THE EFFECTS OF ACADEMIC INTERVENTIONS ON THE DEVELOPMENT OF
READING ACADEMIC COMPETENCE IN FOURTH GRADE STUDENTS

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This dissertation examined the effects of academic interventions on the development of reading academic competence in fourth grade students who performed at or below grade level as determined by TAKS reading scale scores. Fifty students in fifth grade were chosen to participate in the study from five elementary schools in the Fort Worth Independent School District in Fort Worth, Texas. Only 46 students completed the study. The study was conducted with a control \( (N = 23) \) and treatment group \( (N = 23) \). The fourth grade students were administered pretests and posttests using the ACES and the fourth grade TAKS reading test. This quantitative study used a quasi-experimental design to answer the research questions. The final data results did not indicate that the implementation of interventions significantly increased TAKS reading scores at the \( p > .05 \) level. In addition, there were no significant increases at the \( p > .05 \) level between the ACES pretests and posttests. Although there were no significant gains on the TAKS or ACES, there are implications the interventions had a positive effect on teacher perceptions of their students' academic competence and some growth was evident for the treatment groups on both TAKS and ACE.
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I would like to thank God for giving me the ability to accomplish this task. There are many people who made the completion of my doctoral work possible also. First, I want to thank my husband and daughter for understanding and supporting me during this time. Without their love and admiration, I would not have been able to accomplish this goal. A special thank you is also due to the rest of my family for helping me both at home and work, for their love and support, and for believing in me.

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CHAPTER 1

INTRODUCTION

Eliminating the achievement gap between white students and various subgroups of students is a national concern. In 2001, President Bush set forth in the legislation of the No Child Left Behind Act (NCLB) that by 2014 schools are to close the test-score gaps between minority and white students that have persisted since standardized testing began. This legislation causes much consternation among educators, legislators, and parents. Texas educators in particular struggle to determine which instructional strategies and interventions lead to academic success as determined by the Texas Assessment of Knowledge and Skills (TAKS™).

Texas’ annual dropout rates, TAKS scores, and Academic Yearly Progress (AYP) ratings cause alarm for politicians, educators, parents, and the community. The Grade 7-12 annual dropout rate in Texas for 2005-2006 for African Americans was 3.8%, for Asians 1.0%, Hispanics 3.5%, Native Americans 2.1%, and White 1.3%. The percentages may not seem as alarming as the actual number of children accounted for in the annual dropout rates. For example, in 2005-2006, 29,313 Hispanic children dropped out of high school, and 11,692 African American children dropped out. Hispanics account for 56.5% of the dropouts, and African Americans account for 22.6% of the dropouts (Texas Education Agency [TEA], 2007a). The TAKS scores in Texas for 2005-2006 may be another factor causing anxiety.

In 2005, the Texas passing rate for third grade reading students was 75%, increasing to 81% in 2006. Fourth grade students did not do as well with 69% meeting standard in 2005 and 76% in 2006. By fifth grade, the state’s Academic Excellence Indicator System Report indicated the passing rate in reading was 60%, increasing to
65% in 2006 (TEA, n.d.b). Texas schools are not only faced with high stakes state testing, but the stakes are also being demanded at the federal level with NCLB. Schools are required to meet AYP or risk sanctions. In the 2007 Preliminary AYP State Summary Table, 12.2% of all districts missed AYP, and 9.1% of schools missed AYP (TEA, 2007c). Schools are judged on a number of criteria including reading and math performance and/or participation, graduation rates, and attendance. Dropout rates and TAKS scores are linked to meeting AYP through NCLB. The need to decrease dropout rates in Texas, pass TAKS tests to be promoted and to graduate, and to meet AYP guidelines to prevent sanctions has required districts to provide interventions for many students. This study focused on interventions provided to elementary school children who were struggling to meet state standards in reading by the end of fourth grade.

This chapter discusses the background of the study, statement of the problem, hypotheses, significance of the study, overview of methodology, delimitations, limitations, and definitions of key terms to be used in the study. The chapter concludes with a summary.

Background of the Study

Best practices that lead to academic success aim to meet the learner's needs. Attention to both academic skills and nonacademic behaviors are common themes noted in the research on classroom-based interventions. Such interventions are used for improving academic competencies for students who struggle to learn how to read and write and provide guidance in making instructional decisions. The Northwest Regional Educational Laboratory conducted a variety of studies on effective schooling and showed the relationship between district, school, and classroom practices to
students’ academic and behavioral performance (Cotton, 1991). The findings from the studies suggest educators should adapt instructional methods to meet the needs of students and produce desired outcomes.

When teachers do not adapt instructional methods to meet the needs of a struggling learner, the end results are dismal. Students find themselves in cycles of failure, become behavior problems, or at risk of dropping out of school at the earliest possible age. According to Margaret Spellings, U.S. Secretary of Education, 90% of the fastest growing jobs will require some form of postsecondary education (Wise, 2006). To help students become successful productive adult members of society it is extremely important that educators continue to focus on essential knowledge and skills. It is equally important for educators to focus on academic enablers such as attitudes and behaviors that facilitate academic success.

A research-based framework that combines academic competence with academic enablers may serve to provide practices that lead to greater academic success. For students in Texas the TAKS is the primary measure of academic success. Elliott, DiPerna, and Shapiro (2001) have researched the components of an academic competence framework and have developed an integrated approach to assess a student’s academic competence, plan specific classroom-based interventions, and monitor and evaluate the interventions. Educators spend extensive amounts of time planning interventions, creating innovative approaches to learning, and providing extended tutoring services for students who may still not meet standards on state exams. The integrated approach by Elliott et al. is worthy of note to educators because it consists not only of the academic skills commonly addressed, but it also addresses academic enablers that are often ignored.
According to the 2007 Preliminary AYP State Summary Table (TEA, 2007c), almost 2% of Texas schools did not meet AYP due to poor reading performance and/or participation. To better serve students with lagging TAKS reading scores educators must seek and implement effective instructional and behavioral interventions.

Estimated amounts spent on remedial education were not found; however, TAKS scores are a strong indicator of how many students must receive remediation for failing to meet standards in one or more core subjects. In Texas' 2005-2006 Academic Excellence Indicator System (AEIS) Report (TEA, n.d.b), 65% of fifth graders met standard in reading leaving 35% of the fifth grade population eligible for reading remediation. In the same report, 84% of eighth graders met state standards in reading leaving 16% of the eighth grade population eligible for reading remediation. During the same year, 89% of all eleventh graders met state standards in reading leaving 11% of the eleventh grade population eligible for reading remediation.

Remediation begins the first day of school before TAKS scores are acquired for the respective school year and ends the last day of summer school. Large amounts of money are spent yearly on interventions when the number of students involved in interventions for each of the core subjects is considered for the duration of a school year and extended school year.

This research study was designed to determine if classroom interventions increase TAKS scores and academic competence. The study sought to determine whether or not classroom-based interventions are an effective method for improving a student's academic competencies and increasing TAKS reading scores. The Academic Competence Evaluation Scale (ACES™) and the Academic Intervention Monitoring
System (AIMSTM) were tools used in this study to help identify areas of need and monitoring. The students selected for this study received scale scores between 1919 and 2185 on the TAKS reading test in third grade.

This study answered the following questions:

1. Does the implementation of AIMS result in a significant increase at the \( p < .05 \) level in student performance on the fourth grade April 2007 TAKS reading test between the control and treatment groups?

2. How do the ACES posttest total scores and the subscores of academic skills and enablers of the treatment and control groups compare?

Hypotheses

This study utilized the following null hypotheses to answer the questions above:

1. There will be a signification difference at the \( p < .05 \) level on the 2007TAKS reading scores at the fourth grade level between the treatment and control group members.

2. There will be a significant difference at the \( p < .05 \) level on the ACES posttest scores between the treatment and control group members.

Significance of the Study

For the class of 2006, the most recent year for which data is available, TEA (2007b) reported in its annual Secondary School Completion and Dropouts in Texas Public Schools, 2005-2006 – District Supplement a dropout rate of 14.8% for the Fort Worth Independent School District (Forth Worth ISD) using data from a longitudinal Grade 9 cohort. This percentage accounts for students who continued high school or
received a General Equivalency Diploma (GED). The Fort Worth ISD and many other large school districts in the state of Texas seek answers to reducing and eventually eliminating the dropout epidemic. Studies which contribute to the research on interventions for elementary aged children who struggle in reading pose a possible solution for educators in their search for reducing the dropout rate.

According to TEA (n.d.a), school districts reported 58% of all dropouts listed a school-related concern such as poor attendance or failing grades as their reason for leaving school. The U.S. Department of Education in the 19th Annual IDEA Report to Congress in 1997 found that continuing failed remediation past the primary grades further deprives children of the opportunity to learn advanced subject matter such as science.

In 1999, the 76th Texas Legislature enacted the Student Success Initiative (SSI) to ensure every third and fifth grade student is reading on or above grade level by the end of the school year. Fifth graders are also required to be on grade level in mathematics by the end of their fifth grade year. The SSI requirements will be applied to the Grade 8 reading and mathematics tests beginning in the 2007-2008 school year. As specified by these requirements, a student may advance to the next grade level only by passing these tests or by a unanimous decision by the grade placement committee (TEA, 2006-2007).

According to TEA’s (2006-2007) Grade Placement Committee Manual for Grade Advancement Requirements of the Student Success Initiative, when low-achieving students cannot pass the state’s reading assessment, school district personnel are charged with creating accelerated instructional plans to assist the failing students in meeting standards on TAKS in reading in third and fifth grades. Students are given
three opportunities to meet standard or a scale score of 2100. Scale scores are used to compare scores with the standard and provide a statistical comparison in the level of difficulty of the test form used. A student has met standard when he or she has performed at or above the state passing standard.

Many students who do not pass the TAKS reading test are still promoted by a Grade Placement Committee (GPC). According to data from the TEA, about 3% or 8,600 third graders did not pass the TAKS reading test after the third administration during the first 2 years of the SSI requirement; however, more than half of the 8,600 students advanced to the fourth grade (Embry, 2005). These alarming numbers are the rationale for finding research-based practices that have proven to work with struggling learners. If designing reading interventions around academic enablers and academic competencies prove to be effective, this method of intervention should be given serious consideration by other school districts with a considerable number of students failing the TAKS reading exam.

Overview of Methodology

This study was designed to determine the effect interventions have on the development of academic competence as determined by scores on the 2007 TAKS fourth grade reading test. The students chosen to participate in this study had performance levels at or below meeting standards on the 2006 TAKS reading test in third grade. The students were identified from five schools in the Fort Worth ISD, Fort Worth, TX. All students remained anonymous through the use of coding by school number, grade, and participant number. A control group was established for comparisons.
The data collected included ACES, AIMS, goal-attainment scale (GAS) graph ratings, and TAKS reading scale scores from 2006 and 2007. Both ACES and TAKS have undergone reliability and validity testing. The ACES Manual K-12 provides substantial evidence of reliability and validity through the standardization process and independent research (DiPerna & Elliott, 2000). The TAKS undergoes a development process which includes field testing, data analyses for reliability, validity, and possible bias by a data review committee of individuals trained in statistical analysis of field test data (TEA, 2004-2005).

More information regarding the measurements used for this study can be found in Chapter 3. Data were analyzed to qualify and provide information about the control and treatment groups. Groups were qualified using independent t tests to determine if there were differences between the treatment and control group scores on the 2006 TAKS at pre-ACES. In addition, bivariate correlational statistics were used to determine if there was a correlation between students' reading achievement on both the 2006 TAKS and the pre-ACES and the 2007 TAKS reading test and the post-ACES. The first question in the study required the use of a repeated measure ANOVA to determine whether or not the implementation of interventions resulted in a significant increase in student performance on the 2007 TAKS reading test. Descriptive statistics were utilized to determine the findings between the 2007 TAKS reading scores and the post-ACES total scores of the control group as compared with those of the treatment group for Question 2. Once the pre-ACES and post-ACES data were collected, a Crombach alpha was used to find the internal consistency reliability coefficient. Validity issues were addressed using the interfactor correlation for the pre-ACES and post-ACES data.
Delimitations of the Study

The study was limited to Fort Worth ISD students at five elementary campuses who were enrolled at the selected schools for school years 2005-2006 and 2006-2007. Students were selected using scale scores from the third grade TAKS reading test administered during the spring of 2006.

Limitations of the Study

Internal Validity

The threats to internal validity for this research included history, maturation, instrumentation, testing, and experimental mortality. This experiment extended over a 3-month time period which allowed other events to occur that could influence the students' learning environment and ultimately impact the outcomes of student achievement.

To control for threats of internal validity as related to history, this study included data of other 2007 fourth grade students in each of the five selected elementary schools who did not receive intervention and whose scores on the third grade TAKS reading test in 2006 fell at a scale score of 2185 and below. A comparison was made to determine whether the 2007 fourth grade students in the study were as likely, less likely, or more likely to pass the fourth grade TAKS test in April 2007 with interventions. Using these two comparison groups were important to controlling the threat that history had on this study since the fourth grade control group had the same likelihood of history influencing their learning environment.

Due to the 3-month research period, maturation was another concern of internal validity. The same data group used to eliminate the concern for internal validity for
history was used for maturation. The fourth graders in the control group had the same opportunity to mature during the 3-month period from February 2007 through April 2007 for a total of 10 weeks.

Instrumentation could also have threatened the internal validity of this study. Teachers may have given students a more favorable rating the second time on the ACES since they were an active part of the student interventions. In essence, improved results on the ACES could be a reflection of a teacher’s effectiveness in implementing the intervention plan. The study depended on the effectiveness of the interventions for increased reading scale scores. A safeguard was used to reduce the threat of instrumentation. Reading content teachers were allowed to request input from another one of the child’s teachers for a second opinion when a change in an academic or nonacademic behavior was noted.

Testing is a threat to the internal validity of a quasi-experimental design because the design consists of a pretest and posttest (Gall, Gall, & Borg, 2003). In this study, there were two pretests and posttests, the ACES and TAKS. The ACES was completed by the teacher and was based on a teacher’s perception of the student in January 2007. Then the teacher completed the ACES again at the end of a 10-week intervention period. The students also took 2 fourth grade level TAKS tests. The first test given in December 2006 was the fourth grade 2006 TAKS release test. The students were administered the TAKS test again in fourth grade in April 2007. The comparisons between the TAKS pretest and posttest helped determine if students were on level in reading and whether or not students had made academic growth in reading. Thus these two measurements helped reduce the threat of internal validity.
Experimental mortality threatened this study’s internal validity. It was possible students could relocate or could be absent during the TAKS testing period. In order to reduce the likelihood this would occur, the only students allowed into the treatment group were those students whose parents identified them as not likely to move during the school year. By the end of the 10 weeks, only one student had moved to another school.

*External Validity*

This research may have had threats to its external validity in both population validity and ecological validity. The population validity was threatened because students were chosen from a group known as the local or accessible population. When a researcher accesses the accessible population, the ability to generalize is threatened. In this study, the small number of students in the control and treatment groups did not allow generalizations. Additional threats to external validity were the personological variables which interacted with the treatment effects. However, some personological variables could be reduced. For example, variation in instructional formats could be reduced simply because the treatment groups were from the same district and were participating in the same reading program. Students’ abilities could be reduced because the students identified for this study were considered borderline or below grade level as determined by the TAKS reading scale scores in fourth grade. Variables such as student personality, gender, and test anxiety levels could have been difficult to manage and may have required more interventions which were unrelated to the goals of this study; therefore, these variables were not addressed.
Ecological validity threatened this study through the description of the experimental treatment, the multiple-treatment interference, the Hawthorne Effect, novelty and disruption effect, and experimenter effect. A detailed description of the experimental treatment was necessary to ensure a replicable study. A description of the experimental treatment was critical because of the nature of the actual treatment. Although the treatment was documented and monitored, the actual interventions may have varied in quality and quantity. To reduce the likelihood of this occurrence, training was provided to each teacher, along with a specific written plan, a checklist, and two observations. In addition, ongoing monitoring and communication with participating teachers were conducted a minimum of two times per month.

Multiple-treatment interference was a concern of this study because the treatment allowed for a variety of possible intervention treatments, making the generalization of one intervention treatment difficult to identify. The effectiveness of one intervention treatment may also have depended on the development of another intervention treatment. In order to deter multiple-treatment interference as a threat to external validity, only one academic enabler and one academic skill were part of the plan for each student in the experiment.

The Hawthorne Effect threatens external validity. Because teachers were provided with support and students received special attention from the teachers, a change in student behavior may have occurred, resulting in the Hawthorne effect (Gall et al., 2003). To reduce the Hawthorne effect or prevent special attention from occurring, teachers were given research-based strategies that were also used with other students in the classroom. However, students in the study may have recognized
the difference since they were introduced to their goals or when I visited and interviewed the students in the study.

Novelty and disruption occur when the newness of the treatment is effective because the instruction is different from what the student is accustomed to receiving (Gall et al., 2003). The novelty may have existed for the teacher at the beginning of the experiment, but the length of the study should have addressed this threat. Over a 3-month time period, the concern for novelty effect should not exist. The disruption effect was not a concern because explicit directions were given to teachers to ensure interventions enhanced rather than disrupted the students’ normal routines.

The generalizability of the experiment may be limited to the measurement of the dependent variable, which in this case was student achievement on the TAKS reading test. Student achievement in this study was based on a criterion referenced multiple choice test which may not be generalized to an essay exam or a norm referenced test. However, the academic competence levels as determined by ACES should have more generalizability across all types of tests and academic situations.

