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Mixed-Methods Exploration of Teacher Perceptions: Background, Practices, and Attitudes Related to Student Achievement

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MIXED-METHODS EXPLORATION OF TEACHER PERCEPTIONS:
BACKGROUND, PRACTICES, AND ATTITUDES RELATED TO
STUDENT ACHIEVEMENT

A Dissertation
Presented to
the Faculty of the Morgridge College of Education
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of the Requirements for the Degree
Doctor of Philosophy

by
Deborah Isabell Faust
November 2012
Advisor: Duan Zhang, Ph.D.
ABSTRACT

Education policy has focused on teacher quality and student achievement since the implementation of the No Child Left Behind Act, which defined teacher quality in terms of teachers’ professional qualifications and certification. This is consistent with a history of econometric studies examining the effects of teacher background characteristics on student achievement. More recently, researchers have argued that investigations of teacher effectiveness should examine what actually happens in the classroom, and that teacher attitudes and instructional practices are conspicuously missing from the prior research.

This study uses a two-phase parallel mixed methods design to explore teacher perceptions of the influence of their background characteristics, attitudes, and instructional practices on student achievement. The first phase is a quantitative analysis using structural equation modeling and data from the Early-Childhood Longitudinal Study, Kindergarten Class of 1998-1999 (ECLS-K) to examine the relative effects of teacher background characteristics, attitudes, and instructional practices on student achievement. The second phase is a case study of an innovative elementary school meeting State expectations for student growth.

The results of the quantitative analysis revealed that teacher attitudes typically have a significant effect on student achievement, but teacher background characteristics
and perceptions related to their instructional practices do not. The teachers in the case study agreed that teacher attitudes are important and are likely to have an effect on students, as well as on other teachers. However, the teachers in the case study also perceived that a number of instructional practices are crucial to increasing student achievement and closing achievement gaps.
ACKNOWLEDGEMENTS

Many people supported me in pursuing this work and contributed to the completion of this study. Most importantly, I would like to thank my husband, Doug, for his boundless support and encouragement to pursue my goals and dreams, and I dedicate this dissertation to him. I also am grateful to my parents, Vince and Delcie Runco, for instilling the value of education and for modeling education as a means of transforming lives.

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Finally, I am grateful to the teachers, principal, child, and parent who participated in the case study and who openly shared their experiences, their perceptions of their attitudes and instructional practices, and their thoughts about the most important aspects reforming education and enhancing student achievement.
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Chapter I

INTRODUCTION

Importance of Study

Teacher quality and student achievement have been at the forefront of primary and secondary education policy for many years, especially since the implementation of the No Child Left Behind Act of 2001 (NCLB) and its requirements related to teacher quality and school accountability. NCLB sought to improve student progress by implementing statewide standards and assessments for student achievement and by increasing the numbers of highly qualified teachers in high needs (Title I) schools. Education researchers and policymakers generally agree that (1) teachers differ in terms of quality, and (2) teacher quality influences student achievement (Goldhaber & Anthony, 2005; Goldhaber & Brewer, 2000; Clotfelter, Ladd & Vigdor, 2007a; Measures of Effective Teaching Project, 2010; Palardy & Rumberger, 2008). However, it has proven difficult to measure or to consistently define teacher quality, and there is little consensus about the qualities that contribute to a teacher’s effectiveness in raising student achievement (Clotfelter, Ladd & Vigdor, 2007a; Palardy & Rumberger, 2008; Rowan, Correnti & Miller, 2002).

Under NCLB, highly qualified teachers are defined in terms of their professional qualifications and certification. Similarly, much prior research seeking to understand the relationship of teacher quality to student achievement has focused on teacher background
characteristics (Goldhaber & Anthony, 2005; Goldhaber & Brewer, 2000; Clotfelter, Ladd & Vigdor, 2006, 2007). More recently, researchers and scholars have begun to distinguish between teacher characteristics and teacher effectiveness, and have focused on teacher attitudes and practices. However, research related to the influences of teacher attitudes and instructional practices on student achievement is limited due, in part, to insufficient multilevel data for conducting such analyses.

The Early-Childhood Longitudinal Study, Kindergarten Class of 1998-1999 (ECLS-K) data collection instruments consisted of questionnaires submitted to students, teachers, parents, and school administrators, as well as scores on measures of student achievement in reading, mathematics, and science. Thus, it permits the examination of teacher influences on student achievement. Because the ECLS-K collection of teacher data is self-reported, it reflects teachers’ perceptions rather than objective measures of their attitudes and the frequency of their instructional practices.

**Purpose of Study**

The purpose of this study is to explore teacher perceptions of the influence of their background characteristics, attitudes, and instructional practices on student achievement. This study is a two-phase parallel mixed-methods design consisting of a quantitative analysis using the Early-Childhood Longitudinal Study, Kindergarten Class of 1998-1999 (ECLS-K) database, and a qualitative collective case study (Teddlie & Tashakkori, 2009). In the quantitative phase of the study, I employed structural equation modeling to analyze ECLS-K data investigating the relative contributions of teacher background characteristics, teacher attitudes, and teacher perceptions of their instructional practices on student achievement for students in first, third, and fifth grades.
In the second phase of the study, I examined teachers’ perceptions of these influences on student achievement through a case study of teachers in an elementary school that is meeting expectations for its student growth on state standardized-student achievement measures. The mixed-methods design provided an opportunity for the comparison of the two phases of analysis to explore whether the results were consistent or contradictory. In addition, the case study informs, provides context for, and at different points both validates and challenges findings generated through the quantitative analysis. The qualitative phase of the study also permits the investigation of teacher-identified background, attitudinal, and practice influences related to student achievement that are not represented by questions, variables, or concepts addressed by the ECLS-K database. Thus, this study adds to the literature by giving voice to teacher perceptions of the influence of various background characteristics, attitudes, and instructional practices, and their influence on student achievement.

**Definition of Terms**

In this body of research, some terms are used differently by various researchers. Thus, it is important to clarify the uses of three terms central to teacher effectiveness research: teacher effects, teacher background characteristics, and teacher effectiveness.

*Teacher Effects:* In the literature, use of the term “teacher effects” is not always consistent. It is commonly used in two ways. First, in many cases, it is used to refer to the overall impact of teachers and teaching on student achievement (Heck, 2009; Konstantopoulous, 2009; Nye, Konstantopoulous, & Hedges, 2004; Rowan, Correnti & Miller, 2002). Second, since much of the research related to the impact of teachers and teaching has focused on teacher background characteristics, some researchers use the
term “teacher effects” synonymously with “teacher background characteristics” (Ding & Sherman, 2006). For this reason, where possible in this study I distinguish whether the teacher effects referred to are pertaining to (1) the “overall teacher effects” (i.e., the impact of teachers and teaching on student achievement), or (2) “specific effects” related to teacher background characteristics, attitudes, or instructional practices.

Teacher Background Characteristics: Teacher background characteristics, sometimes referred to as “teacher characteristics” or “teacher inputs” (Odden, Borman, & Fermanich, 2004; Wenglinsky, 2002), typically relate to teacher features such as type of licensure or certification, highest level of education, type of degree and content area, years of experience, coursework, and undergraduate college or university ranking.

Teacher Effectiveness: “Teacher effectiveness” is sometimes used interchangeably with “teacher effects,” referring to the impact of teacher background characteristics or specific instructional practices on student achievement, but, as Ding & Sherman (2006) point out, it is necessary to distinguish between teacher effects and teacher effectiveness. Teacher effectiveness varies across classrooms and across schools, and it “implies variability in the relationship between instructional strategies, behavior, or effects, and student outcomes,” usually measured by scores on standardized achievement tests (Heck, 2009, pp. 228, 230). While large studies are underway to develop multiple measures of teacher effectiveness so that analyses are able to incorporate additional outcome variables (Measures of Effective Teaching Project, 2010), in the meantime it is important for estimates of overall teacher effects or teacher effectiveness to include various independent variables rather than being limited to
teacher background characteristics (Ding & Sherman, 2006; Odden, Borman & Fermanich, 2004; Palardy & Rumberger, 2008).

**Conceptual Framework**

Researchers outline several quantitative research traditions related to investigations of teacher effectiveness. The first is the process-product research, which Hill, Rowan, and Ball (2005) describe as classroom-level research examining the relationship between teacher behaviors or practices and student achievement. The focus of these studies was on what teachers do in the classroom, and they relied heavily on correlational data (Hill, Rowan, & Ball, 2005). Because these studies did not address the nested structure of educational data, there has been little research following this tradition for more than a decade (Seidel & Shavelson, 2007).

Another, and for the most part, more recent quantitative research tradition related to teacher effectiveness, is one based upon education production function analyses examining the impact of teacher characteristics on student achievement. Like NCLB, these investigations of teacher effects on student achievement focused on teacher characteristics, such as years of experience. As discussed more fully below, the results and interpretations of this research have been inconsistent, and they have been criticized for focusing too much attention on isolated student, classroom, and school characteristics using methods that sometimes ignore the nested structure of the data (Odden, Borman, & Fermanich, 2004). As a result, these studies have not sufficiently illuminated the factors that contribute to increased teacher effectiveness in raising student achievement and closing achievement gaps. Thus, some authors have suggested more complex educational models recommending the inclusion of, among other things, classroom-level components.
such as content, instructional practice, and grouping strategies (Ding & Sherman, 2006; Odden, Borman, & Fermanich, 2004; Palardy & Rumberger, 2008).

While researchers have expanded upon initial regression-based models of education production function research of teacher effects using multilevel modeling and variance decomposition models (covariate adjustment or gain score value-added models), they often continued to emphasize the relationship of teacher background characteristics and student achievement using district aggregated data (e.g., Monk 1994). Palardy and Rumberger (2008) assert that despite the extensive research aimed at understanding teacher effectiveness “surprisingly little is known about two fundamental aspects of teacher effects: the degree to which teachers matter and the features of teachers and teaching that are most important to student learning” (p. 112). They point out that teacher attitudes and teacher instructional practices are two elements neglected in the body of research focused on teacher background characteristics. They incorporate teacher attitudes and teacher instructional practices into their analysis using three-level hierarchical linear modeling. Thus, they contend that their conceptual framework with the three aspects of teacher effects and multilevel modeling “is a precise model of teacher effects in that it isolates the variance of student learning that can be attributed to teacher effectiveness” (Palardy and Rumberger, 2008, p. 116). In order to have the most precise estimates of achievement gains, Palardy and Rumberger used the ECLS-K first grade data because it contained fall and spring achievement scores within the same year.

The quantitative portion of this dissertation uses the three-component conceptual framework of teacher effects outlined by Palardy and Rumberger (2008) in a structural equation model analysis to illuminate the relative influence of teacher background
characteristics, teacher attitudes and instructional practices on student achievement beyond the first grade. In this conceptual framework (see Figure 1 below) instructional practices are thought to have a direct effect on student achievement, whereas teacher attitudes and background characteristics are perceived as having an indirect effect on student achievement “through their association with instructional practices” (Palardy & Rumberger, 2008). These three components of teacher effects are then explored further in the qualitative case study.

Figure 1

*Hypothesized Model*

<table>
<thead>
<tr>
<th>Research Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The following research questions are addressed in the first quantitative phase of the study:</td>
</tr>
<tr>
<td>1. What are the relative influences of teacher background characteristics, teacher attitudes, and instructional practices on student achievement?</td>
</tr>
<tr>
<td>2. Are the influences of teacher background characteristics and attitudes on student achievement mediated by teacher instructional practice?</td>
</tr>
<tr>
<td>3. Do teacher background characteristics and teacher attitudes as mediated through teacher instructional practice have a significant impact on student achievement?</td>
</tr>
</tbody>
</table>
4. Do teacher instructional practices, as measured by frequency of instructional tasks and evaluation practices, have a significant impact on student achievement?

5. Are there significant differences in the impact of teacher background characteristics, teacher attitudes and teacher instructional practice on the achievement of students in Title I schools, compared with those in non-Title I schools?

6. Are there significant differences in the impact of teacher background characteristics, teacher attitudes, and teacher instructional practices on the achievement of students of color?

7. Are there significant differences in the impact of teacher background characteristics, teacher attitudes, and teacher instructional practices on the achievement of high ability students compared with other students?

The qualitative phase of the study will seek to further illuminate the results of the quantitative analysis and to address these additional questions:

8. What are teachers’ perceptions of the practices that contribute to increased student achievement?

9. How do teachers perceive that their attitudes impact student achievement and learning?

10. How do teachers perceive that their background characteristics impact student achievement and learning?
11. What instructional practices do teachers perceive are most important for improving student achievement and closing achievement gaps?

12. To what extent are teachers’ perceptions aligned or not aligned with the results of the quantitative analysis?
Chapter II

REVIEW OF LITERATURE

Much of the research examining the relationship between teacher quality or effectiveness to student achievement investigated specific teacher background characteristics, such as degree and major content area, undergraduate college ranking, type of licensure (traditional, emergency, or alternative), type of teacher preparation, years of experience, and board certification. However, the results of research related to these types of teacher effects are inconsistent (Clotfelter, Ladd & Vigdor, 2007; Palardy & Rumberger, 2008; Rowan, Correnti & Miller, 2002).

Other researchers and scholars distinguish between these teacher characteristics and teacher effectiveness. They contend that teacher effectiveness is a function of best practices, such as the implementation of curricular content, instructional practices, grouping strategies, and evaluation of students. Another set of factors related to teacher quality is comprised of teacher attitudes related to their perceptions of school climate, their expectations of students, their beliefs about students’ abilities to learn, their teacher self-efficacy (described as teachers’ perception of their ability to influence student learning), their value of and participation in educational collaborations, and their level of career satisfaction.

Many of the early studies of teacher characteristics utilized education production function analyses or studies of variation in teacher effects using multiple regression or
multivariate analyses of variance or covariance. These studies began with measures of student achievement status, and later shifted to the assessment of student achievement gains through value-added models. Scholars advocating for a more inclusive and robust examination of teacher effectiveness recommend the use of multilevel modeling techniques that take into account the nested structure of students within classrooms and of classrooms within schools.

The following is a review of some of the research pertaining to the relationship of the three components examined in this study—teacher background characteristics, teacher attitudes, and teacher instructional practices.

**Teacher Background Characteristics**

In the late 1990s, educators and policymakers anticipated that the need for high quality teachers would rise in the upcoming decade due to dramatic increases in K-12 enrollment coupled with unprecedented retirement of veteran baby-boom teachers (Lankford, Ochshorn, & Wyckoff, 1996). The projected surge in the need for new teachers, in turn, led to concerns about teacher recruitment, attrition, training, and development (Darling-Hammond, 1997; Darling-Hammond & Falk 1997; Lankford, Ochshorn & Wyckoff, 1996) and spawned a body of literature investigating the links between teacher background characteristics and student achievement. Of greatest interest in these studies were the teacher credentials deemed most likely to be affected by education or fiscal policies. Researchers sought to identify characteristics associated with student achievement in hopes that this would lead to the implementation of public policies that would bring about increases in student achievement and reductions in
achievement gaps. The identification of such characteristics and policies was thought to be imperative because, to the extent that these effects accumulate and
teachers with weaker credentials end up in classrooms with more educationally disadvantaged children, schools would tend to widen, rather than reduce, the already large achievement gaps associated with socioeconomic differences that students bring to the classroom (Clotfelter, Ladd & Vigdor, 2007a).

Teacher background characteristics investigated in such studies included teacher certification, highest degree earned and degree content areas, years of teacher experience, and teacher preparation. Information pertaining to a number of these characteristics is contained in the ECLS-K database.

**Teacher Certification**

Teachers are certified to teach through state licensing structures and requirements. In response to the increased demand for teachers, particularly in high poverty districts where hiring sufficient numbers of qualified teachers is a challenge, many states created alternative or emergency certification processes. In many cases, these requirements were re-examined and amended as a result of NCLB requirements and definitions of highly qualified teachers.

Goldhaber and Brewer (2000) examined the relationship of the type of teacher certification (probationary, emergency, private school, or no certification) to student achievement gains. Their results suggest that the relevance of teacher certification is ambiguous. They found that mathematics students whose teachers are not certified in the content area, or who have private school certification, do not perform as well as students whose teachers have standard, probationary, or emergency certification in the subject area. On the other hand, they also found that “holding all else constant, there is no
evidence that teachers with standard certification outperform those with emergency credentials,” despite the fact that teachers with emergency certification had less experience and were more likely to teach in high-poverty schools (Goldhaber & Brewer, 2000, p. 139). As with prior research, they determined that student and family background characteristics, including prior student achievement, “explain the overwhelming majority of the variance in 12th grade mathematics and science test scores,” (Goldhaber & Brewer, 2000, p. 136). Moreover, students who performed poorly on the prior test administrations were more likely to subsequently be assigned to teachers without standard certification putting them at even greater academic risk.

Goldhaber and Brewer (2000) also point out that since state licensure requirements vary from state-to-state, student achievement scores might be expected to reflect differences in eligibility requirements or exam administrations. However, the results of their analyses, which were conducted on 12th grade students in a national dataset (NELS:88), did not reflect that such differences had an impact on student performance on standardized tests. Similarly, in a multilevel analysis of ECLS-K data, Guarino, Hamilton, Lockwood, Rathbun, and Hausken (2006) found that teacher certification was unrelated to kindergarten student achievement gains and was also unrelated to teacher emphasis on instructional practice scales in reading and math, with the exception of a positive association between certification and emphasis on measurement and advanced topics in mathematics.

In contrast, Clotfelter, Ladd, and Vigdor’s (2006, 2007a) analyses of North Carolina data of elementary students found that higher student achievement is associated with increases in teacher licensure test scores and that teachers with provisional or
emergency licenses are not as effective as teachers with standard licenses. However, in their analysis, they were not able to detect whether the negative effect of provisional or emergency licenses endured once teachers received their regular license. With regard to the licensure test scores, the results were nonlinear in that having a teacher whose scores were at either extreme had a larger effect on student achievement than teachers with average test scores (Clotfelter, Ladd & Vigdor, 2007a).

In addition to state licensure certification requirements, many veteran teachers receive national board certification through the National Board for Professional Teaching Standards. Goldhaber and Anthony (2005) found that national board certification identifies highly qualified teachers through its application process, as applicants who become certified are more effective than unsuccessful applicants. They also found that national board certification provides information about teacher quality “above and beyond what can be learned from performance on teacher licensure tests alone” (Goldhaber and Anthony, 2005, p. 15). However, they also found that teachers with national board certification were actually more effective prior to certification than after they were certified. They surmised two potential explanations for this phenomenon: (1) that board-certified teachers take on additional responsibilities, and/or (2) because evidence shows that high-achieving students are more likely to have highly qualified teachers, there may be a regression-toward-the-mean effect among students scoring high on pre-test scores resulting in a negative bias in the estimates of board certified teachers.

National Board Certification is often linked to constructivist approaches to teaching, intensive self-reflection on one’s own teaching practices, and on language development and language arts (Goldhaber and Anthony, 2005; Darling-Hammond,
Thus, it may not be surprising that in another study national board certification was related to increased student achievement in reading, but not in mathematics (Clotfelter, Ladd & Vigdor, 2006). In their longitudinal analysis, Clotfelter, Ladd and Vigdor (2007a) found that teachers with national board certification were more effective than those without the certification, but again they were unable to tell whether the effect was associated with becoming board certified or they were simply more effective prior to applying for the certification.

Unfortunately, whether or not a teacher has National Board Certification is not contained in the ECLS-K database. As a result, this variable, which would be of particular interest for the comparison between Title I and non-Title I schools, cannot be included in the quantitative analysis.

**Teacher Degree**

With regard to degree levels, teachers with advanced degrees were generally not more effective than teachers with only undergraduate degrees (Clotfelter, Ladd & Vigdor, 2006, 2007a; Goldhaber & Brewer, 1997; Guarino, et al. 2006; Nye, Konstantopoulos & Hedges, 2004; Wenglinsky, 2002). Further, in the case of teachers who pursued their master’s degree more than five years after entering teaching, they were slightly less effective than teachers without a master’s degree (Clotfelter, Ladd & Vigdor, 2006, 2007a).

Overall, teacher major is moderately related to student achievement (Wenglinsky, 2002). However, students whose teachers have a content-related bachelors or master’s degree have higher mathematics test scores than students whose teachers had degrees in other content areas (Goldhaber & Brewer, 1997, 2000). In addition, even if they did not
have content-related degrees, teachers who had more college-level courses in mathematics or courses on math pedagogy were associated with higher student achievement scores in math (Monk, 1994).

Similarly, Kukla-Acevedo (2009) found that teacher overall college GPA consistently has a positive impact on students’ math achievement, and the effect is larger for African American students. There is also an indication that math education GPA predicts math achievement across groups, but the effect is small. Still, Kukla-Acevedo contends that the cumulative effect over time could be considerable.

**Teacher Experience**

Some studies have found that students of teachers with greater experience (i.e., more years teaching in the classroom) had higher achievement scores (Clotfelter, Ladd & Vigdor, 2006, 2007; Goldhaber & Anthony, 2005; Goldhaber & Brewer, 1997; Jepsen, 2005; Murnane & Phillips, 1981; Noell, 2005; Rivkin et al., 2005; Sanders, Ashton & Wright, 2005). However, other studies have not found that teaching experience had a significant impact on student achievement (Cooper & Cohn, 1997; Ehrenberg & Brewer, 1994; Ferguson & Ladd, 1996; Wenglinsky, 2002). Kukla-Acevedo points out that in some cases this is likely due to the use of “OLS estimation without fixed effects, making the estimates vulnerable to omitted variable bias” (p. 49). In other cases, OLS estimation does not account for the lack of significant relationship between teacher experience and student achievement (Guarino, 2006).

Using the Tennessee Project STAR (Student-Teacher Achievement Ratio) data in which students were randomly assigned to classrooms, teachers with more than three years of experience had significant impacts on student achievement gains only for second
grade reading and third grade mathematics achievement when gain scores were used (Nye, Konstantopoulos & Hedges, 2004). The effects were smaller and significant only for second grade reading if achievement status was used.

Murnane and Phillips (1981) indicate that the relationship between teacher experience and student achievement is non-linear, and it is hypothesized that the negative impact of experience at certain points may be related to other factors, such as labor market conditions when a teacher enters the field or life cycle stages. Thus, they contend that the impact of teacher experience may differ among various cohorts of teachers.

Rivkin, Hanushek and Kain (2005) found that teachers with less than three years of experience performed significantly worse than teachers with more experience, and they hypothesized that the differences may be related to two factors: (1) new teacher adjustment periods as they learn to teach, and (2) the attrition of ineffective teachers in the early years of teaching. They also found that the benefits of additional years of experience were small and not significant.

Clotfelter, Ladd and Vigdor (2006) found statistically significant positive effects of teacher experience on student achievement in both reading and mathematics. The differences in teacher effectiveness were greatest for teachers in their first one to two years of teaching, after which the slope flattened out and peaked in the range of 20+ years of experience. Likewise, Kukla-Acevedo (2009) found significant positive effects for teacher experience which peaked at 14 years of experience before beginning to decline and have a negative impact on student achievement.

In a follow-up study, Clotfelter, Ladd, and Vigdor (2007a) conducted a longitudinal analysis of third, fourth, and fifth grade elementary students in North
Carolina from 1995-2004 in order to investigate whether the effects of years of teaching experience in the cross-sectional study were due to the increased effectiveness as teachers gained experience or to higher rates of attrition among lower-quality teachers. As in the cross-sectional study, they found that teachers with greater experience were consistently more effective than less experienced teachers, and were most likely to be so, due to experience-related improvement as opposed to attrition. Examining the opposite view of teacher attrition, Krieg (2006) called into question the frequent assumption that the field of education loses high-quality teachers in disproportionate rates, finding instead that teacher characteristics and quality are unrelated to attrition, except in the case of high-ability women who were actually less likely to exit the profession.

**Teacher Preparation**

The focus on teacher effectiveness has stimulated interest in strengthening teacher preparation, and many states have undertaken efforts to reinforce licensure standards and verify the qualifications of prospective teachers, at the same time that they are creating additional pathways for teachers in order to meet increasing demands. Some states are implementing or considering the implementation of systems to assess the impact of specific teacher preparation programs on student achievement.

In at least one study, highly qualified teachers were found to be more equitably distributed in New York City schools in 2005 than they were in 2000 with many schools having large proportions of minority and high-poverty students seeing improvements in teacher qualifications. This increase in teacher qualification appeared to be due to policy changes in the recruiting and hiring of new teachers. "Nonetheless, a meaningful number
of schools with large proportions of poor students did not demonstrate such improvement” (Boyd, Lankford, Loeb, Rockoff, and Wyckoff, 2007).

This shift in teacher qualification was due, at least in part, to entry pathways created for Teaching Fellows and Teach for America teachers who, on average, had higher test scores and stronger academic backgrounds; moreover, the strengthening of teacher qualifications associated with these additional entry pathways appear to have resulted in increased student achievement (Boyd, Lankford, Loeb, Rockoff, and Wyckoff, 2007). Other studies suggest that teachers participating in alternative certification programs that require extensive supervision or clinical experiences have a positive impact on student achievement and are more likely to employ instructional strategies that increase student achievement (Gimbert, Bol & Wallace, 2007; Miller, Miller & McKenna, 1998).

Boyd, Grossman, Lankford, Loeb & Wyckoff (2009) conducted a more in-depth investigation of the effects of teacher preparation on teachers’ impact on value-added student achievement scores. Controlling for the entering characteristics of teachers, they found that programs that emphasized content or practice related to a teacher’s first-year experience had a positive effect on student achievement. Examples of such content or practice included: the opportunity to engage in the actual practices of teaching, increased supervision of student-teaching, required capstone projects, opportunities to review the actual curriculum used in the district, and congruence of their student-teaching placement.

Similarly, coursework taken by teachers is related to the emphasis placed on certain instructional practices. For example, two or more courses in reading pedagogy is
related to increased emphasis on mixed-achievement grouping, four or more courses is related to greater emphasis on student-centered instruction, and six or more courses is related to emphasis on phonics and reading and writing activities (Guarino et al., 2006). Likewise, courses pertaining to teaching mathematics were related to emphasis on each of the ECLS-K mathematics instructional practice scales, except for measurement and advanced topics (Guarino et al., 2006).

