 study used ANOVA to compare student achievement gains between Georgia Criterion-Referenced Competency Test (CRCT) scores in PDS schools and matched comparison schools. Through her quantitative data analysis, she concluded that there were no significant gains in mathematics and science means when comparing PDS schools with matched comparison schools. Ogletree further found that "beginning teachers (years 1-3) perform significantly worse than more experienced teachers and that new teachers go through an adjustment period where the art of teaching is learned" (p. 37). The qualitative data in the 2009 study of the TIP model included the TIP resident interns, teachers, faculty and parent focus groups, report cards, journals, and portfolios from teachers and students (Ogletree, 2009). The qualitative data was used to assess" if particular PDS programs are successful or failures;" and the quantitative data analysis essentially resulted in no statistical significance regarding the student outcome measures at the school level (Ogletree, 2007, p. 93).

According to Ogletree's research in 2009, the TIP model of preparing interns for classroom level teaching provided an opportunity to show student academic achievement. She goes on the say the preparation includes the discussion and collaboration with a mentor teacher and a university professor to meet the instructional needs of classroom students. The university professor's collaboration and discussion help to provide support to the TIP residents' implementation

of their AAR plans on a unit of classroom instruction. The mentor teacher provides the classroom in which to conduct the study as well as regular daily support and encouragement (Ogletree, 2009).

Previous research in 2009 by Ogletree provides supporting research for conducting this study. Her 2009 mixed-methods research used both qualitative and quantitative data to "explore the effects on the TIP model on teaching intern experiences and student academic achievement" (p. 43). Her research used a quasi-experimental design of teacher-made pretests and posttests comparing the student achievement of only two TIP resident classrooms to only two comparison teacher classrooms using Bayesian statistics. The results of her study found that the "TIP group has higher achievement than the control group [the comparison classroom teachers]" (p. 76). This research expands on Ogletree's research by comparing at least eight TIP resident AAR plans with eight comparison classroom teachers. The analysis for this research study builds on the research conducted in 2014 by Curlette, Hendrick, Ogletree, and Benson. Their study used meta-analysis to analyze the pretest and posttest student achievement data.

Meta-analysis in this study was used to assess student achievement by summarizing student academic achievement gains. Independent t-tests assessed the student academic achievement mean gain scores between the TIP residents' classrooms students and the comparison teachers' classrooms students. The mean gain scores were summarized using meta-analysis to see if the TIP residents' means were greater than the comparison teachers' mean scores. Curlette et al. (2014) chose meta-analysis because "it takes into account the sample sizes in each action research study during the process of weighing each student in the summary across studies, which is reported in an overall effect size" (p. 64). Using Cohen's d effect size (Cohen, 1988), their

study found an overall effect size of 0.387 to be statistically significant which provides “evidence for a PDS approach for improving student achievement” (p. 70). From their research and for this research, meta-analysis was used because it has shown to be a reliable and valid approach to summarize mean gain scores across the TIP residents AAR studies (Curlette et al., 2014).

The qualitative data for Ogletree's 2009 study came from observations, interviews, and document analysis. Through her analysis, the qualitative data provided background and context to “teachers’ sense of self-efficacy” (p. 86). Four themes emerged from her data: “personal efficacy,” “teacher efficacy,” “collaboration,” and “experiences in teaching” (p.86). Two additional themes emerged from the discussions and meeting observations of the TIP residents, “relevance of learning” and “resilience of student teachers” (p. 104). Therefore, a total of six themes emerged from qualitative data analysis of the TIP residents with AAR in 2009. Ogletree did not interview school leadership and its impact on the perceptions of the TIP model with AAR. Henceforth, this research adds to Ogletree's body of work by interviewing school leadership through the lens of instructional leadership constructs of Hallinger et al. (2016) and characteristics of Bradley (2004).

The Holmes Group and the National Network for Educational Renewal coined the name ‘Professional Development Schools’ (PDS) (McDowell & Iorio, 2015). Professional development schools (PDSs) refers to the partnership among universities and schools that is a collaboration often designed to improve student achievement and professional development by blending the pedagogical theories found in university coursework with the practicalities of classroom teaching (Basile, 2011; Byrd & McIntyre, 1999; Teitel, 2003). McDowell and Iorio (2015) state

there are four primary missions of a PDS partnership: "(a) preparing new teachers, (b) developing new faculty and staff, (c) research directed at improvement of practice, and (d) enhancing student achievement" (pp. 49-50). Thus, the involvement of the two institutions builds competencies that enhance the learning experience for preservice or student teachers.

The partnership between public schools and universities provide collaborations mutually beneficial to develop preservice teachers (Robinson & Darling-Hammond, 1994; Siry, Ferrara, & Lang, 2014). For a successful partnership, according to Robinson and Darling-Hammond (1994), "all parties must recognize and utilize the talents and perspectives of each participant" (p. 2010). A useful collaborative method, for example, is through preservice teachers' Anchor Action Research projects (Curlette et al., 2014).

The implications of the university professor working at a k-12 school is essential for providing much-needed support for preservice teachers (Vernon-Dotson & Floyd, 2012). Preservice teachers benefit from PDS programs that support confidence in instructional knowledge and readiness to teach, a more genuine and structured learning experience, opportunities to act as professional colleagues, and more consistent feedback from the mentor teacher (Darling-Hammond, 2010; Edwards, Tsu, & Simpson, 2009; Hunt, 2014). Even though the potential and likely benefits for supporting the preservice teachers and for improving PDSs has been discussed, there is a lack of research on "how principals from Professional Development Schools and the wider research on new teacher induction can be used in concert to more fully support novice teachers in their first year" (Hunt, 2014, p. 36).

This research draws on the instructional leadership from the views of Bradley (2004) as well as Hallinger and Wang (2016). Implementing instructional leadership is the process of installing an instructional planned (Beauchamp, 1975; DeMatthews, 2014; Yeager, 1996; Wiles,

2009). The responsibility of implementing the planned instruction is the role of the instructional leader of the school. Instructional leaders of a school can be a principal, an administrator, or a team of teachers (DeMatthews, 2014; Mullen, 2007). These leaders use modifiers to classify instruction such as creative and transformative. (DeMatthews, 2014; Mullen, 2007).

There are many definitions of instructional leadership. For this study, it is "the exercise of those functions that enable school systems and the schools to achieve their goal of ensuring quality in what students learn" (Glatthorn, Jailall, & Jailall 2017, p. 63). Instructional leadership supports the PDS model partnership between the university and school by providing instruction to prepare students for future success (Mullen, 2007; Perry, 2013). Thus, the PDS relationship builds a pre-service program and instructional practices that can make a difference.

Bradley (2004) as well as Hallinger and Wang (2016) have similar viewpoints for evaluating instruction. Bradley describes evaluation as a decision while Hallinger and Wang describe evaluation as a construct for managing a program. In either case, their interpretations have links to this research by evaluating the pretest and posttest scores of the students taught by resident interns of the TIP model. These test scores provide evidence for evaluating the instructional practices of the interns as well as assessing the student achievement of their students. The TIP model is a good example of this shared role of evaluating instruction with a professor and mentor teachers as instructional leads to assist the resident intern ("A Closer Look," 2015). Bradley (2004) summarizes this shared vision by saying the instructional leader is more than the organizational position; it is the concept of the position to assist instructional practices.

Instructional leaders also need to monitor the student achievement for all students in their respective schools (Wiles, 2009). The Teacher-Intern-Professor model with Anchor Action Research monitors the student achievement through comparing the pretest and posttest means from

the residents and the comparison classroom teachers (Ogletree, 2009). Therefore, the instructional leaders in PDSs with TIP residents have a research design with the potential to show student achievement.

In summary, Wiles (2009) advocates for the definition of instruction which he had previously developed as representing "a set of desired goals or values that are activated through a development process and culminate in successful learning experiences for students" (p. 2). The implementation of the CREST-Ed Grant student teacher program with the TIP model into PDSs is an instructional decision for principals of the schools (Glatthorn et al., 2017; Harris, Lowery-Moore, & Farrow, 2008). Moreover, the communication about the results of TIP with AAR in a school is a function of a school-based instructional leader. This study provides research in instructional leadership of local school instructional leaders, mentor instructors, and preservice teachers utilizing the Teacher-Inter-Professor model with Anchor Action Research in urban professional development schools.

Methodology

In this case study, the researcher examines the perceptions of the participants implementing the Teacher-Intern-Professor model in PDSs for improved student achievement through face-to-face interviews, focus groups, and artifacts. The researcher described the qualitative analysis of the participants' lived experience regarding the elements of the TIP program as it relates to the artifacts and perceived outcomes regarding student achievement. The outcome regarding student achievement data from pretest and posttest gain scores were analyzed quantitatively using independent sample t-tests and meta-analysis. In other words, the purpose of this investigation is to provide a descriptive case study of TIP with AAR using quantitative data from the meta-analysis and qualitative data from the perceptions of participants in the TIP model.

Previously, data collected from schools implementing the TIP program focused on quantitative measures, including survey results and student pretest and posttest scores. The qualitative data collected in this case study were used to create the themes that emerged from the perceptions of local school instructional leaders, district coordinators, and TIP residents, who were implementing Anchor Action Research instruction for increasing student achievement. The research questions guiding this study are as follows:

1. How do local school instructional leaders, district coordinators, and TIP residents describe the influences on student achievement utilizing the TIP model?
2. How do the TIP interns describe the impact of their Anchor Action Research activities on student achievement?

Participants.

The participants in this study consisted of the resident interns, district coordinators, and local school instructional leaders who associate with the Teacher-Intern-Professor program. The Teacher-Intern-Professor group of participants consists of five resident interns, and a selection of Georgia State University professors called district coordinators ("A Closer Look," 2015; "CREST-Ed Snapshot," n.d.). The Anchor Action Research studies conducted by the TIP resident interns in their middle school and high school student teaching classes take place during the fall semester of class and edTPA occured during the spring semester ("A Closer Look," 2015; "CREST-Ed Snapshot," n.d.). The district coordinators work among the local school leaders, TIP residents, and CREST-Ed coordinators to help facilitate communication between k-12 schools and universites. There are five district coordinators who work with the TIP residents with each k-12 school assigned a district coordinator to help with completing CREST-Ed paperwork and

providing feedback in regards to instruction, and classroom management. Another group of participants is the local school instructional leaders associated with the placement of the TIP residents.

The TIP residents are assigned to an urban middle or high school to complete their action research plan, and from these middle or high schools there was a group of comparison classroom teachers as well as a group of school leaders ("A Closer Look," 2015; "CREST-Ed Snapshot," n.d.). The group of comparison teachers consisted of classroom teachers with five or more years of experience teaching the same unit of study as the TIP resident ("A Closer Look," 2015; "CREST-Ed Snapshot," n.d.).

Research Design.

The research design for this study focuses on case study methodology from Robert Yin's perspective (Yin, 2014). Yin is one of the prominent methodologists in case study research; Robert Stake and Sharan Merriam are two other well-known case study methodologists (Yazan, 2015). Each methodologist interprets the design for conducting case study research differently. Yin's case study design consists of five components, which include "defining your study's questions, propositions, units of analysis, defining the logic linking the data to the propositions, and the criteria for interpreting the findings" (Yin, 2014, p. 36). Yin also provides the use of quantitative and qualitative to analysis to evaluate the data for interpreting the findings (Creswell, 2013; Yazan, 2015; Yin, 2014). The other two methodologists do not share Yin's viewpoint. Both Stake and Merriam interpret case study research for analyzing only qualitative data (Merriam, 1998; Stake 1995).

The designs for conducting case study research are different among these methodologists. Yin's approach to case study employs the following four design criteria: construct validity, internal validity, external validity, and reliability to evaluate the rigor of the study (Creswell, 2013; Yin, 2014). Stake's approach to case study research is less structured than both Yin's and Merriam's. Additionally, the less structured design by Stake allows researchers to modify the design of the study while conducting research (Stake, 1995; Yazan, 2015).

The approach used for obtaining validity and reliability in case study research differs among these methodologists (Yazan, 2015). Stake and Merriam use the construct of triangulation for analyzing qualitative data (Merriam, 1998; Stake 1995; Yazan, 2015). However, Yin utilizes the construct of multiple sources of evidence for interpreting the results from the data because his case study design employs both qualitative and quantitative data for understanding the case study. With these differences in mind, the researcher for this study chose Yin's methodological approach because this case study of TIP with AAR includes both qualitative and quantitative data.

A descriptive case study design was used in this research to collect and analyze the data because there is a need for combining the qualitative data (e.g. interviews and focus groups) with the quantitative results (e.g. pretest and posttest means) to understand the instructional methods of the TIP residents in math and/or science (MacPhee & Kaufman, 2014; Yin, 2014; Ylimaki 2012). This includes their influences on student achievement and the effects of conducting an AAR study by the residents on their instruction.

In particular, this case study used multiple sources of evidence to obtain validity from interviews, focus group, and artifacts (Creswell, 2013; Yin, 2014). Multiple sources of evidence, as defined by Yin (2014), is a tactic, which converges evidence from two or more sources on the

same findings. Furthermore, Yin (2014) believes using multiple sources of evidence "allows a researcher to address a broader range of historical and behavior issues" (p. 119). Therefore, establishing converging lines of inquiry from multiple sources of evidence is needed to develop validity in case study research (Creswell, 2013; Yin, 2014). To further support validity as well as reliability, Yin (2014) recommends establishing a chain of evidence, which, in this study involved interviews, focus group, and artifacts. A chain of evidence, according to Yin (2014), maintains the data in an organized way such that an outside observer can trace the steps from the research question to the conclusion or from the conclusion to the research question. Procedures need to be in place to keep a clear chain of evidence throughout the research to support validity as well as to increase reliability.

The design of the majority of the individual Anchor Action Research (AAR) studies is a quasi-experimental design that compares the pretest and posttest means from a non-random selected comparison group to the observed results from a class taught by TIP resident. Shadish, Cook, and Campbell, (2002) refer to this design as the *Untreated Control Group Design with Dependent Pretest and Posttest Samples,* which is described in Figure 1. This design employs non-random assignment of participants because residents are placed into existing mentor teacher classrooms. A university faculty member associated the TIP grant assigns resident interns to the mentor teacher classrooms utilizing the school's and university's established partnership. As a result, the schools and the mentor teachers were not randomly selected because of the implementation process imposed by the schools.

Untreated Control Group Design with Dependent Pretest and Posttest Samples

NR O_1 X O_2

NR O_1 O_2

Figure 1. Non-random experimental design comparing the pretest and posttest results from the observed TIP group compared to the observed comparison group (Shadish, Cook, & Campbell, 2002, p.137).

The quasi-experimental design selected can control the threats to internal validity easier due to the use of the pretest and comparison groups rather than a design without these two features (Shadish et al., 2002). The examination of the validity helps provide more understanding of the results from the pretest of the TIP group and comparison groups as well as the posttest of the TIP group (Shadish et al., 2002). This design also allows the results to provide evidence for instruction even though there is presumed selection bias present (Shadish et al., 2002).

In summary, the review of the literature describes the history from the beginning of standardizing public schools to standardized testing and a systematic approach to evaluating student interns (edTPA). The edTPA approach does not use a comparison group; thus, is a weaker design than the TIP model with AAR. This research helps (a) validate a PDS model for improving k-12 student achievement (i.e., TIP with AAR) on a unit of instruction, (b) possibly refine instruction methods for increasing student achievement, (c) and provide opportunities for enhancing the instruction in educational leadership.

Research Data.