Finally, experimenter effect was a threat to external validity because the teachers who administered the treatment may have done so at different levels of effectiveness. These variations are also known as experimenter bias. In order to reduce experimenter biases from occurring, teachers were provided with criteria for effective treatment and documentation for accountability through the GAS. I also monitored and observed teacher-student interactions during treatment.

Definitions of Key Terms

Academic competence – “Academic competence is a multidimensional construct
composed of the skills, attitudes, and behaviors of a learner which contribute to academic success in the classroom” (Elliott et al., 2001, p. 5).

Academic skills – Academic skills consist of both basic and complex skills which are a necessary part of curriculum and instruction in school (Elliott et al., 2001).

Academic enablers – Academic enablers are behaviors and attitudes which facilitate learning academic skills (Elliott et al., 2001).

Reading-language arts – In this study, reading-language arts refers to the content area of reading only.

Critical thinking – Critical thinking in this study refers to Marzano’s framework of dimensions of thinking which include eight core thinking skills: focusing, information gathering, remembering, organizing, analyzing, generating, integrating, and evaluating (Elliott et al., 2001).

Motivation – Motivation pushes a student to act or engage in activities. It drives a student’s persistence and level of interest and has been shown to correlate with high academic achievement (Elliott et al., 2001).

Study skills – Study skills are defined as a set of strategies a student uses to process new information (Elliott et al., 2001).

Engagement – When a student is engaged in learning, he or she is an active participant in classroom instruction (Greenwood, 1996).

Interpersonal skills – Interpersonal skills are defined as skills that are necessary for getting along with others (Elliott et al., 2001).

Summary

The purpose of this research was to determine the effects of academic
intervention on the development of reading academic competence in fourth grade
students who performed at or below grade level as determined by TAKS reading scale
scores in 2006. Specifically, the study focused on interventions that addressed
development of reading skills, critical thinking, motivation, study skills, engagement, and
interpersonal skills. The interventions were monitored using the GAS and measured
using two posttests, the fourth grade April 2007 TAKS reading test and a second ACES.
The study included a review of the literature, methodology, analyses of the data, and
conclusions.
CHAPTER 2
REVIEW OF THE LITERATURE

The purpose of this chapter is to examine the theoretical framework and current literature related to the study of classroom-based interventions on developing academic competence in reading. This chapter is organized around six sections. The first section provides a discussion of the historical background of this system, which supports the many facets of this study. Section two consists of the key concepts used to define the general intervention strategies. Section three focuses on the selection and use of interventions to support the development of academic competence. Section four discusses academic competence as it relates to the development of the concept, strategies for interventions, and interventions to address reading. The chapter concludes with a summary and limitations of the literature presented in the chapter.

Historical Background

A plethora of research is available relating to the development of academic competence in reading. Since students who struggle in reading have been in our educational setting for many years, the historical background of this topic is broad. In an effort to align this study with a more focused historical background, attention was given to the construct of academic competence, the precursors leading up to the ACES, teacher-based judgments of academic achievement, the development of AIMs, teachers’ ability to provide interventions, and best practices for interventions.

Construct of Academic Competence and its Relationship to Academic Enablers and Skills

The model of academic competence as defined by DiPerna and Elliott (2000) has
two dimensions: academic skills and academic enablers. Academic skills encompass both basic and complex skills taught in schools, and academic enablers are behaviors that allow students to learn. DiPerna and Elliott use seven clusters to identify skills and enablers in each of these domains. The academic clusters are reading, mathematics, and critical thinking. The academic enabler clusters include interpersonal skills, motivation, study skills, and engagement. Each of these clusters is supported in the literature as important for learning. The mathematics cluster will not be discussed as it was not considered a part of developing academic competence in reading as suggested in this study.

**Reading skills.**

Most students struggling with academic skills have difficulties in reading/language arts. According to the President’s Commission on Excellence in Special Education, 80% of individuals with learning disabilities struggle in the area of reading (U.S. Department of Education, 2002). As a result of reading difficulties, Blachman (1996) has reviewed the literature to determine the consequences. The findings are dismal with consequences resulting in unsuccessful reading skills throughout life and potential traumatic emotional experiences. Other relationships supported by research are the links between early academic problems which turn into lifelong problems. These lifelong problems affect employment, delinquency, and cause other antisocial behaviors (Maguin & Loeber, 1996). The consequences of poor reading skills have led to a plethora of studies relating to the development of reading skills.

Elliott et al. (2001) constructed their reading skill development on five learning processes that build on each other: phonological awareness, word analysis/recognition,
fluency, comprehension, and content-area reading. In the *AIMS Guidebook* (Elliott et al., 2001), phonological awareness is defined as the understanding of how sounds of speech are combined to form meaningful units of language. Word analysis is linked to five essential elements: letter-sound knowledge, regular-word reading, story reading, irregular-word reading, and advanced word-analysis skills. Reading fluency refers to the rate at which words are decoded and comprehension is obtaining meaning from the text. Finally, content-area reading allows for the application of reading principles to science, social studies, and other content areas. Another cluster identified in the AIMS Guidebook (Elliott et al., 2001) closely connected to reading skills are critical thinking skills.

**Critical thinking skills.**

Critical thinking skills have been researched and organized by Benjamin Bloom and Robert Marzano. Bloom (1956) presented a framework using six types of thinking skills: knowledge, comprehension, application, analysis, synthesis, and evaluation. Later, Marzano et al. (1988) used Bloom’s framework to develop dimensions of thinking. The dimensions of thinking framework consisted of eight core thinking skills: focusing, information gathering, remembering, organizing, analyzing, generating, integrating, and evaluating.

**Interpersonal skills.**

Many researchers have supported the use of cooperative learning as an effective strategy for classroom instruction. Di Perna and Elliott (2000) emphasized cooperative learning behaviors as necessary skills for interacting with other people. In a study of 423
sixth and seventh grade students, Wentzel (1993) found that prosocial and antisocial behaviors had a direct influence on students’ academic achievement when considering academic behavior and teachers’ preferences for students. The study related social behaviors to standardized test scores and found a significant correlation. Prior to this research, Wentzel (1991) also found a student’s IQ is not a predictor of responsible behavior when other social factors are considered. Wentzel (1993) used his research experiences to suggest that socialization may increase positive academic outcomes.

A strong theoretical foundation supports the use of cooperative learning to increase academic functioning (Slavin, 1995). Gillies and Ashman (2003) completed an extensive review of the literature on the use of both socialization and learning as significant outcomes from the use of cooperative learning. They concluded that groups enhance learning, mediate academic achievement, and promote cognitive language strategies.

Motivation.

Research on developing academic competence supports the use of motivational strategies in the classroom (Elliott et al., 2001). The AIMS Guidebook provides motivational strategies supported by task-mastery orientation, performance orientation, and self-efficacy. Motivation through reinforcement and cooperative learning is also linked to improved academic competence.

Linnenbrink and Pintrich (2001) explored task-mastery orientation and performance orientation as they relate to learning and achievement goals. Using a task-mastery approach, the learner focuses on mastering a specific task, learning a set group of facts, or understanding a specific process. Learning through mastering tasks
requires the use of standards of self-improvement, measurements of progress, and a deep understanding of the material being learned. Motivation which focuses on performance orientation results in students trying to outperform each other. Students may use more normative standards such as being at the top of their class or earning the highest grades in a group.

Another aspect of reading motivation is self-efficacy. Bandura (1986) defined self-efficacy as “people’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performances” (p. 391). According to Schunk and Zimmerman (1997), students with a high self-efficacy see difficult reading tasks as challenging and work diligently to master those using cognitive strategies. Baker, Scher, & Mackler (1997) found positive climates, storybook reading, and parents’ beliefs about reading have strong implications for literacy intervention programs.

Engagement.

Cambourne (1995) describes engagement as the point at which learners are convinced they can do what they have observed. Demonstrations must be perceived as a purpose to further the learner’s life, at which point security in engagement then occurs without fear of physiological or psychological damage if attempts are incorrect. Guthrie, McGough, Bennett, and Rice (1996) state that engaged readers are students who are motivated, strategic, knowledgeable, and socially interactive. More specifically, readers are motivated to read for attainment of personal goals, are strategic in using comprehension strategies, use knowledge to construct understandings, and interact socially.
Study skills.

Study skills encompass both skill-based and self-directional aspects (Gettinger and Knopik, 1987). The skills-based perspective views skills as learned abilities to acquire and retain knowledge. These skills are associated with acquiring, recording, organizing, synthesizing, remembering, and using information in the classroom. A self-direction approach emphasizes personality characteristics related to academic performance. The ability to concentrate, a positive self-concept, ability to set and reach goals, interest in learning, and skill in managing frustration are parts of the self-direction approach in developing study skills.

DiPerna and Elliott (2000) supported a study skills cluster of academic competence based on academic skills, academic learning time, and academic responding (Hoge, 1983). Hoge analyzed academic skills and teacher judgment measures to determine the reliability and validity of such measures. The correlated results of the psychometric properties of teacher judgments on student achievement were used to help develop the properties of the study skills cluster. Academic learning time was defined as the amount of time it takes a student to master a task or the amount of time a student engages in learning. Academic responding was defined as interaction between teacher-directed antecedent stimuli such as materials presented or questions asked and the success the stimuli had on the academic response desired (Greenwood, Delgquadri, & Hall, 1984).

Marzano, Pickering, and McTighe (1993) developed the Dimensions of Learning Model which focuses on five dimensions of learning: positive attitudes and perceptions about learning, acquiring and integrating knowledge, extending and refining knowledge, using knowledge meaningfully, and productive habits of mind. Each of the five
dimensions is necessary in order for successful learning to occur. First the learner must think positively about the task being taught and feel positive about the environment in which it is occurring. Then the modeling can lead the learner to make an effective process for the new learning and then practice the task. However, the learning process is not complete unless the learner extends the new learning through a reasoning process using higher order thinking. The last step necessary to complete the learning process is to give meaning to the new learning through the use of problem-solving, investigations, or other meaningful activities.

In summary, the research supporting the development of study skills is evident in Marzano et al.'s (1993) Dimensions of Learning Model and through the development of academic survival skills, increased learning time, and academic responding. The use of ACES and AIMS in this study utilized these ideas to increase academic competence of fourth grade students in reading.

Precursors Leading Up to the Development of ACES

ACES was essentially developed in two phases: Phase I: Conceptual Development and Phase II: Development of Teacher and Student Forms. The Student Forms will not be discussed since they were not used in the study. In Phase I, the development of a teacher evaluation scale began in the mid-1980s. Elliott (1987) developed a teacher judgment rating scale he called the Prerefereral Behavior Inventory and Intervention Planner (PBIIP). The PBIIP included a teacher rating scale using a criterion-referenced grade level scale and a list of classroom management tools and instructional tactics they were willing to use a part of the interventions. At about the same time, Elliott and Gresham (1990) were working on the Social Skills Rating System
(SSRS). The SSRS included an Academic Competence Scale and a Teacher Ratings of Academic Progress (TRAP). These instruments have proven to be strong predictors of students’ performance on achievement tests. However, neither of these instruments provided enough information to guide the identification of interventions (DiPerna & Elliott, 2000). By the late 1980s, the PBIIP and the SSRS served as the impetus for the development of more comprehensive teacher rating scales which led to the development of the ACES.

In Phase II, the development of the ACES Teacher Form became possible after the conceptual groundwork was accomplished through the PBIIP and SSRS. A pilot version was created by 1996. Expert educators were provided with the opportunity to give feedback to the developers regarding the items on the initial ACES. The feedback provided led to the elimination of items and revisions. The standardization of the ACES occurred in 1999, and the item pool was expanded to include higher-order thinking skills (DiPerna & Elliott, 2000). The final Teacher Form includes 73 items which allows teachers to provide judgments of academic achievement for their students.

Elliott, DiPerna, and Lang (2004) later conducted a large study with 2,060 participants in K-12 to determine whether or not teacher ratings indicated students without disabilities demonstrated higher levels of academic enablers than those at-risk with disabilities. Teacher volunteers were solicited in 30 states to complete the ACES on a stratified random sample of students within their classrooms. Students had to be identified as having disabilities, as being at-risk for poverty, and as being at-risk academically by their teachers. Elliott et al. found their predictions to be accurate. General education students had higher ratings on enablers than their learning disabled peers and students identified as academically at-risk. However, Elliott et al. did not
correctly predict students with learning disabilities would have higher ratings on academic enablers than at-risk students. In addition, the results supported females as having higher ratings than males, and medium to large correlations were found between teacher and student self-ratings of academic enablers in a matched sample. Overall, the 2004 study supports the ACES as a useful evaluative tool for educators. The next topic of thoughtful inquiry leads the discussion to the validity of teacher-based judgments.

**Teacher-Based Judgments of Academic Achievement**

Teachers are thoughtful professionals who base part of their instructional decisions on judgments they make regarding their students’ comprehension. Teachers’ thoughts, cognitions, judgments, thinking, and learning processes have been the core of studies relating to effective teaching. The judgments and thinking a teacher represents are known to have significant effects on the teaching and learning process in the classroom (Peterson, 1988).

The accuracy of a teacher’s judgment has also been debated. Researchers collect data using both direct and indirect evaluation. Indirect evaluation does not require teachers to specify students’ actual achievement levels. For example, a teacher may be asked to estimate the number of problems each student would answer correctly. Direct evaluation requires teachers to specify their students’ actual achievement levels. Using both direct and indirect evaluations, Hoge and Coladarci (1989) examined teacher-based judgments and the extent to which teachers’ judgments correlated to students’ actual achievement.

Hoge and Coladarci (1989) reviewed 16 studies, 10 of which used indirect teacher evaluations similar to ACES. Of the 16 studies reviewed, 14 reported
correlations between the teachers’ judgments of their students and the students’ actual performance on a standardized test. The median correlation of the correspondence between teacher judgments and student achievement was 0.66 which suggested a moderate to strong correlation. Coladarci (1986) reported that teachers correctly judged their students’ responses on an average of at least 70% of the items on reading and math subtests. Hoge and Coladarci’s (1989) study validated that teacher judgments consistently have a moderate to strong correlation to reading subtests. In fact, teacher judgments consistently have a stronger correlation in reading than in the other core content areas evaluated.

Hoge and Coladarci (1989) also examined other variables’ affects on the accuracy of teacher judgments such as differences among teachers, student gender effects, subject matter differences, and student ability. In brief summary, their data demonstrated that teachers vary in how accurately they judge their students’ achievement. The 16 studies researched by Hoge and Coladarci supported the validity of teacher-based achievement judgments overall. Student gender differences failed to show any significant affects on teacher judgment. Subject matter differences were statistically supported in a 1985 study by Hopkins et al. (as cited in Hoge & Coladarci, 1989). Correlation for social studies and science was significantly lower than reading, language arts, and mathematics. More specifically, the 1983 Leinhardt study (as cited in Hoge & Coladarci, 1989) and the 1986 Coladarci study (as cited in Hoge & Coladarci, 1989) supported stronger correlation between teacher judgments and student achievement among higher-achieving students than for lower-achieving students.

Although the moderator variables were carefully reviewed, the overall findings supported Hoge and Coladarci’s (1989) conclusion that performance judgments made
by teachers are valid. The researchers did not suggest these judgments were free of error; however, they recommended that teacher judgment measures be given the same attention as other measurement instruments as implications for teaching.

DuPaul et al. (2004) investigated possible predictors of academic achievement in a sample of students meeting criteria for attention deficit and/or hyperactivity disorder (AD/HD) using teacher ratings. The participants consisted of 136 AD/HD students and 53 students in the normal control group from first through fourth grades. Teacher ratings were used to predict student performance on standardized tests and report card grades. The teacher ratings related to AD/HD symptoms, academic skills, achievement-related behaviors, problem behaviors, and social skills. In addition to the teacher ratings, data from direct classroom observations were also collected. DuPaul et al. found several of the prediction variables strongly correlated with academic achievement. More specifically, academic skills, academic enablers, inattentive symptoms, and observations of off-task behavior predicted academic achievement. The results of the study supported a stronger correlation between the predictor variables and reading than math for both the AD/HD group and the normal control group. Teacher rating scales served as predictors of reading skills and enablers for students with AD/HD but only predicted reading skills for the normal control group. The implications of the study suggest teachers’ grading is biased, but grades do not affect skill attainment on achievement tests, thereby supporting the use of the ACES and correlating teachers’ perceptions from the results of the ACES to the reading Texas Assessment of Knowledge and Skills (TAKS™) achievement tests.

The results of DuPaul’s et al. (2004) study indicated teachers are strong predictors of reading skills when taking into consideration a teacher’s perception of a
student’s academic skills and enablers on achievement tests. The study supports the value in using teacher ratings to predict reading skills in elementary school children.

This collection of studies suggests teacher ratings can be a reliable source of information to predict reading ability in elementary school students. Identification of students in need of interventions in literacy is valuable. The ability to intervene is the next important plan of action provided through AIMS, a 5-step process developed by the same team who developed ACES.