There were no questions related to teacher preparation included in the ECLS-K teacher questionnaires. However, it is anticipated that the qualitative interviews will provide an opportunity to explore teachers’ perceptions about the impact of their teacher preparation programs on their teacher attitudes and practices.

**Teacher Attitudes**

Research has found that teacher attitudes are shaped by the interrelated perceptions of their sense of self-efficacy pertaining to their ability to impact student learning, their expectations of students and their opinions of the factors that influence student achievement, and their views of school climate and organizational structure.

**Teacher Efficacy**

Bandura (1977) distinguished efficacy expectations from outcome expectations. He defined *outcome expectations* as “a person’s estimate that a given behavior will lead to certain outcomes,” whereas an *efficacy expectation* is the “conviction that one can successfully execute the behavior required to produce the outcomes” (Bandura, 1977, p. 193). Thus, people’s doubts about their ability to carry out an action or behavior, may inhibit them from engaging in the behavior they know or believe will produce the desired outcome and could influence their actions, efforts, persistence, and coping strategies.
Bandura (1977) outlined four sources of efficacy: performance accomplishments (later termed mastery experiences), vicarious experience, verbal persuasion, and emotional arousal.

Initial attempts to measure teacher efficacy were done with two statements developed by the RAND Corporation (Tschannen-Moran, Hoy & Hoy, 1998). Later, Gibson and Dembo (1984) developed a 30-item instrument to measure teacher efficacy containing two factors which they labeled, personal teaching efficacy and teaching efficacy (often referred to as general teaching efficacy). The personal teaching efficacy factor reflects teachers’ sense of responsibility and belief in their ability to impact student learning, and general teaching efficacy is the extent to which teachers believe their ability to affect change is inhibited by external factors (Gibson & Dembo, 1984). Hoy and Spero (2005) suggest that instead of measuring outcome expectancy as Gibson and Dembo anticipated, the second factor appears to “reflect a general belief about the power of teaching to reach difficult children and may have more in common with teachers’ conservative/liberal attitudes towards education” (p. 347). Studies have shown that both the RAND statements and the Gibson and Dembo instruments are significantly related to student achievement (Tschannen-Moran, Hoy, & Hoy, 1998).

Bandura contends that “those who cease their coping efforts prematurely will retain their self-debilitating expectations and fears for a long time” (Bandura, 1977, p. 194), and this has been interpreted to suggest that teacher efficacy is most likely to be developed or changed in the early years of teaching (Ross, 1994; Tschannen-Moran, Hoy, & Hoy, 1998). In a longitudinal analysis of teacher efficacy in novice and preservice teachers, Hoy and Spero (2005) found that teacher efficacy rises during
teacher preparation and student teaching, but falls when novice teachers begin their first year as teacher of record. Experienced teachers’ efficacy is generally stable, and once established is not easily changed; on the other hand, when teachers take on new activities or practices, their efficacy may decline for a time before rising again and increasing their overall sense of efficacy (Ross, 1994). There is also evidence that the collective efficacy manifest among teachers in schools is positively associated with student achievement (Goddard, Hoy, & Hoy, 2000; Lee, Smith & Croninger, 1997; Tschannen-Moran, Hoy & Hoy, 1998).

**Teacher Expectations**

Rosenthal and Jacobson (1968) introduced the theory that teacher expectations have an effect on student achievement and thus become self-fulfilling prophecies. As Brophy and Good (1970) pointed out, Rosenthal and Jacobson had, at best, identified the “existence of expectancy effects; their study did not address itself to any of the events intervening between the inducement of teacher expectations and administration of the criterion achievement test” (p. 365), and thus the concept was initially met with controversy and criticism. Brophy and Good (1970) advocated the systematic examination of teacher expectations and began this body of research by investigating how teacher expectations are communicated to students and how students respond. They found that teacher expectancy is related to achievement test scores, class performance, and interaction between students and teachers.

In their examination of teacher expectations, Cooper, Findley, and Good (1982) found that perceived ability and perceived-tested ability structure were related to student achievement, but teachers’ expectations of student improvement was not, in fact, related
to actual student performance on achievement tests. Teacher expectations also have been found to have an impact on student performance even if there is little knowledge of or contact with the student before the expectations are formed and the effects were consistent irrespective of the performance instruments used (Raudenbush, 1984). However, the more a teacher knows a child before developing the expectation, the smaller the effect of expectation bias on performance (Raudenbush, 1984).

Teacher expectations are thought to be related to the achievement gap for minority students, and some studies reveal that the effects of teacher expectation on student achievement are stronger for African American students than for European American students (Jussim, Eccles, & Madon, 1996; McKown and Weinstein, 2002). McKown and Weinstein (2008) examined the link between teacher expectations, classroom contexts, and the achievement gap. In classrooms with high levels of diversity and high levels of student-perceived differential teacher treatment between high-achieving and low-achieving students, teacher expectations were significantly lower for African American and Latino students with similar prior achievement levels to Asian American and European American students and are associated with year-end achievement gaps (McKown and Weinstein, 2008). On the other hand, in classrooms with low levels of student-perceived differential treatment, teacher-expectation bias was lower and resulted in “a negligible contribution to the year-end achievement gap” (Mckown and Weinstein, 2008, p. 256).

Perceptions of School Climate and Community

Teachers’ perceptions of their school climate and community further impact their teaching efficacy and their expectations of students. School organizational structures that
are more communal in nature than bureaucratic influence teacher professionalism and academic achievement (Lee, Smith, & Croninger, 1997). Teachers in schools with communal structures “believe that they can and should address their students’ academic problems, rather than place the cause of such problems on factors outside themselves, such as the families and the students” (Lee, Smith, & Croninger, 1997). However, perceptions of the organizational structure and communal nature of schools differs significantly within schools due to teachers’ different social backgrounds and experiences, as well as departmental differences in teacher working conditions (Rowan, Raudenbush & Kang, 1991). Schools exhibiting communal organization and supportive environments are strong predictors of teacher efficacy and satisfaction (Lee, Dedrick & Smith, 1991).

**Teacher Instructional Practices**

As Palardy and Rumberger (2008) indicate, teacher instructional practices have not been included in much of the econometric studies of teacher effects related to student achievement. However, the ECLS-K database permits the investigation of relationships among a number of teacher practices and student achievement, including frequency of reading instructional practices, mathematics instructional practices, and teacher evaluation of students.

*Instructional Practices – Reading*

The ECLS-K data revealed that the use of phonics is positively associated with kindergarten student achievement, as is the use of integrated language arts, and the effect of integrated language arts is greater than the effect of phonics (Xue & Meisels, 2004). The classroom means were higher when both approaches were used frequently, and
“teachers who used phonics instruction more frequently were also likely to engage children in integrated language arts activities more frequently” (Xue & Meisels, 2004, p. 207). However, integrated language arts instruction was more effective for students with higher entry scores, whereas phonics instruction was unrelated to initial assessment scores.

A number of instructional practices pertaining to reading (reading and writing skills, a didactic approach, phonics, and reading and writing activities) were found to have a significant relationship with student achievement gains, whereas comprehension, mixed-achievement grouping, and student-centered instruction were found to have no significant relationship with achievement gains (Guarino, Hamilton, Lockwood, Rathbun, & Hausken, 2006). Amount of time spent teaching reading is related to the emphasis on instructional practice scales. In addition, teachers with more coursework in reading pedagogy placed increased emphasis on mixed-achievement student grouping strategies (Guarino et al., 2006). Teacher certification and advanced degrees are unrelated to teachers’ emphasis on the instructional practice scales, but kindergarten teaching experience has a negative association with student-centered instruction (Guarino et al., 2006).

**Instructional Practices – Math**

Analysis of the ECLS-K data for kindergarten students revealed Instructional practices pertaining to traditional practices and computation, advanced numbers and operations, measurement and advanced topics, and student-centered instruction have a positive association with student achievement gains in math, whereas an emphasis on numbers and geometry has a negative association with student gains (Guarino et al.,
Teacher certification, coursework, experience, and part-time status were unrelated to student achievement. However, teacher certification is associated with frequency of use of measurement and advanced topics, teaching experience is related to mixed-achievement grouping, and part-time status is negatively associated with the traditional practices and computation scale (Guarino et al., 2006).

Some studies have shown that teacher professional development is significantly related to instructional practices (Wallace, 2009; Wenglinsky, 2002). Wenglinsky (2002) found three constructs related to classroom practices in the NAEP data to be positively related to student achievement: hands-on learning, solving unique problems, and avoiding reliance on inauthentic assessments. Likewise, schools where teachers foster these practices have higher mathematics achievement scores.

Professional development also has a small but sometimes significant effect on student achievement when it is mediated by teacher practice (Wallace, 2009). Teachers majoring in content-related areas are more likely to attend professional development in math and science and to engage their students in hand-on learning and point-in-time assessments, which are significantly related to student achievement gains (Wenglinsky, 2004). Nonetheless, the combined direct effects of teacher practice are greater than the indirect effects of professional development (Wallace, 2009).

**Instructional Practices – Evaluation**

From a measurement perspective, it is argued that teachers should assign grades solely on the basis of academic achievement (Brookhart, 2004; Randall & Englehard, 2010). According to this perspective, other non-achievement factors may be assessed by teachers but should not be included in student grades. In addition, a measurement
perspective calls for teachers to incorporate measurement principles, such as reliability, validity, and standard errors of measurement, into their classroom assessment practice (McMillan, 2003). Contrary to the recommendations of measurement assessment professionals, teachers frequently include non-achievement factors in their assessment and grading (Brookhart, 2004; McMillan, 2003). Non-achievement factors frequently included in teachers’ assessment of students include ability, effort, participation, improvement, and behavior (McMillan, Myran & Workman, 2002; McMillan, 2003; Randall & Englehard, 2010).

From an instructional perspective, evaluation of students is strongest when it is directly linked to specific classroom learning goals and instructional practices. The incorporation of multiple modes of assessment linked to specific classroom contexts maximize student learning, increase student motivation and transfer of understanding, and provide information to improve teacher practices (Marzano, 2000). These two perspectives are not mutually exclusive, and some advocates of assessment consistent with social-constructivist approaches to teaching and learning, also recommend that teachers consider the measurement properties of their classroom assessments. Although the classroom assessments are not subject to the same requirements for reliability and validity as high-stakes achievement testing, teachers are encouraged to explore measurement principles that can aid in increasing consistency and avoiding biased assessments (Shepard, 2000).

The ECLS-K database includes a number of questions pertaining to teachers’ evaluation of students. The questions do not specify teachers’ use of such assessments (i.e., whether or how these evaluations are related to grades assigned to students).
High-Ability Students

Researchers point out that although “gifted” students are often talked about as one group, there is actually considerable heterogeneity in the group (Coleman, 2010; Reis & Renzulli, 2010). Even for schools that do have “pull out” programs for gifted children, there is still a broad range of abilities and talents among these students (Coleman, 2010), and research supports the conception of giftedness as a multidimensional construct that includes “non-intellectual qualities and intellectual potential, such as motivation, self-concept, and creativity” (Reis & Renzulli, 2010). As a result, some scholars advocate the use of terms such as high ability as opposed to “gifted.” Reis and Renzulli (2010) point out that in the broader conception of giftedness, the underrepresentation of diverse students is even more glaring and is likely attributable to ineffective processes and procedures for identification of giftedness.

Educators and researchers question whether gifted students are being challenged at sufficient levels, as most high-ability students in the United States are educated in general education classrooms (Bangel, Moon & Capobianco, 2010). This situation is compounded for high-ability students from underserved populations (Hebert & Reis, 1999). Researchers argue that the lack of challenge is largely attributable to insufficient differentiation practices by classroom teachers (Reis & Renzulli, 2010; Archambault et al., 1993). In addition, classrooms often do not have the materials, such as above-level books, to support advanced students (Reis et al., 2004). Differentiated curricula that enrich the learning of high-ability students and that engage and motivate them include six key elements: acceleration, depth, complexity, challenge, creativity, and abstraction (Little, C.A., 2012; VanTassel-Baska and Stambaugh, 2006). However, as noted by
several scholars and researchers the curricular components and the instructional strategies recommended to enhance the learning of high-ability students are often similar if not identical to those reflected in the Common Core Standards and other frameworks directed toward all students (Little, 2012; Scot, Callahan, & Urquhart, 2009; Tomlinson, 2005). As Tomlinson states, “good curriculum for gifted learners begins with good curriculum and instruction” (2005, p. 161).

Consistent with these standards and recommendations for adequate levels of differentiation, a practice that teachers can use to meet the needs of high-ability students is curriculum compacting, which is “the process of modifying the curriculum and eliminating previously mastered work for high-ability students” (Reis & Renzulli, 2010). The problem that arises is that many, if not most, teachers in general education classrooms have not been trained to implement complex strategies for high levels of differentiation (Bangel, Moon & Capobianco, 2010). Moreover, when teachers do have such training, the current environment of high stakes testing and reporting often leads many school and district administrators to prevent teachers from implementing such practices in order to adhere to curricular guidelines with fidelity (Bangel, Moon & Capobianco, 2010; Scot, Callahan, & Urquhart, 2009). Such constraints are misguided and counter-productive, and the use of an approach that provides adequate training for teachers and that integrates the assessment of the interests and learning needs of individual students with best practices for differentiated instruction and learning, could lead to improved performance and achievement of the majority of learners (Coleman, 2003; Scot, Callahan & Urquhart, 2009). While the instructional strategies and differentiation that benefit high-ability students also benefit all learners, some researchers
maintain that programs targeted toward high-ability students are better able to provide the acceleration needed to result in higher achievement for gifted and talented learners (Duan, Shi, & Zhou, 2010). Nonetheless, as noted above, researchers point out that high ability students are not a homogenous group, and complex levels of differentiation and high-quality instruction is needed even within such targeted programs.

**Classroom Context**

Researchers have investigated a number of classroom effects related to student achievement, including class size and classroom composition. The results of research examining the relationship between class size and student achievement are mixed. Class size and proportion of students eligible for free and reduced lunch students are reported to have a negative association with student achievement (Clotfelter, Ladd & Vigdor, 2007a; Nye, Hedges & Konstatopoulos, 2004). However, Hanushek (2000) points out that while a number of studies report a significant positive relationship between class size and student achievement, other studies report a significant negative relationship between the two, and the majority of studies report no significant relationship. More recently, Borland, Howsen, & Trawick (2005) discuss the limitations of prior research, as well as improved methods that account for these limitations. In their research, they found a statistically significant non-linear and non-monotonic relationship between class size and student achievement in five subjects including reading and math. They concluded that there is an optimum class size ranging from 21 to 23 students related to student achievement. Likewise, Jepsen & Rivkin (2009) found that smaller class size is related to elementary student achievement, and that the effects are larger for low SES students. They found that class size affected math and reading academic achievement, but the
effects of class size are often hampered by teacher inexperience and lack of full certification, particularly in schools with high proportions of low SES or minority students.

Researchers also report that classroom composition, or “peer effects,” also affect student learning, especially for low-performing students and for some groups of students (Hanushek, Kain, Markman, & Rivkin, 2003; Hoxby, 2000; Kukla-Acevedo, 2009; Palardy & Rumberger, 2008). Students ranked at both low- and middle-ability levels have been found to benefit from having high-quality peers in their classrooms (Burke & Sass, 2008).

The ECLS-K database permits the inclusion of a class size and proportion of minority students in the class to be included in the analysis. Unfortunately, the structure of the data does not include information that permits researchers to examine peer-achievement levels.

**Quantitative Analyses of Teacher Effectiveness**

There are a number of research traditions investigating the relationship between teacher effects and student achievement. Researchers discuss how different conceptual and methodological approaches contribute to different conclusions and effect sizes (Hill, Rowan, & Ball, 2005; Rowan, Correnti, & Miller, 2002). This research originated with process-product research, which Hill, Rowan, and Ball (2005) described as classroom-level research examining the relationship between teacher behaviors and student achievement. The premise of such studies was that “what teachers did in their classrooms might affect student achievement” (Hill, Rowan, & Ball, 2005, p. 373). In this tradition, researchers calculated empirical associations between processes (teaching
behaviors or interventions) and products (student outcomes) (Doyle, 1977). While some of these studies included experiments designed to examine student outcomes related to specific teaching behaviors or interventions, they were critiqued for their “excessive reliance” on correlational data and their inattention to subject-matter influences on findings (Hill, Rowan, & Ball, 2005). In addition, the studies did little to “explain how teacher effects occur,” and generally produced “descriptive summaries of the results of statistical analyses” (Doyle, 1977, p. 166). Seidel and Shavelson (2007) indicate that there has been little research following this tradition for more than a decade.

As educational policy placed increased emphasis on teacher quality, education production-function analyses emerged. Education production-function analyses investigate the relationship of specific teacher attributes and student achievement, and initial studies (e.g., the Coleman Report, 1966; Hanushek, 1970) attempted to control for student and family background characteristics as covariates in regression analyses (Konstatopolous, 2009). Hill, Rowan, and Ball (2005) describe two approaches to education production-function analyses. One approach examines teacher background characteristics and professional qualifications, such as degree and major content knowledge, undergraduate college ranking, type of licensure or certification (full, probationary, alternative, emergency), national board certification, years of experience, and, to a lesser extent, teacher preparation. The issues that arise with this type of education production-function analysis is the extent to which the background characteristic variables measured are proxies for teacher knowledge and skills, and the degree to which they actually contribute to student outcomes (Hill, Rowan, & Ball, 2005).
The second approach to education production function attempts to measure teacher knowledge, through items such as exam scores and subject matter expertise, in relation to student performance. In this case researchers “assume a relationship between teacher content knowledge, as measured by these assessments, and the kinds of teaching performances that lead to improved student achievement” (Hill, Rowan, & Ball, 2005). The limitations associated with this type of education production function research are: the studies are generally conducted on limited numbers of subjects; the designs of the studies do not afford broad generalizability; they are cross-sectional rather than longitudinal; the studies often involve aggregation bias or the use composite means; and they still utilize “imprecise definition[s] and indirect measurement of teachers’ intellectual resources and, by extension, the misspecification of the causal processes linking teacher knowledge to student learning” (Hill, Rowan, & Ball, 2005).

Another approach to studies investigating relationships between teacher effects and student achievement are variance decomposition models, also referred to as value-added models. These models use multilevel modeling to decompose the percentage of variance in student achievement into differences between schools, differences between classrooms within schools, and differences between students within classrooms (Rowan, Correnti, & Miller, 2002). An underlying assumption of variance decomposition models is that the variations in student achievement that is between classrooms are attributable to variations in teacher effectiveness (Konstantopoulous, 2009; Kukla-Acevedo, 2009; Nye, Konstantopoulous, & Hedges, 2004).

These studies examine variation in overall student achievement between classrooms controlling for student background characteristics, including prior
achievement. The overall results generally show positive effects of teachers on student achievement (Nye, Konstantopoulous, & Hedges, 2009; Rowan, Correnti, & Miller, 2002). However, they define teacher effects as “general constructs” and measure the variation in residualized student achievement gains across classrooms; thus, they cannot identify which teacher characteristics are responsible for teacher effectiveness (Nye, Konstantopoulous, & Hedges, 2009; Rowan, Correnti, & Miller, 2002).

There are two approaches to variance-decomposition models: covariate adjustment models and gain-score models. In the covariate-adjustment models, students’ achievement status in a given year is adjusted for students’ prior achievement, home and social background, and the social composition of schools, and the variance in students’ adjusted achievement status is decomposed into school, classroom, and student components (Rowan, Correnti, & Miller, 2002).

As indicated in this quote, covariate adjustment models decompose variations in student achievement status, as opposed to changes in student achievement. Thus, it is not unexpected that the results would show small teacher effects. Although covariate adjustment models do not eliminate confounding effects completely, they facilitate causal arguments about teacher effects more than models that do not adjust for prior achievement (Konstantopoulous, 2009).

Gain-score models, on the other hand, involve measures that are unbiased estimates of student annual growth (Hill, Rowan, & Ball, 2005). The gain score models are preferable because they address gains in achievement over a specified period and, as a result, are more accurate measures of achievement growth for use in assessing teacher effects. However, they are subject to unreliability if the variability among students is small, and thus the teacher effects on student achievement are likely to be underestimated.
(Hill, Rowan, & Ball, 2005; Rowan, Correnti, & Miller, 2009). Although the gain score models do not eliminate problems with misspecification, they substantially reduce omitted variable bias (Rivkin, Hanushek, & Kain, 2005).

As mentioned above, it is commonly agreed that teachers are an important factor in the classroom relative to student success. Despite extensive research in the area, there is little clarity about which aspects of teacher characteristics or performance are most significant. A number of econometric studies have used a progression of techniques to examine the effects of teacher background characteristics. However, until recently, teacher attitudes and teacher instructional practices have not been addressed in such analyses.

In response to the paucity of information about the effects of actual teaching practice on student achievement, Palardy and Rumberger conducted a multilevel analysis using the ECLS-K database examining the effects of teacher background characteristics, teacher attitudes, and teacher instructional practices on student achievement. For their analysis, they employed a residual gain-score model utilizing the fall and spring achievement scores in the first grade, and thus they were able to examine isolated teacher and classroom effects on student achievement gains while controlling for students’ background characteristics. In addition, they were able to investigate the extent to which background characteristics are mediated by teacher attitudes and instructional practices.

The results of the Palardy and Rumberger (2008) study revealed that the vast majority of the variance in student reading and math achievement occurs between students within classrooms, as opposed to differences between classrooms or between schools. Approximately three-quarters of the differences in student achievement
occurred between students (72.5% for reading, and 75.3% math achievement), and both family SES and ethnicity were related to student achievement in reading and math. Much smaller portions of the variance were attributable to differences between classrooms, (7.4% for reading and 7.9% for math), and differences between schools (20.2% of the variance in reading and 18.2% of the variance in math).

In comparing the effects of teacher background characteristics, attitudes, and practices, they found that only one teacher background characteristic—full certification—had an impact on gains in reading achievement and none of the background characteristics had an impact on math achievement gains. Similarly, one aspect of teacher attitudes—teacher expectations—was related to reading achievement.

With regard to instructional practices, one measure of instructional time and several measures of instructional frequency (phonics, silent reading, and frequency of writing) had significantly positive associations with reading achievement, while letter names and journal writing had negative associations. None of the measures of instructional modality were related to student achievement gains in reading. With regard to mathematics achievement, frequency of use of math worksheets and problems utilizing calendars had positive associations with achievement gains, while frequency of use of geometric manipulations had a negative relationship on achievement. Other measures of instructional practice, time, and modalities were not associated with achievement gains in math.

Summary

Quantitative research of the relationship between teacher effects and student achievement has focused primarily on teacher background characteristics, such as years
of experience, teacher certification, and level of education. The results of this research have often been mixed and in some cases, such as national board certification, ambiguous. Recently, researchers have advocated the inclusion of teacher attitudes and instructional practices in studies of teacher effectiveness.

The effects of a number of factors on the development of teacher attitudes toward teaching and student learning have been investigated, including their individual and collective self-efficacy, their expectations of students, and their perceptions of school climate and structure (Goddard, Hoy & Hoy, 2000; Lee, Dedrick & Smith, 1991; Newmann, Rutter, & Smith, 1989; Palardy & Rumberger, 2008). Instructional practices that have been shown to have either positive or negative effects on student achievement include the emphasis on time spent on specific content-related instruction, as well as the evaluation of students (Guarino, 2006).

Palardy and Rumberger (2008) conducted a multilevel analysis of teacher effectiveness to explore the importance of teacher background, teacher attitudes, and teacher instructional practices on first-grade student achievement using the ECLS-K database. They found that in first grade, the variance in reading and math achievement attributable to teacher attitudes and instructional practices was greater than that attributable to teacher background characteristics.

This study will build upon Palardy and Rumberger’s study through a mixed-methods analysis consisting of exploration of the relative influence of teacher background characteristics, teacher attitudes, and teacher instructional practices on student achievement in first, third, and fifth grades using structural equation modeling and collective case study.
Chapter III

METHODOLOGY

Mixed-Methods Research

Mixed methods research designs may be fixed or emergent. In fixed mixed-methods designs, the researcher plans in advance the order and emphasis of the analysis, whereas in emergent designs the choice to use a supplemental method is made as a result of issues that arise during the initial analysis (Creswell & Clark, 2011). In mixed-methods studies, researchers collect and analyze both quantitative and qualitative data in order to obtain a deeper understanding of a given phenomenon (Teddle & Tashakkori, 2009). Mixed-methods designs are often used when a researcher determines that one source of data and type of analysis is insufficient to fully understand the phenomenon (Creswell & Clark, 2011).

Creswell (2005) described three designs for mixed-methods research: explanatory sequential, exploratory sequential, and triangulation. Explanatory sequential mixed-methods are two-phase designs involving the collection and analysis of quantitative data followed by the collection and analysis of qualitative data. In explanatory sequential methods researchers may place priority on quantitative analysis and then use the qualitative data to refine, clarify or explain the quantitative findings. Further, in explanatory sequential designs, the participants for the qualitative study are generally a
purposive sample drawn from the quantitative study, which is generally the result of a probability sampling process (Creswell, 2005; Teddlie & Tashakkori, 2009).

Exploratory sequential designs also incorporate qualitative and quantitative data collection and analysis. However, in exploratory sequential designs priority is given to the qualitative data which is collected first. Quantitative data is then connected to extend or refine the results of the qualitative analysis (Creswell, 2005).

In triangulated mixed-methods designs, which Creswell and Clark (2011) later referred to as convergent parallel designs, researchers simultaneously collect both quantitative and qualitative data. Both types of data are given equal priority and the results are compiled and compared in the analysis. Creswell and Clark (2011) discuss additional designs for mixed-methods research that have developed since Creswell’s earlier publication. Embedded designs include both types of data within the framework of a traditionally defined research design; transformative designs may involve either sequential or concurrent data collection, and analysis within a transformative theoretical framework; and multiphase designs include concurrent and sequential quantitative and qualitative components over an extended period.