The achievement data for this research are from the pretests and posttests of the eight TIP residents along with the eight comparison teacher classrooms. Assuming a typical class size is between 25 to 30 students, there were approximately 200 to 240 pretest/posttest pairs of scores

from the TIP groups and about 200 to 240 pretest/posttest pairs of scores from the students in comparison groups. The actual numbers of available test scores was less because of the informed consent and assent process to qualify participating students.

The researcher utilized two different sets of semi-structured interviews in this study. The first set of data were transcribed interviews on the focus group interview of five TIP resident interns. The second set of data were from classroom artifacts of the TIP residents in each school.

It is important to have a data management system when collecting one form of quantitative data and various forms of qualitative data (Creswell, 1998). A computer centralize all data into one location. The data was loaded onto one computer that is password protected to ensure the privacy of all participants. A computer program, Comprehensive Meta-Complete, computed the effect size of the quantitative quasi-experiment design data. The researcher also utilized Microsoft Excel to create graphs of the effect direction of these quasi-experimental design studies. Additionally, a third party company called rev.com transcribed the qualitative data. The researcher once again used Excel to code the interview data for emerging themes.

Finally, the interview data was color-coded by emerging themes for making meaning of the data (Richards & Morse, 2013; Milliot, 2014; Yin, 2014). Miles, Huberman, and Saldaña (2013) suggested employing sticky notes and index cards as a filing system for coding the data which was a concept utilized by the researcher when coding the data in Excel. Additionally, the researcher employed the idea of "jotting" down reactions and ideas while coding to strengthen the explanation of the data (Miles et al., 2013, p. 94).

The research study employed Comprehensive Meta-Analysis, a program by Borenstein (www.meta-analysis.com), to analyze the effect sizes of the quantitative quasi-experimental de-

sign AAR studies. While the researcher used the qualitative interview data transcriptions completed by rev.com to find the emerging themes through hand coding the data in Microsoft Excel. These tools allowed the researcher to conduct this case study by utilizing multiple sources of evidence to look consecutively at the data by first analyzing the quantitative AAR studies and then interpreting the qualitative interviews (Yin, 2014).

Data Collection Methods.

The first method the researcher employed was to collect the quantitative data by obtaining CREST-Ed artifacts of the pretest and posttest scores from the TIP residents and the comparison teacher. The TIP residents gave a pretest and posttest to their students, and the comparison teachers gave the same a pretest and posttest to their students. This data was then analyzed to help asses the effectiveness of the resident interns teaching utilizing their AAR studies for a unit of instruction.

The second method of data collection was through interviews. The researcher collected four forms of interview data. The first form of data was from audio recording the focus group of the TIP residents (MacPhee & Kaufman, 2014; Ogletree, 2009). The researcher then conducted a focus group of the district coordinators who collaborate with the k-12 school and the university to help collect artifacts and provide supports to the instructional leaders and resident interns. The researcher collected data from these artifacts and documents of the TIP residents' AAR instructional method plans that were associated with their CREST-Ed Grant work. The final form of data was from transcriptions of interviews utilizing the company rev.com website.

The interview data collected was stored on one password-protected laptop with files also saved to one external flash drive. The external flash drive was stored in a locked file cabinet with

keys held by the researcher and one other. The computer and external hard drive store all data collected from interviews, document and artifacts, as well as the transcribed interviews notes.

The researcher gathered and analyzed documents and artifacts from the CREST-Ed grant. Specifically, the researcher analyzed the TIP residents' Anchor Action Research model associated with student achievement and leadership. Then the researcher analyzed these data for recurrent themes for common instructional and leadership practices.

Instruments.

Each TIP resident, mentor teacher, and professor administered an instrument that measures student performance based on the AAR unit of instruction. This instrument was the pretest and posttest for the TIP resident's class and the comparison class. Moreover, the pretest and posttest collected data for assessing student achievement for a unit of instruction.

To analyze the TIP residents AAR studies, the researcher utilized a software program named Comprehensive Meta-Complete to calculate the effect sizes of these quasi-experimental design AAR studies. Michael Borenstein who is a leader in the field of meta-analysis developed this program along with others (Borenstein, Hedges, Higgins & Rothstein, 2009). The program provided the calculation of the forest plot that showed the individual AAR study effect size and the overall effect size for this study, which is described in more detail in the results section.

Additionally, the researcher employed two interview instruments in this study. The first instrument utilized semi-structured interviews to conduct focus group interviews with the resident interns and district coordinators (MacPhee & Kaufman, 2014; Ogletree, 2009; Ylimaki, 2012). The researcher also employed this semi-structured interview protocol to conduct the individual interviews of the local school instructional leaders. The second instrument analyzed the documents and artifacts. While the third instrument collected perception data of TIP residents

regarding implementations of their Anchor Action Research plans and activities for student achievement.

Data Analysis.

The quantitative analysis of this study came from student achievement data of TIP residents and their comparison classrooms. The achievement data employed an independent t-test on gain scores from each of the eight AAR studies. Meta-analysis accumulated eight individual TIP with AARs according to procedures outlined in Borenstein, Hedges, Higgins, and Rothstein (2009). Inputted into the meta-analysis were the mean, standard deviation, and correlation results from the TIP with AAR studies to calculate the effect size of each AAR and the overall effect size of all eight studies.

The researcher also analyzed qualitative data which came from interviewing the TIP residents, district coordinators, and local school instructional leaders to find common sentences, quotes, and topics which allowed the researcher to understand the participants' experiences of the TIP model with AAR instruction for student achievement (Merriam, 1998; Yin, 2014). The next step for analyzing the data was to group the statements and quotes from the TIP residents, district coordinators, and local school instructional leaders into themes (Merriam, 1998; Yin, 2014). The researcher further interpreted the meaning from the data by analyzing statements and quotes from these participants as outlined by Manning and Kunkel (2014) and Yin (2014). Finally, the researcher analyzed student achievement gain scores between the pretest and posttest scores between the students of the TIP residents and the comparison teachers using meta-analysis to help understand the effectiveness of the AAR plans and implementations.

To address the two guiding questions, the data from interviews, artifacts, and documents were analyzed likely leading to the emergence of common themes. For the first guiding question,

these common themes included the meaning from the perceptions of the instructional leader, TIP residents, and mentor teachers of the TIP model in PDSs (Manning & Kunkel, 2014; Yin; 2014). The interview and other data provided *evidence of how these stakeholders perceive the TIP model* in a PDS. For the second guiding question, the analysis focused on artifacts, documents (e.g. AAR plans), and interviews from the TIP residents regarding the plans and implementations of their research (i.e. AAR studies) to see if *common themes emerge from the TIP resident data*. These common themes likely would show the instructional methods, teaching practices, and assessment procedures through teacher-made tests implemented by the TIP residents.

The interviews of the school leaders associated with the TIP model lasted approximately 20 minutes. The researcher recorded all of the interviews on audio recording devices. These recordings were then transcribed and color-coded according to the guidelines suggested by Merriam (1998) and Yin (2014). Moreover, these recorded datasets employed the use of a paid service to transcribe them allowing the researcher to begin the coding process by listening and reading the transcribed data within a day of completing each interview.

Sample.

This study employed a purposeful sample because the researcher selected the participants based upon their participation in the Teacher-Intern-Professor model (Richards & Morse, 2013). The researcher purposefully choose a sample of ten TIP resident teachers and eight mentor teachers assigned to work with the TIP residents. The researcher also purposefully choose the instructional-leaders with the placement of each TIP resident, from a maximum of ten principals and/or assistant principals.

Three different sets of semi-structured interview data were used in this study. The first set of data transcriptions were from approximately an hour-long focus group of the five of the ten

TIP residents. The second set of data transcriptions were from roughly a 30-minute interview with six principals or assistant principals, and the third set of data were artifacts of TIP residents' AAR studies. An additional set of data were from archival data belonging to the Collaboration and Resources for Encouraging and Supporting Transformations in Education (CREST-Ed) grant. The archival documents consisted of the TIP residents' anchor action research plans that are related to student achievement and qualitative data collected in the grant.

The individual and focus group interviews produced a total of eight transcriptions. The focus group interviews transcriptions generated two documents and the individual interviews created six documents. The TIP residents' AAR plans and implementations produced ten documents. Furthermore, the analysis of additional documents and artifacts from the CREST-Ed grant afforded the researcher with understanding the resident interns' AAR plans, which was helpful during the focus group interview.

Reduction of Threat.

The reduction of threat establishes a more valid case study (Merriam, 1998; Yin, 2014). There are four commonly used criteria to increase the validity of the research. Yin (2014), as well as other methodologists, categorize these four design criteria as construct validity, internal validity, external validity, and reliability (Creswell, 2013; Merriam, 1998).

Merriam (1998) and Yin (2014) both discuss constructing validity. The definition used in this research is from Yin (2014) and consists of developing a set of operational measures to assess the researcher's objectives. He further adds that construct validity involves the following two steps: 1) define a change of the specific concept and 2) cite matching published studies. To increase the construct validity, Yin (2014) provides three tactics: 1) "multiple sources of evidence," 2) "chain of evidence," and 3) composing reports (pp. 46-67).

Internal validity, which is the main concern in an explanatory case study, explains why and how event *x* leads to event *y* (Yin, 2014). Even though this research is not an explanatory study, there is still internal validity to be addressed in a descriptive case study (Yin, 2014). In this case study, the *x* variable represents TIP instructional activities by the TIP residents and the *y* variable represents the pretest and posttest gain scores for students in the TIP and comparison classrooms. This implies that TIP instructional activities lead to pretest and posttest mean gains.

The next step is showing that the findings from this descriptive case study are generalizable (Merriam 1998; Yin 2014), which Yin (2014) defines as external validity. A process called analytic generalization, according to Yin (2014), is "based on either 1) corroborating, modifying, rejecting, or otherwise advancing theoretical concepts that you referenced in designing your case study or 2) new concepts that arose upon the completion of your case study" (p. 41). The external validity of this case study is based on corroborating how student achievement and instructional leadership utilizing the TIP model provides additional support for the CREST-Ed grant.

The final test for the reduction of threats according to Yin (2014) is reliability. Documenting the process and procedures of this case study as well as previous case studies will provide other researchers with the ability to conduct the same study over again (Yin, 2014). Additionally, case study protocols as well as developing a case study database is followed to ensure the reliability of this descriptive case study (Yin, 2014).

Replicability.

The ability to replicate this study may not be possible because the TIP model is part of a multimillion-dollar federal grant with a professor involved with student teachers (Author, 2014). Moreover, this model is unique to Georgia State University. Nevertheless, the issue of replication

consists in having access to pretest and posttest gain scores as well as the availability of student-teacher models that can be replicated with these scores. Consequently, replication of this study will be difficult. The individual use of interviews, focus group, and meta-analysis from pretests and posttests are replicable in this study. Replicability can occur in this study by comparing student achievement between classroom teachers via interviews, focus group, and meta-analysis of the mean gains from the pretests and posttests.

Ethical Considerations.

Protecting the confidentiality of the participants is a *priority* in this research study. All documents and data collected and used during the study were kept on a password protected computer to which only the researcher and a department chair had access. A back-up of all files was stored on an external flash drive in a locked file cabinet that the researcher and department chair had the only keys. A second flash containing all passwords to encrypted files is stored in a different locked filing cabinet that the researcher had the only keys.

Informed consent and open communication lay the groundwork for maintaining a high standard of ethics in this study, beginning with the review and approval from the Georgia State University Institutional Review Board (IRB). Informed consent documents addressed any risks and benefits to the participants as well as their rights. In this study, risks are minimal as individual responses remained confidential and the subject matter, while important to the TIP residents, mentor teachers, and principals, is not considered highly personal or emotional.

Results

The results of this study following the outlines that of Yin (2014) and more specifically it follows his design as described in his *Case Study Research: Design and Methods* book on page 50. Researcher Yin describes a revelatory single-case study design for utilizing two units of analysis as a "single-case (embedded)" (Yin, 2014, p. 51). An embedded single-case "involves units of analysis at more than one level," which in this research consist of analyzing quantitative data using quasi-experimental design and single-subject design (Yin, 2014, p. 53). This study also utilized qualitative data and analysis based on focus groups and individual interviews with different members involved in the CREST-Ed grant, Teacher-Intern-Professor model. Therefore, the results section of this research will first describe the quantitative data (meta-analysis) and then the qualitative data (interviews) due to the consecutive order in which the data were collected.

Quantitative Unit of Analysis.

Meta-analysis provides the ability to "estimate the common effect (or mean effect)" from different studies in order to synthesize the summary effect among similarly conducted studies (Borenstein et al., 2009). To summarize the effect sizes among the TIP residents' quasi-experimental designed Anchor Action Research (AAR) projects meta-analysis takes into account pretest scores prior to employing their AAR projects and posttest scores after executing their AAR projects. The pretest and posttest are the same or an equivalent test administered to both the treatment and control groups within each AAR project. Students take the test before and after a unit of instruction. The resulting summary effect sizes are among similarly conducted pretest and posttest studies implemented by the TIP residents.

Not all TIP resident conducted an AAR project utilizing a quasi-experimental design that employed a pretest and posttest design. Two residents used a single-subject design (SSD). A

SSD AAR project compared the effects of a treatment applied to a student with learning challenges. These two residents used a single student within the SSD AAR project. According to Borenstein et al., there is a need for a minimum of three subjects within a SSD in order to summarize an effect size comparable to a group difference effect size, because "we might not know what the dispersion actually looks like" (Borenstein et al., 2009, p. 363). Additionally, research conducted by Borenstein et al. (2009) found that effect sizes from the quasi-experimental and the single-subject designs cannot be combined for an overall summary effect size. Therefore, a summarizing effect size from the quasi-experimental design and single-subject does not meet the conditions established by Borenstein and colleagues in 2009.

Due to the constraints aforementioned, the quantitative data of the AAR project is described in the proceeding two sections. The first section presents the quasi-experimental design AAR projects while the second section provides the results from two SSD AAR projects.

Quasi-Experimental Design (pretest and posttest). The time between the pretest and posttest may not be equivalent when conducting between-groups analysis. For this reason, this study does not compare the slopes from all studies. However, within groups there is equivalent time between the pretest and posttest. Since time is equivalent for within groups, the slopes are compared to show the effect direction (Borestein et al., 2009).

Procedures Used to Calculate Quasi-Experimental Design Meta-Analysis. Procedures used to calculate Quasi-Experimental Design Meta-Analysis Standardized Mean Difference (SMD) is calculated by taking the difference between the posttest and pretest means divided by the standard deviation units, which "standardizes" the mean differences (Kratochwill et al., 2013). According to Higgins's and Green's Handbook in 2011, the standardized mean difference "expresses the size of the intervention effect in each study relative to the variability observed in

that study". Moreover, the standard deviation units refers to the "standard deviation of outcome among participants" (Higgins & Green, 2011). An illustration of this equation is as follows:

$$SMD = \frac{difference\ between\ posttest\ and\ pretest\ means}{standard\ deviation\ units} = \frac{\mu_{posttest} - \mu_{pretest}}{\sigma_{units}} \quad (1)$$

The standardized mean differences between the pre and post tests for the groups are recorded as the mean gains between pretest and posttest for both treatment and control groups within each AAR. These mean gain scores are then compared between treatment and control to determine the effect size for that specific AAR.