*Development of Academic Intervention Monitoring System (AIMS)*

The development of the AIMS forms had several phases. The first phase involved the identification of strategies. The developers used the research literature and Elliott’s (1987) previously developed Prerefereral Behavior Inventory (PBI). The second phase allowed for the review of items by educational professionals regarding the content, readability, and usefulness of each item. The third phase was concerned with the standardization of the AIMS forms which involved the completion of the forms by teachers, parents, and students. The data provided through the standardization process were used to validate the content of the forms. Then evidence for content validity was determined using two criteria. The developers wondered if the strategies were helpful in promoting student learning and whether or not the strategies were feasible to implement. The next section addresses a teacher’s ability to provide the interventions recommended through the use of AIMS.

*Teachers’ Ability to Provide Interventions*

There is currently an intervention assistance movement occurring in the United
States. School-based interventions are becoming more popular as educators are faced with the growing diverse needs of students (Rathvon, 1999). Research testing the effectiveness of intervention assistance programs has reported concerns and suggestions for more successful delivery of these interventions.

One such study was conducted in 1994 by Flugum and Reschly. In this study, 360 subjects who had been referred for special education but who did not qualify were used as participants. Data were collected over a 3-year period through questionnaires given to the research students' teachers. Flugum and Reschly found the interventions offered to teachers were low in quality and limited in variety. The implications of the study suggested many students were not receiving interventions; therefore, the need for improved quality of interventions was necessary. In addition, teacher training may be needed to help provide the needed quality interventions.

Harrington and Gibson (1986) surveyed 41 practicing teachers in Kansas who had made at least one referral to a pre-assessment team requesting ideas for interventions. The study found that on average teachers felt the recommendations made by the team were appropriate. However, over 60% agreed or strongly agreed they were satisfied with the team itself. Most teachers admitted to attempting the interventions recommended by the team with 15% admitting to making no effort to implement the interventions, and 27% were unsure if they had implemented the recommended interventions. Most of the teachers agreed they needed assistance defining the academic problems of their students and identifying effective interventions. Overall, teachers stressed the importance of the administrator’s attitude towards the role of the team and its success. In addition, teachers stressed parental support and home-school communication as important to the process.
Meyers, Valentino, Meyers, Boretti, and Brent (1996) studied an intervention team’s procedures and processes in eight urban schools to determine teachers’ abilities to provide interventions. Surveys, interviews, and observations of 62 intervention team members and 72 teachers who were not team members were included as qualitative sources of data. Study variables included teacher involvement, teacher training with use of interventions, effective decision-making strategies, and a focus on child-centered, teacher-centered, and system-centered consultation. Teachers were noted to implement recommended interventions in varying degrees. Meyers et al. observed that teachers’ use of problem-solving processes, data collection, and use of data also varied from teacher to teacher. The study results implied a multivariable approach by intervention teams was effective in supporting teachers in the classroom with their struggling students.

The studies presented in this section support the ability of teachers to provide interventions to students in need of academic assistance. However, accomplishing a successful intervention design, implementation, and evaluation require careful and thoughtful planning. Elliott et al. (2001) present such a plan in their AIMS Guidebook.

*Best Practices for Intervention Design, Implementation and Evaluation*

Elliott et al. (2001) suggested professional standards for intervention design and implementation be used. The researchers determined that users of AIMS must respect student and parent rights, understand theories of learning and behavior change, and be familiar with resources for interventions. Best practices for interventions and evaluation included attention to the problem-solving process for identifying and organizing
interventions, conceptualizing and observing the target behaviors, setting intervention goals, and evaluating interventions.

Choosing the best practices and interventions for a student is not prescribed by only one person. A team of knowledgeable persons such as teachers, campus leaders, and the student’s parents who are involved in the problem-solving process are required. There is an increasing need for parents and teachers to provide interventions to change students’ behavior. Knowledgeable adults have been proven to provide effective and efficient remediation (Kelley, 1990).

The AIMS Guidebook (Elliott et al., 2001) provides common techniques teachers can successfully use for classroom interventions. The techniques include focusing on student behaviors, identifying a method for increasing the desired behavior, applying interventions often, and objectively evaluating the standard of behavior. Elliott et al. also identified six points to consider when designing classroom interventions regardless of the problem: describe the observable behavior for objective measurement, think positively when choosing behaviors for improvement, identify a solution with an attainable goal, identify clear steps for an intervention, allow flexibility by identifying alternative methods for intervening, and generalize the interventions’ effects over time. However, Elliott et al. noted that teachers used these steps only minimally. Educators need to learn and implement skills of collecting assessment results and organizing the results as part of the problem-solving process for interventions.

Elliott, Busse, and Shapiro (1999) developed ACES as a way to organize concerns relating to academic performance. Elliott et al. used Kanfer and Goldstein’s (1986) stimulus-organism-response-consequence (SORC) model to organize desired behaviors. The SORC model includes a stimulus situation, an organism’s internal
reaction, a response, and a consequence. The stimulus situation refers to the people or events that precede an action which represents the stimuli to the actions and represents the first impact point. The organism’s internal reaction refers to the cognition, emotions, and ability to solve problems and serves as the second possible impact point. The third impact point is the response, the overt reactions to a perceived stimulus. The last impact point is the consequence and represents the reaction to the response as perceived by the organism. In order for educators to organize behaviors of concern, the problem must be objectively and clearly be identified and defined. The SORC model is a framework which can provide a useful tool for conceptualizing target behaviors and points for intervention (Elliott et al., 1999).

Suggestions for conceptualizing and observing target behaviors are provided in the ACES: Manual K-12 (DiPerna & Elliott, 2000). The authors noted teachers usually list as many as 5 to 10 behaviors that need to be addressed through interventions. In order to address this dilemma, it is recommended to organize similar behaviors into larger categories. In the ACES-Teacher Report, a student may indicate having difficulty with correcting work, finishing class work, preparing for tests, taking notes, and reviewing materials. In this situation, these problems are grouped in the study skills category and can be addressed using common interventions. The ACES-Teacher Report provides a categorized listing of behaviors which may be considered for interventions.

After the target behaviors have been identified, the next challenge in the process is determining the method of observing the target behaviors and determining the number of observations to be made. DiPerna and Elliott (2000) recommended the use of indirect observation methods of goal attainment scaling and permanent product
summaries. More specifically, a goal-attainment scale (GAS) is recommended for
design and use with the ACES. The number of observations is not specific; however, it
is recommended the observations be representative of the student’s behavior.

Setting intervention goals through GAS are presented in detail by DiPerna and
Elliott (2000) as the method for an individualized, criterion-referenced approach for
describing the desired behavior changes. Kiresuk and Sherman (1968) developed GAS
for use in the mental health profession. Basically, GAS requires the selection of a target
behavior, an objective description of the desired outcome, and three to five descriptions
of the target behavior that increasingly lead to the desired outcome. More specifically, a
five-point GAS is used to address targeted behaviors. The scale ranges from +2 to –2,
and the descriptions of the target behaviors correspond to the descriptors from more
positive correlates to more negative correlates. An example of GAS taken from the
ACES: Manual K-12 is as follows:

+2 The student turns in 90% to 100% of homework assignments completed and
on time.
+1 The student turns in 80% to 90% of homework assignments completed and
on time.
0 The student turns in 40% to 60% of homework assignments completed and on
time.
-1 The student turns in 20% to 30% of homework assignments partially
completed.
-2 The student turns in less than 10% of homework assignments. (DiPerna &
Elliott, 2000, p.48)

In addition to GAS, Elliott et al. (1999) suggested the use of Kanfer and
Goldstein’s (1986) SORC model to identify interventions at three points: instruction,
engagement, and feedback. Particular attention was recommended to instructional
pacing, direct instruction, peer tutoring, cooperative learning, timed performance, and
reducing seat-work time. During the engagement point, the research showed a positive effect when focusing on the motivation aspect of learning. Feedback proved beneficial with recommendations to provide reinforcement, school-home notes, performance feedback, self-management, peer tutoring, and cooperative learning.

Evaluating interventions is the last part of the intervention process. DiPerna and Elliott (2000) emphasized the importance of identifying a behavior problem which provides clear evidence when the desired behavior is attained. Oftentimes, evidence includes changes in frequency of the behavior problem, changes in a student's class work, increased engagement in learning, increased number of completed assignments, increased achievement scores, and improved ability to work with peers. The recommendations provided in the ACES: Manual K-12 are to use a GAS and post-ACES to evaluate the effectiveness of interventions. DiPerna and Elliott suggested that a GAS be used daily or weekly, post-ACES be completed 4 to 6 weeks after initiation of the intervention, and post-ACES be completed at the end of the intervention period.

Key Concepts

Modeling

According to Elliott et al. (2001), modeling is one of the fundamental strategies for interventions which improve academic enablers (Elliott et al., 2001). Through modeling, students are shown what they are expected to learn, and the learning is reinforced in a positive manner. Bandura (as cited in Ormrod, 1999) suggested modeling is reinforced through one’s environment and can be reinforced several ways. The observer may be reinforced by the model, by a third person, or the behavior itself may be satisfying. In addition, Bandura identified several conditions which were
necessary for modeling to occur including attention, retention, motor reproduction, and motivation.

The *AIMS Guidebook* (Elliott et al., 2001) suggests six steps for modeling: establish a need for learning the new behavior, verbalize parts of the skill to aid students with understanding, model several times, allow students time to rehearse the new skill, provide specific feedback, and help students apply the skill to new situations. Elliott et al. recommended modeling as an intervention because a teacher or peer may provide the motivational force necessary to change the behavior of a student when the learner pays attention, shows retention, and receives reinforcement.

*Practice or Behavioral Rehearsal*

Elliott et al. (2001) also recommended the use of practice or behavioral rehearsal for students who are learning a new skill or behavior. Behavioral rehearsal is supported by Bandura's (1977) social-learning theory and is described by covert, verbal, and overt rehearsal. When a student engages in covert rehearsal, the student imagines the performance of a skill in a specific situation. When a student engages in verbal rehearsal, the student is able to recite the steps necessary to accomplish the skill successfully. In overt rehearsal, the student learning the skill is able to perform the skill learned. Behavioral rehearsal or practice is a fundamental strategy and a key component of the intervention process.

*Reinforcement*

The interventions recommended in the *AIMS Guidebook* (Elliott et al., 2001) focus on operant interventions which target observable behavior and the antecedent
and consequent events that maintain the desired behavior. Reinforcement or reductive methods are used most often to acquire the desired behavior and include feedback. Skinner (as cited in Hergenhahn & Olson, 2001) defined positive reinforcement as something added to a situation by a certain response which increases the likelihood of the desired response. For example, a student may be encouraged after providing a correct response in class. The following section provides evidence in the literature to support effective selection and use of interventions.

Selection and Use

Baer, Wolf, & Risley (1968) defined effective interventions as a change in performance that results in a noticeable difference as perceived by significant others and as measured by comparison to an objective standard. Educators select interventions which have proven to be effective and have a high acceptability rating. Thus, the selected intervention methods can be implemented with integrity and provide the educators with empowerment (Elliott et al., 2001).

In researching treatment acceptability, Elliott (1988) found teachers were more likely to implement treatments which were positive, time efficient, and minimally intrusive. Additionally, teachers were more apt to use the suggested interventions through empowerment. According to Elliot et al. (2001), empowerment assumes the teacher has the skills to change the problem or the teacher avoids using the interventions because of the structure or lack of resources. Therefore, helping teachers identify students’ needs and helping teachers locate resources necessary for supporting the students’ needs is beneficial. When these goals are met, teachers feel empowered and use the suggested treatments.
An important aspect affecting the outcomes of interventions is the degree to which interventions are implemented, also known as intervention integrity. Gresham (1989) stated that interventions often fail because they are not implemented as intended. In the AIMS Guidebook (as cited in Elliott et al., 2001), integrity checklists are recommended to monitor the use of interventions to develop academic competence.

Academic Competence

Development of Concept

The development of academic competence has received growing attention recently. At the Conference on the Future of School Psychology, one of the five major priorities of the profession identified academic competence as a priority goal (Power, 2006). Several studies have been conducted relating to the topic of academic competence. Most of the studies which relate to the topic focus on reading.

It is essential to present a study which tests the model of academic competence as presented in this paper. DiPerna, Volpe, Mroch and Elliott (2001) conducted a study to determine if the academic competence construct or model was an accurate representation of the relationships between academic enablers and reading/language arts achievement. A sample of 394 students and 104 teachers were used from 21 schools in the northeastern United States. The sample included two groups, primary (K through Grade 2) and intermediate (Grades 3 through 6) students. The fourth graders represented in the study accounted for 33% of the study sample. The results of the study demonstrated that the model fit both primary and intermediate samples of students. Stronger connections were evident between study skills and reading/language arts, while there was a slight decrease in the analyses between engagement and
reading. The data also suggested study skills become more significant as students advance through elementary school. In addition, there were consistent relationships between reading/language arts and prior achievement, motivation, and interpersonal skills. The implications of the study suggested that educators should make decisions about skills and attitudes/behaviors to determine interventions. The study also suggested that prior achievement is a strong predictor of current achievement and future achievement. The authors recommended the framework be considered in total context rather than exclusively and that the four enablers (motivation, engagement, study skills, and interpersonal skills) are worthy of consideration for students facing academic difficulties. The following section presents a case study which utilizes the framework to determine appropriate interventions as supported in the 2008 study.

In the case study about Christopher, an 8-year-old third grader, Elliott et al. (2001) shared how the ACES and AIMS tools work in schools. Christopher’s teacher, Ms. Burgard, was concerned about his progress in reading and math. His situation was reviewed by the Building Support Team (BST) at the school to determine ways to intervene.

Ms. Burgard was first asked to complete an ACES-Teacher Form prior to the BST review (Elliott et al., 2001). Christopher’s ratings were developing in reading/language arts and mathematics and near competent levels in critical thinking skills. However, ACES indicated his skills were far below grade-level in reading/language arts. More positively, he scored at competent levels for academic enablers. His teacher evaluated him at high levels in having interpersonal skills, engagement in class, motivation, and study skills.
The first BST review was held and discussions supported the findings from ACES (Elliott et al., 2001). After careful analysis, Ms. Burgard suggested to the committee that Christopher’s interventions focus on word attack skills and fluency. His target behaviors were specifically written: “Christopher will accurately and with an even pace read aloud a page of text from his reading book” (p. 124). Then the committee reviewed the GAS which stated, “He accurately reads 30% to 40% of words and has a slow uneven pace when reading a page of text aloud” (p. 126). The committee also estimated 8 to10 weeks would be necessary for the intervention to make an impact.

The GAS was completed each week along with an integrity checklist and a graph describing daily implementation of the intervention plan (Elliott et al., 2001). After a week of implementation, Ms. Burgard reported no gains in reading skills; however, Christopher’s academic behaviors such as his motivation to read had increased. At approximately the third week, Ms. Burgard began to note reading skills. The ACES scoring assistant was used to calculate the reliability change index which confirmed the improvement was statistically significant. Ms. Burgard also completed an ACES which indicated changes in both enablers and skills. The BST met after the intervention and the post intervention ACES to review whether or not Christopher attained the goals. The team recommended a continuation of the interventions because growth was documented; however, more improvement was still needed.

Other studies supporting the academic competence framework have been conducted with a quantitative perspective. One such study examined the relationship between social adjustments as measured by perceived social support, self-concept, social skills, and performance on achievement tests (Ray & Elliott, 2006). The study included 77 participants in Grades 4 and 8 from 11 school districts in Wisconsin. The
results suggested there were significant group differences in social adjustment based on a student’s identified academic and behavior competencies. The study showed that social functioning can influence academic achievement, and self-concept is related to achievement test scores.

Ray and Elliott (2006) revised their model of academic achievement to suggest students’ social skills and self-concepts affect academic achievement through academic competence. The study findings have strong implications regarding social and academic competence. First, perceived support from teachers and classmates is more highly correlated to school-related competencies such as attendance or attitudes than students’ perceptions of overall support from various sources. Second, the study indicates global self-concept may not be directly related to achievement. The last implication suggests social skills and self-concept should be considered as intervention targets for students.

Other studies have also been conducted which purport the same implications. Malecki and Elliott conducted one such study in 2002. The primary question relating to academic competence addressed the relationship between social behavior and academic achievements. In this study, 139 third and fourth graders and their teachers from a large urban area in Massachusetts participated in the study to determine the relationship between social behaviors and academic achievements. The SSRS and the Iowa Test of Basic Skills-Survey Battery were used as part of the instrumentation and measurement tools. The results suggested social skills are positively related to academic achievement, problem behaviors negatively predict academic achievement, and only social skills are a significant prediction of future academic functioning. The
implications of Malecki and Elliott’s study suggest educators should not ignore the role
social skills play in students’ academic learning.

A different perspective relating to academic competence was presented in a
study by Rotheram (1987) which evaluated students’ academic competence. A group of
241 children from Grades 3 through 6 were studied to determine if the interpersonal
problem-solving ability, assertiveness, and self-esteem were related to competence with
peers, teachers, and academic subjects. The subjects were given an Interpersonal
Problem-Solving Test (IPS), Children’s Assertion Quiz, and Coopersmith Self-Esteem
Inventory. In addition, students were evaluated on their behavioral effectiveness with
peers, students were asked to complete peer ratings, teachers completed teacher rating
evaluation scales, and other behavioral observations were recorded. The results were
accomplished by examining the relationships between the variables previously
mentioned, and a sub-packet factor analysis was conducted. Rotheram found that
better behaved students were less effective in securing a goal with peers. The teacher
ratings suggested students who used assertive alternatives on the IPS and Assertion
Quiz were better behaved. The problem-solving measures resulted in the need to teach
prosocial behaviors in addition to academic skills. The results also supported a
significant correlation between social skills and academic competence. The relationship
stressed the importance of assessing social skills as multidimensional skills. The
implications of Rotheram’s study suggested that there are various domains of social
competence for students in this age group. Although there were a few differences,
scores on measures used did not result in significant variations.