Many researchers have used Creswell’s (2005) typology for identifying their mixed-methods designs. However, a number of other typologies have emerged as the use of mixed-methods designs has increased. In their conceptualization of five types of mixed-methods designs Tashakkori and Teddlie refer to each type as a “family to portray the possible permutations of each type” (Nastasi, Hitchcock, & Brown, 2010). They contend that it is virtually impossible to identify a complete or static taxonomy because
of the constantly evolving permutations in mixed-methods designs (Tashakkori & Teddlie, 2006).

One of the designs defined by Teddlie and Tashakkori (2009) is pertinent to this study and is described as a parallel mixed-methods design:

*Parallel mixed designs* refer to [mixed methods] projects where the phases of the study (QUAN, QUAL) occur in a parallel manner, either simultaneously or with some time lapse. The phases address related aspects of the same basic research question(s). (p. 143)

However, Teddlie and Tashakkori (2009) eliminate the priority of methodological approach from their typology of mixed-methods designs “because the actual priority of approach is often determined after the study is complete” and it is not an essential component of the design (p. 140). Further, use of the parallel design eliminates the need for the participants in the qualitative phase to be drawn from the quantitative sample; instead, the sampling for the two phases of analysis may be conducted independently of one another (Teddlie & Tashakkori, 2009, p. 187).

**Sampling and Data Collection**

As indicated above, mixed methods generally involve both purposive and probability sampling linked to the appropriate phases of the study (i.e., the quantitative phase of a study will utilize a type of probability sampling, while the qualitative phase will employ primarily purposive sampling). Unlike probability samples, which are usually large-scale samples, purposive samples are small in size and are intentionally selected.

A purposive sample is typically designed to pick a small number of cases that will yield the most information about a particular phenomenon, whereas a
probability sample is planned to select a large number of cases that are collectively representative of the population of interest (Teddlie & Tashakkori, 2009, pp. 178-79).

With purposive sampling there is no prescribed number of study participants. Instead, the goal is to continue gathering data until reaching “saturation,” the point at which data collection ceases to provide new information for thematic development and analysis (Teddlie & Tashakkori, 2009). Whether employing probability or purposive strategies, sampling should be well thought out and carefully planned.

In mixed-methods research, data is collected from multiple sources using a variety of sampling techniques. In most cases, the size of the qualitative sample is considerably smaller than the sample for the quantitative component of the analysis (Creswell & Clark, 2011). When the objective of the qualitative study is to build upon or explain some of the results of the quantitative analysis, the researcher articulates what quantitative results will be examined further through the qualitative component of the study, and then identifies the participants most likely to yield the desired follow-up data in order to answer the questions posed. The participants for the follow-up qualitative analysis may or may not be drawn from the participants in the quantitative portion of the study (Teddlie & Tashakkori, 2009).

**Analysis**

Creswell and Clark (2011) summarize seven overall stages of mixed-methods data analysis: data reduction, data display, data transformation, data correlation, data consolidation, data comparison, and data integration. With regard to parallel mixed-methods designs, specifically, they involve “separate parallel processes for the analysis of the quantitative and qualitative data” (Teddlie & Tashakkori, 2009). In the quantitative
strand of the study, descriptive and inferential statistics are used in deductive analysis of the quantitative data. In the qualitative strand of the study, inductive and iterative analysis of emergent themes is conducted on data that might include observations, interviews, focus groups, video, documents, and other forms of narrative data (Creswell & Clark, 2009; Patton, 2002).

While there are separate parallel processes for the two strands of analysis, parallel mixed designs may involve parallel track analysis or crossover track analysis. With parallel track analysis, the data is evaluated using the tools and standards appropriate for each method, and then are brought together for consideration in the development of conclusions; with crossover track analysis, the inferences drawn from the two strands are interwoven in the analysis (Teddlie & Tashakkori, 2009).

After analysis of the independent strands of data, researchers begin the process of interpreting the results. This interpretation is facilitated by “inferences made on the basis of the results from each strand and are then integrated or synthesized to form meta-inferences at the end of the study” (Teddlie & Tashakkori, 2009, p. 266). The meta-inferences may be similar to or different from the inferences drawn from the independent strands, and thus they lead to deeper understanding of the phenomenon of inquiry.

In this case, the quantitative analysis was conducted using Structural Equation Modeling. The aim of the quantitative analysis was to test the models for each grade level in order to answer the quantitative research questions. The quantitative analysis was followed by a qualitative analysis to detect themes and patterns in the responses of the teachers and principal interviewed in the case study. The results of the two analyses
were then compared, using the qualitative analysis to inform and provide context for the results of the quantitative analysis.

**Structural Equation Modeling**

Structural Equation Modeling (SEM) refers to a family of statistical techniques in which researchers provide *a priori* specifications of how variables relate to one another. SEM is a large sample technique that permits the analysis of both observed and latent variables. As noted by Byrne (2010), “in the behavioral sciences, researchers are often interested in studying theoretical constructs that cannot be observed directly” (p. 4). In SEM, these underlying constructs are represented by latent variables that cannot be directly observed, and observed variables “serve as indicators of the underlying construct which they are presumed to represent” (Byrne, 2010, p. 4).

Kline (2005) states that SEM is a higher level of analysis in that it permits the evaluation of the full underlying theoretical model. In this evaluation, researchers can explore how well the model fits the sample data and whether it should be rejected, modified, or retained. SEM is considered a large sample technique because technical issues are more likely to arise when it is used with small samples and because power is substantially reduced with small samples. Thus, statistical tests do not play as large a role as they play in other techniques because large samples may yield significant results that are not extremely meaningful (Kline, 2005).

Covariance is the fundamental statistic used in SEM analysis, and it is represented by the equation:

\[
cov_{xy} = r_{xy}SD_xSD_y
\]
As Kline (2005) describes, there are two goals in SEM analysis: “to understand patterns of correlations among a set of variables, and to explain as much of their variance as possible with the model specified by the researcher” (p. 13). In the past, another name for SEM was “causal modeling.” While a goal of SEM is often to evaluate causal connections among variables, as with other statistical techniques inferences of causation require time precedence (the cause precedes the effect), association (the cause and effect are related), and isolation of effects (alternative explanations are omitted) (Shadish, Cook & Campbell, 2002).

Scholars describe three types of SEM models, although they may label these models slightly differently. The first type is a path model serving as a structural model for observed variables in which the presumed causal relationships among the variables are estimated. Path analysis is used to test hypothesized relationships among variables when there is a single measure for each variable. The second type of SEM model is called confirmatory factor analysis, which is the \textit{a priori} analysis of a measurement model specifying the relationship of observed variables and latent variables (factors).

Researchers generally describe two basic types of factor analysis: (1) exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). EFA is a data-driven approach and is used in situations where researchers are exploring potential relationships among observed and latent variables (Byrne, 2010; Kline, 2005). “EFA does not require \textit{a priori} hypotheses about how indicators are related to the underlying factors or even the number of factors” (Kline, 2005, p. 71). In EFA, the factor loadings represent the relationship of observed variables to the underlying latent construct (factor). CFA, on the other hand, is a theoretical approach and is used when researchers have a hypothesis
they wish to test with regard to the relationships among latent and observed variables. Thus, SEM is well-suited for CFA and aids researchers in examining whether the hypothesized factor structure “is consistent with the sample data” (Byrne, 2010).

The third type of SEM model is structural regression modeling in which both measurement and structural aspects of a model are specified and analyzed. These two aspects of analysis can be decomposed in two parts: specification and analysis of the measurement model followed by specification and analysis of the structural model (Kline, 2005). The specification and analysis of a valid measurement model is required prior to the evaluation of the structural components of the model. The structural component of the analysis models the hypothesized relationship among the latent variable constructs. Structural regression models may be either “fully latent” or “partially latent.” In fully latent models all of the variables in the model are latent, whereas partially latent models may contain a single observed variable as an indicator of a latent construct.

As mentioned above, exploratory factor analysis is not generally considered a part of the SEM family of statistical techniques (though some researchers, e.g., Kline (2005), have demonstrated how SEM can be used to reflect exploratory models). However, exploratory factor analysis often precedes the development of confirmatory factor analysis or structural regression models.

There are two primary means of exploratory factor analysis used for purposes of data reduction: principal axis factoring (PAF) and principal components analysis (PCA). The choice of whether to use PAF or PCA often depends on the purpose of the research. PAF is generally recommended in cases where researchers are examining underlying
theoretical constructs, whereas PCA is used to obtain an empirical summary of the data (Tabachnick & Fidell, 2001). For this reason, many researchers prefer PAF for the extraction of factors.

Like extraction, there are two primary forms of factor rotation—varimax and oblique—that aid in the interpretation of the extracted factors. Varimax is the most commonly used rotation technique, and it is used to maximize the variance and simplify the factors. Oblique rotation provides a wide range of correlations between the factors from nearly orthogonal to highly correlated, as specified by the researcher (Tabachnick & Fidell, 2001).

The most important aspect of exploratory factor analysis is that the derived factors make sense. Thus, the researcher may test a variety of solutions.

When using [factor analysis], the researcher should hold in abeyance well-learned proscriptions against data snooping. It is quite common to use PCA and [PAF] as a preliminary extraction technique, followed by one or more of the other procedures, perhaps varying number of factors, communality estimate, and rotational methods with each run. Analysis terminates when the researcher decides on the preferred solution (Tabachnick & Fidell, 2001, p. 609).

Structural models in SEM may be recursive or non-recursive. Recursive models are those in which all effects are unidirectional and the disturbances of exogenous variables are not correlated (Kline, 2005). On the other hand, non-recursive models have either multidirectional feedback loops or disturbance correlations. In addition, non-recursive models may be more difficult to analyze due to under-identification or other technical issues.

Maximum likelihood is the most commonly used estimation method in SEM. The parameter estimates derived “are the ones that maximize the likelihood (the
continuous generation) that the data (the observed covariances) were drawn from this population” (Kline, 2005, p. 112). Maximum likelihood estimation is an iterative process in which an initial solution is derived and then the analysis attempts to improve the estimates.

The assumptions of maximum likelihood are similar to other multivariate techniques, and include: the independence of observations, multivariate normality of endogenous variables, independence of exogenous variables and disturbances, exogenous variables are measured without error, and the model is correctly specified. Maximum likelihood also assumes that there are no missing values, and it analyzes only complete data.

**Case Study**

Case study research is a qualitative approach that involves the in-depth study of a contemporary phenomenon explored through one or more cases within a bounded system (Creswell, 2007; Yin, 2009). Stake (1995) refers to each case as an “integrated system” that can illuminate the complexities related to the subject of inquiry. Case studies are often used when the purpose of the research is explanatory in nature and is designed to answer “how” and “why” questions (Yin, 2009).

Case studies may focus on a single “instrumental” case, on multiple “collective” cases, or on intrinsic cases (Creswell, 2007; Stake 1995). In single instrumental case studies, the researcher selects a single bounded case to investigate the issue central to the study. In the collective case studies, the researcher selects multiple cases to investigate and illustrate the issue. In intrinsic case studies, the focus is on a single case that is considered unusual or unique.
Single cases may be selected to illuminate unique or extreme cases, or to serve as a critical test to support, challenge, or build upon a theoretical construct (Creswell, 2007; Yin, 2009). On the other hand, a researcher may intentionally select a single case because it represents a “typical” or “average” case (Yin, 2009). Multiple case studies involve two or more cases selected to facilitate a replication design (Yin, 2009).

Data collection for case studies is extensive and involves multiple sources of evidence including direct observations, participant observations, interview, documents, archival records, audiovisual materials, and physical artifacts (Creswell, 2007; Yin, 2009). Data collection for case study research requires meticulous organization and maintenance of the data at all stages of the process. This includes maintaining a schedule for obtaining the various sources of data, tools for recording and storing collected data, maintaining the chain of evidence, and manipulating the data (Creswell, 2007; Stake, 1995; Yin, 2009).

In addition to meticulous organization, analysis of case study data collected from multiple sources requires in-depth review, as well as repeated summarization and manipulation of the data. Yin (2009) describes the preliminary stages of manipulating the data:

- Putting information into different arrays
- Making a matrix of categories and placing the evidence with such categories
- Creating data displays—flowcharts and other graphics—for examining the data
- Tabulating the frequency of different events
- Examining the complexity of such tabulations and their relationships by calculating second-order numbers such as means and variances
- Putting information in chronological order or using some other temporal scheme (p. 129)
Further analysis is guided and supported by consideration of theoretical propositions and connections, in-depth descriptions of the case and its context, the use of multiple tools for coherently representing the data, and communicating outcomes, as well as examination of disconfirming evidence and rival explanations (Creswell, 2007; Yin, 2009).

Mixed-Methods Design

The present study employed a multistrand parallel mixed-methods design (Tashakkori & Teddlie, 2009). In this case, the bulk of the quantitative phase, or strand, of the study preceded the qualitative phase of the study. In this way, the design was similar to the explanatory sequential design described by Creswell (2005). The quantitative phase of the study consisted of a secondary analysis of data collected in the ECLS-K database. The qualitative phase of the study consisted of a collective case study of teachers at an “innovative” school that meets state expectations for student growth on standardized achievement tests. Here I use the term “innovative” in a generic sense as opposed to the specific designation used by the state. Although the school is not a state-designated “innovation school,” it appears to have a number of features that lead me to describe it as innovative. It has strong, goal-oriented leadership focused on improving student achievement through a number of strategies, including: (1) data-driven instruction that meets the needs of all students; (2) instructional practices aimed at increasing the long-range understanding and performance of students; and (3) increasing the capacity and effectiveness of teachers in their classrooms by having high expectations of teachers, by providing tools and training to support the teachers, and by fostering an
environment of continuous evaluation and improvement. In addition, the school has a
magnet gifted and talented program.

The rationale for using a parallel mixed-methods design in this case was that it
permitted investigation of an overall research question from different perspectives
(Teddlie & Tashakkori, 2009). The quantitative analysis revealed information about the
relative contributions of teacher background characteristics, teacher attitudes, and teacher
instructional practices on student achievement, and it analyzed whether there were
differences in these influences for: (1) students in schools receiving Title I funds and
students in schools that do not receive Title I funds, (2) students of color and white
students, and (3) high-ability students and non-high-ability students. The quantitative
analysis consisted of descriptive statistics, factor analysis, and structural equation
modeling to address the quantitative research questions identified above; it identified
significant results, non-significant results, outliers, and similarities and differences in the
model fit for different groups.

In the qualitative collective case study phase, data was collected through
individual semi-structured interviews of the teachers, an individual interview of the
principal, classroom observations of teachers’ classes, a review of course plans for
teachers when they were available. The interviews and observations were designed to
enhance and provide context for the quantitative findings, to explain the differences and
similarities in student achievement relative to teacher practices, and to gain an
understanding of teacher perspectives about teacher and classroom influences on student
achievement. Once the qualitative analysis was completed, the quantitative and
qualitative results were synthesized, and the extent to which the qualitative results explain, enhance, inform, and/or provide context for the quantitative results was addressed.

**Quantitative Research Design**

**Introduction**

As discussed above, the Palardy and Rumberger (2008) study illustrates the additive effects of teacher attitudes and teacher instructional practices to studies of teacher effectiveness on first-grade student achievement gains. The purpose of the quantitative portion of this study was to further investigate the impact of teacher attitudes and instructional practices in first, third, and fifth grades.

**Data and Sample**

The Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K) is a multi-source, multi-method study of early childhood education (National Center for Education Statistics, 2009). The study was originally designed to gather data from a nationally representative sample of children from Kindergarten through fifth grade. Later, an additional wave of the study collected data when the students were in the eighth grade.

The ECLS-K consists of data collected from children in the first, third, fifth, and eighth grades, and age-appropriate changes were made in the data collection over time. In addition, the ECLS-K contains data collected from parents, teachers, and school administrators. Thus, the data appeared to be well-suited for analyses of student growth and teacher effects.
For this analysis, the K-8 Full Sample public-use data files for the ECLS-K were used. The K-8 Full Sample public use files contain the data for all of the administrations from kindergarten through eighth grade. This analysis will be limited to the elementary data for first, third, and fifth grades. The full sample of extracted data is of 21,409 children, however the records of students for whom no achievement scores were available were eliminated, bringing the sample size to 17,281.

**Model Development**

In this study, a number of structural equation models were developed and tested pertaining to student achievement in reading and math. To develop the models, the reliability of a series of variables from the ECLS-K data related to teacher background characteristics, teacher attitudes and instructional practices were tested. The data was then split using 50 percent of cases for exploratory factor analysis, and 50 percent of the cases for confirmatory factor analysis.

In the exploratory factor analyses conducted for this study, SPSS Version 17 factor reduction was used beginning with PAF extraction and varimax rotation. If the factors did not make sense or were not upheld in the confirmatory analysis, principal components extraction and/or oblique rotation were used to explore alternative solutions. As noted by Tabachnick and Fidell (2001), although a number of techniques were employed, the solutions were often quite similar.

Confirmatory factor analysis was conducted with SEM via Amos Graphics Version 17 (SPSS, Inc.) on factor solutions identified through exploratory factor analysis. The teacher questionnaires consisted of two sets of questions. Because SEM is susceptible to outliers and missing data, all cases were eliminated if there were no
responses to one set of the questions. This substantially reduced the amount of missing data. Outliers were detected using Mahalanobis Distance and eliminated.

**Student Achievement Outcome Variables**

The ECLS-K data collection included achievement tests administered to students to assess their academic achievement in two cognitive domains (reading and mathematics) in first and third grades, and in three cognitive domains (reading, mathematics, and science) in fifth and eighth grades. This analysis used the IRT scale scores in reading and mathematics in first through fifth grades. The IRT scale scores estimate student achievement for the full set of questions in each cognitive domain. The IRT scale scores use the “pattern of responses to test the probability of correct responses for all assessment questions” (National Center for Education Statistics, 2009). With the IRT scores it is possible to measure student gains in achievement over time “even though the assessments that are administered are not identical at each point” (National Center for Education Statistics, 2009, pp. 3-6).

The kindergarten through fifth grade reading proficiency levels included: letter knowledge, beginning sounds, ending sounds, sight words, words in context, literal inference, extrapolation, evaluation, evaluating nonfiction, and evaluating complex systems.

The following table shows the means and standard deviations reported for the ECLS-K IRT scale scores for reading and mathematics: 53
Table 1:
IRT Scale Scores for Reading and Mathematics (ECLS-K)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Range of Values</th>
<th>Weighted M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4R4RSCL</td>
<td>Grade 1 Reading Score</td>
<td>0-212</td>
<td>77.07</td>
<td>23.70</td>
</tr>
<tr>
<td>C5R4RSCL</td>
<td>Grade 3 Reading Score</td>
<td>0-212</td>
<td>125.70</td>
<td>28.57</td>
</tr>
<tr>
<td>C6R4RSCL</td>
<td>Grade 5 Reading Score</td>
<td>0-212</td>
<td>148.67</td>
<td>26.85</td>
</tr>
<tr>
<td>C4R4MSCL</td>
<td>Grade 1 Math Score</td>
<td>0-174</td>
<td>61.50</td>
<td>17.66</td>
</tr>
<tr>
<td>C5R4MSCL</td>
<td>Grade 3 Math Score</td>
<td>0-174</td>
<td>98.77</td>
<td>24.96</td>
</tr>
<tr>
<td>C6R4MSCL</td>
<td>Grade 5 Math Score</td>
<td>0-174</td>
<td>122.94</td>
<td>25.18</td>
</tr>
</tbody>
</table>

Table 2:
IRT Scale Scores for Reading and Mathematics (This Analysis)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>N</th>
<th>Range</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4R4RSCL</td>
<td>1st Grade Reading Score</td>
<td>14,743</td>
<td>25-184</td>
<td>77.75</td>
<td>23.63</td>
</tr>
<tr>
<td>C5R4RSCL</td>
<td>3rd Grade Reading Score</td>
<td>11,639</td>
<td>51-201</td>
<td>128.03</td>
<td>27.61</td>
</tr>
<tr>
<td>C6R4RSCL</td>
<td>5th Grade Reading Score</td>
<td>10,813</td>
<td>65-203</td>
<td>150.23</td>
<td>26.33</td>
</tr>
<tr>
<td>C4R4MSCL</td>
<td>1st Grade Math Score</td>
<td>15,004</td>
<td>13-132</td>
<td>61.58</td>
<td>17.92</td>
</tr>
<tr>
<td>C5R4MSCL</td>
<td>3rd Grade Math Score</td>
<td>11,706</td>
<td>35-166</td>
<td>99.69</td>
<td>26.33</td>
</tr>
<tr>
<td>C6R4MSCL</td>
<td>5th Grade Math Score</td>
<td>5,347</td>
<td>51-171</td>
<td>123.54</td>
<td>24.93</td>
</tr>
</tbody>
</table>

Reliability statistics test the consistency of a measurement over a series of items (Bond & Fox, 2011; Cronbach, 1960). Reliability assesses “the extent to which test items in a set are related to each other and to the score scale as a whole” (National Center for Education Statistics, pp. 3-25). The reliability reported for the reading IRT scores from first through fifth grades range from .93 to .96. The reliability for the mathematics IRT scores range from .94 to .95.
The validity of the ECLS-K cognitive assessments in reading and mathematics was established through multiple sources, including a review of and comparison with national and state performance standards, as well as comparisons with the NAEP frameworks and other publishers. In addition, input from a panel of secondary educators and curriculum experts reviewed the test content and specifications (National Center for Education Statistics, 2009).

*Teacher Background Characteristics*

In this study, teacher background characteristics were measured by number of years of experience, type of certification, ESL certification (third and fifth grade), and highest degree earned, as shown in Figure 2. The model is consistent across the three years of administration. These variables were identified through a review of the literature related to the relationship of teacher background characteristics and student achievement. Exploratory factor analysis using PAF with varimax rotation revealed that ESL certification does not load on this factor. However, as this resulted in a just identified model, confirmatory factor analysis was conducted using all four variables for third and fifth grades. The results of the confirmatory factor analyses are shown in Table 3 below. At this point ESL certification was not removed from the model. For fifth-grade math, only two items loaded on the background characteristics factor, as the exploratory factor analysis revealed that type of teaching certificate may load on a second factor. Nonetheless, using the initial four-item factor in confirmatory factor analyses revealed acceptable model fit.
Table 3
Confirmatory Factor Analysis – Teacher Background Characteristics

<table>
<thead>
<tr>
<th>Administration</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>LO 90</th>
<th>HI 90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 3</td>
<td>6.7</td>
<td>2</td>
<td>.034</td>
<td>.025</td>
<td>.998</td>
<td>.991</td>
<td>.033</td>
<td>.024</td>
<td>.075</td>
</tr>
<tr>
<td>Grade 5 – Reading</td>
<td>11.9</td>
<td>2</td>
<td>.003</td>
<td>.028</td>
<td>.997</td>
<td>.971</td>
<td>.047</td>
<td>.024</td>
<td>.075</td>
</tr>
<tr>
<td>Grade 5 – Math</td>
<td>11.4</td>
<td>2</td>
<td>.003</td>
<td>.056</td>
<td>.996</td>
<td>.980</td>
<td>.056</td>
<td>.028</td>
<td>.090</td>
</tr>
</tbody>
</table>

Teacher Attitudes

In this model, teacher attitudes are measured by four factors: collective efficacy, behavioral issues, teacher engagement, and perceptions of school climate. In the ECLS-K teacher questionnaire for the first, third, and fifth grade administrations, questions that could be related to teacher attitudes were measured by three scales: a seven-item scale related to perceptions of staff and students, a three-item scale related to teacher engagement, and a six-item scale regarding perceptions of school administration.

Exploratory factor analysis of the items contained in these scales using PAF with varimax rotation revealed a four-factor solution. As shown in Appendix A, in first grade three items loaded on a factor labeled *collective efficacy*, three items loaded on a factor
labeled *negative expectations*, three items loaded on a factor labeled *teacher engagement*, and four items loaded on a factor labeled *school climate*. After the factor analysis was conducted, the names and construction of the factors were reviewed by a former teacher and principal, as were the other factor analyses in this study.

In the third and fifth grade, additional items were added to the scale related to school administration. The addition of these items shifted the loadings on the factor labeled *negative expectations* in first grade. As shown by these factor loadings, the emphasis of this factor changed to a focus on behavioral issues. Although the exploratory factor analysis for fifth-grade reading revealed an additional item—children incapable of learning—loading on this factor, the factor makes more sense if this item is excluded, and indeed the model fit indices indicate better fit to the sample data if this item was excluded. The other three factors are similar across all of the administrations.

As shown in Table 4 below, the results of the exploratory factor analyses were supported by confirmatory factor analysis. Figure 3 below is an example of the model for Teacher Attitudes. The model depicted is the one for the first-grade administrations.

<table>
<thead>
<tr>
<th>Administration</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>LO 90</th>
<th>HI 90</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; Grade</td>
<td>416.176</td>
<td>61</td>
<td>&lt;.001</td>
<td>.030</td>
<td>.966</td>
<td>.958</td>
<td>.056</td>
<td>.051</td>
<td>.061</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; Grade</td>
<td>436.731</td>
<td>61</td>
<td>&lt;.001</td>
<td>.041</td>
<td>.969</td>
<td>.969</td>
<td>.053</td>
<td>.048</td>
<td>.058</td>
</tr>
<tr>
<td>5&lt;sup&gt;th&lt;/sup&gt; Grade Reading</td>
<td>463.732</td>
<td>61</td>
<td>&lt;.001</td>
<td>.036</td>
<td>.969</td>
<td>.968</td>
<td>.055</td>
<td>.050</td>
<td>.059</td>
</tr>
<tr>
<td>5&lt;sup&gt;th&lt;/sup&gt; Grade Math</td>
<td>503.566</td>
<td>61</td>
<td>&lt;.001</td>
<td>.043</td>
<td>.948</td>
<td>.946</td>
<td>.070</td>
<td>.064</td>
<td>.075</td>
</tr>
</tbody>
</table>
As shown in Appendix A, a number of questions on the ECLS-K surveys were related to instructional practices for first grade reading. PAF with varimax rotation revealed a four-factor solution: a writing practices factor with four items, a three-item reading/predictable text factor, a five-item work on projects factor, and a seven-item evaluation factor. This four-factor solution was supported by confirmatory factor
analysis, $\chi^2(148, N=1853)=963.423, p < .001, \text{RMR}.05, \text{GFI}.947, \text{CFI}.921, \text{RMSEA}.05$. Specific items for these factors are shown in Appendix A.