Comprehensive Meta-Complete to calculate the effect size for each AAR study. Borenstein et al. (2009) define the difference between mean gain scores of the treatment and control groups as

$$\Delta = \mu_T - \mu_C. \quad (2)$$

To estimate the mean difference Δ, Borenstein et al. (2009) states to "Let $\bar{X}_1$ and $\overline{X_2}$ be the sample means of the two independent groups. The sample estimate of Δ is just the difference in sample means, namely

$$D = \overline{X_1} - \overline{X_2}" \text{ (p. 22).} \quad (3)$$

According to Borenstein et al. (2009), the following formula is used to calculate the variance of D where $n_1$and n_2 are the sample sizes for the treatment and control groups, respectfully. Assuming the populations standard deviations are the same $\sigma_1 = \sigma_2 = \sigma$, then the calculation for the variance is

$$V_D = \frac{n_1 + n_2}{n_1 n_2} S^2_{pooled.} \quad (4)$$

In the majority of the AAR studies, the two population standard deviations are not the same. For these studies, there is a different method for calculating the variance of *D*, which is represented in the following formula

$$V_D = \frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}. \quad (5)$$

The formula to calculate the pooled standard deviation and standard error is the same regardless of whether the population standard deviations are the same or not.

$$S_{pooled} = \sqrt{\frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2-2}}. \quad (6)$$

$$SE_D = \sqrt{V_D}. \quad (7)$$

AAR34 Calculations. To understand the steps more fully for computing the meta-analysis effect size of the AAR studies, the following provides an explanation for the calculations of AAR34. Calculations of the random effects meta-analysis statistics are given by the Comprehensive Meta-Analysis Program. Typically, the effect size is calculated by dividing the difference of the pre mean and post mean by the pooled within standard deviation.

$$d = \frac{\overline{X}_1-\overline{X}_2}{S_{within}} \quad (8)$$

$$S_{within} = \sqrt{\frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2-2}} \quad (9)$$

However, in the case where there are pre and post tests for each group, the difference in the means may be interpreted as the effect size when comparing the two group mean gains. Therefore, given the treatment mean gains of 66.02 – 19.16 = 46.86 and control mean gains of 61.27 – 17.19 = 44.08, we can populate the numerator of the effect size calculations:

$$d = \frac{46.86 - 44.08}{S_{within}}$$

For the denominator we have selected to standardize the difference by dividing by the pooled post score standard deviation which is calculated below for AAR34.

$$S_{within} = \sqrt{\frac{(38-1)(22.22)^2 + (37-1)(24.99)^2}{38+37-2}} = 23.62$$

Then enter S_{within} into the formula to calculate Cohen's d effect size:

$$\frac{46.86 - 44.08}{23.62} = 0.118$$

The d = 0.118 is the effect size given by the Comprehensive Meta-Analysis Program for AAR34. The variance of d (V_d) is shown in the formula:

$$V_d = \frac{n_1+n_2}{n_1 * n_2} + \frac{d^2}{2(n_1+n_2)} \quad (10)$$

$$V_d = \frac{38+37}{38*37} + \frac{0.118^2}{2(38+37)} = 0.053$$

The standard error of the effect size is 0.231 which is shown in the AAR34 column.

$$SE_d = \sqrt{V_d} = \sqrt{0.053} = 0.231$$

The AARs included in this meta-analysis are using different sample sizes, interventions, and age groups and the effect sizes are expected to vary; therefore, a random-effects meta-analysis process was used to analysis these data. Prior to completing the random-effects meta-analysis the between-study variance must be estimated using the formula:

$$T^2 = \frac{Q-df}{C} \quad (11)$$

Using the fixed-effects model the between variance (T^2) can be estimated by using the fixed-effect values for the pertinent variables, the calculations are:

$$T^2 = \frac{26.006 - 7}{44.071} = 0.431$$

Once the between variance is estimated then the random-effects meta-analysis formulas are used to calculate the random weights and the total effect size. Staying with the AAR34 example, the total random weight would be equal to the reciprocal of the study variance plus the between variance, which is shown in Table 1 below from utilizing the Comprehensive Meta-Analysis Complete Program.

$$W_{AAR34} = \frac{1}{(0.053 + 0.431)} = \frac{1}{0.485} = 2.063$$

Table 1

Comprehensive Meta-Analysis Complete Program to Calculate Variance

Study Name	Point	Study Variance	Tau^2 Between	Total Variance	IV-Weight	W
AAR26	-0.417	0.161	0.431	0.592	1.689	1.689
AAR27	-0.476	0.196	0.431	0.628	1.593	1.593
AAR28	0.248	0.151	0.431	0.582	1.717	1.717
AAR29	2.062	0.275	0.431	0.706	1.416	1.416
AAR30	-0.637	0.141	0.431	0.572	1.748	1.748
AAR31	-0.948	0.521	0.431	0.952	1.050	1.050
AAR33	0.823	0.203	0.431	0.635	1.576	1.576
AAR34	0.118	0.053	0.431	0.485	2.063	2.063
	0.773	1.702	3.450	5.152	12.852	12.852

Note. The table above shows the meta-analysis from using the Comprehensive Meta-Analysis Program sup porting the hand calculations of AAR34. The AAR studies begin with AAR26 to AAR31 chronologically, and then skips to AAR33 and AAR 34 because these are the quasi-experimental designed AAR projects of this case study of one cohort of resident interns.

The heterogeneity of the AAR studies needs to be identified and quantified. The weighted sum of squares (WWS) or *Q*-statistic has to be calculated to check for heterogeneity or the true effect size(s) among the AAR studies. The *Q*-statistic is necessary to isolate the variation among the AAR studies (Borenstein et al., 2009). However, since the *Q*-statistic is sensitive to the number of studies, there is also a need to calculate the variance of the true effect sizes, *C*, in order to "determine what proportion of the observed variance is real," or I^2 (Borenstein et al., 2009, p.

119). One key factor of I^2 is that it not sensitive to the number of studies employed, thus providing more statistical power than WWS or *Q* (Borenstein et al., 2009).

As shown in the continued calculations of AAR34 and Table 2, I^2 equals 25.51 percent, which according to Borenstein et al. (2009), moves away from zero indicating that the variance is real and "is a small part of a large observed dispersion" (p. 120). Moreover, Huedo-Medina, Sánchez-Meca, Marín-Martínez, and Botella, (2006) state that I^2 "can be interpreted as the percentage of the total variability in a set of effect sizes due to true heterogeneity, that is, to between-studies variability" (p. 5). Nevertheless, Higgins and Thompson (2002) interpret a percentage around 25 percent as having low heterogeneity. Therefore, since $I^2 = 25.51$, there is low heterogeneity among the AAR studies.

$$Q = \sum_{i=1}^{k} W_i \, Y_i^2 - \frac{\left(\sum_{i=1}^{k} W_i Y_i\right)^2}{\sum_{i=1}^{k} W_i} \tag{12}$$

$$Q = 9.531 - \frac{1.72397}{12.852} = 9.397$$

$$C = \sum W_i - \frac{\sum W_i^2}{\sum W_i} \tag{13}$$

$$C = 12.852 - \frac{21.243}{12.852} = 11.1995$$

$$I^2 = \frac{Q - df}{Q} \times 100 \tag{14}$$

$$I^2 = \frac{9.397 - 7}{9.397} \times 100 = 25.51$$

The remaining equations use the estimated T^2 and the random-effects weights to calculate the study variables, which Table 2 shows this calculation using Comprehensive Meta-Analysis Program for AAR34 and the AAR studies as well.

Table 2

Comprehensive Meta-Analysis Complete Program to Estimated T^2 and Random-Effects

	Calculations (Random-Effects)							
Study Name	T*W	T^2*W	W^2	W^3	C	Q	Q df	I^2
AAR26	-0.705	0.294	2.852	4.815	11.199	9.397	7	25.509
AAR27	-0.758	0.361	2.539	4.046	11.199	9.397	7	25.509
AAR28	0.426	0.106	2.948	5.062	11.199	9.397	7	25.509
AAR29	2.920	6.023	2.005	2.839	11.199	9.397	7	25.509
AAR30	-1.114	0.709	3.057	5.345	11.199	9.397	7	25.509
AAR31	-0.996	0.944	1.102	1.158	11.199	9.397	7	25.509
AAR33	1.296	1.066	2.483	3.912	11.199	9.397	7	25.509
AAR34	0.243	0.029	4.257	8.782	11.199	9.397	7	25.509
	1.313	9.531	21.243	35.959	11.199	9.397	7	25.509

Note. The table above utilizes Comprehensive Meta-Complete Program to estimate the random-effects of the AAR studies, which supports the hand calculations aforementioned.

The final calculation of the AAR studies produced an overall effect size, as shown in Table 3. The point estimate of the total effect size of 0.102 does favor the resident interns as compared to the comparison teachers who had at least three years teaching experience. Since the summary effect size prefers the resident interns, it can be interpreted that the resident interns teaching of a unit of instruction employing AAR is as good as a certified teacher of at least three years teaching experience. Moreover, this effect size also suggests that the Teacher-Intern-Professor model provides the supports necessary for a preservice teacher to facilitate a unit of instruction as good as a certified teacher.

Table 3

Quasi-Experimental Design Study Statistics

Study Name	Standard Difference in means	Standard error	Variance	Lower Limit	Upper Limit	z-Value	p-Value
AAR26	-0.417	0.401	0.161	-1.204	0.369	-1.040	0.298
AAR27	-0.476	0.443	0.196	-1.344	0.393	-1.074	0.283
AAR28	0.248	0.389	0.151	-0.514	1.010	0.639	0.523
AAR29	2.062	0.524	0.275	1.035	3.090	3.933	0.000
AAR30	-0.637	0.375	0.141	-1.372	0.098	-1.698	0.089
AAR31	-0.948	0.722	0.521	-2.363	0.467	-1.313	0.189
AAR33	0.823	0.451	0.203	-0.061	1.706	1.824	0.068
AAR34	0.118	0.231	0.053	-0.335	0.571	0.509	0.611
	0.102	0.279	0.078	-0.445	0.649	0.366	0.714

Note. Resident interns' quasi-experimental design AAR study statistics show the standard difference in means, which represents the effect size of each study (Borenstein, 2009). The last row is the summary statistic for all eight AAR studies with a summary effect size of 0.102 that favors the resident interns but is not statistically significant.

Effect Direction. According to Borenstein et al. (2009), the effect direction compares the linear segments from subtracting the mean pretest score from the mean posttest. For example, to calculate the effect direction of AAR26 of the treatment and control group the horizontal axis represents the pretest and posttest values while the vertical axis consists of the treatment pretest mean and posttest mean. Utilizing the data from AAR26, the treatment group pretest mean is 18.220 and the posttest mean is 47.480, and the control group pretest mean is 35.800 and the posttest mean is 73.530, which is shown in Table 4. Since the horizontal axis a constant, representing pretest and posttest scores, the comparable analysis is to calculate the effect direction by comparing the means of the control and treatment groups. The resulting effect direction of AAR26 is negative because the control group outperformed the treatment group, which Figure 2 displays. The researcher conducted this same process for calculating and displaying the effect direction for all quasi-experimental design AAR studies, found in Appendix B.

Table 4

AAR Study Statistics for the Effect Directions

Study Name	Treatment Pre Mean	Treatment Post Mean	Comparison Pre Mean	Comparison Post Mean	Effect Direction
AAR26	18.220	47.480	35.800	73.530	Negative
AAR27	82.800	90.600	78.400	90.800	Negative
AAR28	50.93	63.13	21.25	41.17	Positive
AAR29	35.4	74.2	22	40.2	Positive
AAR30	25.5	68.5	23.6	80.7	Negative
AAR31	13.6	17.7	2.9	17.3	Negative
AAR33	72.46	81.46	89.22	84.44	Positive
AAR34	19.16	66.02	17.19	61.27	Positive

*Note. The above table shows the treatment and comparison pre and post mean used to calculate the effect direction of each AAR study.

Effect Direction Analysis of AAR26

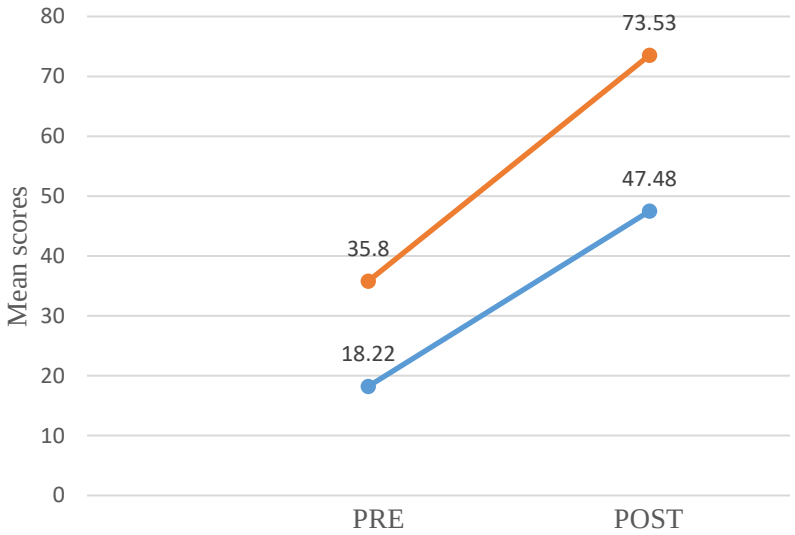


Figure 2. The effect direction is negative for AAR26 because the rate of change is greater in the control group (red line) than the treatment group (blue line).

Single-Subject. The single-subject studies use baseline data and treatment data instead of a pretest and posttest design. To analogize quasi-experimental design to single-subject would be to say that pretest is to posttest as baseline is to treatment. This analogy helps to provide a better understanding of how to relate the analysis between these two meta-analysis studies. It should be noted that the statistical analysis in the quasi-experimental design and the single subject studies did not use the same metric. Therefore, the result is two separate views of the effect sizes.

According to Kratochwill et al. (2013), the What Works Clearinghouse Design Pilot Standards for Single Subject Designs (SCDs), V 1.0 states that a single-subject study design implements one of the following designs: ABAB, Multiple-baseline, or Alternating treatment design. The single-subject design (SSD) AAR projects implemented by the two resident interns followed the multiple-baseline design (MBD). The SSD projects consisted of observing one student over a consecutive number of days to establish the baseline phase, and implementing a treatment to this same student to establish the treatment phase, which according to Moeyaert et al. (2013) meets the condition of a MBD study. Moeyaert et al. (2013) and other researchers state that when utilizing one baseline phase and one treatment phase, this represents an AB phase design (Borenstein et al. 2009; Kauffman, Hallahan, & Pullen, 2017). Moreover, the advantage for utilizing a MBD designed AAR study allowed the resident interns to assess the effect of the treatment because the "dependent variable cannot be reversed, removed, or altered with another treatment" (Kauffman, Hallahan, & Pullen, 2017, p. 123). Therefore, to Meet Standards With Reservations a minimum of four repetitions is needed, which both single-subject AAR studies met. Because the SSD AAR studies had at least four repetitions within the baseline and treatment phases, they met the standards imposed by the What Works Clearinghouse (Kratochwill et al., 2013; What Works Clearinghouse).

Single-Subject AAR32. In the AAR32 single-subject study, the resident intern analyzed appropriate and inappropriate actions of a Hispanic seventh-grade male receiving special education services who had free or reduced lunch status. The resident intern who conducted this AAR project collected data over fourteen consecutive days that consisted of baseline data during the first four days, and then she applied a treatment for the next ten days. It is important to note that during the first days of treatment, there was no change observed for appropriate interruptions as displayed in Figure 3. However, during these same four days, the student's inappropriate interruptions decreased, which one can assume is a positive outcome when inappropriate interruptions decrease even though no change occurred to the appropriate interruptions. Because the data for this AAR study consisted of two events being measured, the researcher analyzed the appropriate and inappropriate interruptions independently by conducting a PND and a PAND that included the value of phi, which provided this study with an effect size for appropriate and inappropriate interruptions. Since, according to Borenstein et al. (2009), there needs to be a minimum of three effect sizes to combine results from meta-analysis studies, there is no overall effect size to support the combination of the appropriate and inappropriate interruptions. Nevertheless, the researcher assumed an observational effect size based on the two independent effect sizes because individual data points were not available.