In a more recent study, Valiente, Lemery-Chalfant, and Castro (2007) used a
sample of 240 regular education students ranging in ages from 7 to 12 years old to
examine the relationship between students’ effortful control (EC), school liking, and academic competence. In brief, EC is the idea that children can voluntarily control their attention and behavior. School liking is the degree to which students like school, and Valiente et al. found that students with high EC focused on their school work for longer periods of time than students with less EC. Students with less EC received less instruction as a result of inattentiveness and focus and received less positive feedback with peers and teachers, and students with low EC are less apt to have these positive relationships. The implications of the Valiente et al. study provide positive evidence between EC and academic competence relationship.

Valiente, Lemery-Chalfant, Swanson, and Reiser (2008) conducted similar research and examined the relations among EC, school relationships, classroom participation, and academic competence. The study included a sample of 264 students ages 7-12 years of age from two schools in a southwestern U.S. city. Preliminary analyses were conducted to test for age and sex differences, and then zero-order relations were examined among the study variables. Mixed model regressions were computed to test the hypotheses. The results indicated there is a significant positive correlation between the variables. More specifically, the relationship factor, social competence, and academic competence influenced EC and its impact on students’ grade point average (GPA). Teacher-student relationships and students’ participation in class impacted the relationship between EC and number of school absences. The 2008 study had significant implications on variables influencing academic competence. The findings suggest the importance of regulatory and social influences on academic competence.

The research relating to academic competence as a predictor to future academic
performance is also evident in the literature. Such a study was conducted by Rock and Pollack (2002) on behalf of the United States Department of Education to determine if predictors of future academic achievement could be identified as early as kindergarten. The sample of kindergartners consisted of 20,000 students from across the United States. Parents and teachers of the sample of students were surveyed. The results of the study indicated students’ varying levels of reading readiness significantly influenced reading achievement. Rock and Pollack evaluated persistence, organization, attention, and eagerness to learn as they relate to the entering levels of reading readiness. The students with the ability to persist, organize, attend, and were eager to learn were more likely to develop reading skills. Students who lacked these characteristics were more likely to be delayed in their development of reading skills. The implications of the study support the need for earlier interventions, especially for children of Hispanic, African American, and Native American backgrounds since these three ethnic groups received lower ratings by their teachers than their Caucasian peers.

In summary, the studies supporting academic competence as an important dimension of teaching and learning imply the need to develop both academic and nonacademic behaviors. Bloom’s (1976) research suggests the need to include non-cognitive domains such as self-concept of students towards their academics and school itself. His research indicated approximately 25% of effective and motivational characteristics are linked to the variance in students’ academic achievement. The studies supporting the construct of academic competence have led researchers to seek answers to how educators can develop academic competence in students lacking these characteristics through interventions.
Academic Competence and Strategies for Interventions

Researchers continue to seek effective interventions for students who lack academic competence. The studies presented in this review of the literature consider interventions which support the development of academic competence.

Shields (1995) examined the short-term impact of interventions on academic performance, behavior, and attendance. The study included 37 students in the treatment group and 28 students in the control group. Each of the participants in the Shields study were identified as at-risk and ranged in age from kindergarten to Grade 6. The treatment group received intervention services for one year while the control group did not receive any focused intervention. At the beginning of the intervention period, one or two interventions were determined by a team based on the needs of the students receiving interventions. Examples of interventions consisted of counseling with parents and/or students, outside agency referrals, and specific classroom activities. The students in the treatment group also participated in programs such as Drug Abuse Resistance Education (DARE), Interventions to Manage Stressful Changes for Students (STAGE), Program Assisting Learning of Students (PALS), Reading Recovery (an early reading intervention program), and AIDS Awareness and Prevention Program. In addition, many self-esteem materials were used in the classrooms.

Shields’ (1995) findings were significant in the subject area of reading as measured by grades and the CTBS. Math resulted in significant results on the CTBS only. There were no significant differences between the treatment group and the control group in the subject area of language as related to their grades and achievement scores on the CTBS. Findings comparing any significant differences between both groups in attendance and behavior were not evident. Shields suggested that more research is
needed in identification and intervention programming for elementary aged at-risk students. The results also suggested dropout intervention programs are needed before third grade since students who drop out decide to leave school by third grade, and students at-risk of dropping out can be identified through achievement scores, behavior problems, and poor attendance. Finally, Shields’ research implied that interventions can improve achievement in reading and math.

Another study supporting and identifying interventions for developing academic competence was conducted by Obach (2003). The study examined academic competence and motivation by evaluating the developmental course of perceived academic competence among middle school students. Longitudinally, Obach also investigated the relationship between academic competence and motivational beliefs for learning. The participants in the study consisted of three cohorts from urban parochial schools in a large urban setting. The students were enrolled in the fifth through the eighth grades. There were approximately 30 children in each cohort when the 3-year study was terminated. Obach used the scholastic subscale from the Self-Perception Profile for Children to measure the students’ ratings of competence in academic settings. In addition, end of the year standardized achievement test results and final grades in reading and math were used in the study. The results of the study showed that students perceived themselves as academically competent if they used mastery goals, were self-monitoring, and persisted in school work. The implications of the study suggested middle schools need reform if they are to adopt more effective instructional practices that focus on mastery goals, encourage strategies, and rewards for students who persist. In addition, Obach suggested that teachers need to use both effort and ability attributions in order to help their students master academic skills.
Other studies have also focused on motivation as a precursor for academic achievement. Alfassi (2004) examined the efficacy of learner-centered environments to enhance both academic achievement and motivations of at-risk high school students. Seventy-four male students from three urban alternative high schools who served students at-risk of dropping out participated in the study. Twenty students were enrolled at a traditional alternative school. The students in the treatment group consisted of 54 students enrolled at schools that applied structured learner-centered environments. The students’ ages ranged from 13 to 18 years. The Alfassi study is an appropriate example of supportive literature for this study due to the small age difference between the fourth graders in the current study and the younger students in the Alfassi study. Data in the Alfassi study were collected using measures of academic motivational orientation and achievement scores in math and language. Students in traditional programs scored between 23% to 52% on achievement tests, and students who participated in the structured learner-centered program scored an average of 70% on achievement tests, which equaled the average of all high school students. In addition, the students exposed to a structured learner-centered environment displayed a greater intrinsic motivation. The implications of the study support the need for schools to emphasize student engagement and for teachers to develop personal relationships with the students. More specifically, students need frequent monitoring and assessments. Alfassi suggested this could be accomplished through structured learner-centered environments which are based on research-validated principles.

The studies presented in this section support research-based interventions and strategies for developing academic competence. As mentioned in the first chapter of the current study, the need for schools to prepare students for the future poses a challenge
for schools since they are charged with offering these opportunities to all students (Darling-Hammond, 1996). The studies supporting interventions or strategies for developing academic competence provide an overview of general research-based strategies which have proven effective. The following section will review the literature of academic competence as it relates to reading interventions.

**Academic Competence and Reading Interventions**

A number of studies have been conducted to discover effective interventions for students who lack academic competence in reading. In fact, most of the research conducted in improving academic competence has focused on reading. Most of the research available has emphasized the use of curriculum-based measurements to monitor progress in reading for students in need of assistance and to evaluate the effectiveness of the treatments provided (Power, 2006). The studies presented in this section review the literature as it relates to academic competence and reading interventions.

Colvin and Schlosser (1997) examined how behaviors in literacy correlate to academic success. The researchers studied ways teachers could support academic competence by creating learning environments where students could have more academic success. Bandura's (1986) social learning theory and theory of self-efficacy provided the framework for Colvin and Schlosser's (1997) study. Bandura's (1986) theory of self-efficacy states that a student's confidence to perform a task influences the actual performance of completing the task.

At Southwestern Middle School, Colvin and Schlosser (1997) conducted their study through observations and interviews. Students were asked to tell about their self-
efficacy and performance as it related to literacy. High and low performing students participated in the study as well as their teachers. The study was followed up with strategies teachers could use to improve their students’ academic performance in literacy. The strategies focused on the instructional setting and student behaviors to support the self-efficacy theory.

Colvin and Schlosser (1997) discovered that struggling learners could not articulate the repertoire of knowledge about learning strategies; however, the struggling learners’ peers were well aware of the strategies which brought them success in the classroom. Overall profiles of the efficacious and less efficacious students were identified. Colvin and Schlosser noted that the more efficacious students were confident, strategic, and organized when approaching literacy tasks. The students in the study communicated that working with others, rereading material, asking internal questioning techniques while reading, perseverance, and asking for help assisted them in succeeding. The profile of the less efficacious students was the contrary. The less efficacious student would rather avoid situations which would show their peers and teachers they struggled in reading. Rather than persevere, they avoided the situation altogether and avoided peer feedback or asking for help because they did not know how to ask. Most of the less efficacious students could only share one reading strategy. They revealed more about their performance when asked to define good reading and writing.

Research findings and implications provide teachers with methods to create classrooms which promote more efficacious behaviors by their students. First, teachers should understand the developmental relationships between student learning and literacy. Second, teachers have to believe that all students can learn and believe in their
ability to be competent learners. Third, giving students tasks that are easy will not improve their motivations; the opposite is true. Students need to work in their zone of proximal development, the distance between a student’s actual developmental level and a higher level of potential with adult guidance (Vygotsky, 1978). Fourth, teachers should break tasks into parts or steps and address one step at a time. Fifth, teachers should be direct and explicit both in their teaching and their discussions with students about their learning. Using strategies or teaching lessons which imply other parts of learning have already occurred do not support the less efficacious student. Colvin and Schlosser (1997) noted that students should be encouraged to self-evaluate and join in the evaluation process to determine where they want to improve as readers. Additionally, Colvin and Schlosser believe self-efficacy is influenced by culture and language.

White (2006) examined predictors to reading growth through the use of responsiveness-to-interventions (RTI) with 165 participants across six schools. White used the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) assessments at the end of kindergarten and beginning of first grade to identify students who responded and who did not respond to interventions using the RTI approach. The students in the study were given another DIBELS assessment at the end of first grade to determine if the prediction model worked to identify those students who resisted the RTI approach and those who did not. The study went one step further to evaluate behavior related skills along with the reading skills identified by the DIBELS. In order to accomplish this task, the students’ teachers were asked to complete behavior rating scales using the SSRS-Teacher Form (Gresham & Elliott, 1990).

White (2006) used students’ pretest scores in reading, behaviors, social skills, and language to perform a sequential logistic regression to predict the RTI status of
each student. The findings indicated that their prediction model was accurate 86% of
the time. The sensitivity index used in the study predicted 65% of the non-RTI and
91% of the RTI. The research indicated social skills and teacher ratings of academic
competence were significant predictors, and problem behaviors and reading screenings
were non-significant predictors. Overall, the findings of this study were successful
although the model predicted RTI better than non-RTI.

White’s (2006) study supports the need for a more comprehensive literacy
screening at the beginning of first grade. Although the study successfully predicted the
students who would and would not respond to interventions, the need to identify what
would work for non-RTI students is still left to be answered. Second, more intensive
interventions may not be possible for non-RTI students; therefore, close progress
monitoring is necessary for these students.

The studies presented in this section support research-based interventions which
support the development of academic competence in literacy. The studies discussed in
this chapter focused on self-efficacy and responsiveness to interventions as they relate
to the development of academic competence in reading. Although there is
comprehensive research supporting academic competence, strategies for interventions,
and academic competence and the development of reading through interventions, there
are limitations to this research.

Summary of the Review of the Literature

The research is clear on how the clusters which make up the academic
competence construct effect learning. Reading skills, critical thinking, interpersonal
skills, motivation, engagement, and study skills are strongly supported in the literature
as they correlate to student achievement. The research also supports teachers’ perceptions about their students’ learning as a reliable means for predicting and correlating to students’ academic performance in reading (Flugum & Reschly, 1994; Harrington & Gibson, 1986; Meyers et al., 1996). In the research, teachers were also linked to having the ability to provide successful delivery of interventions.

Choosing the interventions for individual students are not prescribed and evaluation of these interventions are even less evident. The research suggests (Gresham, 1989) selection and use of interventions often fail because of the degree to which the interventions are implemented. The intervention integrity and failure to include an evaluation component poses limitations for the research.

The literature review of academic competence supports academic competence as an important dimension of teaching and learning, and has led researchers to find answers to how academic competence can be developed. Although there were a few studies on interventions for the development of academic competence and a few others focusing on reading interventions, there are gaps in the research. The research did not offer a quasi-experimental study with a quantitative perspective which included all of the clusters in the construct of academic competence as presented in the current study. In addition to having the complete construct, the current study also linked the comprehensive construct to interventions which were evaluated for effectiveness through pretest and posttest measurements.

Limitations to the Review of the Literature

Several limitations are connected to the comprehensive review of the literature
relating to this study. The shortcomings in knowledge of developing academic
competence in reading through interventions can be linked to intervention effectiveness,
the complexities relating to the definition of academic competence, and the instruments
used to measure academic competence.

The effectiveness dilemma of using interventions to develop academic
competence is challenging because educators lack an efficient process for identifying a
problem, developing strategies to address the problem, and evaluating outcomes from
the intervention (Elliott et al., 2001). In addition to the effectiveness shortcomings, the
definition and use of academic competence make research difficult to target the
construct of academic competence. Researchers have noted that definitions used in the
research are inconsistent (Rotheram, 1987; Wentzel, 1993). For example, some
research papers use terms such as academic performance, academic ability, and
measurement of the construct. Measurement of the construct is similar to the definition
of academic competence in that both are defined inconsistently. The tools used to
measure academic competence are also inconsistent. According to DiPerna and Elliott
(2000), the teacher report of the SSRS, the Self Perception Profile for Children, the
school competence scale from the Child Behavior Checklist, the Teacher Rating of
Academic Performance, and the Academic Performance Rating Scale have all been
used to measure academic competence.

The limitations associated with academic competence may also be linked to the
need for more information relating treatment implementation to performance outcomes.
Research by Martens, Witt, Daly, and Vollmer (1998) has documented several barriers
to the implementation of interventions. First, a collaboration barrier exists between the
teacher and the professional recommending interventions. The second barrier to
treatment implementation is measurement. The third barrier is the level of implementation of the recommended interventions. A teacher can choose to apply the interventions or ignore the recommendations altogether. Martens et al. (1998) also note a hypothetical constructs barrier which refers to the treatment acceptability.

Conclusion

This study was designed to determine if developing students’ academic competence in literacy can have positive academic results on state testing, more specifically, Texas’ high stakes accountability system. The results will inform the Fort Worth Independent School District and other school districts in Texas whether research-based interventions increase student achievement, improve teacher knowledge, and decrease the number of special education referrals. If the interventions prove successful, then the interventions are a worthwhile use of teachers’ time and effort to help improve success on the TAKS reading test.

The current research literature base on reading interventions in the intermediate grades includes a vast amount of information, and the studies continue to occur year after year. The need to further study the research problem will never end since the need for more effective approaches for all students continues. The need for students to learn to read on grade level will forever persist in our society and so will the research which seeks the answers to this age old dilemma.
CHAPTER 3

METHODOLOGY

Chapter 3 describes the detailed methodology used to determine the effects of classroom-based interventions on developing reading academic competence of fourth grade students. This chapter discusses the context, design, population and selection, instrumentation, steps used for data collection, and data analyses used to answer the research questions.

Research Context

This dissertation studied the effects of classroom-based interventions on developing academic competence in reading. The study focused on student achievement in reading in five elementary schools in the Fort Worth Independent School District (Forth Worth ISD) in Fort Worth, TX. The Academic Competence Evaluation Scale (ACES™)-Teacher Form and classroom-based interventions were implemented and monitored using the Academic Intervention Monitoring System (AIMS™) to measure the effects of interventions. In this study AIMS and ACES were used with students in fourth grade who were selected from a group of students whose scale scores ranged from 1919 to 2185 on the third grade 2006 Texas Assessment of Knowledge and Skills (TAKS™) reading test. The study was conducted to determine if classroom-based interventions have a positive impact on students’ academic competencies in reading. Success was determined by student scale scores from the fourth grade 2007 TAKS reading test. More specifically, this research determined if a concentrated focus on the development of academic competencies in reading skills
along with a focus on academic enablers would lead to greater student academic success on TAKS.

Design

The research design for this study was quasi-experimental, non-equivalent control group design. A quasi-experimental design is an experiment that provides useful knowledge about causal relationships between variables but lacks random assignment (Gall et al., 2003). The control and treatment groups for this study were chosen through a convenience sample rather than through random assignment after consent forms were signed by parents and scale scores were identified. The sub-type, non-equivalent control group design allows for stronger inferences regarding the experimental treatment on the posttest since both the treatment and control groups receive pretests. In the current study, both the control and treatment groups received the ACES pretest and posttest. The data from the pre-ACES was used to determine necessary classroom-based interventions for the treatment group only. In addition, both groups were administered the TAKS fourth grade reading pretest and posttest.