Third- and fifth-grade reading have three factors. In third and fifth grade, the three factors are: reading, writing, and evaluation. Although the factors are similar for third and fifth grade, they are constructed of slightly different items, which may be due to differences in the concepts emphasized in third- and fifth-grade curricula. PAF with varimax rotation revealed the three-factor solution in third grade, which was supported by confirmatory factor analysis, $\chi^2(149, N=2184)=926.859, p < .001, \text{RMR}.015, \text{GFI}.956, \text{CFI}.937, \text{RMSEA}.05$. In fifth grade, PAF revealed a two-factor solution with the reading and writing items loading on a single factor. However, confirmatory factor analysis supported dividing reading and writing into two factors resulting in a three-factor solution similar to the third grade solution, $\chi^2(101, N=2220)=843.446, p < .001, \text{RMR}.025, \text{GFI}.954, \text{CFI}.929, \text{RMSEA}.058$. The items contained in the factors for each grade level are listed in Appendix A. The model for third grade instructional practices is shown below.
As with reading instructional practices, a number of questions in the ECLS-K teacher questionnaires were related to math instructional practices. Principal axis factoring with varimax rotation revealed a four-factor solution for first-grade math, which was supported by confirmatory factor analysis, as shown in Figure 5 below. The
factors for first-grade math instructional practices are: *solving problems, measuring/estimating quantities, sorting and ordering*, and *evaluation*.

Although there is a four-factor solution for grade one, three, and five, the factors and items comprising the factors are different for each grade level. Again, this is likely due to differences in the concepts emphasized in first-, third-, and fifth-grade curricula. For third- and fifth-grade math instructional practices, the solutions identified through exploratory factor analysis did not result in solutions with satisfactory model fit when tested through confirmatory factor analysis. The reliability of the instructional practice was confirmed, $\alpha = .842$ and .843, respectively. Solutions developed through exploratory factor analyses of the math-related items in conjunction with the advice of a math instructor and former principal resulted in models with acceptable model fit when tested with confirmatory factor analysis. The factors for third-grade math instructional practices are: *math skills, tools and manipulatives, talking through math problems*, and *evaluation*. The factors for fifth-grade math instructional practices are: *concepts and operations, problem solving, math disciplines*, and *evaluation*.

The individual items comprising the factors for each grade level are listed in Appendix A. A sample of one of the models for math instructional practices is shown in Figure 5.
**Table 5**  
*Confirmatory Factor Analysis - Instructional Practices - Math*

<table>
<thead>
<tr>
<th>Administration</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>LO 90</th>
<th>HI 90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1</td>
<td>1204.064</td>
<td>205</td>
<td>&lt;.001</td>
<td>.060</td>
<td>.943</td>
<td>.924</td>
<td>.051</td>
<td>.049</td>
<td>.054</td>
</tr>
<tr>
<td>Grade 3</td>
<td>1276.213</td>
<td>148</td>
<td>&lt;.001</td>
<td>.026</td>
<td>.941</td>
<td>.920</td>
<td>.059</td>
<td>.056</td>
<td>.062</td>
</tr>
<tr>
<td>Grade 5</td>
<td>766.445</td>
<td>147</td>
<td>&lt;.001</td>
<td>.029</td>
<td>.949</td>
<td>.916</td>
<td>.053</td>
<td>.049</td>
<td>.057</td>
</tr>
</tbody>
</table>
**Structural Model**

The structural model for the analysis is shown in Figure 6 below. The structural model is the same for each grade level. This is a partially latent model in which teacher background characteristics, teacher attitudes, and teacher instructional practices are measured via the models described above, and student achievement is measured by a single IRT achievement score in each subject, reading and math.

**Figure 6**
Structural Model

![Structural Model Diagram](image)

**Qualitative Research Design**

The qualitative analysis is a collective case study (Stake, 1995) of a number of teachers in a school that meets expectations for student growth on State standardized tests and that is implementing a number of strategies to increase student achievement through effective instruction. The selection of participants had aspects of purposive sampling, as well as aspects of convenience sampling. The important consideration in making this decision was to select a case that was likely to “maximize what we can learn” (Stake, 1995, p. 4). It was anticipated that teachers from this magnet school would provide information that contributes to an understanding of teacher effectiveness. In this collective case study, each individual case was instrumental to learning about teacher perceptions of the effects of their background characteristics, attitudes, and instructional
practices on student achievement, and likewise the coordination among cases and cross-case analysis (Creswell, 2007; Stake, 1995) contributed to a greater understanding of the phenomena.

Data Collection

As described above, case studies are in-depth investigations using multiple sources of data (Creswell, 2007; Stake, 1995; Yin, 2009). In this study, data collection consisted of interviews of six teachers, an interview of the principal, classroom observations, and a limited review of documents and artifacts. Once the interviews and observations were completed, I evaluated whether “saturation” was reached by examining the extent to which I was learning new information as the interviews progressed. The teachers focused on similar instructional practices and teacher attitudes, although there were differences in their individual implementation of the practices, as well as their individual responses to the attitudes. While there is still much to explore in future research with regard to the impact of teacher attitudes and instructional practices overall, the information provided by these teachers and principal was sufficient to answer the questions posed in this study with regard to this particular context, as well as to point to potential subsequent inquiries.

For the semi-structured interviews and classroom observations of the teachers, I used protocols developed in an earlier pilot case study (Faust, 2011) of a single exemplary teacher in a Title I school. In the pilot study, I used questions and variables from the ECLS-K survey of teachers to develop the observation (Appendix D) and interview (Appendix E) protocols.
The observation protocols consisted of two one-page notecatchers, one for math and one for reading. In the pilot study, the observation notecatchers worked well as a reminder of the various items to be observed in conjunction with each lesson (reading or math). I elected not to use a laptop computer for taking notes during the observations, as taking notes on the notecatchers and notepad provided greater flexibility to walk around the classroom and more closely observe what students were doing, as well as what they were saying to one another.

The interview protocol consisted of preliminary open-ended questions to elicit a teacher’s initial impressions related to teacher effectiveness, student achievement, and student learning. The preliminary questions were followed by sections with specific questions related to teacher instructional practices, teacher attitudes, and teacher background characteristics, and their influence upon student achievement and student learning. In the interview, after asking the specific questions in each section, I used supplemental forms, which list the items from the ECLS-K teacher survey pertaining to that section, to prompt additional thoughts and seek the teachers’ opinions regarding the relevance of the ECLS-K items. I also asked the teachers to indicate what their responses would be to those particular questions on the ECLS-K survey. The final section of the interview protocol consisted of questions about what might be needed to improve teacher effectiveness and student achievement in the school. Each interview was audiotaped and transcribed. Prior to conducting the actual observations and interviews in the collective case study, I conducted cognitive interviews (Willis, 2005) of other elementary teachers outside the school to gain insights about how teachers interpret the interview questions and observation components.
The pattern of asking the open-ended questions prior to introducing the list of ECLS-K items relevant to each section worked well in the pilot study, as well as in this study. This allowed me to obtain the teachers’ first impressions, and then the list prompted the teacher to address additional pertinent items.

The documents and artifacts examined consisted of the materials on the classroom walls of each teacher, as well as a review of the teachers’ lesson plans when they were available. To facilitate analysis of the data, I photographed the classroom walls of each teacher’s classroom.

**Qualitative Data Analysis**

Qualitative analysis is holistic, inductive, and emergent (Creswell, 2007; Patton, 2002; Yin 2009). Thus, it encompasses a “bottom-up” approach to identifying patterns and themes, classifying the data into broader and more abstract categories of information (Creswell, 2007). It also involves investigation of the complexities and multiple perspectives within the data, in this case both within and between cases (Creswell, 2007; Patton 2002).

Qualitative data analysis begins early in a study and it is ongoing; it is an interactive and dynamic process in which the themes and patterns are re-examined and modified as new cases and pieces of data are investigated (Creswell, 2007). In the qualitative analysis, my ultimate objective was to present an in-depth depiction of teachers’ perceptions of the influences of teacher effectiveness and student achievement.

The qualitative equivalent to validity, reliability, and generalizability in quantitative inquiry are credibility, trustworthiness, and transferability. Credibility is established by carrying out the study with rigorous methods, the credibility of the
researcher, and a commitment to “naturalistic inquiry, qualitative methods, inductive analysis, purposeful sampling, and holistic thinking” (Patton 2002, p. 553).

In this study, data analysis of the individual and collective case studies consisted of systematic within-case analysis and in-depth descriptions, as well as cross-case analysis of emerging themes exploring similarities and differences among cases. Within the analysis, I used a number of strategies to enhance credibility and to assist readers with gauging whether the accounts represented in the case study are trustworthy and transferrable to other circumstances.

Once the observation notes and interviews were transcribed, I created electronic field notes and file memoranda to use as analytic tools to capture self-reflections, emerging questions, patterns, and themes (Creswell, 2007; Patton, 2002). The transcripts, notes, and memoranda were analyzed using manual and computer-assisted (QSR Nvivo 9) coding. The initial coding structures were derived from the quantitative analysis, as well as from the coding structure used in the pilot study. These codes are “tags or labels for assigning units of meaning” to the data collected in the study that can be used for categorizing and organizing the data (Miles & Huberman, 1994). The coding was an iterative process, and thus supplemental codes were added as the analysis progressed. The codes then were classified into broader categories of meaningful units of analysis.

In this way, the data from each case was deconstructed and reconstructed to examine relationships of various components within a case to develop individual case descriptions and to make cross-case comparisons: “Two strategic ways that researchers reach new meanings about cases are through direct interpretation of the individual instance and through aggregations of instances until something can be said about them as
Thus, the information from individual cases was interpreted and aggregated across cases to generate meaning about teachers’ perceptions of the influences on student achievement and student learning.

In this analysis, I triangulated the data from the observations and interviews to corroborate the findings across cases. As Stake (1995) points out, the objective of triangulating data from multiple sources of information is not just to look at different sources of data, but to examine whether the “case remains the same at other times, in other spaces, or as persons interact differently” (p. 112). In this case, the triangulation of data from the observations and interviews and from a number of teachers permitted an investigation of inconsistencies, negative cases, and disconfirming evidence, which contributed to greater understanding of the phenomena (Creswell, 2007; Patton, 2002; Stake, 1995). Likewise, the methodological comparison and exploration of quantitative and qualitative analyses provided insights for in-depth understanding and alternative interpretations of the phenomena.

My aim in reporting the results of this collective case study was to provide the reader with in-depth accounts of the data by including sufficient quotations and raw data, in addition to information about the analysis and triangulation of the data. My objective was to permit the reader to assess the trustworthiness and transferability of the cases, as well as the opportunity to contemplate alternative explanations or interpretations.

**Writing and Reporting**

There is no standard format for reporting case study research. However, written reports of qualitative research generally contain thick descriptions and the liberal use of quotations. Thick description is rich and detailed descriptions of the people, settings, and
contexts under examination. Such thick description is provided to create for the reader a solid foundation on which a researcher’s interpretations are based (Teddlie & Tashakkori, 2009). Thus, I have included thick description to allow readers to assess whether the interpretations are reasonable and believable, as well as help them to evaluate whether the accounts represented in the case study are comparable or transferrable to other circumstances.

Creswell and Clark (2011) describe three types of quotations used in qualitative research: short eye catching quotes that are easy to read; brief embedded quotes within the report; and longer block quotations with more in-depth information. In this case study, I use thick description, each of the three methods of quotations, and vignettes to allow readers to assess whether the interpretations made during the analysis process are reasonable. After the qualitative analysis, I also integrate, compare, contrast, and summarize the results of the two strands. In order to protect their identity, pseudonyms are used in the vignettes, quotes, and case study information.

**Member Checking**

Member checking (Creswell, 2007; Miles & Huberman, 1994) was used in two ways: first, I sent interview transcripts to each participant for review and revision; second, I submitted drafts of written analysis and interpretations to participants providing them an opportunity to proffer supplemental information and alternative perspectives (Creswell, 2007; Yin 2009).

**Role of the Researcher**

An important aspect of qualitative research is for the researcher to discuss their role and acknowledge potential areas of bias. My perspective as a researcher in this
collective case study was primarily from an etic point of view, as I am not an elementary school teacher (Creswell, 2005). During the classrooms observations, I was a complete observer with limited passive participation.

With regard to researcher knowledge and expertise, in addition to qualitative coursework taken in this doctoral program, I have a Master of Arts in cultural anthropology, and I have conducted qualitative inquiries relevant to my employment. While I am not a K-12 teacher, I am employed by a teacher preparation program, and my work is related to the assessment of novice teacher readiness and performance.

**Ethical Considerations**

Ethical considerations were addressed at each stage of this study. As noted above, in compliance with University policy, the appropriate documentation was filed seeking approval from both District and University Internal Review Boards before proceeding with the study.

Participation in the study was voluntary. A consent form was signed by each participant prior to the classroom observations and interviews. The consent form outlined the nature of the study, participants’ right to withdraw from the study at any point without adverse effects, and researcher and advisor contact information for questions or concerns about the study.

The interview questions and list of ECLS-K variables elicited information pertaining to the influence of school and district administrative decisions on teacher attitudes and student learning. Given the precarious employment positions of teachers in the current environment of educational accountability and teacher cutbacks, information related to teacher performance and satisfaction are reported with extreme caution. In
addition, transcripts of the interviews and classroom observation notes do not contain identifying information related to the participants, and care was taken to report information in a manner that minimizes the risk of identification of participants. Likewise, the audio recordings were stored in protected files accessible only to the researcher until the transcriptions were completed, and then they were destroyed.

To compensate them for their participation in this study, teacher participants received a $50 gift certificate for a company that provides classroom texts, resources, and manipulatives, in addition to cash compensation of $50. Likewise, the principal received a $200 donation for the school, as well as cash compensation of $50.
Chapter IV

QUANTITATIVE RESULTS

The quantitative analysis examined the effects of three factors, teacher background characteristics, teacher attitudes, and instructional practices on student achievement. It also examined whether teacher background characteristics and teacher attitudes are mediated through instructional practices. In addition, the analysis investigated whether the effects of these factors differed among three different groupings of students: (1) students in schools receiving Title I funds and students in schools that do not receive such funding; (2) students of color and white students; and (3) high-ability students and non-high-ability students.

Reading Models

First-Grade Reading

Testing of the full structural equation model for first-grade reading began by examining the hypothesized model set forth in Chapter III, in which teacher background characteristics and teacher attitudes are mediated through teacher instructional practices on student achievement. Testing of this model indicated some revisions could result in improvements in the model fit. The loading of ESL certification on teacher background characteristics was not significant ($p = .558$). The modification indices also showed correlations between the variables years of teaching experience and perceptions of parent
support (M.I. 127.621; PAR = .616), as well as correlations in the residuals of variables related to frequency that children work in small groups and the frequency that they work on long projects (M.I. 673.187; PAR = .241). In addition, the latent variable evaluation seemed to contribute little to instructional practices. These changes to the model were made in an iterative process resulting in a revised model with slightly improved model fit. Further, teacher background characteristics did not have a significant impact on instructional practices ($p = .547$), and instructional practices only moderately significant given the sample size ($p = .037$). On the other hand, teacher attitudes had a significant effect on instructional practices ($p < .001$).

These results suggest that the effects of teacher attitudes may not be mediated through teacher instructional practices. This was tested via examination of a direct-effects model with the paths of teacher attitudes and teacher background characteristics loading directly on student achievement, as opposed to through instructional practices. As shown in Table 7, below, the direct-effects model confirms the significance of teacher attitudes, as well as the insignificant effects of instructional practices as measured by the ECLS-K database. The standardized regression weights for the factors of interest are shown in Table 7 below. The parameter estimates for the full revised direct-effects model are shown in Table 56 in Appendix B.
**Table 6**
*Model Fit for Grade 1 Reading Models*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>AIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypothesized Model</td>
<td>17,529</td>
<td>618</td>
<td>&lt;.001</td>
<td>.490</td>
<td>.936</td>
<td>.892</td>
<td>.043</td>
<td>17,699</td>
</tr>
<tr>
<td>Revised Model</td>
<td>10,174</td>
<td>365</td>
<td>&lt;.001</td>
<td>.606</td>
<td>.953</td>
<td>.915</td>
<td>.043</td>
<td>10,314</td>
</tr>
<tr>
<td>Direct-Effects Model</td>
<td>10,121</td>
<td>366</td>
<td>&lt;.001</td>
<td>.491</td>
<td>.953</td>
<td>.916</td>
<td>.043</td>
<td>10,259</td>
</tr>
<tr>
<td><strong>With Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revised Model</td>
<td>10,360</td>
<td>393</td>
<td>&lt;.001</td>
<td>.769</td>
<td>.953</td>
<td>.830</td>
<td>.042</td>
<td>10,504</td>
</tr>
<tr>
<td>Direct-Effects Model</td>
<td>10,482</td>
<td>394</td>
<td>&lt;.001</td>
<td>.802</td>
<td>.953</td>
<td>.919</td>
<td>.042</td>
<td>10,623</td>
</tr>
</tbody>
</table>

**Table 7**
*Standardized Regression Weights for Grade 1 Reading Models*

<table>
<thead>
<tr>
<th></th>
<th>Direct-Effects Model (w/o Cov)</th>
<th>Direct-Effects Model (w/ Cov)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Achievement</td>
<td>➔ Background Characteristics</td>
<td>.013</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>➔ Instructional Practices</td>
<td>.004</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>➔ Teacher Attitudes</td>
<td>.154***</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>➔ Prior Achievement</td>
<td>--</td>
</tr>
<tr>
<td>SMC</td>
<td></td>
<td>.024</td>
</tr>
</tbody>
</table>

*significant at p<.05
**significant at p<.01
***significant at p<.001

While teacher attitudes have a greater impact on student achievement than teacher background characteristics or instructional practices, the majority of variance in student achievement is explained by prior achievement. Without prior achievement included in the model, it accounts for only 2.4% of the variance in reading scores, whereas with the covariate of kindergarten-reading scores in the model, it accounts for 43% of the variance.
in first-grade reading scores, and the regression coefficient for the prior achievement path is .653.

**Group Comparisons for Schools Receiving Title I Funds**

To test whether the direct-effects model was invariant among students in schools that receive Title I funds and those that do not receive Title I funds, baseline analyses were run for each group. As Table 8 shows, the CFI for students in schools receiving Title I funds was below .9.

Table 8  
*Multi-group Comparisons - Title I Schools for Grade 1 Reading*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title I Funds</td>
<td>6,068</td>
<td>366</td>
<td>&lt;.001</td>
<td>.332</td>
<td>.937</td>
<td>.877</td>
<td>.049</td>
</tr>
<tr>
<td>No Title I Funds</td>
<td>6,141</td>
<td>366</td>
<td>&lt;.011</td>
<td>.492</td>
<td>.949</td>
<td>.913</td>
<td>.044</td>
</tr>
</tbody>
</table>

Table 9  
*Standardized Regression Weights for Title I Funds Group Comparison*

<table>
<thead>
<tr>
<th></th>
<th>Background Characteristics</th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title I Funds</td>
<td>.024</td>
<td>.045**</td>
<td>.102***</td>
<td></td>
</tr>
<tr>
<td>No Title I Funds</td>
<td>.010</td>
<td>-.016</td>
<td>.133***</td>
<td></td>
</tr>
<tr>
<td><strong>With Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title I Funds</td>
<td>-.023</td>
<td>.047***</td>
<td>.045***</td>
<td>.578***</td>
</tr>
<tr>
<td>No Title I Funds</td>
<td>.021</td>
<td>-.007</td>
<td>.056***</td>
<td>.687***</td>
</tr>
</tbody>
</table>

*significant at p<.05  
**significant at p<.01  
***significant at p<.001

The results of the parameter estimates revealed that the effects of instructional practices on reading scores are significant for students in schools that receive Title I funds
(p < .003), but are not significant for students in schools that do not receive Title I funds
(p = .219). Teacher background characteristics are not significant for either group, and
teacher attitudes are significant for both groups.

*Group Differences for Students of Color and White Students*

Baseline analyses for the various racial/ethnic groups indicated some problems
with model fit, primarily due to negative variances in reading and projects variables.
After amending the model to exclude the *work related to book, choose books, and skits*
items, the model was admissible for the Asian, Black, Hispanic, and White groups. It
was not admissible for the Native American or Multiracial groups, which may be due to
the size of those groups. While the solutions were admissible the model clearly did not
fit the data equally well for all groups, as shown in Table 10.

**Table 10**

*Multi-group Comparisons - Racial/Ethnicity Comparisons for Grade 1 Reading*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>1547</td>
<td>288</td>
<td>&lt;.001</td>
<td>.655</td>
<td>.855</td>
<td>.824</td>
<td>.069</td>
</tr>
<tr>
<td>Black</td>
<td>2263</td>
<td>288</td>
<td>&lt;.001</td>
<td>.431</td>
<td>.916</td>
<td>.887</td>
<td>.061</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1983</td>
<td>288</td>
<td>&lt;.001</td>
<td>.410</td>
<td>.941</td>
<td>.903</td>
<td>.049</td>
</tr>
<tr>
<td>White</td>
<td>5413</td>
<td>288</td>
<td>&lt;.001</td>
<td>.290</td>
<td>.952</td>
<td>.913</td>
<td>.046</td>
</tr>
</tbody>
</table>

**Table 11**

*Standardized Regression Weights for Racial/Ethnicity Comparisons*

<table>
<thead>
<tr>
<th></th>
<th>Background Characteristics</th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>.116*</td>
<td>-.011</td>
<td>.055***</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>-.102***</td>
<td>.063**</td>
<td>.084***</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>.059*</td>
<td>.008</td>
<td>.066**</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>-.023</td>
<td>-.007</td>
<td>.090***</td>
<td></td>
</tr>
</tbody>
</table>
Group Differences for High-Ability Students

The ECLS-K database does not contain an identifier for gifted and talented students. In the interview with the principal from the case study, she indicated that the school district permits students in the 90th percentile on a gifted and talented screening assessment to be placed in the gifted and talented classrooms. According to the principal, the GT screening assessment includes other factors in addition to traditional achievement scores. Since this type of data is not available in the ECLS-K database, the 90th percentile on a composite reading and math achievement score was used as a proxy to examine group differences among high-ability students and non-high-ability students. The baseline analyses revealed acceptable model fit for both groups (see Table 12). However, the model is not invariant across the groups. As shown in the regression weights below, neither teacher background characteristics nor instructional practices are significant for either group. While teacher attitudes are significant for both groups, they are less significant for high-ability students and are not significant for high-ability students when prior achievement is included in the model.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>.028</td>
<td>-.046</td>
<td>.113***</td>
<td>.686***</td>
</tr>
<tr>
<td>Black</td>
<td>.007</td>
<td>.042</td>
<td>.056***</td>
<td>.758***</td>
</tr>
<tr>
<td>Hispanic</td>
<td>.001</td>
<td>.031</td>
<td>.027</td>
<td>.432***</td>
</tr>
<tr>
<td>White</td>
<td>.014</td>
<td>-.021</td>
<td>.041***</td>
<td>.734***</td>
</tr>
</tbody>
</table>

*significant at p<.05  
**significant at p<.01  
***significant at p<.001
Table 12
*Multi-group Comparisons - Ability Groups for Grade 1 Reading*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Ability</td>
<td>1,533</td>
<td>366</td>
<td>&lt;.001</td>
<td>.349</td>
<td>.933</td>
<td>.906</td>
<td>.046</td>
</tr>
<tr>
<td>Not-High Ability</td>
<td>9,128</td>
<td>366</td>
<td>&lt;.001</td>
<td>.338</td>
<td>.953</td>
<td>.915</td>
<td>.043</td>
</tr>
</tbody>
</table>

Table 13
*Standardized Regression Weights for High-Ability Students*

<table>
<thead>
<tr>
<th></th>
<th>Background Characteristics</th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Ability</td>
<td>.020</td>
<td>.062</td>
<td>.081**</td>
<td></td>
</tr>
<tr>
<td>Not-High Ability</td>
<td>.012</td>
<td>-.008</td>
<td>.142***</td>
<td></td>
</tr>
<tr>
<td><strong>With Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Ability</td>
<td>.006</td>
<td>.015</td>
<td>.035</td>
<td>.609***</td>
</tr>
<tr>
<td>Not-High Ability</td>
<td>-.006</td>
<td>.017</td>
<td>.078**</td>
<td>.502***</td>
</tr>
</tbody>
</table>

*significant at $p<.05$
**significant at $p<.01$
***significant at $p<.001$

*Third-Grade Reading*

As with first-grade reading, testing of the full structural equation model for third-grade reading began by examining the hypothesized model, in which teacher background characteristics and teacher attitudes are mediated through teacher instructional practices on student achievement. Testing of this model indicated some revisions could result in improvements in the model fit. The modification indices indicated a correlation between the residuals of the evaluation of class participation and class attendance and between writing purpose and outlines. The addition of these correlations in the revised version of the hypothesized model improved the fit statistics. The modification indices also indicated that the residual for reading achievement was correlated with the disturbance.
for negative expectations; however, the correlation turned out to be very small \( r = .034 \).

As a result, the sub-model was retained in the model. Despite the changes in the model, the impacts of instructional practices on student achievement appeared to be only moderately significant given the sample size, \( p = .021 \), and teacher attitudes did not have a significant impact on instructional practices, \( p = .144 \).

Although examination of the direct-effects model did not result in improved model fit, it confirmed that the effects of instructional practices as measured by the ECLS-K on student achievement were not statistically significant. Removal of instructional practices from the direct-effects model, however, did not result in acceptable fit statistics. Comparison of the results of the direct-effects model and the hypothesized model reveals that the direct-effects model accounts for a larger proportion of the variance in student achievement, but both models account for very little of the variation in student achievement. In the model development stage, the construction of the third-grade sub-models were considerably more challenging than those of first grade or fifth grade, and this is reflected in this analysis.