The PND and PAND calculations use ratios that compare the number of treatment values above the highest baseline data point. However, the researcher reversed the PND calculations for calculating the inappropriate interruptions since a reduction, not an improvement, is a positive outcome during the treatment phase. The PAND calculations incorporate two additional steps. The first extra step is to count the number of overlapping values that overlap between the treat-

ment and baseline. The second step is to calculate the phi value, which according to Parker, Vannest, and Davis (2011), provides an effect size. The following paragraphs explain the calculations for completing the PND and PAND analysis.

Appropriate Interruptions. The PND calculations for the appropriate interruptions, as displayed in Figure 3, shows "the percentages of Phase B [treatment] data exceeding the single highest Phase A [baseline] data point" (Parker et al., 2011, p. 8). The highest point in the baseline phase is 0 (zero), and five of the ten points are above 0 in the treatment phase, so PND = 5 / 10 = .50 or 50%, which provides questionable effectiveness according to Scruggs and Mastropieri (1998).

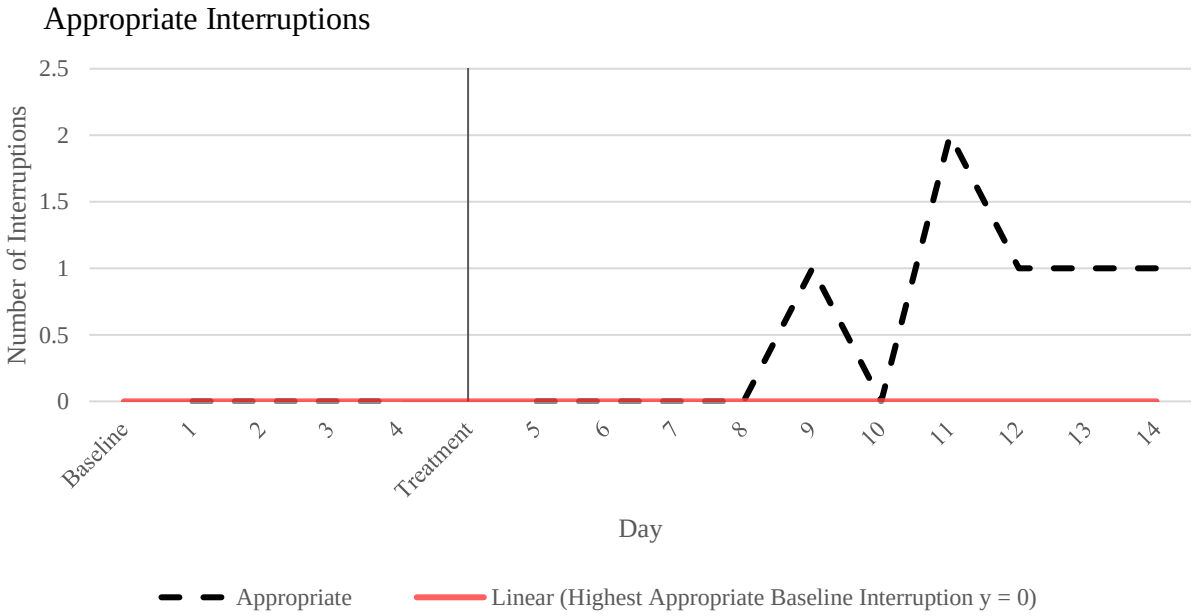


Figure 3. The appropriate behaviors are represented with the dotted line. During the treatment phase no appropriate behaviors were recorded. A change in behavior occurs after day eight. The redline represents the highest appropriate behavior during the baseline phase, which is the evaluation trend line used in a PND meta-analysis (Parker et al., 2011).

The researcher utilized the PAND technique to analyze further the appropriate interruptions data line. The PAND "index is conceptualized as the percentage of data remaining after removing the fewest data points that would eliminate all overlap" (Parker et al., 2011, p. 8). Figure 4 shows the five overlapping data circled below the non-overlap line. The PAND equals the remaining data (non-circled) in the treatment phase divided by the total, baseline plus treatment days subtracted from one, which is PAND = 1 – (5/14) = 14/14 – 5/14 = 9/14 = 0.643 or approximately 64%. Phi, according to Parker et al., (2011), is "intended to legitimize PAND with a well-reputed effect size," so the researcher further calculated Phi to establish an effect size for appropriate interruptions (p. 8). Phi is calculated using a 2 x 2 contingency table, which is shown in the bottom right-hand corner in Figure 5. "Phi is calculated on a 2 x 2 table composed of two ratios, one for each phase. The baseline ratio is as follows: "half of all removed data points divided by the remaining lower Phase A [baseline] data points" (Parker et al., 2011, p. 9). The treatment ratio is the reverse: "the remainder (high) of Phase B [treatment] data points divided by one-half of all removed data points" (Parker et al., 2011, p. 9). The baseline and treatment ratios utilize a cross-tabulation analysis, yielding Phi to which Phi = 0.47. Because Phi is a well-believed effect size, the effect size of the appropriate interruptions is 0.47, which according to Cohen, 1998 is nearly a large effect size.

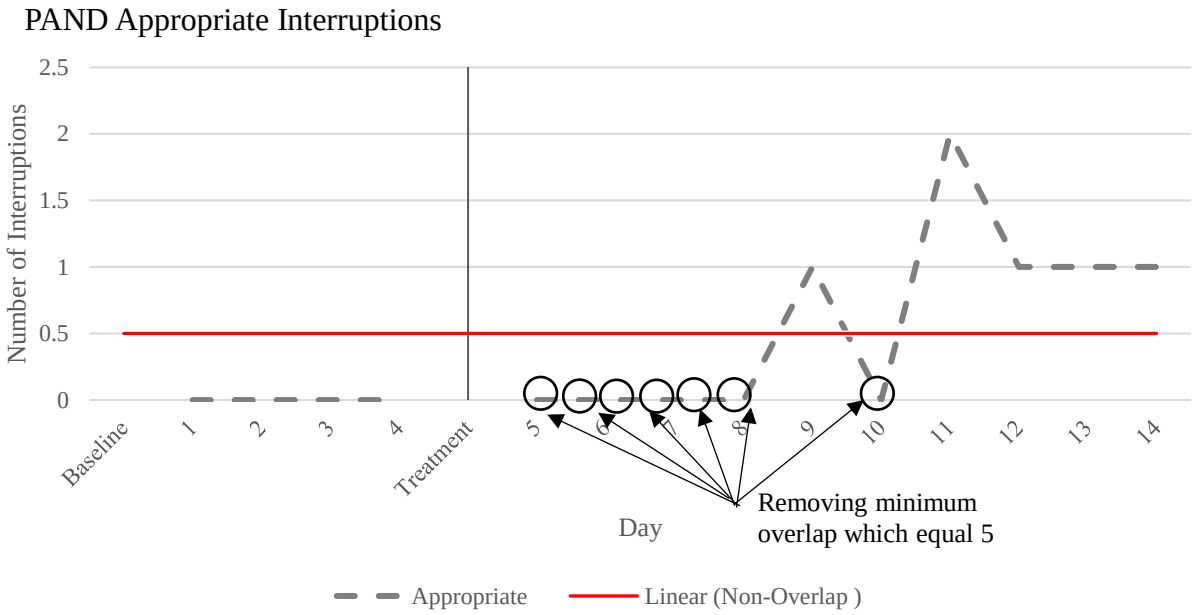
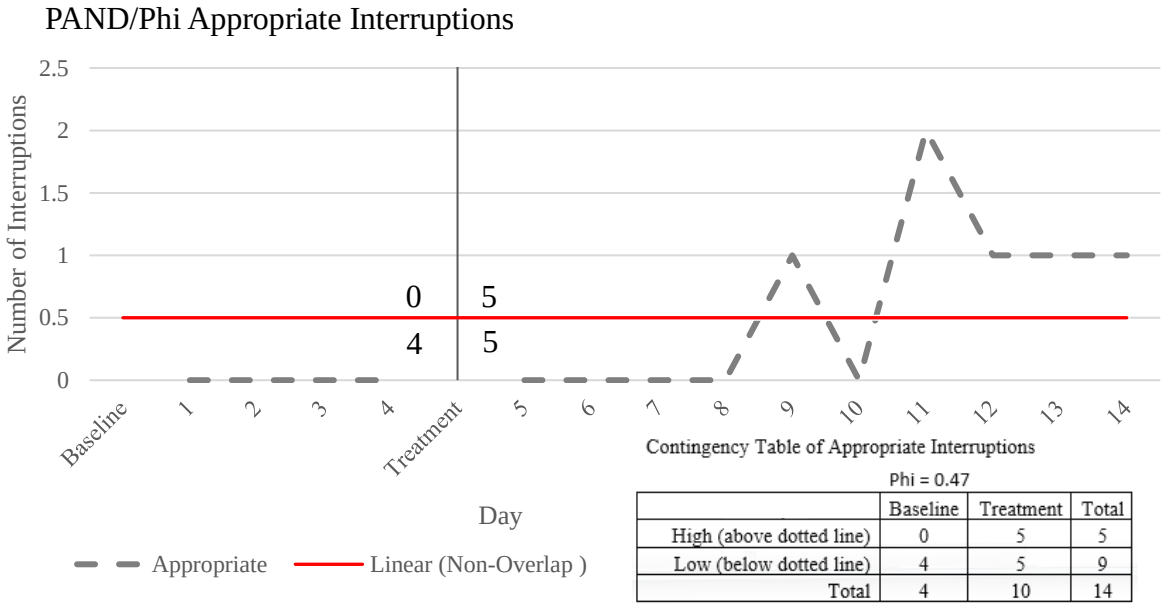


Figure 4. The appropriate behaviors are represented by the dashed line. The redline is drawn just above the highest appropriate behavior during the baseline phase, which is the evaluation trend line used in a PAND meta-analysis according to Parker et al., 2011. In this PAND meta-analysis, the lowest overlapping treatments are removed from the calculations, which is shown with the circled treatments above (Parker et al., 2011).



Contingency Table of Appropriate Interruptions

Phi = 0.47

	Baseline	Treatment	Total
High (above dotted line)	0	5	5
Low (below dotted line)	4	5	9
Total	4	10	14

Figure 5. The calculation is Phi, which is 0.47, is shown above by displaying the number of appropriate interruptions above and below the PAND line shown as a solid red line.

Inappropriate Interruptions. The PND calculations for the inappropriate interruptions are calculated similarly to the appropriate interruptions with one exception. The decrease of inappropriate interruptions represents a positive outcome whereas an increase in inappropriate interruptions, as described above, represents a positive outcome. Therefore, the lowest point in the baseline phase, shown in Figure 6, is four and three of the ten points are below four in the treatment phase, so PND = 3 / 10 = .30 or 30%, which provides no observable effect according to Scruggs and Mastropieri (1998).

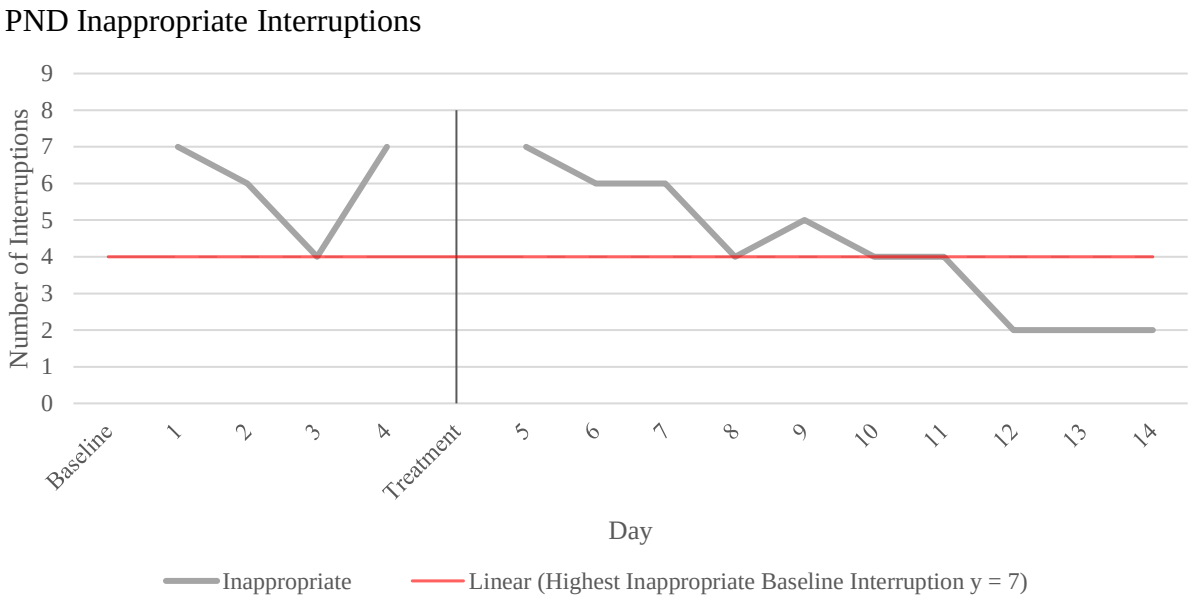


Figure 6. The inappropriate behaviors are represented with the solid line. During the treatment phase shows a decrease then an increase before the treatment phase. The treatment phase shows a consistent decrease in the inappropriate behaviors. The redline represents the lower inappropriate behavior during the baseline phase, which is the evaluation trend line used in a PND meta-analysis (Parker et al., 2011).

The researcher utilized the PAND technique to analyze further the appropriate interruptions data line. The PAND "index is conceptualized as the percentage of data remaining after removing the fewest data points that would eliminate all overlap" (Parker et al., 2011, p. 8). Figure

7 shows the seven overlapping data circled above the non-overlap line. The PAND equals the remaining data (non-circled) in the treatment phase divided by the total, baseline plus treatment days subtracted from one, which is PAND = 1 – (6/14) = 14/14 – 6/14 = 8/14 = 0.571 or approximately 57%. Again, the researcher further calculated Phi, shown in Figure 8, to establish an effect size for appropriate interruptions by the same method as described above using a 2 x 2 contingency table and cross-tabulation analysis to yield Phi = 0.33 or an effect size of 0.33 to which Cohen (1998) is a medium effect size (Parker et al., 2011).