Population and Selection

The beginnings of the current study started when I shared my research topic with my study group. The group of principals expressed interest in the study, so I asked if their respective schools would participate. I needed five schools to participate in the study, and five of the principals eagerly volunteered their campuses. When the five principals returned to their campuses, they were prepared to ask a teacher they identified as an excellent fourth grade reading teacher to participate in the study by
providing interventions to five students. Once the principals and teachers were recruited, consent forms were sent home with every fourth grade student in order to acquire third grade TAKS reading scale scores. A database of scores was compiled for each student who returned their consent forms giving permission for the district to release their reading scale scores from the previous school year.

The scale score for meeting standard is 2100 on the reading TAKS test. Subjects for both the treatment and control groups were selected based on third grade 2006 TAKS reading scale scores. Students scoring 1919 to 2185 are considered bubble students. Bubble students are students who barely missed or met standard on TAKS. These students were chosen because of a stronger likelihood for growth. If the study included high performing students, the interventions would be difficult to evaluate.

Since the process for selection was determined through parent consents, third grade TAKS reading scale scores, and assigned reading teachers, the population of the study was considered a convenience sample. A convenience sampling occurs when the sample suits the study and is convenient (Gall et al., 2003). In the current study, I chose convenience sampling I worked in the same district where I conducted the study, and my close colleagues gave approval for data collection.

The process to identify the convenience sampling population was slightly complex. When the school district released the students’ scale scores, students who scored between 1919 and 2185 were identified. Each student’s reading teacher was also identified and grouped accordingly. The students were categorized into a possible treatment or control group depending on their assigned reading teacher. The students who qualified as treatment group participants were assigned to teachers who agreed to participate in the study and provide interventions. Five students were identified for the
control group and five for the treatment group on each campus for a total of 25 students in each group cumulatively. The 25 students in the treatment group were also provided with parental consent forms to participate in the study.

Overall, the selection process allowed for 50 fourth grade students enrolled in five elementary schools across Forth Worth Independent School District (Fort Worth ISD) to participate in the study. Forty-six students completed the study. The students who did not complete the study either moved to another campus or qualified for special education which exempted them from taking the post-TAKS.

Of the 46 students who completed the study, 44 (95.7%) of the students were considered to have a low socioeconomic status (SES). Forty-three (93.5%) of the participants were Hispanic. The number of English language learners (ELL) was 25 (54.3%). Twenty-four (52.2%) of the students were females and 22 (47.8%) of the students were males. Table 1 displays demographic information for the 46 students who completed the study.

Table 1

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Total Students</th>
<th>Treatment Group</th>
<th>Control Group</th>
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<td></td>
<td>Frequency</td>
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<tr>
<td>Gender</td>
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<tr>
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</tr>
<tr>
<td>ELL</td>
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<td>54.3</td>
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</table>
Instrumentation

The instruments and tools required to conduct this study included ACES, AIMS, and TAKS reading tests. The AIMS also included the use of a goal-attainment scale (GAS). Each of these instruments is described in more detail in the following sections.

ACES-Teacher Form

ACES is an assessment tool used to identify weaknesses and strengths in academic functioning of students in K-12 or college. It is often used as a pre-referral tool for planning and evaluating classroom-based interventions for students who are having academic difficulties. ACES include three forms: teacher, student, and college student. For the purpose of this study, the teacher form was the only instrument utilized. Studies conducted with ACES to determine validity and reliability provide evidence that the instrument is cost effective and a measure of overall academic competence for students whose academic skills are well below grade level (DiPerna & Elliott, 2000).

The conceptual foundation for the ACES was the unpublished Pre-referral Behavior Inventory and Intervention Planner (PBIIP) developed by Elliott in 1986 and the Social Skills Rating System (SSRS) by Gresham and Elliott (1990). The published version of the ACES includes 73 items organized into two broad scales: academic skills and academic enablers. The academic skills scale includes 33 items with three subscales: reading/language arts, mathematics, and critical thinking. The academic enablers scale includes 40 items with four subscales: interpersonal skills, engagement, motivation, and study skills (DiPerna & Elliott, 2000).

The ACES is a published tool with evidence of reliability and validity. The reliability tests include internal consistency, test-retest reliability, interrater agreement,
and standard error of measurement. The mean coefficient alphas for the ACES skills and enablers scales are .99, and range from .94 to .99 on the subscales. The test-retest reliabilities for the skills and enablers scales were .95 for the skills scale and .96 for the enablers scale. The test-retest was given to a sample of 188 students, and the evidence supported the reliability of the ACES-Teacher Form. The interrater agreement was determined by having pairs of teachers complete an ACES \((n=181)\) for the same student. The correlation for the skills scale was .99 and .61 for the enablers scale. The standard error of measurement for the ACES-Teacher Form included skills scale scores between 2.46 and 3.07 raw score points. The enablers scale contained scores ranging from 3.63 to 4.73 (DiPerna & Elliott, 2000). The ACES Manual K-12 provides more data and includes the same reliability information for each of the subscales.

A Cronbach’s (1951) alpha was used to determine if the pre-ACES and post-ACES instrument was a reliable psychometric instrument. Validity issues were addressed using the interfactor correlation for the pre-ACES and post-ACES. The Cronbach alpha of internal consistency reliability coefficient was used to determine whether or not teachers gave consistent responses on ACES. The pre-ACES had 65 items with a Cronbach’s alpha of .961, and the post-ACES also had 65 items with a Cronbach’s alpha of .979. Both Cronbach alphas were indicative of a highly reliable instrument. DiPerna et al. (2000) also carefully reviewed the ACES for validity.

DiPerna and Elliott (2000) developed the ACES-Teacher Form based on three types of validity: content validity, construct validity, and criterion-related validity. Evidence supports the content of ACES-Teacher includes content valued by teachers, is highly readable, and is easy to complete. The construct validity of the ACES-Teacher Form is strong and supported through evidence from an internal consistency analysis.
reflected by high coefficient alphas and the factor analyses completed with standardization samples. The third type of validity researched by DiPerna and Elliott was the criterion-related validity used along with the Iowa Test of Basic Skills (ITBS), Wechsler Individual Achievement Test – Second Edition (WIAT-II), or grade point averages. The evidence from this research supports a strong relationship with criterion-related achievement scores. The results concluded that the ACES-Teacher Form has a statistically significant variance in students’ performances on achievement tests and differentiates between at-risk or learning disabled students.

The ACES-Teacher Form was provided to the reading teachers of the control and treatment groups at each of the five schools where the study was conducted. The teachers were asked to complete the ACES by the end of January 2007. The teachers were instructed to skip the mathematics subscale of the skills scale since the study focused on reading skills and enablers only. The responses collected were input to a database using the ACES Scoring Assistant® software to calculate scores. Summary reports and graphical displays of ACES scores were printed and reviewed to assist in the planning of interventions for students in the treatment group.

**AIMS**

AIMS is used to help connect interventions to implementation through the use of monitoring and evaluation tools. AIMS focuses on intervention strategies supported by a cognitive-behavioral approach to improve the enablers and skills identified in the scales provided in the ACES. More specifically, AIMS is a framework created by Elliott, DiPerna, and Shapiro (2001) which utilizes the stimulus-organism-response-consequence (SORC) model.
AIMS offer questionnaires for teachers, students, and parents which were not used in this study. Instead of requesting that teachers complete more forms, teachers were asked for their input to determine if the interventions were feasible in their classrooms. There are no scores associated with the AIMS intervention forms. The responses provided by the person completing the form provides strategies the respondent believes will be helpful to implement. The same goal was accomplished by reviewing the information provided through the *AIMS Guidebook* (Elliott et al., 2001).

AIMS includes four key features: a framework for organizing thinking about interventions, tools for identifying possible intervention strategies, empirically based intervention strategies, and methods for monitoring intervention strategies (Elliott et al., 2001). The tools recommended as possible interventions are based on teacher input in order to empower the teacher.

AIMS provides three methods for monitoring the progress of interventions: GAS, direct observations, and curriculum-based measures (CBM). Also provided in the AIMS framework are methods for analyzing the progress-monitoring data and for drawing conclusions. If educators identify a concern with a student, ACES can be used to determine if the student is lacking in academic competence. Once the problem areas are identified, interventions can be identified for implementation, and the GAS can be used to monitor progress.

This study utilized a GAS for each student in the treatment group to monitor changes in behavior which occurred as a result of the treatment. GAS was first developed by Kiresuk and Sherman (1968) in the mental health field. The GAS provided a criterion-referenced approach and used the desired behavior, intervention strategy, and five target behaviors that increasingly approximate the desired outcome (Elliott, et
al., 2001). Desired behaviors were identified from the information provided by the ACES to determine the intervention goals for each student. The goals were monitored using the GAS. The *AIMS Guidebook* was used as a resource to help identify specific strategies used to change the target behaviors. The students’ positive, negative, or no change reading outcomes were documented weekly by using the GAS graph.

The GAS used in this study contained a 5-point scale ranging from +2 (best possible behavior) to -2 (worst possible behavior). A description was provided for each point on the scale to describe the criterion of the student’s actual behavior. Using the numerical points on the GAS, the reading teachers providing the interventions or the treatments plotted the number corresponding to the evident behaviors using graphs. The plotted graphs were kept for 10 weeks to provide weekly reports on their students’ progress after interventions were provided. At the end of the 10-week treatment period, the students in the study were evaluated using the post-ACES and TAKS.

**TAKS**

TAKS is Texas’ mandated statewide testing program. The law requires all eligible students in Texas public schools to follow the testing schedule in reading, math, social studies, science, and writing for students in Grades 3 through 11. The TAKS reading test assesses the Texas Essential Knowledge and Skills (TEKS™) in authentic ways. “TAKS has been developed to better reflect good instructional practices and more accurately measure student learning” (TEA, 2004, p. 1).

The TAKS test is a reliable and valid measure. The test reliability indicates internal consistency and standard error of measurement. TAKS tests are based on
internal consistency measures which range from .81 to 0.93. The Kuder-Richardson Formula 20 (KR20) is used to formulate the internal consistency for the multiple-choice formatted items (TEA, Pearson, Harcourt, and Beck, 2004-2005.). The standard error of measurement (SEM) provides the margin of error that occurs on each test. The SEM is a range of scores which places a band around the student’s observed score which will contain the true score. The TAKS tests are not considered perfect tests, so a student’s observed score and true score will vary (TEA et al., 2004-2005).

TAKS validity indicates evidence based on test content, relations to other variables, and different populations. TAKS was created in alignment with the TEKS state curriculum. Numerous committees participated in the development process of TAKS and verified alignment with TEKS. The processes included in the procedures for reviewing TAKS also helped to provide evidence for content validity. The TAKS developers provided evidence of validity by analyzing the relationship between TAKS and other measures such as the Reading Proficiency Test in English (RPTE), designed to evaluate English language acquisition in reading (TEA et al., 2004-2005). Moreover, different populations are considered in the development of TAKS to ensure the tests are fair and measure the curriculum required of all student populations. Procedures are also utilized to ensure there are no ethnic or cultural biases to prevent a negative impact on minority or subpopulations.

The third grade 2006 TAKS reading test was used to identify students for the study, and the fourth grade 2006 TAKS pretest and 2007 TAKS posttest were used to determine if students made significant growth in the area of reading after the treatment or interventions were applied. Specific methods were used to collect the data from the instruments utilized in this study.
Steps Used for Data Collection

A specific set of steps were used to effectively conduct the study. The process was divided into three parts: pre-intervention, intervention, and post-intervention.

Pre-Intervention Period

During the pre-intervention period, teachers who taught reading to the students identified in the treatment and control groups were informed of students' names and asked to administer the ACES for each of the identified students in January 2007. The ACES served as one of the pretest measures in the study, and instructions were given to each teacher prior to the completion of the pre-ACES. The December 2006 administration of the fourth grade TAKS reading release test was used as the second pretest and was administered by the teacher three instructional weeks prior to the completion of the ACES.

Upon completion of the pre-ACES by each of the reading teachers, the ratings were input and calculated using the Scoring Assistant software. The Scoring Assistant produces the ACES Behavior Classification Scheme report which groups the academic skills and enablers into three categories: strengths, performance problems, and acquisition problems. In order to increase teacher buy-in to use the interventions recommended, the ACES Behavior Classification Scheme was used to identify the weakest enabler or skill with the most acquisition problems. Then the problems were reviewed with the teacher and matched to interventions likely to be implemented by the teacher. Appendix C provides a list of interventions used in the study for each of the enablers and skills addressed with the treatment group.
Intervention Period

The framework used for the intervention period included the AIMS five-step process which will be defined later this section. The AIMS steps were completed with approval and input by the teacher which included analysis of the concerns, intervention plan, implementation of the interventions, and evaluation of the interventions using a GAS. The treatment group received interventions to improve engagement, critical thinking, study skills, motivation, and reading skills. The treatment period lasted from early February 2007 through the April administration of the TAKS reading test in 2007 for a total of 10 weeks. The 25 students in the control group did not receive interventions.

During the 10-week intervention period, the teachers were asked to provide a minimum of one or two interventions per day. An integrity checklist was used weekly to allow teacher to identify the interventions used with the students in the treatment group. Appendix D provides an example of an integrity checklist. In addition to the integrity checklist, each teacher was observed once during the 10-week intervention period to determine if the interventions were being implemented. The goal of the observations was to observe one or more of the interventions or find evidence the interventions were occurring. During the visits, the students in the treatment group were interviewed to determine if they knew the goals on their intervention plans and to account for the implementation of the interventions. Student intervention plans were present at the interview and followed up on with the children to determine if the interventions were occurring in their reading class.
The integrity of the implementation of interventions was only one important aspect addressed in the study. How the interventions were implemented by each of the teachers participating in the study was also important. Interviews were conducted after the completion of the study to determine if students received the interventions in a whole group, a small group, or individual settings. Appendix E indicates the types of groupings the teachers used for each of the interventions in the study. It is important to note that when whole group or small group interventions were provided to students in the treatment group, there were no control group students included in those groupings. As mentioned in the population/selection section of this chapter, control group students were assigned to reading teachers who did not participate in the study by providing interventions.

A set of three or four interventions were provided on an intervention chart to the reading teachers participating in the study. The reading teachers were asked to use one or more interventions every day for 10 weeks. At the end of each week during the intervention period, the reading teacher who was providing the interventions documented the progress of the skill or enabler using a graph. Teachers used numbers from the GAS with descriptive criteria to graph progress. Documentation of progress using the GAS rating graph each week helped ensure the treatment was applied consistently as intended. In addition, orientation training and an integrity checklist were provided to each participating educator, as well as a minimum of two classroom observations and follow-up checkpoints to ensure the treatment was applied as intended.

Post-Intervention Period
After the 10-week intervention period, the post-ACES and the fourth grade April 2007 TAKS reading test were administered a second time to all students in the treatment and control groups. Each of the instruments used to measure academic competence and reading achievement were administered by the end of April 2007. The fourth grade 2007 TAKS reading test scale scores were available in May 2007 for data analyses.

Summary of AIMS Steps

The AIMS system is a five-step process utilized to identify and provide interventions for struggling students (Elliott et al., 2001). The five steps are:

1. Identify concerns influencing academic success through the use of a problem-solving team and completed ACES Teacher Form. The problem-solving team for the current study was comprised of the reading teacher and researcher.
2. Analyze academic concerns within the instructional environment. The ACES scoring assistant was used for the current study to assist with the analysis process. Behaviors were classified as strengths, performance problems, or acquisition problems.
3. Plan for interventions by determining desired behaviors, intervention goals, and develop the goal-attainment scale (GAS) to monitor each student’s progress.
4. The interventions are implemented and monitored through the use of a GAS daily or weekly.
5. The effectiveness of the interventions are evaluated with a second ACES Teacher Form. The problem-solving team also reviews the GAS and any other pertinent data.

This study utilized the five steps with only one minor modification. The AIMS five-step plan recommends completion of the AIMS intervention form. For the purpose of this study, the AIMS intervention form was not used due to an agreement with the school district to reduce paperwork for the intervention teachers participating in the study. However, in its place, an informal meeting was held with each of the teachers providing interventions to determine helpful and possible interventions during the students’ daily reading lessons. The information provided by the teacher at the meeting served the same purpose as the AIMS intervention forms.

Data Analyses

Data analyses consisted of a repeated measure ANOVA and an independent samples t-test. A repeated measure ANOVA determined whether or not the implementation of interventions resulted in a significant increase in student performance on the 2007 TAKS reading test. An independent t-test was used to determine if there were differences between the treatment and control groups on the post-ACES.

Research Question 1

Research Question 1 asked, “Does the implementation of AIMS result in a significant increase at the $p<.05$ level in student performance on the fourth grade April 2007 TAKS reading test between the control and treatment groups?” The fourth grade students in the study were administered a pre-TAKS reading test in December 2006
and a post-TAKS reading test in April 2007 to provide data for a test of between subject effects. Scale scores were acquired for each student in the control and treatment groups, and a repeated measure ANOVA was computed. The statistical computations from the repeated measure ANOVA helped determine if the pretest-posttest difference for the treatment group was reliably different from the pretest-posttest difference for the control group (Gall et al., 2003). In this study, a significant difference was indicated at the \( p < .05 \) level. For Research Question 1, the following null hypothesis was tested: Fourth grade low-achieving students who received interventions but did not develop academic competence at the developed or competent levels would not meet standards and therefore would not significantly increase test performance at the \( p < .05 \) level on the fourth grade April 2007 TAKS reading test.