Table 14
Model Fit for Grade 3 Reading Models

<table>
<thead>
<tr>
<th>Model</th>
<th>( \chi^2 )</th>
<th>df</th>
<th>( p )</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>AIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypothesized Model</td>
<td>15,798</td>
<td>619</td>
<td>&lt;.001</td>
<td>.791</td>
<td>.932</td>
<td>.931</td>
<td>.046</td>
<td>15,966</td>
</tr>
<tr>
<td>Revised Model</td>
<td>15,232</td>
<td>617</td>
<td>&lt;.001</td>
<td>.791</td>
<td>.935</td>
<td>.933</td>
<td>.045</td>
<td>15,404</td>
</tr>
<tr>
<td>Direct-Effects Model</td>
<td>12,337</td>
<td>618</td>
<td>&lt;.001</td>
<td>.489</td>
<td>.947</td>
<td>.944</td>
<td>.040</td>
<td>12,507</td>
</tr>
<tr>
<td><strong>With Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revised Model</td>
<td>15,379</td>
<td>653</td>
<td>&lt;.001</td>
<td>.913</td>
<td>.936</td>
<td>.935</td>
<td>.044</td>
<td>15,554</td>
</tr>
<tr>
<td>Direct-Effects Model</td>
<td>12,533</td>
<td>654</td>
<td>&lt;.001</td>
<td>.834</td>
<td>.947</td>
<td>.946</td>
<td>.040</td>
<td>12,707</td>
</tr>
</tbody>
</table>
Table 15
Standardized Regression Weights for Grade 3 Reading Models

<table>
<thead>
<tr>
<th></th>
<th>Direct-Effects Model (w/o Cov)</th>
<th>Direct-Effects Model (w/ Cov)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Achievement</td>
<td>Background Characteristics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.077***</td>
<td>.032*</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>Instructional Practices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.024*</td>
<td>.004</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>Teacher Attitudes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.075***</td>
<td>.023*</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>Prior Achievement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>--</td>
<td>.687***</td>
</tr>
<tr>
<td>SMC</td>
<td></td>
<td>.012</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.474</td>
</tr>
</tbody>
</table>

*significant at p<.05
**significant at p<.01
***significant at p<.001

Group Comparisons for Schools Receiving Title I Funds

Analyses showed that the effects of teacher background characteristics, instructional practices and teacher attitudes are different for students in schools receiving Title I funds and students in schools that do not receive Title I funds. For students in schools that receive Title I funds, teacher background characteristics had a significant effect on reading achievement, whereas instructional practices and teacher attitudes did not. For students in schools that did not receive Title I funds, teacher attitudes was significant but instructional practices and teacher background characteristics were not. The model accounted for similar amounts of the variance in reading achievement (SMC = .006 for Title I and SMC = .005 for Non-Title I). As Table 16 shows, the CFI for students in schools receiving Title I funds was below .9, thus the direct-effects model fits the data better for students in schools that do not receive Title I Funds.

80
Table 16
Multi-group Comparisons - Title 1 Schools Grade 3 Reading

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title I Funds</td>
<td>12.287</td>
<td>618</td>
<td>&lt;.001</td>
<td>.658</td>
<td>.910</td>
<td>.927</td>
<td>.053</td>
</tr>
<tr>
<td>No Title I Funds</td>
<td>11.193</td>
<td>618</td>
<td>&lt;.001</td>
<td>.638</td>
<td>.889</td>
<td>.913</td>
<td>.058</td>
</tr>
</tbody>
</table>

Table 17
Standardized Regression Weights for Title I Funds Group Comparison

<table>
<thead>
<tr>
<th>Without Covariate</th>
<th>Background Characteristics</th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title I Funds</td>
<td>.036*</td>
<td>-.004</td>
<td>-.005</td>
<td></td>
</tr>
<tr>
<td>No Title I Funds</td>
<td>.022</td>
<td>.032</td>
<td>.066**</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>With Covariate</th>
<th>Background Characteristics</th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title I Funds</td>
<td>.036*</td>
<td>.001</td>
<td>.005</td>
<td>.673***</td>
</tr>
<tr>
<td>No Title I Funds</td>
<td>.031*</td>
<td>.010</td>
<td>.054***</td>
<td>.682***</td>
</tr>
</tbody>
</table>

*significant at p<.05
**significant at p<.01
***significant at p<.001

The results of the parameter estimates revealed that the effects of teacher attitudes on reading scores are significant for students in schools that receive Title I funds ($p < .008$), but are not significant for students in schools that do not receive Title I funds ($p = .247$). Instructional practices are not significant for either group, and background characteristics are significant for both groups though the significance level is lower.

Group Differences for Students of Color and White Students

As with first-grade reading, baseline analyses for the various racial/ethnic groups indicated some problems with model fit, primarily due to negative variances in writing and negative expectations. The addition of a residual correlation between child
misbehavior affects teaching item and the bullying is a problem item resulted in admissible solutions for the Black and Hispanic groups, as well as for White students. The model was not admissible for the Asian, Native American or Multiracial groups. While the solutions were admissible, the model clearly did not fit the data equally well for all groups, nor were the effects the same across the groups. None of the factors has a significant impact on reading achievement for Black students or Hispanic students, but teacher attitudes had a significant effect on reading achievement for White students.

Table 18
Multi-group Comparisons – Racial/Ethnicity Comparisons Grade 3 Reading

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>3,616</td>
<td>583</td>
<td>&lt;.001</td>
<td>.398</td>
<td>.880</td>
<td>.908</td>
<td>.061</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4,642</td>
<td>583</td>
<td>&lt;.001</td>
<td>.394</td>
<td>.887</td>
<td>.926</td>
<td>.061</td>
</tr>
<tr>
<td>White</td>
<td>13,510</td>
<td>583</td>
<td>&lt;.001</td>
<td>.249</td>
<td>.903</td>
<td>.912</td>
<td>.056</td>
</tr>
</tbody>
</table>

Table 19
Standardized Regression Weights for Racial/Ethnicity Comparisons

<table>
<thead>
<tr>
<th>Without Covariate</th>
<th>Background Characteristics</th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>.044</td>
<td>-.001</td>
<td>.055</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>.048</td>
<td>.000</td>
<td>.027</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>-.030</td>
<td>.003</td>
<td>.048***</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>With Covariate</th>
<th>Background Characteristics</th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>.032</td>
<td>.019</td>
<td>.045</td>
<td>.672***</td>
</tr>
<tr>
<td>Hispanic</td>
<td>.049</td>
<td>-.008</td>
<td>-.046</td>
<td>.648***</td>
</tr>
<tr>
<td>White</td>
<td>.001</td>
<td>.001</td>
<td>.030**</td>
<td>.672***</td>
</tr>
</tbody>
</table>

*significant at p<.05  
**significant at p<.01  
***significant at p<.001
Group Differences for High-Ability Students

As with first grade-reading the 90th percentile of a composite of reading and math achievement scores was used as a proxy for high ability students. As Table 20 indicates, the direct-effects model does not fit the data for high-ability students as well as it does for other students. As shown in the regression weights below, neither teacher background characteristics nor teacher attitudes have a significant effect on reading achievement for high-ability students, and instructional practices as measured in the ECLS-K and represented in the model have a slight negative effect. For students in the not-high-ability group, teacher background characteristics and teacher attitudes appear to have significant effects on reading achievement, but these small effects are diminished when prior achievement is included in the model. Of the factors present in the model, prior achievement has the greatest impact on reading achievement; with prior achievement, the model accounts for 32% of the variance in reading achievement scores for students in the not-high-ability group, whereas it accounts for 12% of the variance in the high-ability group. However, when prior achievement is excluded from the model it accounts for a small 1.3% of the variance in reading achievement for high ability students and a negligible amount of the variance for students in the not-high-ability group (SMC .002).

Table 20
Multi-group Comparisons – Ability Groups for 3rd-Grade Reading

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Ability</td>
<td>4,216</td>
<td>618</td>
<td>&lt;.001</td>
<td>.244</td>
<td>.853</td>
<td>.843</td>
<td>.068</td>
</tr>
<tr>
<td>Not High Ability</td>
<td>16,938</td>
<td>618</td>
<td>&lt;.001</td>
<td>.564</td>
<td>.918</td>
<td>.955</td>
<td>.050</td>
</tr>
</tbody>
</table>
Table 21  
*Standardized Regression Weights for Ability Groups Comparison*

<table>
<thead>
<tr>
<th></th>
<th>Background Characteristics</th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Ability</td>
<td>.040</td>
<td>-.101**</td>
<td>.030</td>
<td></td>
</tr>
<tr>
<td>Not High Ability</td>
<td>.035**</td>
<td>-.001</td>
<td>.030**</td>
<td></td>
</tr>
<tr>
<td><strong>With Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Ability</td>
<td>-.007</td>
<td>-.003</td>
<td>.043</td>
<td>.352***</td>
</tr>
<tr>
<td>Not High Ability</td>
<td>.028*</td>
<td>.004</td>
<td>.020*</td>
<td>.630***</td>
</tr>
</tbody>
</table>

*significant at p<.05  
**significant at p<.01  
***significant at p<.001

**Fifth-Grade Reading**

Testing of the model for fifth-grade reading also began with the hypothesized model in which teacher background characteristics and teacher attitudes are mediated through instructional practices. Examination of the modification indices indicated two issues. The residuals for years of teaching were highly correlated with many of the error terms in the model. In addition, the residual for student achievement was highly correlated with the disturbance for negative expectations. Removal of the years of teaching variable and inclusion of the correlation in the residuals for the reading score and the disturbance for negative expectations improved the model fit, and resolved several other correlation issues. Testing the direct-effects model with these changes showed that teacher background characteristics were not significant (p = .912). The model fit for these models is shown in Table 22 below.
Table 22
Model Fit for Grade 5 Reading Models

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>AIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypothesized Model</td>
<td>11,833</td>
<td>519</td>
<td>&lt;.001</td>
<td>1.148</td>
<td>.937</td>
<td>.903</td>
<td>.045</td>
<td>11,985</td>
</tr>
<tr>
<td>Revised Model</td>
<td>10,569</td>
<td>485</td>
<td>&lt;.001</td>
<td>.438</td>
<td>.942</td>
<td>.912</td>
<td>.044</td>
<td>10,721</td>
</tr>
<tr>
<td>Direct-Effects Model</td>
<td>10,662</td>
<td>485</td>
<td>&lt;.001</td>
<td>.307</td>
<td>.942</td>
<td>.911</td>
<td>.044</td>
<td>10,814</td>
</tr>
<tr>
<td><strong>With Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revised Model</td>
<td>10,712</td>
<td>517</td>
<td>&lt;.001</td>
<td>.622</td>
<td>.943</td>
<td>.919</td>
<td>.043</td>
<td>10,868</td>
</tr>
<tr>
<td>Direct-Effects Model</td>
<td>11,043</td>
<td>517</td>
<td>&lt;.001</td>
<td>.712</td>
<td>.941</td>
<td>.917</td>
<td>.043</td>
<td>11,199</td>
</tr>
</tbody>
</table>

In addition to having improved model fit, the direct-effects model accounts for 2.2% of the variance in student reading scores, whereas the hypothesized model accounts for only .8% of the variance. The standardized regression weights of the direct-effects model also indicate that teacher attitudes have a greater impact on student achievement than instructional practices. However, as with the other grades, the impact of prior achievement in these models is much greater than the effects of teacher background characteristics, teacher attitudes or instructional practices. In the case of the direct-effects model, inclusion of prior achievement resulted in the model accounting for the majority of the variance in student achievement ($SMC = .673$).
Table 23
*Standardized Regression Weights for Grade 5 Reading Models*

<table>
<thead>
<tr>
<th></th>
<th>Direct-Effects Model (w/o Cov)</th>
<th>Direct-Effects Model (w/ Cov)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Achievement</strong></td>
<td>-0.601</td>
<td>-0.004</td>
</tr>
<tr>
<td><strong>Background Characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Student Achievement</strong></td>
<td>0.082***</td>
<td>0.016</td>
</tr>
<tr>
<td><strong>Instructional Practices</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Student Achievement</strong></td>
<td>0.160***</td>
<td>0.040***</td>
</tr>
<tr>
<td><strong>Teacher Attitudes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Student Achievement</strong></td>
<td>--</td>
<td>0.819***</td>
</tr>
<tr>
<td><strong>Prior Achievement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SMC</strong></td>
<td>0.022</td>
<td>0.673</td>
</tr>
</tbody>
</table>

*significant at p<.05
**significant at p<.01
***significant at p<.001

**Group Comparisons for Schools Receiving Title I Funds**

To test whether the direct-effects model was similar for students in schools receiving Title I funds and those in schools that did not receive Title I funds, I first ran baseline analyses for each group. The baseline analysis showed that while the model had acceptable model fit for the Title I Funds group, the model was not admissible for Non-Title I Funds group due to negative variances in reading. Attempted revisions to the model did not result in acceptable model fit. However, removal of instructional practices from the model resulted in acceptable model fit for both groups, as shown in Table 24.

After running baseline tests for the attitudes-only model for both groups, the automated multi-group analysis in AMOS was used to test for model invariance in the two groups. Byrne (2010) describes two approaches for assessing invariance among groups. The first is the traditional chi-square difference approach, and the second is the CFI difference approach. Using the traditional approach, if the chi-square difference is statistically significant, the models cannot be assumed to be invariant across the groups.
and additional tests are required to detect where the differences in the model occur. Some researchers argue that the chi-square difference approach is “an excessively stringent test of invariance” (Byrne 2010). Using the more recent CFI difference approach proposed by Cheung and Rensvold (2007), the models are considered invariant for CFI probability differences less than .01. Byrne points out that these two approaches often suggest contradictory conclusions. However, since the CFI difference method is not yet widely accepted, Byrne suggests that researchers either choose to report the results they believe are more appropriate or that they report the results related to both approaches.

In this case, the analyses resulted in the contradictory results described by Byrne. Although the chi-square difference tests were significant indicating the models are not invariant across groups, the CFI difference showed that they might be invariant across the groups. However, examination of the measurement and structural weights indicate that the model does appear to be functioning similarly for both groups.

Table 24
*Model Fit for Grade 5 Reading Teacher Attitudes-Only Model*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title I Funds</td>
<td>2,316</td>
<td>113</td>
<td>&lt;.001</td>
<td>.541</td>
<td>.960</td>
<td>.940</td>
<td>.053</td>
</tr>
<tr>
<td>No Title I Funds</td>
<td>1,563</td>
<td>113</td>
<td>&lt;.001</td>
<td>.516</td>
<td>.955</td>
<td>.936</td>
<td>.056</td>
</tr>
</tbody>
</table>
Table 25

Multi-group Comparisons – Title I Schools

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configural Model</td>
<td>3,879</td>
<td>226</td>
<td>&lt;.001</td>
<td>.529</td>
<td>.959</td>
<td>.939</td>
<td>.039</td>
</tr>
<tr>
<td>Measurement Weights</td>
<td>3,930</td>
<td>239</td>
<td>&lt;.001</td>
<td>.554</td>
<td>.958</td>
<td>.939</td>
<td>.038</td>
</tr>
<tr>
<td>Structural Weights</td>
<td>3,937</td>
<td>242</td>
<td>&lt;.001</td>
<td>.541</td>
<td>.958</td>
<td>.938</td>
<td>.037</td>
</tr>
</tbody>
</table>

Table 26

Standardized Regression Weights for Title I Students

<table>
<thead>
<tr>
<th>Background Characteristic</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without Covariate</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title I Funds</td>
<td>-.056</td>
<td>.173***</td>
</tr>
<tr>
<td>No Title I Funds</td>
<td>.163</td>
<td></td>
</tr>
<tr>
<td><strong>With Covariate</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title I Funds</td>
<td>-.011</td>
<td>.039***</td>
</tr>
<tr>
<td>No Title I Funds</td>
<td>.007</td>
<td>.043***</td>
</tr>
</tbody>
</table>

*significant at $p<.05$
**significant at $p<.01$
***significant at $p<.001$

Group Differences for Students of Color and White Students

The baseline analyses for the composite racial/ethnicity groups revealed acceptable model fit for each of the Asian, Black, Hispanic, and White groups. The model was inadmissible for the Multiracial and Native American groups, perhaps due to the size of the groups ($n = 263$ and $n= 342$, respectively). The model fit for the groups with acceptable fit statistics are listed in Table 27, and the standardized regression weights for these groups are shown in Table 28.
Table 27  
**Multi-group Comparisons – Students of Color for Grade 5 Reading**

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>1458</td>
<td>485</td>
<td>&lt;.001</td>
<td>.307</td>
<td>.892</td>
<td>.879</td>
<td>.052</td>
</tr>
<tr>
<td>Black</td>
<td>2049</td>
<td>485</td>
<td>&lt;.001</td>
<td>.263</td>
<td>.908</td>
<td>.900</td>
<td>.051</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2458</td>
<td>485</td>
<td>&lt;.001</td>
<td>.288</td>
<td>.929</td>
<td>.911</td>
<td>.045</td>
</tr>
<tr>
<td>White</td>
<td>6888</td>
<td>485</td>
<td>&lt;.001</td>
<td>.180</td>
<td>.940</td>
<td>.903</td>
<td>.044</td>
</tr>
</tbody>
</table>

Table 28  
**Standardized Regression Weights for Students of Color**

<table>
<thead>
<tr>
<th></th>
<th>Without Covariate</th>
<th>With Covariate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Background</td>
<td>Instructional</td>
</tr>
<tr>
<td></td>
<td>Characteristics</td>
<td>Practices</td>
</tr>
<tr>
<td>Asian</td>
<td>-.291</td>
<td>.106</td>
</tr>
<tr>
<td>Black</td>
<td>.059</td>
<td>.089**</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-.205***</td>
<td>.101***</td>
</tr>
<tr>
<td>White</td>
<td>-.010</td>
<td>.142***</td>
</tr>
</tbody>
</table>

*significant at $p<.05$
**significant at $p<.01$
***significant at $p<.001$

**Group Differences for High-Ability Students**

The baseline analyses revealed that the direct-effects model with instructional practices and teacher attitudes was not admissible for gifted students. Again, the indications from the parameter estimates were that the instructional practices are not significant indicators for reading achievement. To investigate whether there are similarities in the effects of teacher attitudes, instructional practices were deleted from
the model. This attitudes-only model resulted in an acceptable model fit for both groups, see Table 29. However, the parameter estimates revealed that teacher attitudes are not significant indicators of student reading scores for high-ability students \((p = .089)\), whereas they are significant indicators for non-high-ability students \((p < .001)\) with a regression weight of .154.

Table 29

<table>
<thead>
<tr>
<th>Model</th>
<th>(\chi^2)</th>
<th>df</th>
<th>(p)</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Ability</td>
<td>392</td>
<td>73</td>
<td>&lt;.001</td>
<td>.056</td>
<td>.953</td>
<td>.941</td>
<td>.063</td>
</tr>
<tr>
<td>Not High Ability</td>
<td>2,669</td>
<td>73</td>
<td>&lt;.001</td>
<td>.513</td>
<td>.961</td>
<td>.951</td>
<td>.060</td>
</tr>
</tbody>
</table>

Math

First-Grade Math

The hypothesized model for first-grade math resulted in acceptable model fit, but teacher ESL certification was not significant \((p = .936)\) nor was instructional practices \((p = .730)\). Background characteristics was only moderately significant given the sample size, \((p = .041)\). In addition, the model did not explain any of the variance in the math score \((SMC = .000)\). Turning to the direct-effects model, the modification indices indicated that the residual terms *frequency use measuring instrument* and *frequency use measuring instruments accurate*, as well as for *frequency recognizing ordinal numbers* and *frequency telling time* were correlated. Adding the correlation of these error terms and the elimination of teacher ESL certification, were made to the model, but teacher background characteristics and instructional practices were not significant \((p = .303\) and
However, the direct-effects model accounted for 2% of the variance in math scores. The inclusion of the covariate, kindergarten math score, in the model results in similar model fit. As with the other models, prior achievement has the greatest effect on the math scores, accounting for 53.4% of the variance in fifth-grade student achievement.

Table 30
Model Fit for Grade 1 Math Models

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>AIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypothesized Model</td>
<td>19,408</td>
<td>729</td>
<td>&lt;.001</td>
<td>.283</td>
<td>.935</td>
<td>.898</td>
<td>.042</td>
<td>19,591</td>
</tr>
<tr>
<td>Direct-Effects Model</td>
<td>17,357</td>
<td>690</td>
<td>&lt;.001</td>
<td>.245</td>
<td>.940</td>
<td>.909</td>
<td>.041</td>
<td>17,537</td>
</tr>
</tbody>
</table>

| **With Covariate**     |          |    |       |      |      |      |       |       |
| Hypothesized Model     | 19,408   | 729| <.001 | .283 | .935 | .898 | .042  | 19,591|
| Direct-Effects Model    | 17,733   | 728| <.001 | .342 | .940 | .912 | .040  | 17,917|

Table 31
Standardized Regression Weights for Grade 1 Reading Models

<table>
<thead>
<tr>
<th></th>
<th>Direct-Effects Model (w/o Cov)</th>
<th>Direct-Effects Model (w/ Cov)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Achievement</td>
<td>Background Characteristics</td>
<td>.006</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>Instructional Practices</td>
<td>-.019</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>Teacher Attitudes</td>
<td>.142***</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>Prior Achievement</td>
<td>--</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>SMC</td>
<td>.020</td>
</tr>
</tbody>
</table>

*significant at $p<.05$
**significant at $p<.01$
***significant at $p<.001$
Group Comparisons for Schools Receiving Title I Funds

In examining whether the model was similar for students in schools receiving Title I funds and for students in schools that do not receive Title I Funds, I first analyzed the full direct-effects model for each group. This confirmed that teacher background characteristics and instructional practices were not significant for either group. However, when prior achievement was included in the model, teacher background characteristics had a low level of significance.

Table 32
Model Fit for Grade 1 Math Models

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title I Funds</td>
<td>10,691</td>
<td>690</td>
<td>&lt;.001</td>
<td>.209</td>
<td>.919</td>
<td>.879</td>
<td>.048</td>
</tr>
<tr>
<td>No Title I Funds</td>
<td>10,965</td>
<td>690</td>
<td>&lt;.001</td>
<td>.249</td>
<td>.933</td>
<td>.900</td>
<td>.043</td>
</tr>
</tbody>
</table>

Table 33
Standardized Regression Weights for Title I Groups

<table>
<thead>
<tr>
<th></th>
<th>Background Characteristics</th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without Covariate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title I Funds</td>
<td>-.015</td>
<td>-.009</td>
<td>.103***</td>
<td></td>
</tr>
<tr>
<td>No Title I Funds</td>
<td>-.017</td>
<td>.020</td>
<td>.115**</td>
<td></td>
</tr>
<tr>
<td>With Covariate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title I Funds</td>
<td>-.024*</td>
<td>.017</td>
<td>.029**</td>
<td>.715***</td>
</tr>
<tr>
<td>No Title I Funds</td>
<td>-.028</td>
<td>.009</td>
<td>.028**</td>
<td>.724***</td>
</tr>
</tbody>
</table>

*significant at p<.05
**significant at p<.01
***significant at p<.001

The automated multiple-group approach in AMOS 17 was used to analyze the group comparisons. Table 34 shows the fit statistics for the multi-group comparisons.
Table 34  
*Multi-group Comparisons – Title I Schools*  

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configural Model</td>
<td>21,656</td>
<td>1380</td>
<td>&lt;.001</td>
<td>.227</td>
<td>.927</td>
<td>.891</td>
<td>.040</td>
</tr>
<tr>
<td>Measurement Weights</td>
<td>22,184</td>
<td>1412</td>
<td>&lt;.001</td>
<td>.264</td>
<td>.925</td>
<td>.888</td>
<td>.040</td>
</tr>
<tr>
<td>Structural Weights</td>
<td>22,229</td>
<td>1418</td>
<td>&lt;.001</td>
<td>.266</td>
<td>.925</td>
<td>.888</td>
<td>.040</td>
</tr>
</tbody>
</table>

The chi-square difference scores are statistically significant indicating that the model is not invariant across the groups, whereas the CFI difference scores indicate that the model is invariant across the groups ($\Delta$CFI = .002). This is a case where the differences in the two models are more subtle. However, when the covariate is added, it appears that background characteristics may be significant for students in schools receiving Title I funds.  