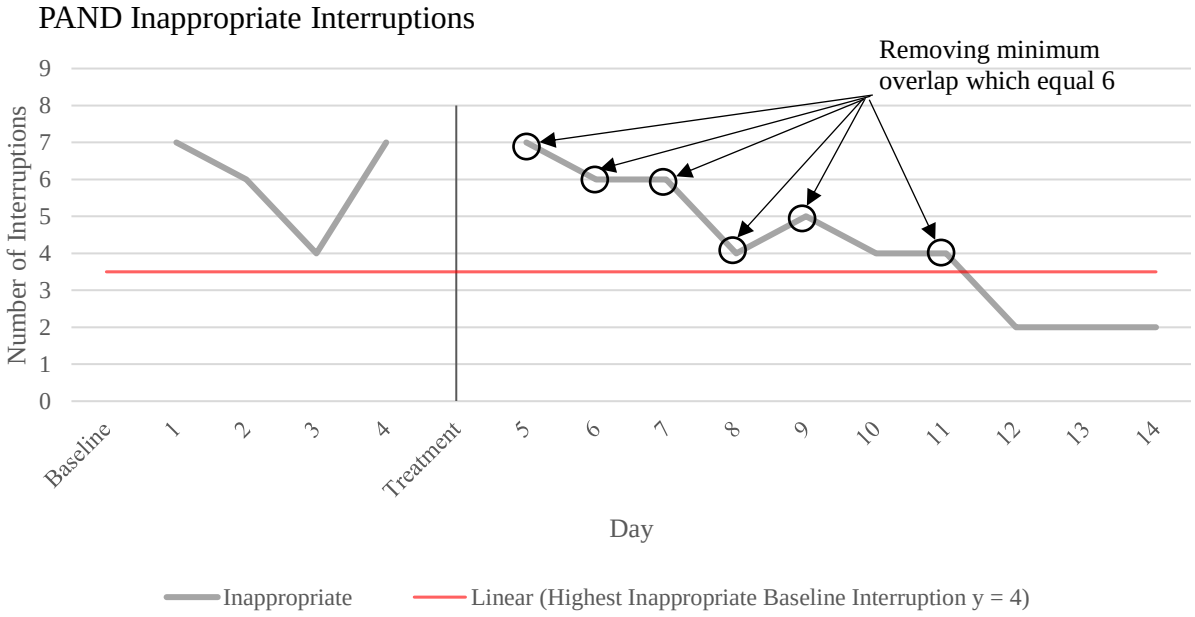
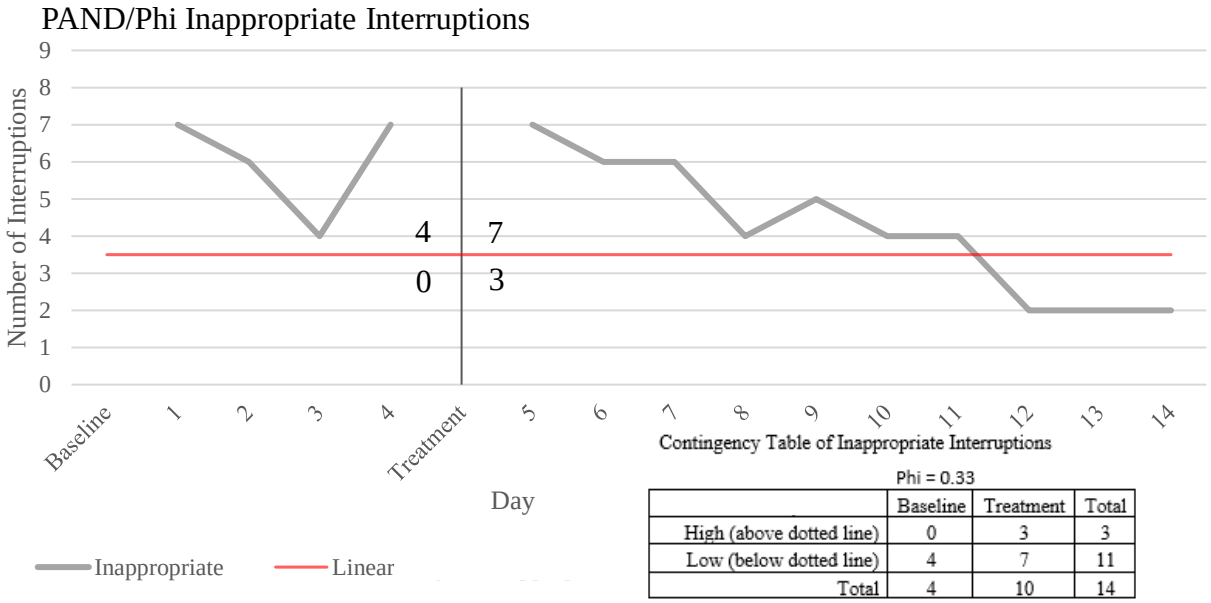


Figure 7. The red line is drawn just below the least inappropriate behavior during the baseline phase, which is the evaluation line used in a PAND meta-analysis according to Parker et al., 2011. In this PAND meta-analysis, the highest overlapping treatment inappropriate behaviors are removed from the calculations, which is shown with the circled treatments above (Parker et al., 2011).



Contingency Table of Inappropriate Interruptions

Phi = 0.33

	Baseline	Treatment	Total
High (above dotted line)	0	3	3
Low (below dotted line)	4	7	11
Total	4	10	14

Figure 8. A Phi of 0.33 is calculated from the number of inappropriate behaviors above and below the red line, which is shown in the graph above. The table shows the values used to calculate Phi.

Results of Appropriate and Inappropriate. The resulting observation effect of the treatment applied the increase of appropriate and a decrease of inappropriate interruptions show a medium overall effect size. This medium effect size takes into account the two effect sizes of 0.47 and 0.33, which are both in the medium magnitude of effect size according to Cohen (1988). Thus, the research concludes that this male Hispanic whose family income is at or below the poverty line, the benchmark for qualifying for free or reduced lunch, has a moderate trend of decreasing his inappropriate interruptions while increasing his interruptions due to the research strategy utilized by the resident intern of AAR32.

Single-Subject AAR35. The AAR35 single subject design consists of one student's ability to identify the recognition of sounds in a specific order. The sounds this special education student was to recognize was letter patter sounds, such as C-A-M, L-E-D, and T-I-S. The resident

intern of this AAR study used a plus sign and a negative sign symbol to indicate if the student was able to identify the letter and its corresponding sound correctly.

In order to calculate an effect size, the researcher utilized the risk ratio meta-analysis method. The ratio consisted of the numerator representing the number, counting method, of positive cognitions identifying the correct letter and corresponding sound. The denominator of the risk ratio represents the number of non-plus signs or negatives signs, which represents the observations of this special education student not recognizing the letter and corresponding sound correctly. According to the AAR35 report, this student had a baseline of recognizing 38% of letter sounds and 17% of recognizing the letter. After the treatment period, this student improved to recognizing 88% of sounds and 92% of letters. Subtracting the sound and letter percentages of the baseline from the treatment results in a 75% increase in sound and a 50% increase in letter recognition, respectively. Therefore, the observed ratio effect size for this single-subject AAR supports the effectiveness of the treatment provided to this special education student, which Figure 9 displays below.

AAR35 Baseline and Treatment Recogition Perentages

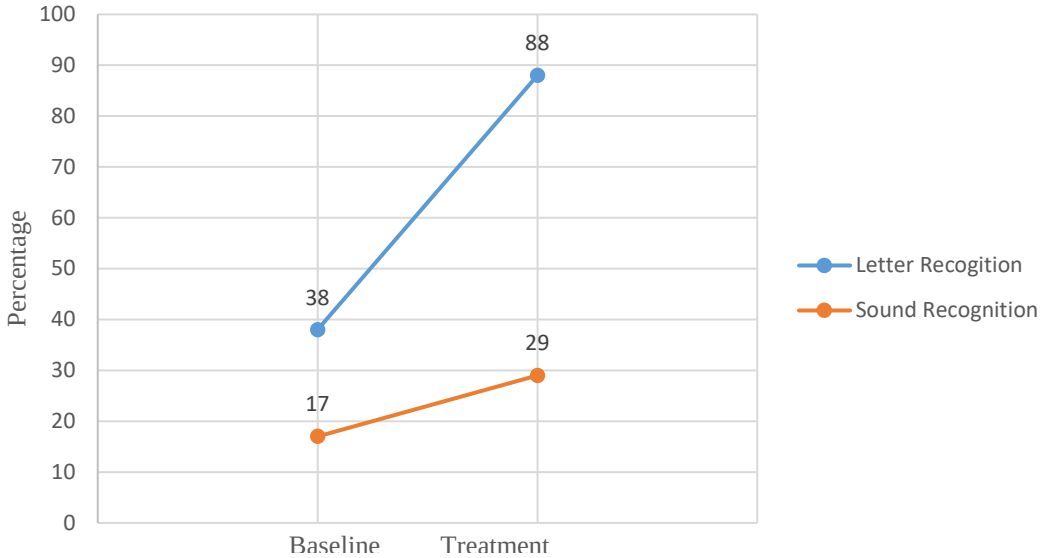


Figure 9. The blue line shows the increase from applying a treatment to letter recognition. The orange line displays the increase in sound recognition after a treatment is applied. Both segments show a rate of increase from the beginning to end, thus repressing a positive trend.

Single-Subject Design Study Limitation. A limitation of the single-subject design is that it provides "less precise and potentially more biased estimates when the assumptions are met" (Morris & DeShon, 2002). Borenstein and colleagues (2009) argue that the method chosen for the study may likely produce a different outcome had the researcher employed a different method for calculating the effect size for the single subject studies. Future researchers have the option to choose the analytical method of their choosing for calculating the overall effect size of their research. Therefore, the lack of agreement on a general approach for calculating single-subject effect sizes for a meta-analysis is a likely limitation, which could lead to potentially different results due to the analytical method chosen.

Representing Data. The forest plot provides an opportunity for limitations to the study to be noticed visually. According to Borenstein et al. (2009), utilizing a forest plot illustrates the outliers that may skew the findings of the overall effect size.

The pretest and posttest data in Figure 11 display the meta-analysis data from the AAR studies conducted during the 2016 – 2017 academic year. One way of displaying each study's effect size on a graph, which provides a visual way to view the results of each individual study (Borenstein et al., 2009). This display is called a forest plot. "In the forest plot each study as well as the summary effect is depicted as a point estimate bounded by its confidence interval" (Borenstein et al. 2009, p. 366). This study employed a 95 percent confidence interval with a significance level of 0.05 ($p = 0.05$).

A forest plot was employed to show the effect sizes from the meta-analysis as well as the overall effect among the AAR studies (Borenstein et al., 2009). "The plot puts a face on the statistics, helping to ensure that they will be interpreted properly, and highlighting anomalies, such as outliers, that require attention," as asserted by Borenstein and colleagues in 2009.

The AAR studies are displayed in Figure 10 in a forest plot. A forest plot displays the effect size bounded by a 95 percent confidence interval among all the quasi-experimental design AAR studies. A summary effect size is shown as the last line item in the figure. The overall effect size is 0.102 favoring the teachings of the resident interns' AAR studies.

Forest Plot of Quasi-Experimental Design AAR Studies

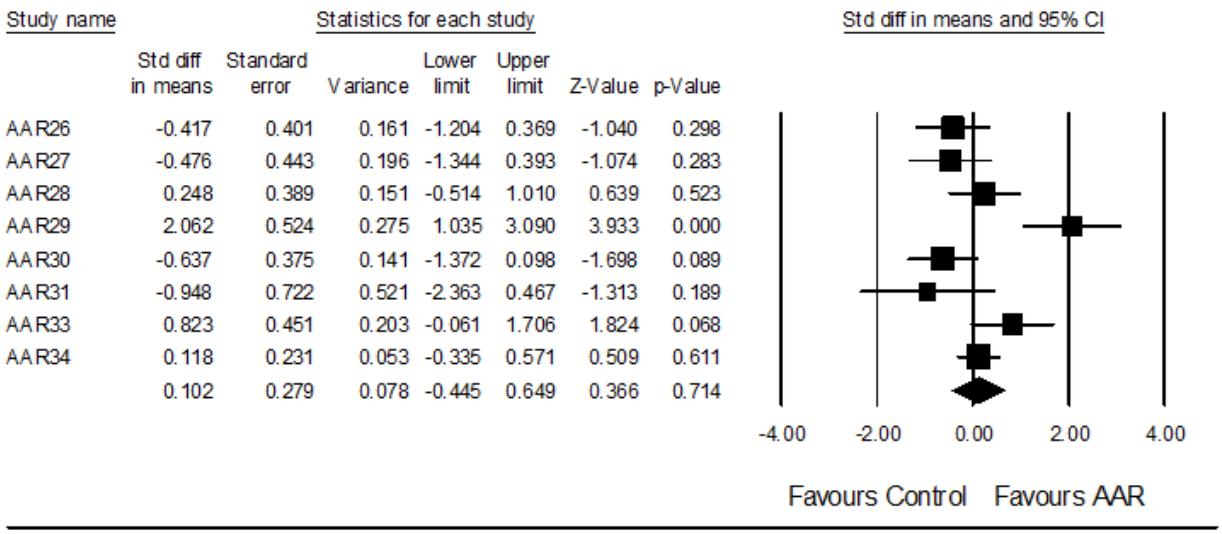


Figure 10. The AAR studies statistics are shown above where the "Std diff in means" represents the effect size of each AAR studies. The last row is the summary for each column; thus, the overall effect size of the quasi-experimental studies is 0.102. In the forest plot, a 95% confidence interval on the point estimate of 0.102 is shown by a large diamond.

Quantitative Summary. In summary, even though there is no quantitative measure to combine the overall effect sizes of the quasi-experimental design AAR projects with the two single-subject design AAR projects, there is the ability to concluded through observational data results of three effect sizes all favoring the instructional practices of the resident interns. Thus, it is likely that the resident interns produced results that were as effective as or slightly more effective than the comparison teachers or the standard teachings in regards to special education instruction.

The quasi-experimental design AAR studies had a summary effect size of 0.102 favoring the unit of instruction implemented by the resident interns. The single-subject designed AAR projects produced effect sizes of 0.47 and 0.33, both of which indicate that the treatment intervention successfully improved the learning objectives for each of the students taught by a resident intern. Though these effect sizes for differing models are not numerically combined, these effect sizes provide evidence utilizing observational data that favor the teachings of the resident

interns; thus, there is evidence for a strong argument to be made that supports the instructional practices of the resident interns. This evidence suggests that developing an Anchor Action Research project during a unit of instruction, the CREST-Ed grant TIP model, produces a preservice teacher that is able to teach as well as a certified teacher of at least three years of experience.

Qualitative Unit of Analysis.

The qualitative data for this case study utilizes the responses from three distinct groups of individuals involved in the CREST-Ed grant TIP program. These individuals are the resident interns, school leaders, and district coordinators. The resident interns and school leaders were previously mentioned in the above literature; however, through research discovery, the researcher found that the CREST-Ed model evolved into utilizing district coordinators as liaisons rather than university professors. This change took place to reduce the workload of university professors, which was aforementioned as a limitation to university professors working with professional development schools. With the district coordinator now involved with assisting with paperwork and timeline completion of tasks, the university professors are able to work more directly with the resident interns' AAR projects and classroom management strategies.

To analyze the qualitative data within this study, the researcher utilized the work from several researchers to find spatial relationships, which is looking "for phases for the form X is close to Y" (Bernard, Wutich, & Ryan, 2017, p. 109). The researcher also utilized time-oriented relationships because of the sequential order of events: developing an AAR project, creating and implementing a pretest, teaching a unit of study, giving a posttest, and analyzing the data results of the AAR project (Bernard, Wutich, & Ryan, 2017). While using these two techniques, the researcher also looked for patterns of similarities and differences by "making systematic comparisons across units of data" (Bernard, Wutich, & Ryan, 2017, p. 107) to identify

"information about the data and interpretive constructs related to analysis" (Merriam, 1998, p. 164). Therefore, according to Yin (2014), these qualitative data techniques will likely help to uncover "the behavior and events that your [this] case study is trying to explain – typically the 'outcomes' in an evaluative case study" (p. 137).