**Research Question 2**

Research Question 2 asked, "How does the ACES posttest total scores and the subscores of academic skills and enablers of the treatment and control groups compare?" The total score on the post-ACES and the sub scores of academic skills and enablers were acquired after the 10-week intervention period for the treatment group. The same data was collected for the control group after a 10-week period without interventions. Data analysis results from an independent \( t \) test for equality of means was used to test the hypothesis. For Question 2, the following hypothesis was tested: There would be a significant difference at the \( p < .05 \) level on the ACES posttest scores between the treatment and control groups.

**Summary of the Methodology**
Chapter 3 described the quantitative and quasi-experimental methods used in this study to determine the effectiveness of interventions in improving reading achievement on the fourth grade 2007 TAKS reading test. The fourth grade students from five elementary schools used in the study were administered pretests and posttests using the ACES and the fourth grade TAKS reading test. Data analyses consisted of t tests and a repeated measure ANOVA. The hypothesis from the study was that students from both the control and treatment groups were similar at the pre-ACES stages. Findings from the study propose to assist educators in determining the effects of interventions to improve reading achievement of fourth grade students.
CHAPTER 4
RESULTS

As stated in Chapter 1, this study examined whether the implementation of the Academic Intervention Monitoring System (AIMS™) would result in a significant increase in student performance on the fourth grade 2007 Texas Assessment of Knowledge and Skill (TAKS™) reading scale scores. AIMS is a five-step process that utilizes the Academic Competence Evaluation Scale (ACES™) to help identify areas of need and monitoring. The results of this study are presented in terms of the two questions posed in Chapter 3. Qualifying and informative data representing the control and treatment groups in this study are provided as well as the descriptive statistics for TAKS pretests and posttests.

Qualifying and Informative Data

The first set of data analyses in the study determined whether or not there was a statistically significant difference between the treatment and control groups prior to providing the treatment to the treatment group. As a second attempt to qualify the groups, bivariate correlations were used to determine if a correlation existed between students’ reading achievement as measured by the reading scale scores on the fourth grade TAKS release test in December 2006 and students’ scores on the ACES pretest. Additional informative data were compiled and analyzed using the posttest results of the ACES and TAKS.

The first attempt to qualify groups sought to determine whether there were any statistically significant differences between the treatment and control group scale scores on the fourth grade TAKS release test in December 2006, the ACES pretest total score,
skills subscore, and enablers subscore. Table 2 provides the analysis for the group differences for the fourth grade TAKS release test in December 2006 and the ACES pretest total scores and subscores.

Table 2 provides data which demonstrate there were no statistically significant differences between the two groups at the .01 level. A 2-tailed t test was used to support the finding of no significant differences with a .558 significance for TAKS, .388 for ACES total, .625 for the skills subscale, and .372 for the enablers subscale.

The mean difference for the fourth grade TAKS release test in December 2006 was 17.000, and the ACES total score had a mean difference of 9.565. The skills and enablers subscale scores had a mean difference of 1.739 and 7.826, respectively. The means were used to calculate the effect size (the strength between two variables) on the fourth grade TAKS release test in December 2006. More specifically, Cohen’s $d$ was used to evaluate the $t$ test on means. The $d$ represents the difference between the two sample means divided by the pooled standard deviation for those means (Hinkle, Wiersma, & Jurs, 2003). The effect size for the fourth grade TAKS release test in December 2006 was calculated at 0.17. According to Cohen (1992), 0.2 is indicative of a small effect, 0.5 a medium effect, and 0.8 a large effect. Therefore, using Cohen’s classification, there was a small difference in TAKS scale scores, on average, between the treatment and control groups. Thus, the data support both treatment and control groups were matched at the beginning of the study, but the effect size suggests there was only a small measure of strength between the fourth grade TAKS release test in December 2006 and the ACES pretest total scores for each of the groups in the study.
Table 2

*Group Differences for the Fourth Grade TAKS Release Test in December 2006 and the ACES Pretest Total Scores and Subscores*

<table>
<thead>
<tr>
<th></th>
<th>Mean Difference</th>
<th>(T)</th>
<th>df</th>
<th>Significance (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAKS 2006 Pretest</td>
<td>17.000</td>
<td>.590</td>
<td>44</td>
<td>.558</td>
</tr>
<tr>
<td>ACES Pretest Total Scores</td>
<td>9.565</td>
<td>.871</td>
<td>44</td>
<td>.388</td>
</tr>
<tr>
<td>Skills Scores</td>
<td>1.739</td>
<td>.492</td>
<td>44</td>
<td>.625</td>
</tr>
<tr>
<td>Enablers Scores</td>
<td>7.826</td>
<td>.902</td>
<td>44</td>
<td>.372</td>
</tr>
</tbody>
</table>

The second qualifying data analysis was conducted to determine if there was a correlation between student reading achievement as measured by reading scale scores on the fourth grade TAKS release test in December 2006 and students’ scores on the ACES pretest total scores, academic skills scores, and academic enablers scores. Table 3 provides the analysis for the correlations between scales scores on the fourth grade TAKS release test in December 2006 and the ACES pretest total scores and subscores.

The results indicated the fourth grade TAKS release test in December 2006 and the ACES pretest were correlated using a Pearson \(r\) correlation. Pearson \(r\) correlations are used when scores are continuous as evident in the TAKS and ACES measurements (Gall et al., 2003). The Pearson \(r\) can indicate a perfect negative relationship, a perfect positive relationship, or no relationship at all. In general, practical significance for correlations are \(r = .1\) small, \(r = .3\) medium, and \(r = .5\) large (Cohen, 1988). The skills
subscale scores and the enabler subscale scores were statistically significant at the .001 level and consisted of a large correlation. According to Cohen (1992), the practical significance for mean type is \( d = .2 \), \( d = .5 \), and \( d = .8 \). The .2 value is indicative of a small effect size, .5 a medium effect size, and .8 a large effect size. When the pre-skills and pre-enabler scores correlate, the construct validity can be judged. The effect size for this study was medium.

Correlations between scale scores of the fourth grade TAKS release test in December 2006 and the ACES pretest total scores, skills subscores, and enablers subscores were .439, .487, and .359, respectively. The scores listed for the ACES pretest total scores and skills subscores were significant at the \( p < .01 \) level. The scores listed for the enabler subscores were significant at the \( p < .05 \) level. On the other hand, the correlations between the ACES pretest total scores and its two component subscores were statistically correlated at the .001 level. In addition, the correlations between the subscores of the skills and enablers were also correlated at the .001 level. The correlations between the ACES pretest total scores and the skills subscores and enablers subscores were .746 and .963, respectively. However, the coefficient or Pearson’s \( r \) between the subscale components (skills and enablers) was .539. In other words, large portions of the variance were explained separately by the two subscales and therefore support the construct validity of the ACES.

The analyses demonstrate the correlation between both instruments which supports the study. The correlation between the fourth grade TAKS release test in December 2006 and the ACES pretest was strong, and the effect size was medium according to Cohen’s classification for effect size.
Table 3

*Correlation Between the Scale Scores on the Fourth Grade TAKS Release Test in December 2006 and the ACES Pretest Total Scores and Subscores*

<table>
<thead>
<tr>
<th></th>
<th>ACES Pretest</th>
<th>Pre-Skills</th>
<th>Pre-Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Scores</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAKS 2006 Pretest</td>
<td>.439</td>
<td>.487</td>
<td>.359</td>
</tr>
<tr>
<td>Correlation Significance</td>
<td>(.002)**</td>
<td>(.001)**</td>
<td>(.014)*</td>
</tr>
<tr>
<td>(2-tailed)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACES Pretest Total Scores</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Significance</td>
<td>.746</td>
<td>.963</td>
<td></td>
</tr>
<tr>
<td>(2-tailed)</td>
<td>(.000)**</td>
<td>(.000)**</td>
<td></td>
</tr>
<tr>
<td>Pre-Enablers Subscores</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Significance</td>
<td>.539</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2-tailed)</td>
<td>(.000)**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note:* **p < .01, * p < .05.*

Additional data were sought to determine whether or not there was a correlation between student reading achievement as measured by the reading scale scores on the fourth grade TAKS test in April 2007 and students' scores on the ACES posttest total scores, academic skills scores, and academic enablers scores.

Table 4 displays the results from the analysis for the correlations between the fourth grade April TAKS 2007 reading scale scores and the ACES posttest total scores and subscores. Fourth grade April TAKS 2007 reading scale scores and the ACES
posttest total scores, post skills subscores, and post enablers subscores were correlated at .516, .473, and .493, respectively. All of the correlations were significant at the $p < .01$ level.

The correlations between ACES posttest total scores and its two component subscores were statistically correlated at the .001 level. Pearson $r$ correlations were used to correlate the TAKS and ACES measurements. The results indicated a large correlation between both measurements.

The correlations between the ACES posttest total scores and skills and enablers subscores were .786 and .925, respectively. The correlations between the ACES posttest total scores and the subscores were statistically significant at the .001 level and practically consistent with a large correlation (Cohen, 1988). The Pearson $r$ correlation between the skills and enablers subscore components had a coefficient of .552. The correlations for the skills subscores and the enabler subscores were statistically significant at the .001 level and practically consistent with a large correlation (Cohen, 1988). Large portions of the ACES posttest variance were explained separately by the two subscores to support strong construct validity.

The effect size of Cohen’s $d$ for the fourth grade April 2007 TAKS reading test analysis was 0.03. The practical significance for the mean type in the study was $d = .2$, $d = .5$, and $d = .8$. The 0.03 value was indicative of a small effect for the scale score differences of the fourth grade April TAKS 2007 reading test between the treatment and control groups.

The fourth grade April 2007 TAKS reading scale scores and the teachers’ perception of students’ academic competence during the posttest period were correlated. Construct validity supported a correlation between the post enablers and
post skills subscales. In this study, the data analyses explained by the two subscales supported the construct validity of the ACES posttest. The data analyses suggest there is a strong correlation between the fourth grade April 2007 TAKS reading scale scores and the ACES posttest. According to Cohen’s classification, the effect size for the fourth grade April 2007 TAKS reading scale scores were medium.

Table 4

*Correlation between TAKS Scores and ACES Scores*

<table>
<thead>
<tr>
<th></th>
<th>ACES Posttest Total</th>
<th>Post-Skills Total</th>
<th>Post-Enablers Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAKS 2007 Posttest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Significance</td>
<td>.516</td>
<td>.473</td>
<td>.493</td>
</tr>
<tr>
<td>(2-tailed)</td>
<td>(.000)**</td>
<td>(.001)**</td>
<td>(.000)**</td>
</tr>
<tr>
<td>ACES Posttest Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Significance</td>
<td>.786</td>
<td>.925</td>
<td></td>
</tr>
<tr>
<td>(2-tailed)</td>
<td>(.000)**</td>
<td>(.000)**</td>
<td></td>
</tr>
<tr>
<td>Post-Enablers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Significance</td>
<td>.552</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2-tailed)</td>
<td>(.000)**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: **p < .01, * p < .05.

Descriptive Statistics of TAKS Pretest and Posttest

Participants in the sample received two pretest and posttest assessments and evaluations in reference to their reading performance. The reading skills assessments were the fourth grade TAKS release test in December 2006 and the fourth grade
April 2007 TAKS reading test. Table 5 provides descriptive statistics for the TAKS pretest and posttest used in the study.

The mean scale score for the fourth grade TAKS release test in December 2006 was 2017.57 for the control group and 2000.57 for the treatment group, yielding a difference of 17. The fourth grade April 2007 TAKS reading test indicated an even smaller difference of 3.56 with a mean scale score of 2035.39 for the control group and 2031.83 for the treatment group. As illustrated in Table 5, the mean scale scores increased for both the control and treatment groups when the posttest was given four months after the pretest.

Table 5

**Descriptive Statistics for TAKS Pretest and Posttest**

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TAKS 2006 Pretest</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control group</td>
<td>2017.57</td>
<td>103.842</td>
<td>23</td>
</tr>
<tr>
<td>Treatment</td>
<td>2000.57</td>
<td>91.229</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>2009.07</td>
<td>97.028</td>
<td>46</td>
</tr>
<tr>
<td><strong>TAKS 2007 Posttest</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control group</td>
<td>2035.39</td>
<td>131.707</td>
<td>23</td>
</tr>
<tr>
<td>Treatment</td>
<td>2031.83</td>
<td>86.013</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>2033.61</td>
<td>110.003</td>
<td>46</td>
</tr>
</tbody>
</table>

The teacher ratings of academic competence were obtained with the ACES pretest and ACES posttest. The ACES allows teachers the opportunity to use their
perceptions of students’ academic skills and enablers in reading and evaluate the
students’ level of competence using subscales. Table 6 provides descriptive statistics
for the ACES pretest and posttest evaluations.

The mean score for the ACES pretest was 183.87 for the control group and
174.30 for the treatment group, yielding a difference of 9.57. The mean scores
increased for both the control and treatment groups when the ACES posttest was given
four months after the ACES pretest. However, on the ACES posttest, there was a
greater difference between the control group and the treatment group scores, yielding a
difference of 20.35. The mean score was 189.78 for the control group and 210.13 for
the treatment group, yielding a difference of 20.35. The growth in the mean score for the
treatment group provides evidence the teacher raters who provided the treatment
perceived student growth in reading skills and enablers.

Table 6

Descriptive Statistics for ACES Pretest and Posttest

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACES Pretest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control group</td>
<td>183.87</td>
<td>35.440</td>
<td>23</td>
</tr>
<tr>
<td>Treatment</td>
<td>174.30</td>
<td>38.961</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>179.085</td>
<td>37.2005</td>
<td>46</td>
</tr>
<tr>
<td>ACES Posttest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control group</td>
<td>189.78</td>
<td>32.305</td>
<td>23</td>
</tr>
<tr>
<td>Treatment</td>
<td>210.13</td>
<td>44.289</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>199.955</td>
<td>38.297</td>
<td>46</td>
</tr>
</tbody>
</table>
Research Findings

In order to determine whether the implementation of the intervention plans resulted in a significant increase in student performance on the fourth grade April 2007 TAKS reading test, a repeated measure analysis of variance (ANOVA) was used for the analysis. The repeated measure ANOVA allowed the analyses to include within and between subject effects to determine the sums of squares, degrees of freedom, mean square, $F$ ratio, and partial $\eta^2$. This analysis was one of the most important since it helped determine whether or not the interventions were successful.

The second set of analyses consisted of an independent samples $t$ test to determine if there was a significant difference between the treatment and control groups in relationship to the ACES posttest. The mean difference, $t$ distribution, degrees of freedom, and significance were calculated to determine if the hypotheses could be proven or disproven.

Question 1: Does the implementation of AIMS result in a significant increase at the .05 level in student performance on the fourth grade April 2007 TAKS reading test between the control and treatment groups?

Hypothesis Testing

Fourth grade low-achieving students who received interventions but did not develop academic competence at the developed or competent levels would not meet standards and therefore would not significantly increase test performance at the .05 level on the fourth grade April 2007 TAKS reading test. The analysis for Question 1 indicated the hypothesis was not supported.

Table 7 illustrates there was no significant difference at the $p<.05$ level between the control and treatment groups in the study. More specifically, the 2 (TAKS
reading/pretest and posttest) x 2 (groups/control and treatment) repeated measure analysis of variance revealed the main effect for group was not statistically significant, $F (1,44) = .150, p > .05, \eta^2 = .003$. The results indicated there were no statistically significant differences in the TAKS scores between the control ($M = 2026$) and treatment groups ($M = 2016$). The main effect for TAKS was also not statistically significant, $F (1,44) = 2.440, p > .05, \eta^2 = .053$. The TAKS scores did not show statistically significant differences between the two time periods ($M_1 = 2009$ and $M_2 = 2034$). The within group x TAKS results also lacked statistical significance, $F (1,44) = .183, p < .05$, with a weak effect ($\eta^2 = .004$).

Table 7

Mixed Repeated Measure ANOVA Summary

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>Df</th>
<th>MS</th>
<th>$F$</th>
<th>Partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>2431.837</td>
<td>1</td>
<td>2431.837</td>
<td>.150</td>
<td>.003</td>
</tr>
<tr>
<td>Error</td>
<td>714909.217</td>
<td>44</td>
<td>16247.937</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAKS</td>
<td>13854.793</td>
<td>1</td>
<td>13854.793</td>
<td>2.440</td>
<td>.053</td>
</tr>
<tr>
<td>Group x TAKS</td>
<td>1037.837</td>
<td>1</td>
<td>1037.837</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>249804.870</td>
<td>44</td>
<td>5677.383</td>
<td>.183</td>
<td>.004</td>
</tr>
</tbody>
</table>

Note: ** $p < .01$, * $p < .05$. 
In addition, Figure 1 displays the growth made by both the control and treatment groups. The slope for the treatment group indicates more growth was made by that group. The mean scale scores for the fourth grade TAKS release test in December 2006 (pretest) and the fourth grade April 2007 TAKS reading test (posttest) grew from 2001 to 2032 for the treatment group. The mean scale scores for the fourth grade TAKS release test in December 2006 (pretest) and the fourth grade April 2007 TAKS reading test (posttest) grew from 2018 to 2035 for the control group. Although the increases accomplished by the treatment group were greater than those made by the control group, the treatment group did not meet or exceed the mean scale scores for the control group.

**Estimated Marginal Means of Measure**

*Figure 1. Estimated marginal means of TAKS pretest and posttest.*
Question 2: How does the ACES posttest total scores and the subscores of academic skills and enablers of the treatment and control groups compare?