*Group Comparisons for Students of Color*  

Testing the composite race/ethnicity code showed that the model does not fit the data well for all groups. The model fits the data best for Hispanic and White students. Examination of the results of the analysis show that the effects of background characteristics and instructional practices are different across the groups, whereas teacher attitudes appears that it may have similar effects for all groups. However, when prior achievement is included, the effects of teacher attitudes has low levels of significance for Asian, Black, and White students, and instructional practice has low levels of significance for Multiracial and White students.
Table 35

*Multi-group Comparisons – Students of Color for Grade 1 Math*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>3,420</td>
<td>690</td>
<td>&lt;.001</td>
<td>.337</td>
<td>.826</td>
<td>.785</td>
<td>.065</td>
</tr>
<tr>
<td>Black</td>
<td>4,550</td>
<td>690</td>
<td>&lt;.001</td>
<td>.210</td>
<td>.892</td>
<td>.871</td>
<td>.053</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4,151</td>
<td>690</td>
<td>&lt;.001</td>
<td>.248</td>
<td>.919</td>
<td>.890</td>
<td>.045</td>
</tr>
<tr>
<td>Multiracial</td>
<td>1,309</td>
<td>690</td>
<td>&lt;.001</td>
<td>.310</td>
<td>.848</td>
<td>.868</td>
<td>.050</td>
</tr>
<tr>
<td>White</td>
<td>11,010</td>
<td>690</td>
<td>&lt;.001</td>
<td>.174</td>
<td>.936</td>
<td>.901</td>
<td>.042</td>
</tr>
</tbody>
</table>

Table 36

*Standardized Regression Weights for Students of Color*

Without Covariate

<table>
<thead>
<tr>
<th>Background Characteristics</th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>.047</td>
<td>-.066</td>
<td>.108***</td>
</tr>
<tr>
<td>Black</td>
<td>-.061*</td>
<td>.006</td>
<td>.077**</td>
</tr>
<tr>
<td>Hispanic</td>
<td>.022</td>
<td>.014</td>
<td>.064**</td>
</tr>
<tr>
<td>Multiracial</td>
<td>.014*</td>
<td>.156</td>
<td>.139*</td>
</tr>
<tr>
<td>White</td>
<td>-.044</td>
<td>.017**</td>
<td>.095***</td>
</tr>
</tbody>
</table>

With Covariate

<table>
<thead>
<tr>
<th>Background Characteristics</th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>-.025</td>
<td>-.023</td>
<td>.075*</td>
</tr>
<tr>
<td>Black</td>
<td>-.003</td>
<td>.013</td>
<td>.034*</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-.021</td>
<td>-.025</td>
<td>-.006</td>
</tr>
<tr>
<td>Multiracial</td>
<td>.001</td>
<td>.094*</td>
<td>.021</td>
</tr>
<tr>
<td>White</td>
<td>.003</td>
<td>.020*</td>
<td>.013*</td>
</tr>
</tbody>
</table>

*significant at $p<.05$  
**significant at $p<.01$  
***significant at $p<.001$

*Group Comparisons Based on Student Ability*

As with first-grade reading, the 90th percentile on a composite of students’ reading and math achievement scores was used as a proxy to indicate high-ability students in order to examine group differences among high-ability students and non-high-ability students. As Tables 37 and 38 show, although the model fit the data well for both groups, teacher attitudes were significant for non-high-ability students even when
controlling for prior achievement. On the other hand, teacher attitudes did not have a significant effect on math achievement scores of high ability students with or without the prior achievement score in the model.

Table 37
**Multi-group Comparisons – Ability Groups**

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Ability</td>
<td>2,931</td>
<td>690</td>
<td>&lt;.001</td>
<td>.153</td>
<td>.908</td>
<td>.883</td>
<td>.046</td>
</tr>
<tr>
<td>Non-High Ability</td>
<td>15,440</td>
<td>690</td>
<td>&lt;.001</td>
<td>.185</td>
<td>.941</td>
<td>.910</td>
<td>.040</td>
</tr>
</tbody>
</table>

Table 38
**Standardized Regression Weights for Ability Groups**

<table>
<thead>
<tr>
<th></th>
<th>Without Covariate</th>
<th>With Covariate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Background</td>
<td>Instructional</td>
</tr>
<tr>
<td></td>
<td>Characteristics</td>
<td>Practices</td>
</tr>
<tr>
<td>High Ability</td>
<td>.018</td>
<td>.004</td>
</tr>
<tr>
<td>Not High Ability</td>
<td>-.002</td>
<td>-.015</td>
</tr>
<tr>
<td>High Ability</td>
<td>.002</td>
<td>.001</td>
</tr>
<tr>
<td>Not High Ability</td>
<td>.003</td>
<td>.017</td>
</tr>
</tbody>
</table>

*p*significant at *p*<.05  
**significant at *p*<.01  
***significant at *p*<.001

**Third-Grade Math**

Although the hypothesized model resulted in acceptable model fit, the path from instructional practices to math achievement was not significant (*p* = .183), and the model accounted for virtually none of the variance in math achievement. Although the modification indices identified a couple of residual correlations that improved the model slightly, instructional practices still did not have a significant effect on math achievement.
In this case, the direct-effects model did not improve the model fit. In addition, the path from instructional practices to math achievement was not significant \( (p = .935) \), and teacher attitudes was only slightly significant \( (p = .042) \). Given the large sample size, it is possible that a significant effect in this case is spurious. Likewise the model accounted for very little of the variation in math achievement \( (SMC = .004) \). Additional tests of the effects of the individual factors and of some of the components of sub-models suggested by the modification indices did not provide meaningful results for this analysis. As with the other models, prior achievement has the greatest effect on the math scores, accounting for 53.4% of the variance in fifth-grade student achievement.

Table 39  
*Model Fit for Grade 3 Math Models*

<table>
<thead>
<tr>
<th>Model</th>
<th>( \chi^2 )</th>
<th>df</th>
<th>( p )</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>AIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesized Model</td>
<td>20,683</td>
<td>618</td>
<td>&lt;.001</td>
<td>.516</td>
<td>.912</td>
<td>.930</td>
<td>.052</td>
<td>20,853</td>
</tr>
<tr>
<td>Direct-Effects Model</td>
<td>22,419</td>
<td>618</td>
<td>&lt;.001</td>
<td>.342</td>
<td>.904</td>
<td>.924</td>
<td>.055</td>
<td>22,589</td>
</tr>
</tbody>
</table>

**Fifth-Grade Math**

The hypothesized model for fifth-grade math reveals that the latent variable background characteristics is not significant \( (p = .114) \). Examination of the modification indices and standardized regression weights for the full hypothesized model indicates that years of teaching experience contributes little to background characteristics. Deleting this variable from the model improves the model fit, but background characteristics is still not significant, \( p = .052 \).

The direct-effects model for fifth-grade math does not result in improved model fit. In the direct-effects model, background characteristics are slightly significant .05,
and instructional practices and teacher attitudes are significant. Again the direct-effects model highlights the relative importance of teacher attitudes, and it accounts for 1.2% of the variance in student achievement as opposed to .5% for the hypothesized model.

Table 40
Model Fit for Grade 5 Math Models

<table>
<thead>
<tr>
<th>Model</th>
<th>( \chi^2 )</th>
<th>df</th>
<th>p</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>AIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Models without Control Variable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypothesized Model</td>
<td>14,079</td>
<td>617</td>
<td>&lt;.001</td>
<td>.677</td>
<td>.933</td>
<td>.923</td>
<td>.045</td>
<td>14,251</td>
</tr>
<tr>
<td>Revised Model</td>
<td>12,898</td>
<td>582</td>
<td>&lt;.001</td>
<td>.398</td>
<td>.937</td>
<td>.929</td>
<td>.044</td>
<td>13,066</td>
</tr>
<tr>
<td>Direct-Effects Model</td>
<td>12,910</td>
<td>582</td>
<td>&lt;.001</td>
<td>.203</td>
<td>.938</td>
<td>.929</td>
<td>.044</td>
<td>13,078</td>
</tr>
<tr>
<td><strong>Models with Control Variable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revised Model</td>
<td>12,971</td>
<td>617</td>
<td>&lt;.001</td>
<td>.445</td>
<td>.939</td>
<td>.932</td>
<td>.043</td>
<td>13,021</td>
</tr>
<tr>
<td>Direct-Effects Model</td>
<td>13,214</td>
<td>617</td>
<td>&lt;.001</td>
<td>.606</td>
<td>.938</td>
<td>.931</td>
<td>.043</td>
<td>13,186</td>
</tr>
</tbody>
</table>

Table 41
Standardized Regression Weights for Grade 5 Math Models

<table>
<thead>
<tr>
<th></th>
<th>Direct-Effects Model (w/o Covariate)</th>
<th>Direct-Effects Model (w/ Covariate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Achievement</td>
<td>◅ Background Characteristics</td>
<td>.026</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>◅ Instructional Practices</td>
<td>-.082***</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>◅ Teacher Attitudes</td>
<td>.070***</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>◅ Prior Achievement</td>
<td>--</td>
</tr>
<tr>
<td>SMC</td>
<td></td>
<td>.012</td>
</tr>
</tbody>
</table>

*significant at p<.05  
**significant at p<.01  
***significant at p<.001

Group Comparisons for Schools Receiving Title I Funds

Comparison of the direct-effects model for students in schools receiving Title I funds with students in schools that do not receive Title I funds resulted in acceptable
model fit for both groups. Teacher background characteristics are slightly significant for both groups when the covariate is not included, but it is not significant for students in schools that receive Title I funds when prior achievement is included in the model.

Instructional practices have a significantly negative impact on math achievement for both groups with or without the covariate in the model. Teacher attitudes have significantly positive impact on math achievement for both groups, though the significance drops when prior achievement is included in the model. As expected, prior achievement is highly significant for both groups and accounts for the majority of the variance in math achievement.

Table 42
Multi-group Comparisons – Title I Funds Grade 5 Math

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title I Funds</td>
<td>9,459</td>
<td>583</td>
<td>&lt;.001</td>
<td>.376</td>
<td>.928</td>
<td>.926</td>
<td>.047</td>
</tr>
<tr>
<td>No-Title I Funds</td>
<td>6,136</td>
<td>583</td>
<td>&lt;.001</td>
<td>.240</td>
<td>.922</td>
<td>.903</td>
<td>.049</td>
</tr>
</tbody>
</table>

Table 43
Standardized Regression Weights for Title I Funds

<table>
<thead>
<tr>
<th></th>
<th>Background Characteristics</th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title I Funds</td>
<td>.041*</td>
<td>-.072***</td>
<td>.060***</td>
<td></td>
</tr>
<tr>
<td>No-Title I Funds</td>
<td>.055*</td>
<td>-.110***</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>With Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title I Funds</td>
<td>.008</td>
<td>-.052***</td>
<td>.021*</td>
<td>.700***</td>
</tr>
<tr>
<td>No-Title I Funds</td>
<td>.052*</td>
<td>-.054***</td>
<td>.025*</td>
<td>.670***</td>
</tr>
</tbody>
</table>

*significant at p<.05
**significant at p<.01
***significant at p<.001

98
Group Comparisons for Students of Color

Using the direct-effects model to compare the effects of the model on math achievement for Students of Color revealed that the model was significant only for White students. The model was inadmissible due to negative variances for Asian, Multiracial and Native American students, and it did not fit the data for Black or Hispanic students. Even when omitting the various sub-models in an iterative process did not resolve the model fit for Students of Color. Using the hypothesized model yielded similar results.

Group Comparisons Based on Student Ability

The direct-effects model was used to examine group differences between high-ability students and not-high-ability students. As with previous analysis the 90th percentile of the composite reading and math scores were used to determine the high ability group. As Table 44 shows, the model had acceptable model fit for the non-high ability group, but the GFI indicator was below .9 for the high-ability group. As shown in Table 45, teacher attitudes and instructional practices are significant for not-high-ability students, whereas background characteristics are slightly significant for high-ability students.

Table 44
Multi-group Comparisons – Ability Groups Grade 5 Math

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-Ability Group</td>
<td>2,326</td>
<td>583</td>
<td>&lt;.001</td>
<td>.177</td>
<td>.898</td>
<td>.929</td>
<td>.052</td>
</tr>
<tr>
<td>Not-High-Ability Group</td>
<td>11,980</td>
<td>583</td>
<td>&lt;.001</td>
<td>.350</td>
<td>.935</td>
<td>.925</td>
<td>.045</td>
</tr>
</tbody>
</table>
Table 45

*Standardized Regression Weights for Ability Groups*

<table>
<thead>
<tr>
<th></th>
<th>Background Characteristics</th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Prior Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Ability</td>
<td>.091*</td>
<td>-.049</td>
<td>.037</td>
<td></td>
</tr>
<tr>
<td>Not High Ability</td>
<td>.021</td>
<td>-.083***</td>
<td>.070***</td>
<td></td>
</tr>
<tr>
<td><strong>With Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Ability</td>
<td>.086*</td>
<td>-.074</td>
<td>-.019</td>
<td>.494***</td>
</tr>
<tr>
<td>Not-High Ability</td>
<td>.017</td>
<td>-.055***</td>
<td>.031***</td>
<td>.681***</td>
</tr>
</tbody>
</table>

*significant at p<.05
**significant at p<.01
***significant at p<.001

The above analysis reveals that the relative influence of teacher attitudes are greater and more consistent across years and grade levels than teacher background characteristics or instructional practices, as measured in the ECLS-K database. The findings above also indicate that the effects of teacher attitudes and teacher background characteristics are likely not mitigated through instructional practices. Generally, instructional practices, as measured by the frequency of the various practices, do not have an effect on reading and math achievement scores in first and third grade, but they do appear to have a negative impact on fifth-grade math achievement scores.

Teacher attitudes are consistently significant for students in schools that receive Title I funds, as well as for students in schools that do not receive Title I funds. On the other hand, teacher background characteristics and instructional practices generally did not have significant effects on either group but instructional practices had a significant impact on math achievement for both groups in fifth grade, and background characteristics had a significant impact on math achievement of students in school that did not receive Title I Funds.
Similarly, teacher attitudes had a significant effect on reading and math achievement scores for Asian, Black, Hispanic and White students. Although the effects of background characteristics and instructional practices were inconsistent across groups and across grade levels, it appears more likely that they may have an impact on Black and Hispanic students than on Asian or White students.

None of the factors, including teacher attitudes, are significant across the grade levels for high-ability students. However, the effects of teacher attitudes are consistent across the grade levels for students whose composite reading and math achievement score is below the 90th percentile. Instructional practices also have a significant negative effect on fifth-grade math achievement for not-high-ability students.

While the analysis of the hypothesized and direct-effects models highlight the relatively consistent and statistically significant influence of teacher attitudes on reading and math achievement scores, examination of the standardized residuals also reveals a consistent amount of misspecification in the model that was unable to be resolved within the three-prong framework. The standardized residuals are similar to z-scores reflecting “estimates of the number of standard deviations the observed residuals are from the zero residuals that would exist if the model were perfect” (Byrne, 2010). Standardized residual values > 2.58 are considered to be large covariances between the identified variables. The standardized residuals for the models in this study seemed to reflect a substantial number of considerably large covariances among variables exposing extensive misspecification of the three-prong framework. Examination of the standardized residuals in conjunction with the modification indices appeared to point
toward the factor *negative expectations* and its potential direct effect on reading and math achievement scores.

Investigation of a model which pulled out *negative expectations* from the *teacher attitudes* factor with a direct path to reading or math achievement provided interesting results. Preliminary investigation of a couple of grade levels revealed that the factor *teacher background characteristics* was considerably insignificant and its elimination resulted in acceptable model fit. As shown in Tables 46 and 47, below, the results of this negative expectations model demonstrated the significance of *negative expectations*, as well as the increase in the amount of variance in reading or math achievement explained by the model.

Table 46
*Model Fit Statistics for Negative Expectations Model*

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>RMR</th>
<th>GFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 1 Reading</td>
<td>11,733</td>
<td>291</td>
<td>&lt;.001</td>
<td>.223</td>
<td>.942</td>
<td>.896</td>
<td>.052</td>
</tr>
<tr>
<td>Grade 3 Reading</td>
<td>13,302</td>
<td>485</td>
<td>&lt;.001</td>
<td>.241</td>
<td>.937</td>
<td>.940</td>
<td>.047</td>
</tr>
<tr>
<td>Grade 5 Reading</td>
<td>10,587</td>
<td>397</td>
<td>&lt;.001</td>
<td>.282</td>
<td>.939</td>
<td>.910</td>
<td>.049</td>
</tr>
<tr>
<td>Grade 1 Math</td>
<td>12,854</td>
<td>367</td>
<td>&lt;.001</td>
<td>.186</td>
<td>.942</td>
<td>.909</td>
<td>.048</td>
</tr>
<tr>
<td>Grade 3 Math</td>
<td>20,349</td>
<td>486</td>
<td>&lt;.001</td>
<td>.293</td>
<td>.903</td>
<td>.929</td>
<td>.059</td>
</tr>
<tr>
<td>Grade 5 Math</td>
<td>13,283</td>
<td>485</td>
<td>&lt;.001</td>
<td>.465</td>
<td>.929</td>
<td>.926</td>
<td>.049</td>
</tr>
<tr>
<td><strong>With Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 1 Reading</td>
<td>12,169</td>
<td>316</td>
<td>&lt;.001</td>
<td>.662</td>
<td>.942</td>
<td>.900</td>
<td>.051</td>
</tr>
<tr>
<td>Grade 3 Reading</td>
<td>13,519</td>
<td>517</td>
<td>&lt;.001</td>
<td>.514</td>
<td>.938</td>
<td>.942</td>
<td>.046</td>
</tr>
<tr>
<td>Grade 5 Reading</td>
<td>11,116</td>
<td>426</td>
<td>&lt;.001</td>
<td>.925</td>
<td>.935</td>
<td>.914</td>
<td>.048</td>
</tr>
<tr>
<td>Grade 1 Math</td>
<td>13,445</td>
<td>395</td>
<td>&lt;.001</td>
<td>.348</td>
<td>.941</td>
<td>.912</td>
<td>.048</td>
</tr>
<tr>
<td>Grade 3 Math</td>
<td>20,558</td>
<td>518</td>
<td>&lt;.001</td>
<td>.353</td>
<td>.905</td>
<td>.931</td>
<td>.057</td>
</tr>
<tr>
<td>Grade 5 Math</td>
<td>13,683</td>
<td>517</td>
<td>&lt;.001</td>
<td>.645</td>
<td>.929</td>
<td>.929</td>
<td>.048</td>
</tr>
</tbody>
</table>
Table 47
Standardized Regression Weights for Ability Groups

<table>
<thead>
<tr>
<th></th>
<th>Instructional Practices</th>
<th>Teacher Attitudes</th>
<th>Negative Expectations</th>
<th>Prior Achievement</th>
<th>SMC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 1 Reading</td>
<td>.006</td>
<td>.007</td>
<td>-.267***</td>
<td>--</td>
<td>.071</td>
</tr>
<tr>
<td>Grade 3 Reading</td>
<td>.023*</td>
<td>.098***</td>
<td>-.129***</td>
<td>--</td>
<td>.027</td>
</tr>
<tr>
<td>Grade 5 Reading</td>
<td>.079***</td>
<td>.039***</td>
<td>-.223***</td>
<td>--</td>
<td>.057</td>
</tr>
<tr>
<td>Grade 1 Math</td>
<td>-.002</td>
<td>-.005</td>
<td>-.257***</td>
<td>--</td>
<td>.066</td>
</tr>
<tr>
<td>Grade 3 Math</td>
<td>.011</td>
<td>.094***</td>
<td>-.114***</td>
<td>--</td>
<td>.022</td>
</tr>
<tr>
<td>Grade 5 Math</td>
<td>-.066***</td>
<td>.151***</td>
<td>-.186***</td>
<td>--</td>
<td>.062</td>
</tr>
<tr>
<td><strong>With Covariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 1 Reading</td>
<td>.016*</td>
<td>-.019*</td>
<td>-.149***</td>
<td>.648***</td>
<td>.442</td>
</tr>
<tr>
<td>Grade 3 Reading</td>
<td>.006</td>
<td>.039***</td>
<td>-.049***</td>
<td>.722***</td>
<td>.525</td>
</tr>
<tr>
<td>Grade 5 Reading</td>
<td>.019**</td>
<td>.014*</td>
<td>-.050***</td>
<td>.817***</td>
<td>.671</td>
</tr>
<tr>
<td>Grade 1 Math</td>
<td>.017*</td>
<td>-.005</td>
<td>-.074***</td>
<td>.727***</td>
<td>.534</td>
</tr>
<tr>
<td>Grade 3 Math</td>
<td>.004</td>
<td>.038***</td>
<td>-.030***</td>
<td>.752***</td>
<td>.567</td>
</tr>
<tr>
<td>Grade 5 Math</td>
<td>-.015**</td>
<td>.042***</td>
<td>-.058***</td>
<td>.843***</td>
<td>.715</td>
</tr>
</tbody>
</table>

*significant at p<.05  
**significant at p<.01  
***significant at p<.001

Byrne (2010) cautions that in conducting numerous models, as I have done in this case, it is important to realize that analyses then become framed within an exploratory, rather than a confirmatory, mode. In other words, once a hypothesized CFA model, for example, has been rejected, this spells the end of the confirmatory factor analytic approach, in its truest sense (p. 89).

Further analysis is also needed to determine a parsimonious negative expectations model, as I think it would be important to re-examine the potential of this model in an appropriate process in which the exploratory and confirmatory analyses are conducted with separate data. Of course, it also would be desirable to conduct this analysis on a dataset with fewer missing data.
Normality

An important assumption of structural equation modeling (SEM) is that of multivariate normality. Extreme kurtosis is particularly problematic for SEM (Kline 2005; Byrne 2010), which was evaluated by examining the critical ratios for kurtosis in AMOS. Problems with kurtosis are often seen when data is categorical rather than continuous. Data with critical ratios > 5.00 are considered to be non-normally distributed (Byrne 2010). The analysis of critical ratios for kurtosis for each of the models in this study revealed severe problems with kurtosis. This suggests that it is inappropriate to use maximum likelihood estimation, because it does not adequately handle the categorical nature of the data. As suggested by Bryne (2010), I used AMOS to run Bayesian estimates for each of the models so that the maximum likelihood estimates could be compared with the Bayesian estimates.

Missing Data

SEM is also sensitive to missing data. Unfortunately, the variables from the ECLS-K database used for this analysis had a large amount of missing data. Analysis of the data revealed a number of cases for each year in which student data was contained in the database, but none of the teacher data reporting information related to the instructional practices and teacher attitudes was available. For this analysis, such cases would mean that the only variable for a specific case for that grade level analysis would be the student’s achievement score. All other data points would need to be imputed. The incidence of these cases increased over time: 31.6% in first grade, 44.7% in third grade, and 49% in fifth grade. Although listwise deletion of missing cases is not a desirable method of handling missing data, given the large amount of missing data for each grade
year it was appropriate in this case. Thus, listwise deletion of cases in which there was
no achievement data for students over time or where there was no teacher data for the
student that year. Because such a large proportion of the data in this case was eliminated
through listwise deletion, this is a severe limitation of this analysis as no assumptions can
be made about the data being missing at random or about the generalizability of the
results of the analyses.

Conclusion

Exploration of the results of the quantitative analyses reveals extensive
misspecification in both the hypothesized and the direct-effects models. However, these
analyses suggest that teacher attitudes may have a consistent significant impact across
grade levels and across most groups of students, with the exception of high-ability
students. Instructional practices, on the other hand, have a significant effect on student
achievement only for fifth grade, and in this case the effect was negative. Background
characteristics have a significant effect on student achievement only for fifth-grade math.

When looking at the group differences in the effects of teacher background
characteristics, teacher attitudes, and instructional practices on student achievement, it
appears that teacher attitudes are significant for students attending schools receiving Title
I funds and for those that do not receive Title I Funds. Instructional practices are
significant for both groups in fifth-grade math. Instructional practices also have a
significant effect on first-grade reading achievement for students in schools receiving
Title I funds, but not for students in schools that do not receive Title I funds.

Likewise, teacher attitudes are generally significant for Students of Color and for
White students in first and fifth grades. Instructional practices are significant for Black,
Hispanic, and White students in fifth grade. Background characteristics are significant for sometimes significant for Students of Color, and for Black students all of the factors are significant in first grade. However, when prior achievement is included in the model only teacher attitudes has a significant effect on first- and fifth-grade reading achievement and for fifth-grade math achievement for Asian, Black, and White students.

Only prior achievement scores are consistently significant for high-ability students. In contrast, teacher attitudes have a significant impact on student achievement for students that are not in the 90\textsuperscript{th} percentile of achievement scores, and instructional practices have a significant negative effect on fifth-grade math achievement for these students.

While the effects of teacher attitudes are significant in the direct-effects model, it still accounts for a very small percentage of the variation in student achievement. Thus, it appears that additional research into the effects of teacher attitudes, particularly the expectations of teachers, on student reading and math achievement scores is warranted.
Chapter V

QUALITATIVE ANALYSIS

The case study examined teacher perceptions of the influence of teacher background characteristics, teacher attitudes, and instructional practices on student achievement. The teachers participating in the study were teachers in an urban school that has a gifted and talented magnet program. The case study involved multiple observations of the classrooms (except one classroom for which only one observation was possible), interviews with the teachers, examination of materials posted on their classroom walls, and their responses to some of the ECLS-K questions. Some of the teachers also shared supplemental information such as artifacts from their classroom, lesson plans, and information about their student growth data this year. Through the interviews, the teachers first discussed the background characteristics, teacher attitudes, and instructional practices that they believe are most important for enhancing student achievement. They then gave their impressions on the items related to these factors, as identified in the quantitative analysis.

Case Study Findings

Sample

The sample for the case study had components of both convenience and purposive sampling. Gilbert Elementary School (a pseudonym) was selected partially because I had a connection, which made the principal and teachers accessible to me; a
colleague worked as an instructional coach at the school last year, which was the first year of a new administration at the school. Thus, she was familiar with the school, the principal, and the teachers. More important to me, it was also selected because it is a school with a magnet gifted and talented program, it is meeting expectations for student growth on State standardized tests, and it is implementing strategies to increase student achievement through effective instruction. Because the school has a gifted and talented classroom at each grade level, the choice of this school allowed me to select a teacher from a gifted and talented classroom and a teacher from a general education class at each grade level to participate in the study. Thus, I observed and interviewed six teachers and the principal at Gilbert Elementary.

Since there was only one gifted and talented classroom at each grade level, each of those teachers was invited to participate in the study. On the other hand, there were at least two general education classrooms at the first-, third-, and fifth-grade levels. In this case, I was particularly interested in observing and interviewing teachers identified as highly effective. Thus, the instructional coach and the principal provided recommendations of teachers at each level who they believed were effective general education teachers who would be reflective and articulate in describing their teacher attitudes and teacher practices. Each of the teachers identified was invited to participate in the study.

After the data collection consisting of observations and interviews of the teachers and the interview with the principal, I learned by happenstance that a colleague’s child attended the school and, in a prior year, was in the class of one of the teachers included in
the case study. I obtained review board approval to interview this parent and child, and to include them in the study, although in a limited manner.

**Sample Teacher Profiles**

Ms. Paxton is a first-grade teacher at Gilbert Elementary. She teaches in a gifted and talented classroom, and she is in her fourth year of teaching. She is enthusiastic and energetic in the classroom. She is articulate about her practice, and she appears eager to learn new teaching techniques and bring them back to her classroom. She has a master’s degree in Education Psychology, and is interested in both the cognitive and socio-emotional development of her students. Thus, she balances the pacing required in a gifted and talented classroom with the need to ensure that developmental stages are not overlooked, which could have a negative effect on students’ progress and/or efficacy later in their schooling.