To code the qualitative data for uncovering behavioral events that took place during the participants lived experiences of the CREST-Ed grant's TIP program, the researcher utilized a hand coding technique similar to the index card coding techniques outlined by researchers Merriam (1998) and Stake (1995). The index card technique implies that participant responses to questions are written on individual index cards to be sorted into groups based on coding techniques, such as the ones aforementioned. Instead of using index cards, the researcher utilized a data matrix or profile matrix as defined by Bernard, Wutich, and Ryan (2017) within the computer software program Microsoft Excel to input the responses to the questions from each participant, which Yin (2014) supports for "arranging the narrative and numerical data" (p. 123). Then, much like the card sorting technique with index cards, the researcher used color coding text and highlighting common themes by colors to sort the qualitative data into the overarching themes.

Procedures. The procedures implemented to code the qualitative interview data involved putting responses from interview questions as well as field notes into an Excel spreadsheet using pseudonyms for each participant; such as resident 1, resident 2, school leader 1, school leader 2, district coordinator 1, district coordinator 2, etc. (Merriam, 1998). The first group of data to input was from the resident intern focus group, and then the district coordinator who worked as liaisons between the university and the k-12 site schools housing the resident interns, and finally the school leaders involved with the CREST-Ed or TIP program. The process for coding each of

these three groups was done by hand using Microsoft Excel because software programs "may blur the lines between quantitative and qualitative in an unacceptable manner," according to Merriam (1998) on page 173. The researcher agrees with Merriam (1998) not to blur the lines because this case study design, utilizing the work of research methodologist Yin, contains both quantitative and qualitative data. Thus, hand coding the data allowed the researcher to limit the use of a computer program to the quantitative data.

The first step in coding the data was to listen and read the interview transcriptions of the responses to each question from everyone interviewed, as shown in Table 5 below, as well as to read the notes taken during the focus groups and individual interviews. For the focus groups with the resident interns and district coordinators, the researcher read the transcription responses and listened to the agreed upon comments plus the sidebar conversational remarks in regards to the questions asked by the researcher. For the individual interviews conducted with the school leaders, the researcher read and listened to the responses to the same question asked to each principal. This pattern was also followed for the focus group with the district coordinators who worked as liaisons between the university and k-12 schools.

Table 5

Summary Demographic Information of Participants Interviewed

Participants	Type of Interview	Male	Female	Total
Resident Interns	Focus Group	3	2	5
District Coordinators	Focus Group	0	5	5
School Leaders	Individual Interviews	2 principals	1 principal 3 assistant principals	6
Total		5	11	16

Note. Resident interns are graduate students who are completing their residency through the CREST-Ed grant. The district coordinators are laisons between the university and k-12 schools. The school leaders position was included since instructional leaders interviewed were principals and assistant principals (Bradley, 2004).

After reading and listening to the responses, the researcher utilized Microsoft Excel to code the data in order to look for patterns from the interview data. The researcher created three spreadsheets, one spreadsheet for each group of participants involved with the CREST-Ed grant TIP program. Within each spreadsheet, the researcher listed the questions in column A and then listed the responses to each question in the following columns B through the number of participants, which is a method supported by Saldana (2016). For example, the spreadsheet of the school leaders consisted of questions listed in column A and the three participants labeled in columns B through D. The researcher used pseudonyms of school leader 1, school leader 2, and school leader 3, as aforementioned and referenced by Merriam (1998) to code this data as well as the resident interns and district coordinators focus group interviews. After denoting the columns, the researcher inputted the interview questions and responses into all three Excel spreadsheets.

The next step in the coding process was to put the participants' responses into an Excel document. These responses were then analyzed into common words and phrases by changing the font color in order to organize these words and phrases into a common theme category within a new column in the Excel document. After highlighting the common remarks, the researcher summed the remarks in a column in the Excel document labeled "theme/comments." The researcher utilized this process for each interview question on each Excel spreadsheet that represented the two focus groups of resident interns and district coordinators as well as the individual interviews of the school leaders. This process of coding was done for all three spreadsheets for each question asked to all participants, which is displayed in Table 6 below.

Table 6.

Coding of the Qualitative Data for Emerging Themes

Theme	Residents	School Leaders	District Coordinator
Supports	The support provided to the resident interns in regards to their AAR projects was mainly from one professor, Dr.Bate. The resident interns who did not take Dr.Bate's class did not receive much if any, AAR support from their professor who taught the required research class. The only additional support from the perspective of the resident interns was from their mentor teacher, who for many resident interns was the department chair.	The school leaders noticed supports provide to the resident intern through feedback from classroom observations. The schools provided support to the resident interns by providing the interns with the ability to attend faculty meetings, department meetings, and school-wide professional developments. These events provide information, teaching strategies, and experiences that will help the resident interns had better perform their jobs facilitating lessons, communicating among educators, and collaborating with teachers. One principal said, “they [mentor teachers] have displayed exceptional, exemplary teaching practice in classroom first … and good communication skills with parents, students, and colleagues in the past. You could only hope that they will continue with the intern.”	The university district coordinators observed school leaders supporting the CREST-Ed program came from the assistant principals, who in many cases serves as an instructional leader in the school.
Full Year Experience vs Traditional Semester	The AAR projects during the first semester of student teaching were tough; however, all residents agreed that this helped them become a better teacher by knowing their students and the curriculum. It also provides much need support and confidence for completing the EdTPA requirements during their second semester of student teaching.	School leaders state, the resident interns 1) "get to see the full picture versus a normal intern who mainly is just doing a semester. Whether it's the fall or spring, they'll only see one side or half a season, and can't maybe connect why they're at this point in March based on what took place, maybe in October." 2) " It inspires those teacher mentors to kind of be on their best game, so to speak, make sure that they are putting their best foot forward." 3) "Like real, true, in the classroom, immediate feedback, practice, opportunities for refinement, just as the profession." 4) "for people really allows us to identify those that are really most compassionate about the work. And secondly, it provides us with an opportunity to develop them, and assure them that this is work that can be done and done successfully."	Dr.Bate's class improves the AAR project and the communication needed to complete the AAR study. We also assist in narrowing and focussing the AAR projects too. As one district coordinator says, "On the back end, normally we have some administrative task around collecting information, storing information, supporting them with how they're going to present it at a final conference."
Participant interactions with Resident Interns	Principal interacted with residents in the hallway, faculty meetings, and duty stations. This is much the same as a typical certified teacher.	Two instructional leaders mentioned they conduct classroom observations to which they provide feedback, and with one leader, this can lead to to a job opportunity in their school. The school leaders provide the perspective of the resident interns participating in grade level, professional developments, and faculty meetings with their mentor teachers. Moreover, the school leader observes the district coordinators utilizing classroom observations and constructive feedback conversations to support the resident interns’ classroom instruction and management.	They provide feedback to the resident interns from their classroom observations and by class discussions during their required university course led by the district coordinators. They confirm that the resident interns participate in grade level meetings, new teacher meeting, professional developments, and faculty meetings during their school residency. Moreover, they noticed that the year only teaching experience provides a richer more authentic experience because the resident intern participates in school activities from day one until the last day of school, which allows them to experience a full year of teaching.

Benefits	The instructional strategies utilized by the residents varied with technology and instructional methods; thus, the meta-analysis results will provide evidence to measure the student achievement gains based on the implementation of their AAR projects.	Based on the mentor teacher and resident intern's relationship and interactions from the perspective of the instructional leaders, there are three benefits of the CREST-Ed program that support the resident intern: ***collaborating, mentoring, and supporting the continued growth of the resident intern***. One leader states "resident is not necessarily diving in and engaging, that teacher's modeling given whatever grade level or content, the role of the teacher. That's not just doesn't relate to instruction inside the classroom, but how they plan for their lessons, how they analyze their data, how they conduct themselves professionally in the building, how they communicate with parents, and how they develop those relationships with the students." While another leader says "mentor really serves in that role as the mentor, and there's also a shared understanding that I'm learning from you, you're learning from me."	The benefit of the district coordinator provides the much need support for k-12 educators to read, interpret, and navigate the paperwork demand of the CREST-Ed grant. For example, a universal agreement from the district coordinators is to print the parent signature sheets in color paper. Two district coordinators suggested not only color paper but neon color paper. Utilizing this strategy, the district coordinators noticed an increase in paper consent forms signed.

Note. Themes began to emerge from utilizing the common remarks made by participants during individual and focus group interviews. The comments above provided support for the emerging themes.

The final step in the coding process was to find the overall themes from all participants by utilizing all the common themes from all the questions asked. In order to find these themes, an additional Excel spreadsheet was created. The researcher copied all the themes from each participant group into a new Excel spreadsheet. The column headings represented the participants (resident interns, school leaders, district coordinators) while the rows represented the questions asked of the participants. Then the themes from coding each group were organized by respondent groups; such as resident interns, school leaders, and district coordinators in order to code the common themes/comment into the overarching themes. To complete this coding task, the researcher inputted the theme/comments into the new Excel spreadsheet to find common topics. The researcher used color coding to separate the different topics, and in doing so, the researcher discovered the following themes: supports to the resident interns, advantages of a full year teaching experience, and benefits of university professor teaching an Anchor Action Research class. These themes are shown in Table 7. The next section, findings, will provide evidence to support each of the themes.

Table 7

Emerging themes of the participant interviews.

Theme	Residents	School Leaders	District Coordinator
Supports	Support from the perspective of the resident interns was from their mentor teacher and university professor Dr. Bates.	The schools provided support to the resident interns by providing the interns with the ability to attend faculty meetings, department meetings, and schoolwide professional developments. These events provide information, teaching strategies, and experiences that will help the resident interns had better perform their jobs facilitating lessons, communicating among educators, and collaborating with teachers.	Observe school leaders providing support as the instructional leader in the school.
Full Year Experience	All residents agreed that this helped them become a better teacher by knowing their students and the curriculum. It also provides much need support and confidence for completing the EdTPA requirements during their second semester of student teaching.	As one leader, states the resident interns "get to see the full picture versus a normal intern who mainly is just doing a semester. Whether it's the fall or spring, they'll only see one side or half a season, and can't maybe connect why they're at this point in March based on what took place, maybe in October."	Dr. Bate's class improves the AAR project and the communication needed to complete the AAR study; we assist in narrowing and focussing the AAR projects too.
Benefits	Dr. Bates provides the blueprint for success in the AAR study.	The university professor benefits CREST-Ed with creating and monitoring AAR study.	The creation of Dr. Bate's course increased the quality of AAR.

Note. The emerging themes displayed above came from the hand coding of the qualitative interview data representing the lived experiences of the participants.

Qualitative Findings. The finding from analyzing the qualitative interview data produced the common themes of providing supports, advantages of a full year teaching experience, and benefits, which includes the effectiveness of a university professor teaching how to conduct Anchor Action Research to the resident interns who are members of the CREST-Ed grant program. The following paragraphs will summarize the interview data from the aforementioned themes from the perspectives of the resident interns, district coordinators, and school leaders who assisted, mentored, and supported the AAR plans of the resident interns.

Supports. The resident interns obtained supports for their Anchor Action Research plans from a university professor, student teaching experience from school leaders, and paperwork completion from district coordinators. The resident interns specifically noted that they received

much needed support for completing their daily tasks from their mentor teachers. These resident interns worked alongside their mentor teacher from the first faculty meeting of the school year until the last day of school the following semester. The mentor teachers "displayed good communication and good communication skills with parents, students, and colleagues in the past" to which a principal comments, and adds that he "hope[s] that they [communication skills] will continue with the intern." In general, the mentor teacher provided advice and leadership to the residents throughout their residency.

Another layer of support came from the university professor teaching the summer-semester research class. This professor taught Anchor Action Research methodology and assisted the resident interns with designing, implementing, and conducting their AAR plans. During the focus group interview with the resident interns, two residents who took this summer class commented that this professor provided a blueprint for completing the AAR project. One resident said, "He'd [research methodologist] give me the whole map, and I was just following the map and pace according to what he said, 'If you follow this map, you should be good in May.'" This resident further explained that

> "He [research methodologist] broke down every step during the summer. I mean, he break down everything before I start. He was like that my support for the AAR. With him [research methodologist], before you even start the AAR, you know exactly. He take[s] it [AAR] from the beginning to the end. He tell[s] you exactly what to do every time, and what to expect. And [he] even check[s] your proposal. I didn't have any problem before I started AAR."

However, a few students who did not take this summer research class commented that their AAR plans were much tougher to complete, as they were not provided a blueprint or any meaningful

guidance for completing the AAR studies. One resident commented, “I think that the guys [other resident interns] that or the students that took the class probably benefited from that.” While another resident, through crosstalk, added “I was winging it [AAR] pretty much.” In addition, a third resident was nodding her head agreeing with these comments and added “me neither” to having the guidance to complete their AAR studies from the summer Anchor Action Research class. Moreover, the district coordinators also commented that they too noticed the impact this summer research class had on the improved quality of the resident interns’ AAR projects to which one district coordinator said,

> “I think more and more, now that they're taking the summer class with Doctor Bate. I think that they are more independent of me because they've had that class, and he started them talking about it [Anchor Action Research], and thinking about it [AAR] in the summer, which I think has been fabulous.”

Another district coordinator added that, “I found out they [resident interns] would get together, and one of them would send an email to Doctor Bates if they had a question. So I kind of saw where he [Dr. Bates] became that university person for them, and they copied each other, and they copied me.” Thus, the addition “two years ago,” as stated by a district coordinator, to offer this Anchor Action Research course helps to support resident interns with completing their AAR plans.

The final layer of support provided to the resident interns was from the district coordinators and instructional leaders, who in most cases were assistant principals. These participants supported the resident interns by providing them with feedback from informal classroom observations. For example, the district coordinators commented that their supports came from giving constructive input after observing classroom instruction. One instructional leader noticed a

district leader always supporting "what is needed to help them [resident interns] grow." Through constructive feedback and a consistent growth mindset, district coordinators and instructional leaders supported the instructional practices of the resident interns.

Full Year Experience. For many years, preservice teachers concluded their undergraduate teaching degree coursework by completing approximately a semester of residency in a k-12 school. During this semester, the preservice teacher observes a certified teacher conduct his or her duties and responsibilities. They also watch the facilitation of lessons as the certified teacher teaches one or two units of study. After this brief time observing the certified teacher, the pre-service teacher teaches a unit of study. The preservice teacher receives feedback from the certified teacher and a university professor who grades the preservice teacher based on his or her observations for one or possibly two days of instruction. This type of experience is typical for pre-service teachers.

However, the CREST-Ed model of the TIP program provides a full year experience to the preservice teacher. In this model, the preservice teacher begins the residency on the first day of school, which typically opens with a faculty meeting in the morning, and concludes on the last day of school at the close of the last faculty meeting of the academic school year. The following paragraphs will tell the story of how participants involved with the CREST-Ed Teacher-Intern-Professor model receive more support than the typical preservice teacher does.

The resident intern has the experience of attending more meetings, as each school leader noted during the interviews. These school leaders all highlighted the advantage of resident interns attending all the academic school year faculty meetings, grade level meetings, and at some schools the new teacher meetings as well. One school leader commented that about the advantage of resident interns attending meetings. He said it is

> “definitely advantageous because it helps them [interns] to start from the beginning to the end. And they're able to look at all the facts of teaching. They're able to look at how to interact with the faculty and staff. They're able to go to faculty and staff meetings. They're able to observe classes and be able to be part of our professional learning, so we talk about differences and instruction. We talk about technology and chrome books and the different software we have like study islands. We talk about the teacher keys, evaluation tools. They're there as professional learning so they get a chance to experience that. I think they get a chance also to ... Some of them work with my special needs students. So they get a chance to look at the various teaching models that are effective research based. And not only just look at those and observe them, but they are part of those. And also look at the rigor and the relevance and what really happens from day to day in school.