Hypothesis Testing

It was hypothesized there would be a significant difference at the \( p < .05 \) level on the ACES posttest scores between the treatment and control groups. There were no statistically significant differences between the treatment and the control groups on the ACES posttest total scores, skills subscores, and enablers subscores. Therefore, the hypothesis was not supported.

The ACES posttest total scores had a mean difference of -20.348. The analysis indicated the mean difference between both groups in the skills and enablers subscores was -7.087 and -10.696, respectively. It is critical to note the mean differences between the ACES pretest and ACES posttest scores between the control and treatment groups. Analysis of the ACES pretest scores showed the differences were positive while the contrary was true for the ACES posttest. The treatment group scored higher than the control group on the ACES posttest analysis.

Table 8

*Independent Samples Test on ACES Posttest Scores*

<table>
<thead>
<tr>
<th></th>
<th>Mean Difference</th>
<th>( t )</th>
<th>( Df )</th>
<th>Significance (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACES Total Scores</td>
<td>-20.348</td>
<td>-1.780</td>
<td>44</td>
<td>.082</td>
</tr>
<tr>
<td>Skills Scores</td>
<td>-7.087</td>
<td>-1.679</td>
<td>44</td>
<td>.100</td>
</tr>
<tr>
<td>Enablers Scores</td>
<td>-10.696</td>
<td>-1.251</td>
<td>44</td>
<td>.218</td>
</tr>
</tbody>
</table>
Summary of the Results

The current study was conducted to determine if interventions addressing academic skills and enablers would result in increased reading performance as measured on the fourth grade April 2007 TAKS reading test. The first part of the study analyzed data to demonstrate that both student groups, the treatment and the control groups, were similar. To qualify the groups, the same pretest measures were used for both the treatment and control groups, the fourth grade TAKS release test in December 2006 and the ACES. The measures were correlated using bivariate correlations. The same findings held true for the correlations between the posttest measures which included the fourth grade April 2007 TAKS reading test and the ACES.

The primary question posed in the study was to determine if the interventions improved performance. The hypotheses were not supported. The power analysis was potentially negatively influenced by the small sample size, which will be discussed in greater detail in Chapter 5. Overall, differences were noted between the performances of the treatment and control groups according to the slopes in Figure 1, but no statistically significant differences were supported.

The second hypothesis was not confirmed because there were no statistically significant differences on the ACES posttest scores between the treatment and control groups. However, it is valuable to note that treatment scores on the ACES exceeded those of the control group at the end of the study. Prior to the students’ receiving the treatment, the treatment group reading teachers evaluated the students in the treatment group at lower levels than the control group teachers evaluated the students in the control group. At the end of the study, both groups of teachers evaluated their students as having increased academic competence in reading skills and enablers.
While the findings may not have yielded statistically significant relationships between interventions and differences on the TAKS reading test and the ACES for both groups, some changes can be supported. Discussions are provided in Chapter 5, including more details about the findings and the implications of the study.
CHAPTER 5
SUMMARY AND DISCUSSION

The final chapter of this study restates the research problem and reviews the methodology used to determine the results. The chapter provides a summary of the results and discusses the implications of the findings for educators.

Statement of the Problem

This study was conducted in five elementary schools to determine if classroom interventions increase Texas Assessment of Knowledge and Skills (TAKS™) reading scale scores and academic competence for students in fourth grade. The Academic Competence Evaluation Scale (ACES™), Academic Intervention Monitoring System (AIMS™), and TAKS reading test were measurements and tools used in this study to help answer the questions in the study.

Review of the Literature

Ongoing research in the field of education continually searches for improvement in teaching methods to help students attain the skills they need to become successful, productive adults. The literature review related to this study described the AIMS and ACES methods of evaluation, reviewed the history of reading academic competence, and presented research studies regarding construct of academic competence, interventions which support the development of academic competence, and effective interventions for students who lack academic competence in reading.
Review of the Methodology

Chapter 3 described the detailed methodology used to determine the effects of classroom-based interventions on developing reading academic competence of fourth grade students. This section reviewed the population, instruments, data collection, and data analyses used to answer the five research questions.

The students were selected from five participating elementary schools in the Fort Worth Independent School District (Fort Worth ISD). Consent notices were sent home with every fourth grade student at each of the five schools in order to obtain permission for release of TAKS reading data from the previous year. Students with TAKS third grade reading scale scores between 1919 and 2185 were pooled through a convenience sampling selection at each campus. If the student’s respective teacher agreed to provide interventions, then the student was eligible for the treatment group. If the student’s reading teacher was not participating in the study, then the student was eligible for the control group.

Each school had one teacher providing interventions to 5 students in the treatment group for a total of 5 reading teachers and 25 students. The control group consisted of a different group of teachers who did not teach any treatment group students and 25 students. The study lost 4 students due to extenuating circumstances resulting in a total of 46 student participants.

ACES forms were given to each of the reading teachers of both the treatment and control groups before the study began and again after the 10-week treatment period ended. More specifically, the treatment period lasted from early February 2007 through the April administration of the TAKS reading test in 2007. The 24 students in
the treatment group received interventions using AIMS which were linked to the assessment results from ACES.

Students were assessed with ACES using the following subscales for academic skills and enablers: reading skills, critical thinking, interpersonal skills, engagement, motivation, and study skills. Students received scores which indicated developing, competent, or advanced skills in the respective subscales. Each student’s two lowest subscale scores were discussed with his or her teacher, allowing the teacher’s input regarding the area of focus for each student’s interventions. The enablers or skills were identified only if the ACES behavior classification scheme indicated the score as developing.

A target behavior was defined in objective terms, and an intervention goal and a desired behavior were identified with a general intervention strategy. The intervention was implemented by the reading teacher and monitored using a goal-attainment scale (GAS).

Three to four interventions were selected for each student in the treatment group and implemented by the reading teachers participating in the study. The reading teachers could use a minimum of one intervention every day for 10 weeks during the reading period. The reading teacher who provided interventions documented the progress of the skill or enabler using a graph at the end of each week during the 10-week period.

After the 10-week intervention period, the post-ACES and the fourth grade April 2007 TAKS reading test were administered to students in both the treatment and control groups. The fourth grade 2007 TAKS reading test scores were later analyzed after the scores were made available in May 2007.
The 10-week intervention period prevented studying the effects of long-term interventions and determining if the interventions would improve scores on state mandated tests such as the TAKS. The impact of more long term interventions on high school dropout rates was also inconclusive.

Summary of the Results

The conclusions of the study were based on statistical analyses of data acquired through the TAKS reading test and ACES. The study used a \( p < .05 \) level to determine whether or not the findings were statistically significant.

Question 1: “Does the implementation of AIMS result in a significant increase at the \( p < .05 \) level in student performance on the fourth grade April 2007 TAKS reading test between the control and treatment groups?” It was hypothesized that there would be a significant difference at the \( p < .05 \) level on the 2007 TAKS reading scores at the fourth grade level between the treatment and control group members. Data analyses results from descriptive statistics and a repeated measure ANOVA for between subject effects were used as a test of between subject effects. The analyses helped determine if the interventions were effective and the hypothesis was not proven.

Question 2 in the study asked, “Does the implementation of AIMS result in a significant increase at the \( p < .05 \) level in student performance on the fourth grade April 2007 TAKS reading test between the control and treatment groups?” Data were collected for an analysis using an independent \( t \) test in order to prove there would be a significant difference at the \( p < .05 \) level on the ACES posttest scores between the treatment and control groups. The second hypothesis was not proven because there were no statistically significant differences on the ACES posttest between the treatment
and control groups. The only differences noted in the current study were those of the treatment group since their scores on the ACES exceeded those of the control group after the 10-week intervention period.

Discussion of the Results

According to the results of this study, it is difficult to determine which interventions effectively support the development of reading skills and academic competence for fourth grade students who struggle to meet state standards on grade-level criterion-referenced tests. The treatment and control groups were found to be similar before any interventions were provided. This helped establish a fair starting point for both groups. Another analysis found that there were significant correlations at the $p < .05$ level between TAKS reading scores and the ACES total scores and subscale scores on both the pretests and posttests. The informational data support their use and provide a sense of reliability and validity for both instruments.

The main question the study addressed was whether or not the interventions were effective in increasing TAKS reading scores. Although there were no statistically significant changes at the $p < .05$ level after the 10-week intervention period, some growth in competence was noted in the treatment group as depicted in Figure 1 of the previous chapter.

Another analysis in which value added could also be considered relates to the differences between the post-ACES total scores and subscale scores for both the control and treatment groups. Although the analysis did not result in a statistically significant change between both groups, the ACES total scores on the pretest and
posttest indicated higher overall scores on the post-ACES for the treatment group than the control group. The evidence of this increase is available in Table 8.

Critics may point out that the teachers who provided the data for the evaluations also provided the interventions. The teachers who taught the students in the control group were not privy to AIMS intervention plans but knew they were working with struggling students who needed support. Therefore, the teachers who taught control group students had the same opportunity to work with their children and then complete a post-ACES. This notion indicates that both sets of teachers to increase scores simply because they worked with the students.

Teachers who worked with students in the treatment group were interviewed after the study to determine how the interventions were provided. The teachers provided information regarding the grouping format when interventions were provided. Appendix E provides information on the responses provided by the five reading teachers who provided the treatment. Teachers gave three possible responses: whole group, small group, or individual interventions to explain how the interventions were provided. Whole group interventions indicated the reading teacher did not differentiate among the students in class and provided the recommended intervention to the whole class. Small group interventions were provided to students in small groups of 5 to 6 students. Individual interventions were only provided to the student participating in the treatment group for which the intervention was prescribed. The reading teacher would work with the student one-on-one to provide the stated interventions. Overall, teachers did not provide every intervention to individual students on a regular basis.
Another area of interest relating to the results of the study is the issue of teacher quality. Prior to the study, principals were asked to provide names of fourth grade teachers who have excelled in the classroom at the respective schools. In order to take a more subjective look at the quality of the teachers providing interventions, the posttest TAKS reading results for each of the teachers were compared to the pretest TAKS reading scores. Descriptive statistics of the analyses are displayed in Table 9 and identified by school.

Table 9

*Descriptive Statistics: Comparisons on Pretest and Posttest TAKS and ACES Scores*

<table>
<thead>
<tr>
<th>School</th>
<th>Pretest M</th>
<th>Posttest M</th>
<th>Difference</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TAKS Posttest</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School 1</td>
<td>2083</td>
<td>2086.75</td>
<td>+3.75</td>
<td>4</td>
</tr>
<tr>
<td>School 2</td>
<td>1980</td>
<td>2013.75</td>
<td>+33.75</td>
<td>4</td>
</tr>
<tr>
<td>School 3</td>
<td>2086.4</td>
<td>2054.4</td>
<td>-32</td>
<td>5</td>
</tr>
<tr>
<td>School 4</td>
<td>2102.6</td>
<td>1999.4</td>
<td>-103.2</td>
<td>5</td>
</tr>
<tr>
<td>School 5</td>
<td>2132.4</td>
<td>2019.4</td>
<td>-113</td>
<td>5</td>
</tr>
<tr>
<td><strong>ACES Posttest</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School 1</td>
<td>189.25</td>
<td>205.75</td>
<td>+16.5</td>
<td>4</td>
</tr>
<tr>
<td>School 2</td>
<td>202</td>
<td>229.5</td>
<td>+26.5</td>
<td>4</td>
</tr>
<tr>
<td>School 3</td>
<td>157.4</td>
<td>197.2</td>
<td>+39.8</td>
<td>5</td>
</tr>
<tr>
<td>School 4</td>
<td>153.8</td>
<td>158</td>
<td>+4.2</td>
<td>5</td>
</tr>
<tr>
<td>School 5</td>
<td>176.8</td>
<td>223.2</td>
<td>+46.4</td>
<td>5</td>
</tr>
</tbody>
</table>
The ACES posttest results suggest increases ranging from 4.2 to 39.8 points on the total score for all five teachers. As mentioned in the instrumentation section, the ACES is a reliable measurement tool. However, the teachers completing the evaluation tool for the pretest and posttest were the same teachers thereby allowing for subjectivity.

On the contrary, the TAKS posttest are objective criterion referenced assessments. The use of the post-TAKS in determining teacher quality served as a more viable source of information. As suggested in Table 9, the average scale score increased at Schools 1 and 2 but suggested decreases at the other three schools. According to the TAKS Raw Score Conversion Table for Reading (2006, TEA), the teacher’s students at School 1 did not show any increases in correct responses, and the teacher’s students at School 2 raised scores by only one more correct response. Neither of these increases is significant enough to suggest teachers at Schools 1 or 2 outperformed their peers at the other three campuses. However, it is important to note the teachers in Schools 1 and 2 did not have students whose average scale scores dropped. Students in School 3 dropped 32 points, an average of 1 question. Students in School 4 dropped an average of 103.2 points, and students in School 5 dropped an average of 113 points, averaging 5 and 6 fewer correct responses from the pretest, respectively. In retrospect, it may be fair to suggest teachers at Schools 1 and 2 may have provided higher quality instruction than the teachers at the other three schools.

**Explanation of Unanticipated Findings**

The results of the study did not demonstrate a statistically significant difference between the control and treatment groups. There are a couple of reasons the unanticipated findings could have occurred. First, Gall et al. (2003) identified four factors
which support statistical power analysis: sample size, level of significance, directionality, and effect size. In research studies, statistical power increases with a larger sample size if other factors are held constant. The sample of the current study was small, thereby making the relationship between the treatment and increased performance on TAKS difficult to support. The level of significance was set at an acceptable level for educational research at $p < .05$. However, lowering the $p$ value may have resulted in opposite results of the desired effect. The $p$ level was set at .10 in some studies, but in doing so, the potential of Type I error becomes more prevalent. A larger sample could have been indicative of proving the hypothesis. The last two factors, directionality and effect size, did not result in a strong statistical power analysis. The treatments in the study varied; therefore, it would be difficult to prove only one treatment made a statistically significant difference. The effect size also posed difficulty for a strong power analysis due to the small effect size.

A stronger statistical power analysis may have allowed for results that were indicative of a statistically significant difference rather than the results obtained. However, the study would have to consider one or more of the following: changing the level of significance, sample size, directionality supported by a one-tailed test, and a large effect size.

Second, the unanticipated findings may be attributed to the 10-week period allowed for the treatment period and the interventions provided. The 10-week period may not have been a sufficient amount of time for the interventions to make a statistically significant impact. The interventions used with the treatment group were determined by the teacher and researcher based upon the ACES results. As with any
classroom interventions, it is possible that a trial and error period is necessary to determine which interventions are most effective for individual students.

According to the data analyses for Question 1 and the descriptive statistics provided in Table 9, it may be concluded the interventions provided to the treatment group were not effective. Several reasons may have contributed to their ineffectiveness. First, the integrity of the implementation of the interventions is worthy of further discussion. The safeguards put in place to preserve the integrity of the interventions were completed successfully; however, the integrity remains an enigma since the teachers providing the prescribed interventions were the only adults in the room a majority of the time. Second, the interventions may have proven unsuccessful because the teachers providing the interventions may not have provided the recommended interventions frequently enough to make a difference. The last reason for this conclusion can be attributed to the number of times the interventions were provided during the intervention period. The teachers were only asked to provide the prescribed interventions one to two times per week. It is possible the students in the treatment group needed to engage in the interventions more than the minimum recommended times in order to have a more successful intervention period.

Although the study did not result in statistically significant gains, there are some implications for future practice. The implications can be based on both the changes in reading performance and the lack of statistically significant gains in reading as measured by the TAKS fourth grade reading test.
Implications for Practice

Although statistically significant gains in reading scale scores on the TAKS test after a 10-week intervention period were not noted, this study does suggest some changes were evident in reading performance on TAKS. Based on the study by White (2006), there are measurements and criteria to successfully predict students who would and would not respond to interventions. However, the need to identify what would work for students who do not respond to interventions is still left to be answered. The current study investigated whether or not the interventions applied would be effective. The students in the study were identified as struggling learners according to test data at the end of their third grade year. The White study suggests interventions should be provided to students by the end of their first grade year. Therefore, schools should pay attention to individual students’ data and provide additional or different interventions prior to the end of their first grade year. Waiting until fourth grade, as with the students in the current study, proves to create circumstances which may be even more difficult to overcome.

Based on another study by Rock and Pollack (2002), the need to support earlier interventions was evident, especially for children of Hispanic, African American, and Native American backgrounds. The current study consisted of predominantly Hispanic children who, after a 10-week intervention period, did not show statistically significant growth. The implications of the current study support interventions at an earlier grade level and longer intervention periods in order to have a stronger impact on student learning in reading.
Rotheram’s (2001) study showed there was a statistically significant correlation between social skills and academic competence. The relationship stressed in the Rotheram study supported the importance of assessing social skills as multidimensional skills and suggested that there are various domains of social competence. The findings of the current study also support the implications of a strong correlation between social skills and academic competence on both the pre-ACES and post-ACES total scores and subscale scores.

In the current study, the treatment scores on the ACES exceeded those of the control group at the end of the study. These results can have positive implications on classroom interventions. If teachers perceive students as having low academic competence, but indicate a higher level of competence after the intervention period, then the changed perceptions could have positive implications on classroom environments. First, teachers would be cognizant of their students’ competencies and be able to identify whether or not they were developing or advanced in a designated skill. Second, classroom experiences could change towards a more positive direction because the teacher who has more positive perceptions about his or her students’ abilities will have higher expectations.