Ms. Evans is a first-grade teacher in a general education classroom at Gilbert Elementary. She is in her fourth year of teaching. Ms. Evans reports that she comes from a “family of teachers,” and she received her master’s degree in education in another state where the population was very different from the students she currently serves. She has a calm demeanor in the classroom, and she blends firm and consistent discipline with nurturing and gently pushing students to do more. She is reflective about her teaching and appears to embrace opportunities to improve her practice through professional development. She is deeply concerned about meeting the needs of each individual student and making sure that no student slips through the cracks.

Ms. Collins is a third-grade teacher with ten years teaching experience. She teaches in a general education classroom. Ms. Collins feels strongly that teachers must
be well prepared academically for the subjects they teach. She has a master’s degree, and she believes that it enhances her instructional practices, as well as her work with her grade-level team. She is passionate about sharing her love of children’s literature with her students. It is important for Ms. Collins that the students in her class are happy learning and that they are making growth. She stresses the need for the classroom environment to be open and welcoming; she does not feel that children can learn in an environment that evokes fear of the teacher or of the content.

Mr. Simpson is a teacher in a third-grade gifted and talented classroom. He is identified by his principal as an exemplary teacher. With over 25 years of experience in the classroom, he has extensive teaching experience, and he has taught in Title I schools, as well as in non-Title I contexts. Likewise, he has taught in gifted-and-talented classrooms, as well as in general education classrooms. Reading, student engagement, and humor are at the core of Mr. Simpson’s instructional practices and are integrated into all of the learning activities in his classroom.

Ms. Webb is a fifth grade teacher in a gifted and talented classroom. She has taught fifth grade in a number of different environments ranging from large inner-city, high-needs schools to suburban schools that are transitioning from middle class to more high-needs contexts. She has a master’s degree in Educational Technology. She is a vibrant teacher who is eager to contribute to educational reform and innovation, and she enjoys introducing creative and inventive technologies and practices into her classroom.

Mr. Mills is a fifth grade teacher in a general education classroom with 17 years of teaching experience. Mr. Mills decided to change his career and go back to school in his mid-thirties. He was so inspired by the commitment and dedication of his teachers
that he decided to change course and continue his education in order to pursue a career in teaching. In reflecting upon his teaching, he emphasizes the need for teachers to establish relationships with students and parents. He feels that in order to be able to inspire children to love learning, you have to know them and their interests. In addition to inspiring students to learn curricular content, he aims to teach them to respect and honor themselves and others.

**Student Achievement**

To understand teachers’ perceptions of how their background characteristics, teacher attitudes, and instructional practices influence student achievement, I first inquired about teachers’ views about student achievement itself. All of the teachers seemed to agree that student learning and student achievement are related, but they are slightly different.

The teachers expressed that student academic achievement is met when students are able to meet objectives, understand the concepts covered, and they are able to apply them at an independent level. They described learning as a “building block” to achievement. They described that although students might learn a concept or skill, they may or may not retain what they have learned, apply it at a later time, and then further be able to extend their learning. Mr. Simpson described this in relation to Bloom’s taxonomy.

So student learning can be at lower levels of Bloom’s taxonomy of knowledge and application, and I see student achievement moving up the ladder of Bloom’s taxonomy into synthesizing. It’s the same thing with learning to read vs. using reading and enjoying reading, or reading to learn instead of learning to read. One is actually the student achievement, and the other is knowledge base.
The teachers indicated that while the term “student achievement” brings to mind high-stakes testing and the examination of student data, they do not believe that “achievement” is limited to academic achievement. There are also socio-emotional aspects related to student achievement, particularly at the lower grades. In addition, although we commonly think of high-stakes testing when we think of academic achievement, many of the teachers asserted that standardized tests are not perfect measures of student achievement and several of them gave examples of students whose work in class is, for various reasons, inadequately measured by the standardized tests.

**Background Characteristics**

Teachers in the case study reported a number of background characteristics that they believe contribute to their effectiveness, including prior experience with children, prior teaching experience, advanced degrees, and professional development. They also related some personal characteristics they believe contribute to their teaching.

Three of the teachers worked with children as teens and/or when they were in college, and they felt that those experiences contributed to their overall preparation to be a teacher. Ms. Evans, specifically, did not think that the background characteristics as reported in the literature had a large impact on her teaching. However, she went on to describe what she termed as “personal characteristics” that she felt influenced her teaching. For example, “I think that coming from a family of teachers and having that attitude of celebrating kids—I think that has helped me to really enjoy kids and have a good attitude to really support them.” In addition to coming from a family of teachers, she began working with children herself at summer camps as a teen. She felt that this personal history contributed to her expectations that all children can learn and her
conviction about the need to develop relationships with her students. Another teacher also worked as a tutor in a summer camp program, and she too found this experience contributed to her preparation to be a teacher. She felt that the tutoring experience helped her understand what actually works with students, as well as the need to make timely adjustments. “You’ve got to know if it is working, and if it’s not you’ve got to change it. No one is going to keep bringing their kid to tutoring if they don’t see progress.” The third teacher worked as a nanny while earning her undergraduate degree. She loved working with the children, but did not think about it at that time largely because of what she heard about the financial compensation of teachers. After completing her undergraduate degree and deciding not to pursue her field of study, she began exploring the possibility of becoming a teacher.

I went to this first-grade classroom to volunteer and from probably the first five minutes of walking in there, [I thought] ‘what am I doing? I am meant to be a teacher.’ I was so happy. I had one day off a week and I would spend it in that school. I would drive a half hour just to spend the day with these kids.

Several teachers talked about the influence of their graduate degrees on their teaching. For one teacher, after deciding to pursue a degree in teaching, she pursued a master’s degree in Educational Psychology and she learned a lot about how the mind works and how children learn, which she found valuable for her current position. Similarly, a teacher who obtained a master’s degree in Elementary Reading and Literacy felt that her degree enhanced her knowledge of literacy and contributed to her guided reading. A teacher who earned a master’s degree in Education and Technology said it has helped her understand what technology is available and how it can be used in her classroom:
Making a Prezi, creating a unit for social studies, studying differentiation and all of these amazing websites and learning through the internet. I have taken almost 100% of what I learned and applied it to this class this year, because this is the first class since the program. I’m a completely different teacher now.

She indicated that her degree has not only transformed her teaching, but it assisted her in taking her students to the next level. She also felt that her initial teacher preparation program and extended clinical experience was very beneficial, particularly with establishing student relations and classroom management.

While some teachers felt that their formal graduate programs were beneficial to their teaching, a number of them also talked about professional development opportunities that had been helpful. Most notably, several of the teachers specifically mentioned the Kagan trainings which have helped them to establish collaborative learning environments in which all students participate, they work together to enhance their learning, and they are held accountable to meeting classroom expectations. The teachers also talked about specific trainings or professional development they attended for grade-level appropriate teaching strategies. The teachers mentioned that such trainings are useful because the featured strategies allow them to bring new techniques back to the classroom. The new techniques are exciting to students because they introduce variety into the classroom, while at the same time ensuring that they are connected to curricular objectives and not just something fun to do.

Some of the teachers discussed having attended the district English Language Acquisition (ELA) trainings which are required by the district for all teachers new to the district. These teachers stressed the importance of ELA training for teachers, but the teachers had mixed reviews of the district trainings. The teachers valued that the district
offers the trainings, and they expressed the desire to continue their education in this area and to go deeper in their study than what is provided by the district. Interestingly, although two of these teachers were teaching in gifted and talented classrooms with fewer culturally diverse students and no students identified as English language learners, they expressed that they knew they would have more culturally and linguistically diverse students in the future and wanted to be prepared to meet their needs.

In contrast, one of the teachers did not feel her teacher preparation program was very helpful to teaching in her current context, because the population of the students and the community are quite different. In addition, the students are “a little more exposed” in her current context than children where she earned her degree and did her student teaching. Instead, she found her experiences as a long-term substitute, a tutor, and a para-professional to be good preparation for becoming a teacher in a classroom “where all of the students are different.” Likewise, two teachers whose teacher preparation was over 15 years ago indicated that their colleagues and interns who have completed teacher preparation programs more recently have received a lot more relevant and applicable information to classroom teaching than they received in their degrees.

Several of the teachers also discussed the significance of some personal characteristics in their teaching styles. A number indicated they felt it is important for teachers to have a reflective personality comfortable with continuously examining their practice and with receiving constructive criticism and making adjustments to applying the feedback. This reflexivity is also helpful in “bridging old and new.” Other teachers felt that characteristics such as being an extrovert that is “energized . . . around groups of people,” having a sense of humor that allows one to blend firm classroom management
with an enjoyable learning environment, and a love of children’s literature that allows them to connect learning to student interests and thereby increase student engagement.

When asked about the effect of their background characteristics on their teaching, the teachers in the case study emphasized prior experiences working with children, particularly experiences such as tutoring. They also talked about their experience and the relevance of their graduate degrees when asked about them. However, in talking about effective teaching, particularly with regard to increasing student achievement and closing achievement gaps, the teachers stressed the importance of teacher attitudes and instructional practices.

**Teacher Attitudes**

The teachers in this elementary school stressed the importance of teacher attitudes and the effects of teacher attitudes on students’ experiences and on their achievement. With regard to teacher attitudes, the teachers from both the gifted and talented classrooms and from the general education classrooms across the board underscored the need to have a positive attitude, to have relationships with students, to believe that all students can learn, and to have high expectations for students. Similarly, the principal of the school expressed that, in her opinion, effective teachers need to “build good relationships with students, have strong classroom management, and foster student learning in their classroom.” As Ms. Evans emphasized, it is important for teachers to believe that their students can learn and to instill in students a sense of academic efficacy:

I think always having a positive attitude, and again feeling that every kid can make that growth and can achieve. I think you have to be excited, and you have to get them excited, engaged, and motivated. Letting them know that they are
capable. They can do it. Never making a kid feel like this isn’t it. To always say, “I think this is great, but I think it can be better. How could we make it better?” I try to do that every day—to be calm, to be positive, to push them in a positive way. I try to kind of be a coach, “come on, come on, come on,” and then celebrate it when they do it.

Mr. Mills agreed that it is essential for teachers to have a positive attitude and added that it helps to “be at peace with yourself and to be a well-adjusted person.” He went on to say that “if something happens, you address it, but not in an over-the-top way. You’re not over-exaggerating. . . . You really need to be a positive person—to have a positive outlook on life, your job, and your surroundings.”

Ms. Paxton added that having a positive attitude helps to create an environment in which kids “know that they can come to me and that I am human.” She said that in addition to letting students see you as a human being, it is important for teachers to share parts of their lives with students so that the students get to know the teacher too. “They know about my dog, they know about my boyfriend, they know I have a house, they know I have a garden, and then we can talk about it.” She added that “it is another way of engaging students,” so that when she is modeling writing a story, the kids will often ask if her boyfriend or her dog are going to be in the story.

Ms. Collins also discussed the need for teachers to be “approachable” so that students are comfortable asking questions and sharing their thinking. She related a story of a student, who in a discussion earlier in the week, said “I don’t know if I should say this, I don’t know if it’s bad.” Ms. Collins suggested that he write it down on a paper and show it to her and then she could advise him. In addition to writing his question on the note, he again included the statement, “I’m not trying to be bad.” The statement was something he had heard about another cultural group, and she was pleased that he felt he
could approach her to ask the question. As a result, she was able to calmly reply to him, “I have never heard this and I don’t think it’s true, but we are not going to say it in front of the whole class,” and to redirect him back to his classwork in a positive manner.

Mr. Simpson added that it is important “that you actually seem to like the students.” He stressed the need to “engage the kids” rather than just “dispel information.” He said that “teachers now get tons of actual in-class training that I never got, but it’s all in the attitude.” He acknowledged that there are more things for a teacher to do in a day than it is possible to accomplish, so it is essential for teachers to prioritize their work.

So you need to take the standards, you need to integrate things, you need to look at your data, and you need to know your students—and you need to actually have a good attitude about it. I look at some of the teachers, and I wonder why they are still teaching. They act like they are in misery. I love coming to the school. I haven’t missed a day all year. I actually have perfect attendance.

He again reiterated his philosophy that good teaching is “part entertainment and part working,” and that he doesn’t let the “small things” get in his way.

Ms. Webb discussed the effect of having a positive attitude on other teachers.

You can have that one toxic member of the school and it can make a huge difference. So it’s important to have a positive attitude that we are all here for the kids. We’re all here for a common goal, and to support each other in the hallway or to take over each other’s classrooms when we need it really makes a difference with everything. It all kind of intertwines with the common goal that every kid is supported and looked at, and every kid has the attention they need in some way or another.

When looking at the teacher attitude items linked with the quantitative analysis, the teachers in this study highlighted the importance of school climate. They discussed that the transition to a new administration, last year, created a “sort of funky school climate.” As one teacher mentioned, “whenever you have a switch in principal, it can be
very dramatic.” Most of the teachers mentioned, in one way or another, the tensions that developed among teachers and parents, as a result of changes implemented by the new administration. They indicated that these tensions had an impact throughout the building. However, they also discussed their efforts to ensure that what was happening in the school community did not have an impact on their students: “Our school community was kind of down about what was happening in the school, but I didn’t let that ever affect my teaching. I didn’t let the kids ever see my underlying attitude.”

Several of the teachers agreed that once they enter their classrooms, “it is all about the kids.” They pointed out that “if everyone is not focused and all working together, then I think some kids will see that. If there is stuff going on that the community or the staff is upset about, it never comes in here.” They emphasized the need to have a professional demeanor regardless of what is going on in the school community:

Obviously in any job you have tense moments, you have tense conversations, but I think remembering to be professional goes a long way. And, that’s the other thing, kids can pick up if teachers have some discrepancy. There are students that can gauge that and be like “they are not getting along.”

The teachers indicated that students also sense it when a teacher is grouchy, unhappy, sick, or just not enthusiastic about lessons, and they asserted that “sometimes you just need to pretend.”

While the teachers discussed the challenge of administrative transitions, they also discussed how the transition has settled quite a bit this year. They talked about how the administration and teachers can have positive impacts on the school climate and teacher attitudes. As one teacher stated,
I think teacher attitudes are also affected by your principal who has to be strong but kind, fair but firm, and trustworthy. I think once you have someone great and trustworthy who pushes us to where we can achieve, kind of like what we do with our kids, it can be a really great environment.

The teachers rated the school spirit high. As one teacher noted, “when people are excited about where they work and they are excited about what is happening here, then everybody senses it.”

The teachers also agreed that the school administration has a clear vision. “She is aggressive; she is firm. Her expectations are clear, and her vision is perfectly clear. And I think I’ve been achieving far more this year because of the perfect formula.” When discussing the challenges they faced last year, several of the teachers talked about pressures from a number of the parents who favored some teachers over others. They discussed how difficult this was for the teachers, and how much they appreciated the principal’s support. They also said that they feel that the principal does what she can to minimize the pressures that come down from the district. The principal confirmed her efforts to “buffer” teachers from outside district, federal, and state pressures: “I think principals have to buffer; I am not super strong with that yet. I hope to get stronger with buffering district, federal, and state pressures so that we stay focused and not try to do too much at once, because you can’t do it all.” The teachers also indicated that they felt that the administration is getting stronger at prioritizing and at encouraging staff. As one teacher said, “I think they understand they need to do that more--they have already said that. But I think this is their second year, and they are still trying to understand the balance of how to push teachers, but in a way to also celebrate what they are doing well.”

In addressing the issue of priorities, the principal compared her role to one of spinning
plates with a lot of competing demands all at the same time and all are important, so it is like

trying to pound down the wackamole with anything trying to put pressure on you—this isn’t important, this isn’t important. You have to stop the politics, because it can be so overwhelming and so crazy and then teachers can’t do a good job because you are saying, do this and do this and do this.

Several of the teachers agreed that the administration encourages and supports staff. They related that they feel that the administration pushes teachers to succeed, but they also provide appropriate supports for the teachers to meet the goals that are established, though the supports valued by the teachers varied seemingly in relation to their individual experience and strengths. With regard to all of these factors—handling outside pressures, priorities, and encouraging staff, one teacher put it this way:

[The principal] does a beautiful job with that... This is her second year as a principal, and I have seen such improvement and growth in all of these areas just after her first year, which could have made her quit and just run away (chuckling) because to be a principal you have the Superintendent on one side giving you impossible tasks; you have parents all pushing in on you; then it’s not easy controlling all the teachers—they are like little children at meetings. You have all of these different things, and for a principal to take all of that—that’s why I am still a classroom teacher!

Nonetheless, several teachers mentioned child behavior, and stated that they hope that in the future the principal will place increased emphasis on child behavior as well.

“I think, I wish that the management of behavior was a little more pushed, but otherwise they do a really good job of getting things done and keeping on goal.” This did not seem to be an overwhelming criticism, and there seemed to be recognition that the administration is aware of the need to do more in addressing student behavior. While it is to be expected that teachers would have suggestions about areas of improvement for an administrator, this may have been on teachers’ minds because of an incident that
occurred at the school during one of the weeks I was conducting interviews and observations, and the incident was vaguely alluded to by a couple of the teachers as they discussed this desire for increased emphasis on handling child behavior.

In addition to the impact of the principal on school climate, other teachers talked about their own influence on the climate of the school:

A long time ago I realized that community building with the teachers was very valuable, and all we did was go to meetings and talk, talk, talk. So one of the things I did here was I talked the principal into letting me have Friday breakfasts in my room. So, on Friday mornings, I’d let teachers come in for a breakfast. And it’s not a meeting; they would just socialize. Because I never saw the kindergarten teachers; I didn’t see the second-grade teachers, except at meetings of course. And as soon as the principals saw how it brought the staff together, they were like “keep your Friday breakfast.” So, now the social committee has taken over Friday breakfast.

A young teacher who is relatively new to the school appreciated the benefits of these informal opportunities to socialize: “Every Friday here we have a teacher breakfast, and grade levels rotate bringing the breakfast. And whether you run in and say ‘hi’ and grab something or you sit and chat, it’s just a time to say ‘hey, we appreciate each other.'”

Again, several of the teachers pointed out that when the school climate is healthy, teachers have an open-door policy and support one another with materials and resources. All of the teachers in the case study stressed the importance of having a “cohesive working team.”

A couple of teachers expressly stated that they are very close to their team and they believe that the collective efficacy of the team, as well as that of the overall teaching community, is vital. As Mr. Simpson said, “I think most of the teachers really believe that they can make a difference.” Further, as Ms. Evans noted,
With everybody working together and being on the same page, I think it helps everybody achieve. When everybody is doing well, everyone is going to do well. So, if we are all working together and we’re all on the same page, and we’re all positive, I think that can affect everybody.

On the other hand, another teacher seemed to be somewhat concerned about the impact of some of the instructional models adopted by the school, such as “flooding,” on their teams. Flooding is a practice to homogenously group students across classrooms so that they receive concentrated support at their ability level in addition to exposure to whole class instruction at their grade level. With this practice, students spend much of the day in their home-room classes, but at certain points of the day some of the students move to other rooms to receive instruction targeted at their ability level in either literacy or math. While teachers still monitor the progress of students and differentiate instruction to meet the needs of each student, the flooding practice reduces the amount of differentiated instruction required by any one teacher and allows the teachers to focus more closely around given ability levels. Thus, “you have to trust your teammates so much because there are kids that I have during the day in my class, they are on my roster, but I don’t have them for reading or for math.” Nonetheless, the teachers stressed that it is key for them to have people they can turn to for support if they have questions or concerns, especially with regard to support for English language learners and special education students.

The teachers also indicated that when teams are stable and are able to work well together over time, they become stronger. “They are able to bounce ideas off of each other—they feel comfortable with each other because they have been teaching together for a while.” On the other hand, they also indicated that it is important to accept new
teachers and team members. As Mr. Mills put it, “I always welcome new teachers, because I can learn something from them and that’s what makes my world go around.” Likewise, whether there are new team members or the teams have been long standing, it is important that the teachers know that they can “rely on one another” and that they are all “continually open to new ideas and new ways of doing things.”

The teachers at this school also agreed that their engagement in the profession is important for their overall attitudes and for their success in the classroom. They concurred that it is crucial to be dedicated to teaching, though there were differences in how they described their dedication. For some, their dedication was expressed in terms of enhancing their skills through continuous learning and furthering their education through formal university programs or through targeted professional development. For others it was expressed in terms of time they spent outside of their normal working hours, whether that meant arriving very early in the morning or working over the weekend on their lesson planning and preparation. As one teacher noted, “I can’t imagine doing this job as a 40-hour a week job. I’ve never looked at it that way; I cannot even imagine anyone doing it that way and doing it well. It’s kind of an all-consuming job. I’ve heard it said, ‘it’s not a profession, it’s a calling.’” Ms. Evans made a similar statement: “I’m always thinking, how can we do better? How can we do more? I’m talking with peers. I’m thinking about it when I go home. I’m thinking about it in my sleep, so you’ve got to be engaged and excited, and you’ve got to be always learning.”

While they described teaching as an intense, time-consuming, and “self-less” job, they also described it as an extremely rewarding job in which one is readily able to see the
results of hard work. Ms. Paxton added, “I work my tail off all the time, but it’s because I see that when I come to school with something new they are like ‘this is so awesome.’”

As might be expected, whereas the teachers affirmed the effects of positive attitudes on student achievement, they also suggest that negativity discourages students and impedes their learning. They reiterated the need not to allow external circumstances to enter the classroom and affect student experiences.

Stuff happens throughout the day, whether it’s our personal life, whether we’ve had a conflict with another staff member, or whether you’re not feeling good—it’s trying not to let that show. I may have just come out of a meeting where I am feeling awful, but that is not my kids’ fault.

In addition to the external factors that can produce negative attitudes, child behavior can also dampen teachers’ spirits and adversely affect their teaching, which is why it is essential to set up rituals and routines early in the year and work out behaviors as soon as possible. Ms. Evans noted, “If you have to constantly stop to deal with behavior, then 22 other kids are missing out on their learning.” Other teachers expressed similar sentiments stating that they went so far as to talk with students and have them calculate the lost instructional time over the course of the year.

Conversely, the teachers cautioned that one cannot assume that behavior is, in any way, “an indication of intelligence or ability or skill. Some of my worst behaved kids are some of my smartest, if we want to look at it that way.” They indicated that in some cases their advanced students get bored if the timing of the lesson and level of differentiation do not keep pace with their ability to digest and directly apply the material. As one teacher explained, he did not have any behavior problems to speak of because appropriate rituals, routines, and expectations were established early in the year.
and followed through consistently. Other teachers discussed the necessity of having a “forgiving” attitude and setting up routines to let students know that every day is a new day: “I have some kids this year that really need to know that it is a clean slate when they come in the morning. Because if it weren’t, oh my goodness, I don’t think they would keep trying.”

Although the teachers generally expressed belief that the classroom environment is best when they can be “authentic” and convey their personalities in the classroom, a few stated that it is sometimes necessary to “reign it in,” because in some years they have a group of students who take advantage of any opportunity to distract lessons requiring them to tightly regulate the classroom environment. For other teachers, they did not view the sharing of their lives and personalities as optional. As Mr. Simpson related, his character and entertainer spirit are an integral part of his instruction. Likewise, Ms. Paxton opined “I can’t even imagine what the class would be like [if they didn’t know me as a person], because we wouldn’t have anything to talk or giggle about.” She went on to say, “it is pretty interesting to see the impact that your attitude can have on their learning.”

The teachers in the case study emphasized the effect of having a positive attitude on student achievement, and they discussed their strategies for contributing to a positive classroom, team, and school climate. Likewise, they recognized the detrimental effects of negative attitudes on student engagement and achievement, as well as on their colleagues. The teachers also acknowledged the negative effects of student misbehavior on student achievement, as well as on school climate. Thus, they stressed the need to set
up strong positive classroom rituals and routines early in the year, which are consistently implemented throughout the year.

**Instructional Practices**

The teachers in this case study identified a number of instructional practices that they believe are necessary to promote student achievement, including getting to know their students, planning and curricula, classroom management, assessment and data analysis, and high expectations. They also illuminated the interrelationships between student engagement, and student behavior. The teachers also reviewed and addressed specific instructional practices related to reading, writing, and math presented in the quantitative analysis.

**Building Relationships with Students**

Some of the teachers indicated that their practice routines change over the course of the year. At the beginning of the year it is crucial to build relationships with students and build community in the classroom, which is actually planned rather than being left to chance. They indicated that it is essential to get to know each student’s abilities in the different content areas, which is an “essential first step for other instructional practices, such as planning and differentiation.” The teachers also described a practice at this school in which teachers provide data and information about each student’s strengths and weaknesses to the teacher that will have that student the following year. Mr. Mills described “when I first started teaching, I wouldn’t know their reading level until a month or two in.” Now, however, teachers from the prior grade level give the teachers information about incoming student performance levels at the end of the prior year. While he acknowledges that the students have had the summer off, “I know generally
where everyone is reading on the first day of school . . . . My having that data, it really allows me to use time better.” This practice was evident during my final observation in Mr. Simpson’s room. He asked students to go through the material in their folders, as well as materials he had hung on the walls over the course of the year, and select items for two stacks: one for their portfolio for their new teacher and one for their parents. He encouraged them not to throw away their work from earlier in the year, but instead to take it to their parents to show their progression over the course of the year. This practice allowed the students to see their progress over the course of the year.

Many of the students talked amongst themselves while doing this activity, and they were clearly familiar with and appreciated one another’s work: “Jadon, you have to put this one in . . . it’s your best story all year.” Another student asked, “Mary, wait! That story was so good! I want to read it again before you give it to him.” They also often went over to Mr. Simpson and said things like, “Remember this one. It is good, isn’t it?” Some even brought their work over to show me what they had done. They were clearly proud to look at where they started and where they were ending the year.

*Planning and Curricula*

Planning is an important instructional practice identified by a number of teachers, although their preferred planning practices varied. Most of the teachers agreed that it is essential to be well-planned and organized, and they typically described a multi-tiered planning process that begins with big picture planning in their collaborative teams, followed by their independent planning usually in the evening or on the weekend. Then they would modify their plans, as needed, throughout the week to adjust for the learning
of their students. Some teachers described coming in early to work on adjustments to their plans, while others worked on them over the lunch hour or in the evening.