By participating in all of these meetings as well as interacting with other teachers in the hallways, duty stations, and break rooms, these residents fully experienced how communication among peers and leaders takes place. Since these are standard locations where teachers share their thoughts and comments regarding ideas about new and old school policies, the resident interns are able to know how it feels to live life as an employee of the school. A male school principal made a comment to this effect.

Additionally, the resident interns gain the experience of understanding the curriculum better than the typical preservice teacher understands it. The school leaders agreed that the resident interns gained an understanding of "how to take the curriculum and implement it in their classroom” because they had the opportunity and time to “consistently ask them [the resident interns] about the support that they need.” A specific school leader said, the resident interns “get to see the full picture versus a normal intern who mainly is just doing a semester. Whether it's the

fall or spring, they'll only see one side or half a season, and can't maybe connect why they're at this point in March based on what took place, maybe in October." Without the time of two semesters, these residents' interns would have lacked the time necessary to know and build a rapport with the school leaders as well as gain the knowledge needed to understand the curriculum through the interactions with school leaders.

The summation and the nearly unanimous agreement of all interviewees is the authentic teaching experience the resident interns acquire from the CREST-Ed Teacher-Intern-Professor model of instruction. As one leader states, the resident interns "get to see the full picture versus a normal intern who mainly is just doing a semester." Another leader says, the residents have an "authentic experience as it relates to teaching," which was confirmed by almost all school leaders. In addition, as another school leaders highlights this advantage saying in detail,

> "Absolutely an entire year [is an advantage], because it allows them to get a very authentic experience as it relates to teaching. I can remember going through my student teaching experience and only having a semester, and though I felt like I learned a whole lot, it was very rushed. So this [TIP residency] process allows them to really gradually move into that role as a teacher in that classroom. So in our particular school we introduced them as a teacher to our students, because we want them to have that same level of respect by the students, but their cooperating teacher, their mentor teacher that they're working with really understands that that needs to be a gradual release process for those interns. And so having a whole year to do that really allows them to get the experience with practice, and feedback, and refinement that they need to be prepared to leave that internship and go into a classroom and be extremely successful.

Nevertheless, the one principal who had difficulty speaking to the full year authenticity was due to a resident intern at his school who did not complete the entire year due to a sickness in the family. Even though the principal did not experience the full year the TIP model, he did agree to place a TIP resident in his school the following year because "the more time you spend in a practice like this, a year versus sometimes six weeks or do a full semester course is going to put you in a better situation once you come out of it." Thus, he believes this model is advantageous to preservice teachers since residents "stay[ing] a full year and get more opportunity to observe, and then roll into some of the practice of what teachers do."

Finally, the resident interns agreed that this experience provided them with the confidence to implement instructional and classroom management strategies shown successful by the results of their AAR projects. A meta-analysis of AAR projects showed an overall effect size favoring academic achievement in resident interns' classes essentially equal to a certified teacher. This confidence and success, which was supported by the meta-analysis, came from three aspects. The resident interns were engage in classroom instruction within the mentor's classroom for approximatly six to eight months. The interns also implemented and analyzed their unit of instruction utilizing AAR. Moreover, the residents attended school meetings and professional developments to help support their teaching and learning. Thus, the TIP residents were seen as "just another teacher in the building" which is a testiment to the quality of training they received during their programs. Being seen as a teaching professional was spoken by many school leaders, district coordinators and agreed to by all resident interns.

Benefit: university professor teaching an Anchor Action Research class. The research class from one specific university professor, Dr. Bate, provided the support to resident interns to complete their Anchor Action Research projects. Dr. Bate is one of many professors teaching the

required research class needed to fulfill graduation requirements for the CREST-Ed resident interns. Based on the focus group interview conversation with district coordinators and resident interns, it came to the researcher's knowledge that Dr. Bate began teaching a summer research class for the resident intern specifically to assist them with designing and conducting their AAR studies. However, some of the resident interns mentioned that they either took the required research class from another professor, took it online or came into the CREST-Ed program with a research course credit; thus, not all students took Dr. Bate's research class.

The resident interns who did take Dr. Bate's class all agreed that he provided the roadmap to complete and implement the required elements successfully for conducting the AAR study. This finding was also supported by the district coordinators. One resident intern said during the focus group interview, "Before I started AAR, I pretty much knew everything I have to do. He [Dr. Bate] broke down everything before I started." A district coordinator further explains these residents' experiences through observing that,

> "Some of the residents are very interested in research, and so they connect with Doctor Bate right away. They have formed relationship with him, invited him to come to the school to help figure things out. Others, they don't even all take the class. They may have already had a research class, so I'd say they're varying degrees how much that [the] university professor is a contact person [for the resident interns]."

Thus, based on the spoken words of the district coordinators, Dr. Bate became indirectly the university supervisor, which as a person who worked directly with the resident interns before the creation of his research course two years ago. Consequently, the creation of Dr. Bate's Anchor Action Research course contributed to the success of the CREST-Ed program.

Discussion

This case study of the CREST-Ed grant utilizing the Teacher-Intern-Professor model combined the research from resident interns' Anchor Action Research projects and interview transcriptions from one cohort class of resident interns, school leaders, and district coordinators. The quantitative data employed meta-analysis of the resident interns' AAR studies to evaluate an effect size utilizing quasi-experimental and single subject. Based on the research by Borenstein et al. (2009) and others as aforementioned regarding the lack of a method for combining single-subject and quasi-experiment design effect sizes that used different unit analysis, there are three independent effect sizes in this case study research. The overall effect size of the quasi-experimental design studies showed that the resident interns were at least as effective in obtaining student achievement as experience teachers. Similarly, the analysis results of both independent single subject projects showed positive effect sizes supporting the implementation of the treatment. Thus, there is evidence that the classroom instruction performed by the resident intern, preservice teacher, who facilitated a unit of instruction that utilized an AAR showed comparable results to a certified teacher having at least three years teaching experience. It is important to point out that the comparable teacher was, in most cases, the department chair as mentioned by the resident interns.

The qualitative data complemented the findings from the quantitative data. Based on the interview data aforementioned, school leaders, district coordinators, and Dr. Bate monitored and supported the implementation of the classroom instruction of the resident interns' AAR studies, which utilized research-based instructional strategies. By providing continual support to the residents' growth through professional feedback, informal peer conversations, attending school-wide

meetings, and participating in academic growth professional development sessions, these resident interns were provided with an authentic teaching experience. Probably because of their authentic teaching experience, all of the interns acquired a teaching position at the conclusion of the program. The TIP Resident interns were sought after because they were given the opportunity to experience the day-to-day duties and responsibilities of a certified teacher. This type of experience is not provided in the typical preservice teacher training where they spend at most a semester in a k-12 school.

Additionally, because of their authentic teacher training, 100% of the resident interns completed the edTPA requirements and obtained their teacher certification. The residents commented that the edTPA process that takes place during their second semester of residency, which for a typical preservice teacher this takes place during their only semester in a k-12 school, was not stressful because of having to design, implement, and analyze an AAR study the semester before completing the state required edTPA process. The interns gained confidence through the collaborative support efforts of the school leaders, district coordinators, and university professors. This support system instilled confidence and provided the interns the skills to complete successfully the edTPA which is a goal of the Teacher-Intern-Professor model of the CREST-Ed grant.

The mean academic achievement outcomes of the AAR project instruction provided by the resident interns in their classrooms proved to be as high or higher when compared to the means of the comparison classroom. The idea is that the resident interns are trained to step into their roles as teachers from the beginning of their internships. This decreases the work on the mentor teachers and allows the resident interns more teaching time in the classroom. The resident interns own the ability to facilitate lessons designed with the support of a mentor teacher,

school leaders, district coordinators, and university professors. However, the resulting outcome was that the teacher residents have the ability to instruct at about the same level while obtaining similar academic outcomes as teachers who have been in the classroom for three years or more.

Focusing on the Research Questions.

The analysis in the previous section described the results of conducting a consecutive case study utilizing multiple sources of evidence from quantitative and then qualitative data (Yin, 2014). This section will discuss the quantitative and qualitative results as they relate to the two underlying research questions, which are the following:

1. How do local school instructional leaders, district coordinators, and TIP residents describe the influences on student achievement utilizing the TIP model?
2. How do the TIP interns describe the impact of their Anchor Action Research activities?

The following two sections will discuss each research question more thoroughly in the chronological order.

Research Question 1. The resulting themes, described in the previous qualitative results section, make sense of meanings that *influence student achievement utilizing the TIP model*. These three themes are *supports*, *yearlong preservice experience*, and *benefits from a summer Anchor Action Research course taught by a specific university professor*. These themes reached saturation due to familiar comments said by three more instructional leaders after the initial coding of the qualitative data from the first three instructional leaders.

The researcher first interviewed three school leaders, the resident interns, and the district coordinators. Then the researcher interviewed three additional school leaders. Since the last three school leader interviewers' comments overlapped consistently with the previous interviews, this

provides evidence for reaching saturation of the qualitative themes as defined by Richards and Morse (2013) as "the replication of data or the verification of incidents/features/facts by several participants and the confidence that adequate data have been obtained" (p. 135). Richard and Mores (2013) further recommend that "attention must be paid to the adequacy and appropriateness of the data to ensure it is enough to establish saturation – that is, enough so the data begin to 'sound familiar' and the researchers begin to feel as though they have 'heard it all' (p. 196) to which Corbin and Strauss (2008) add that "further data gathering and analysis add little new to the conceptualization, though variations can always be discovered" (p. 263). The researcher through the second set of three interviews discovered little variation from the first three interviews of instructional leaders; thus, based on the research aforementioned, there is evidence supporting saturation of the three themes: supports, yearlong preservice experience, and benefits from a summer Anchor Action Research course taught by a specific university professor.

More specifically, as related to the themes above, the TIP model provides a yearlong experience that increases the exposure to experience authentically the expectations and responsibilities of a certified teacher, which usually includes improving student achievement. The interview data from the yearlong experiences of the resident interns, district coordinators, and school leaders helps to *describe the influences on student achievement utilizing the TIP model* by providing the resident interns with the ability to be in the "trenches" with an employee mindset alongside a mentor teacher that displays "great communication skills with colleagues, staff, and parents" as noted by one school principal and embraced by the resident interns, and district coordinators. Previous researchers also recognized that leadership and knowledge sharing occurs from this collaboration among preservice teachers, mentor teachers, school leaders (Darling-

Hammond, 2005; Glatthorn et al., 2017). Additionally, a common viewpoint mentioned supports the opportunities provided by school leaders for resident interns to attend staff professional developments, faculty meetings, and grade-level meetings as opportunities for the resident interns to increase their knowledge to learn strategies for improving student achievement to which Bradley (2004) and Hallinger et al. (2016) describe as an attribute of instructional leadership.

Research Question 2. The quantitative data provides evidence to answer the second question in this study: how do the TIP interns describe the impact of their Anchor Action Research activities? Some of the *supports* and *benifits* of the qualtiative themes relelate to the resident interns experiences with the AAR activties. These AAR activities provides pretest and postest data to obtain an overall effect size from meta-analysis. The AAR studies provided evidence that the resident interns AAR activities influenced student academic achievement at least as well as a certified teacher with three or more years teaching experience. Since the effect sizes favored the treatment applied by the resident interns in the quasi-experimental and single-subject design studies, the researcher believes utilizing observational analysis of the resulting effect sizes that the AAR activities in this study likely helps to impact student academic achievement.

The qualitative data help to explain the effect the AAR studies have on student academic achievement more fully. Utilizing the focus group interviews of the resident interns to answer questions regarding their AAR plans provides comments from two resident interns. One resident conducting a single-subject study, AAR32, said the AAR impacted the "one-on-one social skills with him [a special education student] because the general idea was that his disability wouldn't allow him to learn certain skills and, when we sat down and really worked on it, I think he was really able to learn a new skill. I think it [AAR] really helped him as a classroom skill." Another

resident intern conducting a quasi-experimental design study, AAR28, said, “When you watch the basketball when those player[s] throw the ball, you know that they're trajectory of the curve of that ball, you can track it. And you can track it and cut it look this way, [his hand describing the shape during the focus group interview] and you can type the equation, plug in the calculator, and find how high that the ball can go." Both of these examples provide evidence and meaning for having positive effect sizes, 0.47 and 0.248, that affirms the value-added AAR has on student achievement.

In summary, the two research questions guided the researcher to look for emerging themes and found saturation after conducting an additional three interviews. The three themes in combination with the quantitative meta-analysis support the efforts of the TIP professor model to impact student achievement taught by a preservice teacher. These preservice teachers are able to teach as well as a certified teacher with at least three years of teaching experience based on the concluding results of this research.

Limitations.

A limitation of the research is not having a large sample size for the quantitative data results since the case study is bounded by the participants, which is usually approximately fourteen resident TIP interns (Creswell, 2013; Merriam, 1998). An additional limitation is not having all participants aware of the TIP model. This could happen if the local school-instructional leader is not aware of the TIP model, is not aware of the AAR plans of the TIP residents, or is not aware of the student achievements of the faculty.

Additionally, the research presents two limiting factors including time and replication. The first limiting factor is the amount of time to complete the research. This would include analyzing the numerous pieces of data and completing individual and focus group interviews. The

second limitation of the study is that the TIP model is not workable for the majority of new teachers. Meaning that there are a limited number of PDSs and a small number of universities implementing student teaching programs similar to the TIP model; therefore, time and a small sample size for replication are limitations.

The last limitation is the personal views of the researcher. There is potential research bias from the personal opinions of the researcher influencing the framework in which the data in this research were analyzed. This researcher believes that the TIP model is an exemplary approach for student teaching. He also believes that the TIP model provides greater student achievement than a traditional student teaching model. The researcher must be aware of this bias in order to present research in a proper manner. However, everyone has his or her lens own or filter that is used to interpret events (Creswell, 2013). Thus, extra attention was needed when writing the interpretation to minimize the potential researcher bias.

Quantitative Limitation. In addition to the qualitative limitation, there also exists a quantitative restriction. There is lack of research and methodology for combining the effect size of quasi-experimental and single-subject studies that utilize different metrics to which was aforementioned in this case study research. Even if there was a way to combine these effect sizes, this analysis only produced two single-subject AAR project to evaluate and based on the literature by Borenstein and others, a minimum of three single-subject design students are needed to provide an overall effect size summary. As a result, the researcher chose to summarize the AAR studies into three effect sizes, the total effect size of the quasi-experimental AAR studies and the two individual effect sizes of the single-subject AAR projects. Subsequently, this research reported three effect sizes instead of one whole effect size to summarize the quantitative data.

Qualitative Limitation. The researcher's intentions were to conduct a focus group interview with mentor teachers. However, due to the lack of mentor teacher response to interview requests and the time constraints placed on completing this dissertation and the doctoral coursework, in three years, the interview data from the mentor teachers are not included. Future research can likely include interview data from the mentor teachers that will then provide a richer representation of the role of the mentor teachers and their involvement in the CREST-Ed grant and more specifically the Teacher-Intern-Professor model.

Conclusion

The CREST-Ed grant includes the Teacher-Intern-Professor model and provides an authentic teaching experience for the resident interns. The Anchor Action Research studies implemented by the resident interns prepared the residents to teach at least as well as a certified teacher of at least three years of experience while requiring less supervision from the mentor teacher. Moreover, the lived experiences of the resident interns taking part in the TIP model prepared them to have the confidence to complete edTPA certification requirements and aided them for their first academic year of teaching as a certified teacher. This confidence is evident in the response by the school leaders commenting consistently about the authentic experience the resident intern had with attending school-wide meetings and listening to constructive feedback from classroom observations. Furthermore, the residents themselves highlighted the self-assurance they gained from the input provided to them as well as from attending staff developments, new teacher meetings, and grade-level meetings. The CREST-Ed grant TIP program was instrumental in growing residents from inexperienced preservice teachers to experienced certified teachers. This is because of the authentic lived experiences after fulfilling two semesters of residency in

one k-12 professional development school. This program allowed the resident interns to acquire the skills and experiences of being a certified teacher.