The last implication of the current study suggests growth was evident after the intervention period but not at a statistically significant level. According to the slope for the treatment group, more growth was made by the treatment group than the control group. Although increases accomplished by the treatment group were greater than those made by the control group, the treatment group did not meet or exceed the mean scale scores for the control group. If growth was evident in such a short intervention period, then the results of the current study suggest an extended intervention period
may result in statistically significant improvement in reading skills as measured by the TAKS reading test. It is realistic to suggest students should receive interventions for as long as they are necessary.

The implications suggested in the current study are supported by the results presented in the paper. The research on the use of interventions to develop academic competence in reading is far from complete. The next section provides considerations for additional research.

Recommendations for Additional Research

Further research is needed in the areas of effective interventions to develop and support academic competence in reading, interventions for non-responsiveness-to-intervention (RTI) students, and replication studies to support generalizing the findings. More specifically, additional research is needed to determine which specific interventions provide significant changes in reading performance while addressing both the academic skills and enablers supported by the academic competence construct.

In addition, more research is needed to identify effective interventions for students who do not respond to conventional interventions offered by schools. White's (2006) study demonstrated the effectiveness of a prediction model to determine which struggling readers responded to RTIs and which students did not. The predictor model presented in this study was found to be highly predictive of non-RTI students, thereby making interventions for non-RTI students even more valuable.

Another worthwhile endeavor is a replication study with an increased sample size at elementary schools located in different cities and states. A longer period of intervention time also needs to be considered. The value added in such a short period
as evident in this study leads to another question. How many weeks of effective interventions would be needed to show statistically significant gains at the \( p = .05 \) level? Another consideration for future research is a replication study with various ethnic backgrounds and socioeconomic status, since the study presented was predominantly composed of a Hispanic sample and students on free and reduced lunch,

**Conclusions**

In closing, this study attempted to develop academic competence in reading and improve test scores on the fourth grade TAKS test through the use of research-based interventions. The final data results did not yield statistically significant results at a \( p < .05 \) level; however, the treatment group’s scale scores on the TAKS reading test indicated more gains than those made by the control group. The treatment group data also supported stronger gains on ACES.

The less than statistically significant results may not have been unexpected considering the number of students in the study and the short 10-week intervention period. One can assume that a longer intervention period with above-average teachers would suggest results indicative of statistically significant gains on the TAKS after interventions are implemented to increase a student’s academic competence.
APPENDIX A

INFORMED CONSENT FORM
Before agreeing to your child's participation in this research study, it is important that you read and understand the following explanation of the purpose and benefits of the study and how it will be conducted.

Title of Study: The Impact of Interventions for Developing Academic Competence in Reading of Fourth Grade Students

Principal Investigator: Josie Hernandez-Gutierrez, a graduate student in the University of North Texas (UNT) Department of Education Administration.

Purpose of the Study:
You are asked to allow your child to participate in a study which involves an investigation on the impact academic and nonacademic behaviors have on your child’s learning. Your child’s reading teacher will complete an evaluation that will help identify areas to address. Areas to address shall include reading, critical thinking, interpersonal skills, engagement, motivation, and study skills. Your child’s teacher will set goals and identify strategies for interventions. Activities for interventions may include learning in groups, feedback from teacher, positive reinforcement, or opportunities to respond in class. Teachers will use a graph to chart weekly progress.

Study Procedures:
Your child will be asked to assist the teacher in reaching his or her identified goal throughout the duration of approximately ten weeks. For example, your child may need to work on asking the teacher questions when he or she is in need of help. The time commitment from your child is part of the school day. Depending on how often the intervention(s) are used, students may spend as little as a few minutes on daily interventions. Some interventions may require more time such as working in groups, peer tutoring, etc. Each goal will be included in the teachers’ daily instruction with your child.

Foreseeable Risks:
There are no known potential risks involved in this study.

Benefits to the Subjects or Others:
We expect the project to benefit your child by improving his or her level of academic competencies which will have a positive impact on his/her academic achievement.

Procedures for Maintaining Confidentiality of Research Records:
The confidentiality of your child's individual consent forms and evaluation surveys will be maintained in a portable file container which will be kept in a locked storage on the South Hi Mount campus. None of the evaluations will have names to ensure confidentiality. The evaluation surveys will be coded with numbers and school names only. The publication will also use the number and school name coding to maintain confidentiality.
Questions about the Study:
If you have any questions about the study, you may contact Mrs. Josie Hernandez-Gutierrez at telephone number 817-538-4158, or Dr. J. Hudson, UNT Department of Education, at telephone number 940-565-2175.

Review for the Protection of Participants:
This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940.

Research Participants’ Rights:
Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

• Mrs. Josie Hernandez-Gutierrez has explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.

• You understand that you do not have to allow your child to take part in this study, and your refusal to allow your child to participate or your decision to withdraw him/her from the study will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your child’s participation at any time.

• You understand why the study is being conducted and how it will be performed.

• You understand your rights as the parent/guardian of a research participant and you voluntarily consent to your child’s participation in this study.

• You have been told you will receive a copy of this form.

_______________________________  Printed Name of Parent or Guardian

_______________________________  ____________  Signature of Parent or Guardian  Date

Waiver of Assent
The assent of (_______________________________) was waived due to:

_____ x _____ Age
_________ Maturity
_________ Psychological State

________________________________

Printed Name of Parent/Guardian

_____________________________   _____________
Signature of Parent/Guardian     Date
APPENDIX B

INFORMED TEACHER CONSENT FORM
Informed Teacher Consent Form

Before agreeing to your participation in this research study, it is important that you read and understand the following explanation of the purpose and benefits of the study and how it will be conducted.

Title of Study: The Impact of Interventions for Developing Academic Competence in Reading of Fourth Grade Students

Principal Investigator: Josie Hernandez-Gutierrez, a graduate student in the University of North Texas (UNT) Department of Education Administration.

Purpose of the Study:
You are asked to participate in a study which involves an investigation on the impact academic and nonacademic behaviors on your students’ learning in reading.

Study Procedures:
You will be asked to complete an evaluation scale that will help identify areas to address for each student in the study. Areas to address shall include reading, critical thinking, interpersonal skills, engagement, motivation, and study skills. The results of the evaluation scale will be processed by the researcher. Once weaknesses are identified, you will choose goals and interventions from a list of options. Each goal will be included in the teachers’ daily instruction. Activities for interventions may include learning in groups, feedback from teacher, positive reinforcement, or opportunities to respond in class. Teachers will receive a written plan from the researcher, a checklist for reference, a maximum of two observations, and a minimum of two communications per month either by email or phone during the duration of the study. At the end of the study, you will be asked to make any changes in behaviors to the evaluation scale. The total estimated time required by the teacher for this study is 2.5 hours.

Foreseeable Risks:
There are no known potential risks involved in this study.

Benefits to the Subjects or Others:
We expect the project to benefit students by improving their academic competencies which will have a positive impact on academic achievement.

Procedures for Maintaining Confidentiality of Research Records:
The confidentiality of consent forms and evaluation surveys will be maintained in a portable file container which will be kept in a locked storage on the South Hi Mount campus. None of the evaluations will have names to ensure confidentiality. The evaluation surveys will be coded with numbers and school names only. The publication will also use the number and school name coding to maintain confidentiality.
Questions about the Study:

If you have any questions about the study, you may contact Mrs. Josie Hernandez-Gutierrez at telephone number 817-538-4158, or Dr. J. Hudson, UNT Department of Education, at telephone number 940-565-2175.

Review for the Protection of Participants:

This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940.

Research Participants’ Rights:

Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- *Mrs. Josie Hernandez-Gutierrez* has explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks of the study.

- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw from the study will involve no penalty or loss of rights or benefits.

- You understand why the study is being conducted and how it will be performed.

- You understand your rights as the intervention teacher of a research participant and you voluntarily consent to your participation in this study.

- You have been told you will receive a copy of this form.

_____________________________  ______________
Printed Name of Teacher      Signature of Teacher      Date

For the Principal Investigator or Designee:

I certify that I have reviewed the contents of this form with the teacher signing above. I have explained the possible benefits and the potential risks of the study. It is my opinion that the teacher understood the explanation.

_____________________________  ______________
Signature of Principal Investigator or Designee      Date
Pre-Intervention Period
1. Inform teachers which students will be in control and treatment groups
2. Train teachers to use measurement tools and explain their role in the study
3. Teachers complete an ACES on each student in the control and treatment groups
4. Input responses from ACES – Teacher Form using the Scoring Assistant Software and print out Behavior Classification Scheme
5. Review the Behavior Classification Scheme with treatment group teachers
6. Researcher and teachers identify intervention goals, desired behaviors, and intervention strategies
7. Researcher completes descriptive criteria for monitoring behavior changes with GAS and intervention plan/integrity checklist

Intervention Period
1. Teachers provide interventions to treatment group students daily according to the intervention plan (a minimum of 1 intervention per day)
2. Teachers who provide interventions complete their integrity checklists for each student in the treatment group
3. Teachers who provide interventions also complete a weekly GAS for each student in the treatment group
4. A teacher observation is conducted by researcher to find evidence of interventions
5. Researcher interviews students in treatment group

Post-Intervention Period
1. Teachers with treatment and control group students complete a Post-ACES
2. Teachers with treatment and control group students administer the TAKS Reading Grade 4 test
APPENDIX D

INTEGRITY CHECKLIST SAMPLE FOR 10-WEEK INTERVENTION PERIOD
## Intervention Plan/Integrity Checklist Sample

**Student:**  
**Teacher:**  
**School:**

<table>
<thead>
<tr>
<th>Intervention Components</th>
<th>Engagement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Give positive reinforcement when student participates in class discussions or initiates answers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Teacher privately asks student if she has questions after reading lessons.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3. Pair student with a peer and encourage her to have conversations in class.</td>
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<tr>
<td>4. Encourage student to lead a group of 2 or more.</td>
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<tr>
<td>5. Practice reading aloud to large group, small group, or one on one with teacher.</td>
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</tbody>
</table>
APPENDIX E

METHODS USED BY TEACHERS TO IMPLEMENT INTERVENTIONS
<table>
<thead>
<tr>
<th>Interventions</th>
<th>Whole Group</th>
<th>Small Group</th>
<th>Individual</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engagement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Give positive reinforcement when student participates in class discussions or initiates answers.</td>
<td>Xx</td>
<td>Xx</td>
<td></td>
</tr>
<tr>
<td>Teacher privately asks student if she has questions after reading lessons.</td>
<td>xx</td>
<td>xX</td>
<td>xXxx</td>
</tr>
<tr>
<td>Pair student with a peer and encourage conversations in class.</td>
<td>X</td>
<td>Xxx</td>
<td></td>
</tr>
<tr>
<td>Encourage student to lead a group of 2 or more.</td>
<td></td>
<td>Xx</td>
<td></td>
</tr>
<tr>
<td>Practice reading aloud to large group, small group, or one on one with teacher.</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Encourage class discussions by allowing student to work in smaller groups.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Praise in private/public when student volunteers answers.</td>
<td>X</td>
<td>X</td>
<td>Xx</td>
</tr>
<tr>
<td>Reward student when he/she reads aloud.</td>
<td>X</td>
<td>X</td>
<td>xx</td>
</tr>
<tr>
<td><strong>Study Skills</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide a daily incentive for complete homework.</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Interventions</td>
<td>Whole Group</td>
<td>Small Group</td>
<td>Individual</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>-------------</td>
<td>------------</td>
</tr>
<tr>
<td>Correct all graded reading assignments for extra credit.</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Praise for finishing class work on time.</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review reading passages the day before the assignments are given.</td>
<td>Xx</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Corrects wrong answers to comprehension questions on reading passages.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carries a checklist of items needed for Reading class.</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Reward student for completed assignments at the end of each week.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive reinforcement for accomplishing interventions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher provides one idea at least twice per week to help student prepare for TAKS test or practice test.</td>
<td>X</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>Critical Thinking</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model the process of synthesizing information to identify information related to the correct answer.</td>
<td>xxx</td>
<td>XXX</td>
<td>xxx</td>
</tr>
<tr>
<td>Interventions</td>
<td>Whole Group</td>
<td>Small Group</td>
<td>Individual</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>-------------</td>
<td>------------</td>
</tr>
<tr>
<td>Practice drawing conclusions at least twice per week.</td>
<td>xxxx</td>
<td>X</td>
<td>xxx</td>
</tr>
<tr>
<td>Student will correct answers on passages that were marked wrong.</td>
<td>X</td>
<td>X</td>
<td>xxx</td>
</tr>
<tr>
<td>Model analyzing viewpoints.</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Teacher provides feedback to incorrect responses.</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Teacher praises progress and correct responses.</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Motivation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encourage student to check work without being asked.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Give student ideas for persisting with difficult tasks before giving up.</td>
<td>Xx</td>
<td>Xxxxx</td>
<td>Xxxxx</td>
</tr>
<tr>
<td>Encourage weekly or biweekly goal setting.</td>
<td></td>
<td>Xxx</td>
<td>Xxxxxx</td>
</tr>
<tr>
<td>Reward/praise when student shows responsibility for their learning.</td>
<td>xxx</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Practice evaluating school assignments by correcting errors and occasionally explaining cause for error.</td>
<td>Xx</td>
<td>X</td>
<td>xxxXxxx</td>
</tr>
<tr>
<td>Interventions</td>
<td>Whole Group</td>
<td>Small Group</td>
<td>Individual</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>-------------</td>
<td>------------</td>
</tr>
<tr>
<td>Chooses an assignment to redo at least once per week to improve quality of work. *provide positive reinforcement for completion</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Reward or praise when student stays on task.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reward/praise when student attempts to improve the quality of his/her assignments.</td>
<td></td>
<td>Xxx</td>
<td></td>
</tr>
<tr>
<td>Reward/praise when student makes the most of learning experiences.</td>
<td>Xx</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Reading Skills</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-15 minutes of one-on-one reading with teacher at least twice per week to develop reading fluency and word attack skills</td>
<td></td>
<td></td>
<td>xX</td>
</tr>
<tr>
<td>Practice drawing conclusions from written material.</td>
<td>X</td>
<td>Xx</td>
<td>X</td>
</tr>
<tr>
<td>Teacher models strategies for understanding words.</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Practice strategies for improving reading comprehension.</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Interventions</td>
<td>Whole Group</td>
<td>Small Group</td>
<td>Individual</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>-------------</td>
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<td>------------</td>
</tr>
<tr>
<td>Journal writing across the curriculum with teacher feedback.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model drawing conclusions from written text, main idea, and vocabulary.</td>
<td>X</td>
<td>x</td>
<td>X</td>
</tr>
</tbody>
</table>
APPENDIX F

INTERVENTION TABLE

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>First step</td>
</tr>
<tr>
<td>B</td>
<td>Second step</td>
</tr>
<tr>
<td>C</td>
<td>Final step</td>
</tr>
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</table>

Additional notes on the interventions.
## Intervention Table

<table>
<thead>
<tr>
<th>Engagement</th>
<th>Study Skills</th>
<th>Critical Thinking</th>
<th>Motivation</th>
<th>Reading Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Give positive reinforcement when student participates in class discussions or initiates answers.</td>
<td>Provide a daily incentive for complete homework.</td>
<td>Model the process of synthesizing information to identify information related to the correct answer.</td>
<td>Encourage student to check work without being asked.</td>
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</tr>
<tr>
<td>Teacher privately asks student if she has questions after reading lessons.</td>
<td>Correct all graded reading assignments for extra credit.</td>
<td>Practice drawing conclusions at least twice per week.</td>
<td>Give student ideas for persisting with difficult tasks before giving up. (i.e. ask for help, skip a question, etc.)</td>
<td>Practice drawing conclusions from written material.</td>
</tr>
<tr>
<td>Pair student with a peer and encourage her to have conversations in class.</td>
<td>Praise for finishing class work on time.</td>
<td>Student will correct answers on passages that were marked wrong. (Write a response after wrong answer – Why I got this wrong…)</td>
<td>Encourage weekly or biweekly goal setting.</td>
<td>Teacher models strategies for understanding words. (i.e. context clues, prefixes/suffixes, etc.)</td>
</tr>
<tr>
<td>Encourage student to lead a group of 2 or more.</td>
<td>Review reading passages the day before the assignments are given.</td>
<td>Model analyzing viewpoints.</td>
<td>Reward/praise when student shows responsibility for their learning.</td>
<td>Practice strategies for improving reading comprehension. (i.e. TAKS practice questions using think alouds, oral/written answers without multiple choice responses, etc.)</td>
</tr>
<tr>
<td>Engagement</td>
<td>Study Skills</td>
<td>Critical Thinking</td>
<td>Motivation</td>
<td>Reading Skills</td>
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<td>Reward/praise when student attempts to improve the quality of his/her assignments.</td>
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<tr>
<td>Reward student when he/she reads aloud.</td>
<td>Positive reinforcement for accomplishing interventions.</td>
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<td>Reward/praise when student makes the most of learning experiences.</td>
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<tr>
<td>Teacher provides one idea at least twice per week to help student prepare for TAKS test or practice test.</td>
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</table>
REFERENCES


U.S. Department of Education in the 19th Annual IDEA Report to Congress found continuing failed remediation past the primary grades further deprives children of the opportunity to learn advanced subject matter such as science (1997).