This case study provided information on the lived experiences of the resident interns, school leaders, and district coordinators related to the implementation of the Teacher-Intern-Professor model associated with the CREST-Ed grant. The resident interns told their stories of completing the required AAR studies, academic year of preservice teaching, and edTPA certification assignment. Along with this journey, the AAR project became an additional focus of quantitative research for this case study. These AAR projects contributed to this body of research by utilizing meta-analysis to evaluate an effect size to determine if student academic achievement was the same or greater for the resident intern as compared to a certified teacher with at least three years teaching experience. Through this extensive body of research data, the researcher concludes that the resident interns' student academic classroom achievement was as good as the comparison teacher. The ability to show academic achievement similar to a veteran teacher is likely from the support, feedback, and authentic preservice teaching experience.

Recommendations for Future Research.

This study can also provide a stepping stone for additional research to be conducted in anchor action research with PDSs regarding student achievement and instructional models. The TIP model is one such model that has shown success in providing student achievement gains (Curlette et al., 2014). Also, additional studies could be conducted to investigate in more detail the instructional models used in classes associated with student achievement. Further research can examine innovative designs of other instructional models for student achievement. In summary, the research proposed here will help support additional future research conducted on PDSs regarding student achievement and the instructional processes used to teach student interns.

Another example of additional research is a focus group for the mentor teachers in the CREST-Ed Grant and asking them “How has the TIP model, through the implementation of Anchor Action Research in the CREST-Ed grant, changed your classroom teaching?” A possible follow-up question might be the following: Is transfer related to the degree of mastery of the original subject. Additionally, another issue could be the following: To what extent your school principal was involved in supporting your instruction.

Finally, the development of a methodology to combine quasi-experimental design and single-subject meta-analysis utilizing different metrics into one overall effect size will allow future researchers to calculate an overall effect size of all Anchor Action Research studies. This will provide the ability to gain knowledge of how the single-subject AAR effect sizes affect the total effect size of the quasi-experimental AAR projects.

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APPENDICES

Appendix A

Ylimaki (2012) conducted a qualitative study that interviewed school leaders through the lens of instructional leadership. Ylimaki's research provides support for this researcher's use of semi-structured interview questions. One instrument is a semi-structured interview form to conduct a consistent interview of each TIP resident (Richards & Morse, 2013; Ylimaki, 2012). The possible semi-structured interview questions are:

1. How is the Teacher-Intern-Professor model impacting student achievement in your school?
2. Describe the impact the university professor has on student achievement in your school?
    a. How is the university professor monitoring and evaluating the achievement of your students of the TIP residents?
3. Describe the impact the TIP residents' AAR plans have on the achievement of your students?
4. Describe the impact the mentor teacher(s) has for monitoring and evaluating the TIP residents teaching on student achievement?
5. How do you define your duties and responsibilities as an instructional leader in regarding TIP model?

MacPhee's and Kaufman's (2014) research implemented focus group interviews of pre-service social studies teachers, which provides support for conducting focus group interviews. Therefore, another instrument is a semi-structure focus group of the TIP residents.
These possible semi-structure interview questions are:

1. How did your AAR plan monitor and evaluate the student achievement of your students?
2. Describe your instructional strategies you implemented during your unit of instruction.
3. Describe the impact of the university professor with lesson plans that will directly impact student achievement?
4. Describe the impact of the mentor teacher with lesson plans that will directly impact student achievement?

The final interview instrument is a semi-structured interview form to conduct consistent interviews of university professors who are mentoring the TIP residents (Creswell & Clark, 2011; Ylimaki, 2012). These possible semi-structure interview questions are:

1. How often to you meet with your TIP resident?
2. Describe how your conversation with the TIP resident(s) impacts their AAR plans on student achievement?
3. Describe the impact your involvement with the mentor teacher for improving the instructional practice of the TIP resident.
4. Describe your views on the effectiveness utilizing the TIP model in PDSs for increasing student achievement.

Appendix B

Effect Direction Analysis of AAR27

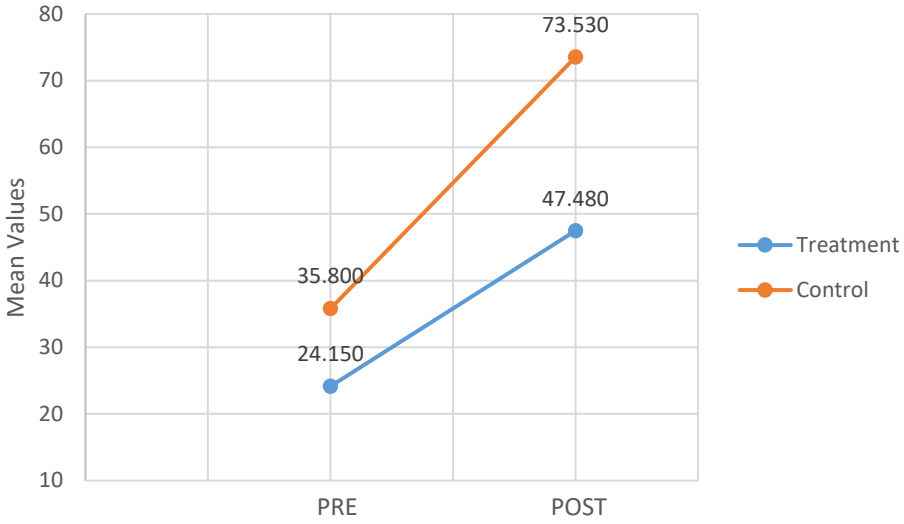

Figure B1. The rate of increase is greater for control (red line), so the effect direction of AAR27 is negative.

Effect Direction Analysis of AAR28

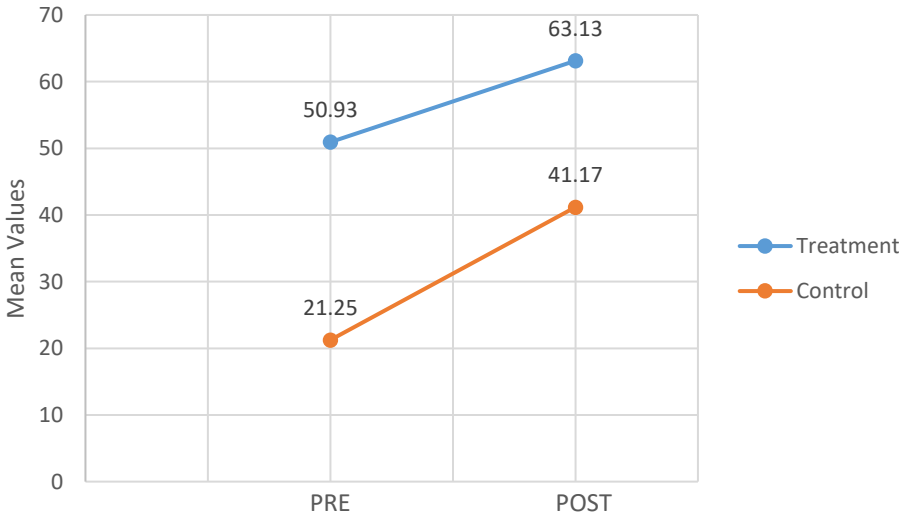

Figure B2. The rate of increase is greater for treatment (blue line), so the effect direction of AAR28 is positive.

Effect Direction Analysis of AAR29

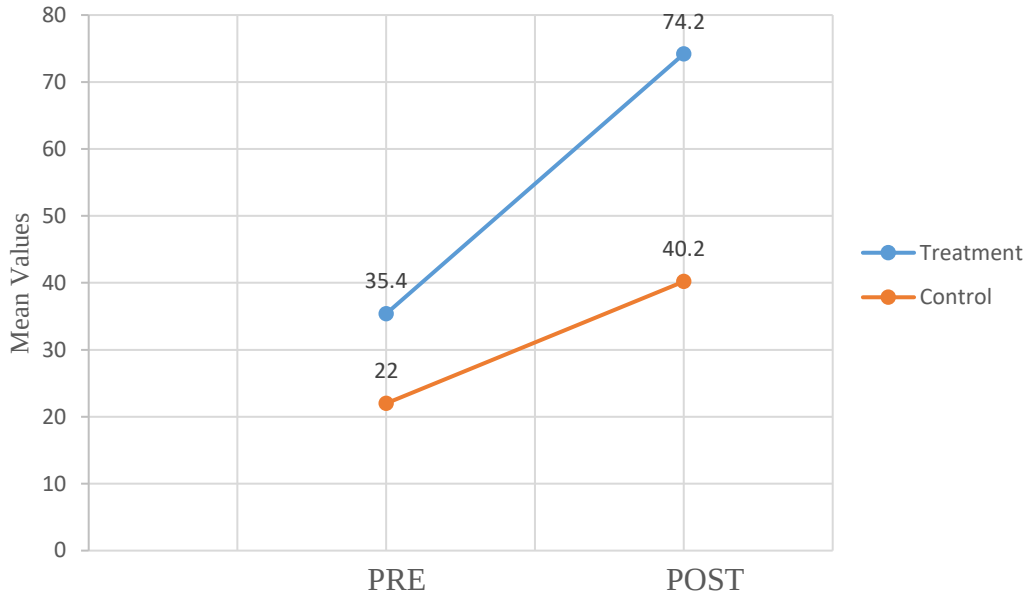

Figure B3. The rate of increase is greater for treatment (blue line), so the effect direction of AAR29 is positive.

Effect Direction Analysis of AAR30

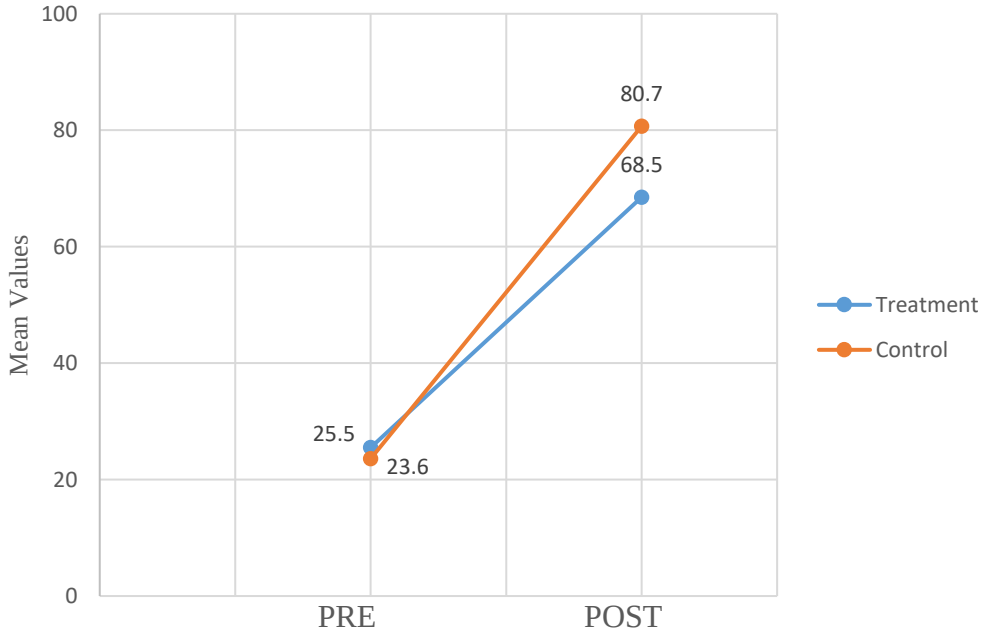

Figure B4. The rate of increase is greater for control (red line), so the effect direction of AAR30 is negative.

Effect Direction Analysis of AAR31

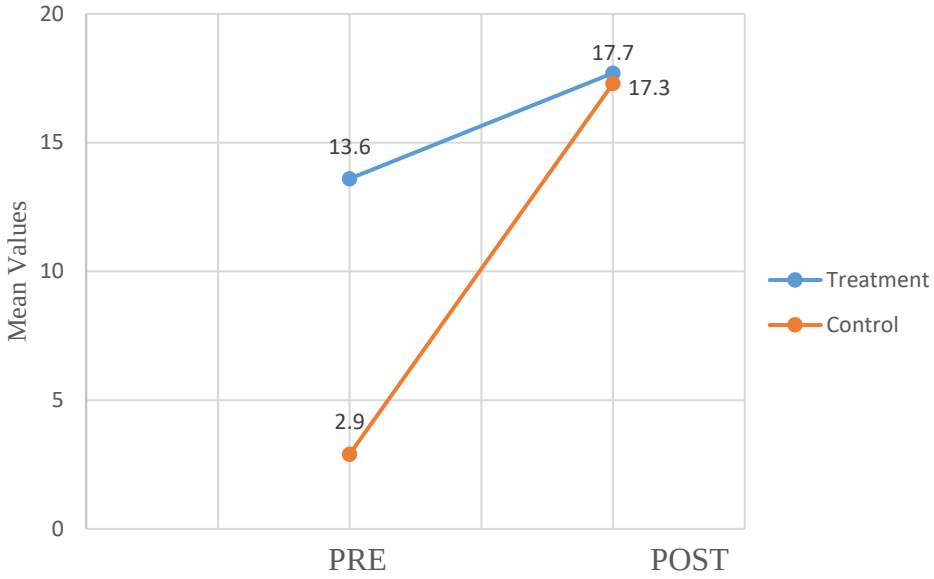

Figure B5. The rate of increase is greater for control (red line), so the effect direction of AAR30 is negative.

Effect Direction Analysis of AAR33

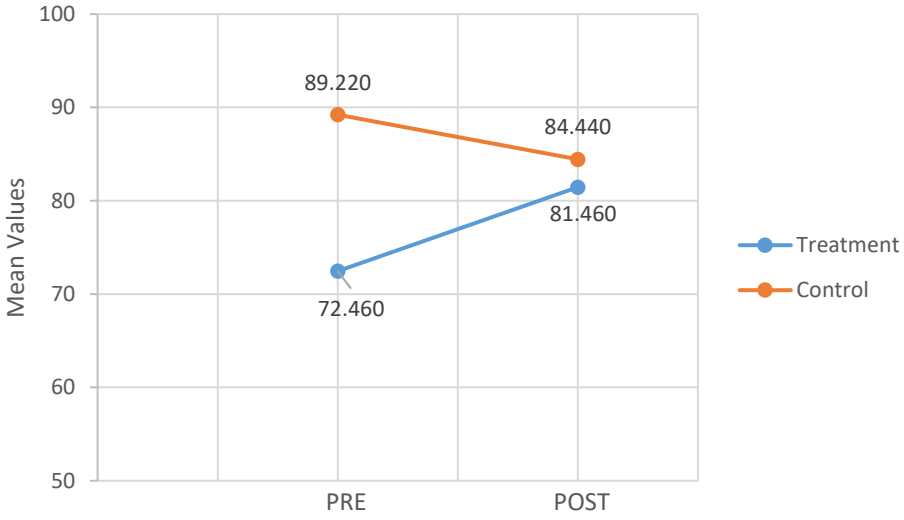

Figure B6. The rate of increase is greater for treatment (blue line), so the effect direction of AAR33 is positive.