As Ms. Collins said, “The more time I have to devote to actually planning to deliver quality instruction, the better it is going to be.” The teachers indicated that the abilities of students must be considered in lesson planning in order to appropriately differentiate. As Ms. Evans noted, “When you are planning lessons, you need to think about ‘what does each particular student need to get where they need to be?’” The teachers stressed that it is important to think about the abilities of each student in the planning process and to consider ways to “always set them up for success, because if you do that through planning, you know what they are ready for and you know what they can achieve, and then you don’t need to be afraid to push them.” Several of the teachers talked about needing to adjust plans occasionally, or recognize when they didn’t get the material and go over the lesson again. Mr. Simpson added that sometimes it is best to just stop the lesson, “One of the other things is, I see teachers go on with the lesson whether it is a failure or not. Many times I will stop and go ‘you’re not ready for this lesson.’” Mr. Mills agreed, “one of the things I learned . . . is that you have to be able to think on your feet. If the lesson is not working, you have to be able to make a change right then. You can’t waste time.” Ms. Evans highlighted the interrelation of a number of factors in the art of lesson planning:

Having a good knowledge of what you are teaching. Being reflective and always evaluating. Looking at your kids and continuing to look at where kids need to go, and I think keeping really good data so that you are constantly tracking kids and seeing how you can change or improve your teaching, how you can change the structure of your lesson—the pacing or whatever you need to make sure that everybody is making growth. I think that also being really purposeful in your lesson planning. I think it is really important to keep standards in mind—to be
aware of those. I think good collaboration with your team and sharing ideas is another thing. Especially this year—our collaborative planning where we backward design lessons and really look at the core standards and then decide, ‘What do we want our kids to come away with? What do we want them to understand? What do we want them to learn?’

While virtually all of the teachers expressed beliefs that lesson planning and setting objectives are essential practices to guide instruction, some of the teachers discussed that having a robust curriculum also is an integral component of strong lesson planning. For example, Ms. Paxton sees it as a benefit that the new administration purchased established curricula in reading, writing, and math for the school. By having the structured curricula, she can concentrate on lesson planning and adjusting the content to meet the diverse needs of her students. While a couple of teachers missed some of the creativity provided by creating their own curriculum, most agreed that having the structured curricula as the foundation of their work was beneficial. They noted, however, that the basic curriculum as provided does not work for all of their students. For Ms. Evans, who also appreciated having the curriculum as a foundation, the most important instructional practice is differentiation and determining “what is going to be best for each kid to make the growth.” She contends that the ability to differentiate effectively for each student begins in the planning process by considering what each student needs to achieve the desired level of growth. She notes that “I have some kids that whatever I’m teaching in Everyday Math that works for them; but it doesn’t work for every kid.” Therefore, Ms. Evans, as well as several other teachers, indicated that in the planning process they have to think about what they need to do to supplement the plan with additional materials, or different ways of presenting the concepts, to meet the needs of all of the students. As a result, the teachers in this school appreciated that the administration
provides some flexibility and does not require teachers to go “page-by-page” through the curriculum. “If [the principal] comes in and sees me off the exact lesson, or changing the lesson up, she understands that that is professionalism. She understands that if the kids aren’t getting it, I need to try another approach.” In addition, some of the teachers working with the gifted and talented classes have to make more extensive adaptations in order to integrate components of the curricula from their grade level and the next grade level at the pace needed for their students.

While the teachers generally appreciated having a curricular base, some of the more experienced teachers also indicated that it can be frustrating to put a lot of time and planning into learning a curriculum, only to have it dropped later in favor of another “new and better” curriculum. Moreover, they suggested that sometimes the “new” curriculum is different and one hopes that it is innovative, but sometimes it appears to be a cyclical repackaging of something they used in the past coming back around. So, while they did not express in any way that they are opposed to using the curricula provided at any given time, it is sometimes hard for them to get as excited by new curricula. On the other hand, they welcome new practices or materials that they view as truly innovative.

Assessment and Data Analysis

A number of teachers identified assessment as an important instructional practice to foster student achievement. They indicated that the assessments may be formal or informal, and that both are beneficial in different ways. When the new principal arrived at the school two years ago, she instituted a practice of data teams for analysis of student data. Mr. Mills reported that before the new administration “we were just left on our
own to look at test scores here and there. We weren’t really intentional about looking at data.”

The focus of the data teams is on student growth and not just proficiency. Nonetheless, the overall long-term goal of this practice is to ensure that all students are at grade level by third grade. The data teams are formatted in a three-week cycle in which teams come together and meet with the principal and assistant principal to review the data. Ms. Collins described the first two weeks of the process:

We have a spreadsheet for each subject: reading, writing, and math, and we track kids’ scores on each assessment, be it a unit test, a writing prompt, all the district required tests, all the state required tests, except the ones we don’t get scores for until summer. All of that goes onto the spreadsheet and then, when we meet that first week, we discuss observations about the data and possible explanations, so for example, if you have six kids below grade level in reading or below expected growth, ‘what could be the reason for that?’ Then the next week you come up with a smart goal based on the data. And so if those are the six kids you are focusing on, you might come up with ‘how do I raise their fluency or their AR (Accelerated Reader) scores?’

The third week involves looking at the results and making adjustments. In the data teams, they rotate through the subjects of reading, writing, and math. Thus, the SMART goals, ability groupings, and strategies are implemented over six weeks.

Ms. Paxton, who is grateful for the opportunity to learn more about using data effectively and views it as a professional opportunity, observed that when they first started the practice, teachers were a bit nervous. They weren’t sure about it and were very stressed out trying to figure it out when they had a new principal they wanted to impress, yet having to implement a process they had never done before and with which they were not at all comfortable. She acknowledges that even though she views it as a valuable process, it is also a stressful one.
So, I’m all positive about it, because I feel pretty confident. And I’ll be honest, I’ve gone into data teams where I’ve walked out of there feeling like I just failed, and I am mortified. I looked awful. And that can set the tone, you know. And luckily we have lunch 20 minutes later. You learn, you move on. But then the next time, yes I did it okay! . . . [The principal] is very good at pushing you and nudging you ‘Why? Why?’ Sometimes I feel like I don’t have those answers. Like one time she caught me, ’so what standard,’ and I just (gestured raising shoulders). We had people observing that day, too, and I was like these people are going to think I don’t know what is going on. She knows you’ve got it, but the meetings are stressful.

Mr. Mills described the progression of the use of data over time. Initially when the teachers began reviewing the data in the teams, “it seemed like we had all of this data but we didn’t have time to look at it, analyze it, and then implement what the data showed us and use it effectively.” He said that although he feels that he can still improve his analysis and use of the data, he now feels that he has integrated the practice into his routine and is using it more effectively. Most teachers agreed that now toward the end of their second year working in the data teams, they feel they are getting “quicker and more insightful” about preparing and interpreting the data. However, some teachers admit that while they appreciate having all the data and being able to use it, they are “less enthused about the amount of time it takes to put it together.” The principal reports that she spends 20% of her time on the data teams, and for some of the teachers it makes a huge difference that she is willing to invest her time in the data teams. They also appreciate how working with the data teams translates back into their work in the classroom.

[The principal] has given me the freedom to not necessarily fail, but to take risks as far as my own teaching in my own way that I have in my classroom. She is sitting there with us at every data team, and she inspires me to use the data. And I think she just basically says, ‘this is important, so important to me that I am going to be there.’ Not to hold your hand, or to say that you have to do this, but to have that collegial discussion about what we can do? What are our next steps? So, personally, she has made me a better teacher, and she is approachable too.
Regardless of how they felt about the data teams, the teachers emphasized that the more formal structured data does not alleviate the need for continuous informal assessment in their classrooms to guide their practice and the adjustment of their lessons. The teachers indicated that there were times that the formal data confirmed what they knew from their informal assessments; nonetheless, it is important to consider in their planning and instruction aspects that they observe in the classroom through informal assessments that are not reflected in standardized tests, benchmark assessments, or even sometimes unit assessments. As one teacher illustrates,

Like Julian, his test scores in the daily math lessons, he is one of the top kids. He figures stuff out, and you can see that he loves math. But then he gets on the test, and with his little ADHD kind of personality, he rushes through the test and it doesn’t give a good picture of who he really is. So those are the things that raw data doesn’t include. So, when I can sit down and I know exactly why he got a 75% instead of a 90%. You take his daily work, and I can sit here and say ‘slow down, check your work,’ and he’ll score higher. But if you give him a standardized test where you have to sit back and watch him, he is not going to do well.

Likewise, Mr. Mills indicates that he has noticed that for many of his students, their writing is better when it is not a high-stakes testing situation. Thus, he questions whether there are other more authentic means of assessment, which he believes supports the value in having the portfolios for students to demonstrate their progress over the course of the year.

**Expectations**

A couple of the teachers indicated that their aim is to take students as high as they can go without setting a ceiling. According to one teacher, the expectations a teacher has “varies greatly from child to child. . . . I almost think that a teacher is ahead to not set a ceiling; to not set a limit on what you think they can do, just give them the tools to keep
moving forward and see how high they can go.” Another teacher agreed, saying “I think that in the classroom, if I see them getting something immediately, I will take them as far as they can go.” However, he went on to say that other factors, such as class size, might impede a teacher’s ability to have high expectations. “With 25 kids . . . you aren’t going to take some of them as high as they could go. Realistically, it is just not reality. . . . Generally, you might have a feel for how high a few kids can go, but you are never going to know how high 20 kids might go.”

For Ms. Evans having high expectations is about believing “that every kid can make growth and every kid can succeed. I am constantly pushing my kids. . . . So, when kids say they can’t, I say ‘Oh yes you can. Go back and do it.’” She also discussed expectations in terms of curricular rubrics and goals. “They know that we always look at rubrics and we say ‘Here is where we want to be. Set your goals.’” She said that students want to know what their goals are and how to achieve them, so it is important for teachers to hold students to those expectations and let them know what is needed to get there. Ms. Paxton agreed, saying at this grade level it is important to “nudge them to perform better,” but to make sure they are not “crushed” if they don’t get there. Thus, she contends that it is imperative to know your students, both academically and emotionally. For example, one of her students is a perfectionist and is devastated if she gets something wrong. “Some kids love, love, love the challenge and some kids are so smart that they don’t know how to fail.” Thus, she emphasized the need for a teacher to know each student, to “nudge” them appropriately as individuals, and celebrate whatever they do achieve. Ms. Webb, a teacher at a higher level related a similar thought about pushing students to perform, stating that the key is to “know where they can
achieve and finding this line of where they can go and then pushing them to maybe a little bit above.” She also said that it is essential to never give up on students: “I’ve had kids that never read first-grade level, and by believing in them and constantly bringing them books, ‘try this one, I think you’re going to like it,’ and eventually I found the genre they liked and then it was just sailing away.’’

Another teacher had a different perspective of what it takes to really have high expectations. He initially talked about expectations related to the math curriculum used at the school. “I spent years in mastery, you will master this skill and then move on. Then to say, no that’s not right, they’ll pick it up eventually. It’s like, no they are not going to pick it up eventually, they are picking it up right now!” So, for this teacher it is important to know your students and what they can achieve, but he also underscored the need to know the curriculum well, which may mean having an understanding of teaching the subject matter beyond the curriculum currently in use at the school. He also stressed the need to know the curriculum requirements or expectations at different levels:

Well the problem with new teachers, they don’t know the expectations because they don’t know – you must know the curriculum – the curriculum below you. . . . How are you going to have high expectations if you don’t know what the expectations of fourth grade are? Or if you don’t know the expectations and standards for fifth grade?

He also reiterated the need for teachers to be consistent with their expectations. For him, it is important that once students demonstrate that they understand a concept or can perform a skill that teachers “follow through every single time” holding them to those expectations. Likewise, if a teacher tells students something is important and they set a class norm or standard, they should hold students to that standard in order to
reinforce the knowledge or skill, again building mastery. “How can say you have high expectations if you let them get away with all of this junk?”

*Classroom Management, Student Engagement, and Student Behavior*

Ms. Collins indicated that the primary practice a teacher needs to implement is classroom management. She said, “I’ve actually heard my friends say this – ‘If you’re not a magician, you can’t teach,’ because if kids are chaotic, then learning is most likely not occurring.” Ms. Webb agrees that classroom management is a crucial practice and added that “students have to walk in knowing that they are there to learn. It has to be a safe environment.” Ms. Collins also said that rapport building is an essential component of classroom management. Similarly, the principal said,

When I look at my brand new teachers that need more experience to become master teachers, the two predictors that I look at often times are (1) do they have strong classroom management and (2) do they build relationships with kids. Because I think those are really hard to teach. Teachers can get more tools in their toolbox around management, but to teach a teacher how to build a relationship with 25 different kids—that is really hard to teach.

Several teachers stressed that while a teacher uses the first two weeks of school to establish routines and build the classroom community, the routines and behavioral expectations have to be consistently reinforced throughout the year, particularly at mid-year. As Ms. Paxton noted, “I think teachers sometimes get a little lax and then they’ve lost control of some big pieces, as well as a loss of time for learning.” She also added that it is important to get to know students in the first two weeks of school, but she also said that you have to recognize that every class is different from year-to-year, because students “are not going to get everything out of it that they possibly could . . . if I am trying to teach the class I had last year.”
Ms. Paxton described one of the challenges of effective teaching as “finding ways for the kids always to be engaged. . . . I feel I’m effectively teaching them if they are engaged because they are more likely to be taking it in.” For other teachers student engagement is illustrated by students who are “happy,” who are “on task and learning,” and who have “bought into what they are doing.” Moreover, if students are engaged, they are more likely to want to be there. They also indicated that engaging students is critical, because otherwise you may have turned them off of school at the elementary level and that can have a devastating and lasting impact on a child’s life. As a result, teachers feel successful if the students are still engaged at the end of the year.

Ms. Evans says that child behavior “can affect teaching and that is why it is important to work those out as quickly as you can. Because if you have to constantly stop to deal with behavior, then 22 other kids are missing out on their learning today.” This was illustrated by the experiences of two teachers. One teacher indicated that she has a difficult group of students this year, which has had an impact on her teaching style throughout the year. The other talked about a class that “got further in extensions in several curriculum areas than any other class, and it was the largest class I had. But the behavior was just a cut above, and so anything a teacher can do to enhance or improve the behavior of kids is huge.” As pointed out by these teachers, the problem with behavioral issues is that they slow down instruction and detract from the learning and engagement of other students. It is not uncommon for “one kid [to] steal all of the time because he or she is a brat and it ruins the lesson. The teacher then has to take 10-15 minutes to solve this problem while the other kids are sitting there.” As Mr. Simpson noted, his “travelers” (the students from the flooding groups) enjoy coming into his room
because he pushes the kids to work and does not tolerate behavioral disruptions that “ruin it for every single kid.”

On the other hand, the teachers in this school indicate that child misbehavior may be due, at least in part, to a lack of student engagement. Therefore, in order to foster student engagement, teachers must be engaged themselves. “If you present each lesson like it is important, and you make it interesting—the two have to go together—that is how you get engagement.” Thus, one of the keys to increasing student engagement and minimizing behavioral disruptions is the enthusiastic presentation of lessons: “I present all of my lessons like it is the most exciting thing, and then you get buy in.” As Mr. Simpson noted, it does not accomplish anything for the teacher or the student if the teacher has the best well-planned, organized, and instructionally sound lesson if the students are not interested and listening. It is essential to capture and retain student attention, which can be done by making the classroom entertaining and fun. “I think that being a teacher, too, is being half entertainer and then half a provider of knowledge, because in the video world of today, they seek entertainment. Entertainment can be good, and it can be educational.” However, it occurs to me after talking with the teachers in the case study that there may be differences in what the teachers believe constitute student engagement and problematic student behavior.

Several teachers discussed the use of collaborative learning structures which have contributed to increased student engagement. As noted by Ms. Evans, “It has helped their listening and speaking skills, their working together and cooperating, and it has led to 100% participation.” In addition to helping with student engagement, the teachers feel that collaborative learning helps with classroom management and with informal
assessment because every student has to demonstrate their learning. The teachers also believe that it supports the development of social and emotional skills. At a higher grade level, Ms. Webb also emphasizes that students need opportunities to collaborate and communicate with one another in order to develop higher level skills: “Students have to be able to collaborate with each other, they need to have a voice, they need a chance to share their thinking, [and] to compare and contrast.” She also believes it is important to provide opportunities for students to teach one another their strategies in order to deepen their understanding of the concepts.

**Reading and Writing**

The instructional practices identified by the case study teachers that are most important to promote student achievement in reading were small group guided reading, independent reading, basic skills, and simply the amount of reading. The instructional practices to foster student achievement in writing were identified as engaging students in the writing process, modeling, using a variety of techniques, and integrating writing with other subjects.

The practice emphasized by most of the case study teachers was related to small group guided reading. As noted by Ms. Evans, students all have such different needs and by using small group strategies, “you can see that one kid is having problems with decoding, where other kids are having difficulty with comprehension. And, again, that goes along with differentiation.” She goes on to say that the grouping process is not a static process consisting of fixed groups. Rather, it is important for teachers to constantly monitor and assess students, because some students will make more progress than others, and thus their needs change and “you need to move them around.” She
asserts that by teaching students in small groups, “you can really focus on each kid.”

Again, as mentioned earlier, the flooding procedure also facilitates the grouping and
differentiation process. Ms. Paxton added that in the small groups “I can challenge them
above what they can do independently and we can talk about it and [they can] help each
other.”

The teachers also stressed independent reading. As Mr. Simpson asserted: “once
they learn to read, they must read.” In observing the case study teachers, it appeared that
an essential component of independent reading is fostering the desire to read in students.
In this case, the desire to read was evident among many students in all classrooms, not
just in the gifted and talented ones. In one of the general education classrooms, a large
percentage of the students wanted to spend more time reading. Several times there were
students who moved away from friends who were working on other projects or who were
talking so that they could focus on reading. It was clear that the students had a strategy
of doing their other work as quickly as possible so that they could spend more time
reading. While this was not as prevalent in the other two classrooms, it looked like at
least half of the students in the other classrooms also had a strong interest in reading.
One student stood out in my mind. In group reading time, he alternated between an
independent reading book and the book the group was reading. He would read the pages
from the group book as quickly as possible so that he could go back to reading his book
while the rest of the group finished reading the group pages. Then he would contribute
to the discussion of the reading. This pattern was repeated several times. Although this
may be an indication that this student was not grouped appropriately, in talking with him
and hearing his conversation with the group, I suspect he was more engaged in the genre
of his independent reading book than in the genre of the group book. As noted by Ms. Webb and Mr. Simpson earlier, this may be another indication that the key is for a teacher to work with students to find the type of books and incentives to engage each student in reading. Ms. Webb added, “You have to keep pushing and finding that niche for each kid.” The teachers also indicated that it is helpful to allow as much time as possible for reading, which they often accomplished by integrating reading with other subjects. The integration of reading with other subjects is also important because the teachers sometimes find that it is the non-fictional texts that are engaging for some students and that stimulate their interest in reading.

While the small group reading and independent reading were highlighted by most of the teachers, the teachers also indicated that they used shared or oral whole group reading, particularly to build vocabulary and sight word recognition. The teachers of the first-grade classrooms also stressed the need to establish the basic building blocks of reading, such as phonics, phonemic awareness, vocabulary, and sight word development. As Ms. Paxton stated,

I would say, the first thing [to promote student achievement in reading at this level] is, obviously, those basic building blocks of phonics, phonemic awareness, anywhere from spelling to reading to sight words. Sight words are huge. I don’t know if you saw our word wall. It’s huge by the end of the year. Now I’m pulling ones off that we don’t need any more.

She also indicated that it is necessary to balance working on the fundamental skills with engaging them in reading itself so that they do not get down the line and have gaps in the basic skills or in comprehension.

Most of the teachers discussed the difficulty of teaching writing, whether the students are in gifted and talented or general education classrooms. Several of the
teachers specifically noted that regardless of their reading ability, students have greater difficulty “transferring what is in their heads onto paper.” The teachers related similar strategies to foster student writing, including attempting to engage students in writing by encouraging them to write about topics of particular interest to them or having them write about things familiar to them. The teachers also found it important to present step-by-step modeling of a variety of writing techniques, such as responses to reading, biographies, research, and personal narratives. In addition, they encourage students to keep a journal and to track their progress over the year. The impact of highlighting their progress was noted by one of the first-grade teachers:

   In their writing journals I have them look back to the front and see, ‘look where you came into first grade and look where you are writing now,’ . . . . [At the beginning of the year] they are writing all over the page, they don’t know where they are, and now they know to write in the lines, line-to-line. I had kids, this year more than ever, when I said “go back and look and your handwriting,” they said “I can’t believe I used to write like that.” So them seeing it for themselves is obviously huge, because it means more to them.

   One of the teachers asserted that many teachers “dread teaching writing.” While the teachers in the case study did not indicate that they dreaded teaching writing, they did confirm that it is more challenging to engage students in writing. However, Mr. Simpson articulated, “kids hate writing because [the prompts] make them write about things they don’t even care about.” He advises teachers to integrate writing into all subjects, particularly if a teacher can identify topics related to each student’s interests. He reported that he has had greatest success through prompts integrating writing and reading, particularly the assignment to have students put themselves into the shoes of the author and write what happens next. With regard to both reading and writing, the third-
and fifth-grade teachers in the gifted and talented classes specifically emphasized the strategic use of the higher levels of Bloom’s taxonomy.

So, it is not about teaching them how to read at this level. It’s about hitting more of the Bloom’s questions—the higher level thinking; making meaning and linking it to their own lives. They really lacked the written piece. So they can understand it, but can they effectively communicate it on paper through writing. Even my higher-level readers would have a hard time. They understood it in their minds, but could they take the evidence and answer the questions?

When addressing the literacy items included in the quantitative analysis, teachers indicated that most items were done once a week or every day. Of the items related to reading and writing, there was little difference between the responses of the gifted and talented teachers and the general education teachers. As the instructors filled out these sheets, each of them asked questions along the lines of “When? Do you mean this week?” or “At what point in the year? It changes over the course of the year.”

**Mathematics**

When discussing specific instructional practices to promote student achievement in mathematics, the teachers highlighted some strategies directly related to the math curriculum used by the school. The teachers generally agreed that a benefit was the spiraling nature of the curriculum so that students are exposed to specific math skills a number of times, and the skills build upon one another in a strategic fashion. They also agreed that the curriculum’s “math boxes” were very useful, particularly when used in a way in which the students become the teachers by explaining to their peers how they solved the problems.

We started everyday having them do math boxes, which is a review of all the concepts, which is good for everybody to do. I’ll have kids teach or at least
explain their strategies, and for some kids, they are like “Oh, that's a cool strategy.” So, it’s great that when their peers do it and explain it, it really clicks for them.

A couple of the teachers explained that they did not feel they could rely solely on the curriculum. As one teacher describes with the spiraling curriculum, “you will hit on one thing one day, and you don’t see it the next. It comes around later, but for some of those guys, they need more repetitions of that same skill before they’ve got it.” In addition, there may be a test over skills learned several weeks ago, and for some students they will need supplemental instruction or review before they are adequately prepared to take the test.

One of the teachers of gifted and talented students indicated that when the students appear to be very confident in their work, the teachers might assume that the student is correct and that may not be the case. This actually occurred in more than one of the classes, both general education and gifted and talented, in which I observed while they were doing the math boxes exercise. The students explained how they solved the problems. In one case the strategy was okay, but the calculation was incorrect; in the other case, both the strategy and the result appeared to be flawed. In neither case did the teacher appear to notice the error.

Other strategies mentioned by the case study teachers included cooperative groups, mixed level groups, and flooding. Whereas in reading the teachers indicated that the students were likely to be grouped in homogeneous groups, in math the teachers suggested that students were often grouped heterogeneously. “We do highs, mediums, and lows and then we arrange them so you have a high talking to a medium, a medium talking to low. So you don’t have a super high kid talking to a super low kid, because
that’s not going to get them anywhere.” However, some teachers also indicated that if their data or informal assessments showed that they had a number of students that were not getting a particular concept, they would pull a small group to do targeted work with that group so that they did not fall behind. As one teacher expressed, small group instruction in math works best when teachers have strong classroom management that allows them to have center that can be rotated, as is often done in reading. She said that when she has implemented math centers, “the kids have told me ‘I feel so much more comfortable asking questions now than I did in front of the whole class.’ Even the loud ones say now that they feel more comfortable.” She also indicated that it gives students the chance to go to the board and “teach” a skill, thus providing another opportunity for information assessment of their learning. Again, the teachers added that the flooding procedure grouped students by ability levels and reduced the amount of differentiation required of any given teacher.

The importance of grouping and differentiation were evident in one particular math class. The teacher conducted a whole group lesson in which a number of problems were displayed on the board, and the teacher was attempting to use different strategies, which I later learned were related to the curriculum. This occurred on a day in which some kids were in the classroom that are not normally there during that time period, which necessitated greater-than-normal differentiation for the class. The result was that many of the students had completed all of the problems displayed using more advanced strategies than the teacher was modeling and the teacher was still reviewing the first problem for some of the students in the class. As a result, the students who had completed the problems began talking amongst themselves. It is unclear whether the
teacher was aware that so many of the students had completed the work. Again, this situation may have been difficult to avoid when the teacher suddenly had a situation requiring a greater level of differentiation than the teacher or the students were used to.

The teachers in the case study also indicated that the majority of the mathematics items included in the quantitative analysis were addressed in their classroom at least once a week. Overall, they indicated that fewer than 20% of the instructional practice items were covered less than once a week in their classrooms. Similarly there was little deviation in the responses of general education and gifted and talented classrooms.

Comparison of Gifted and Talented and General Education Classrooms

The teachers in the case study reported that the major difference between the gifted and talented classrooms and the general education classrooms is the pacing through the curriculum. As the teacher in the first-grade general education classroom said: “Where sometimes with math, I go back on the second day with the same lesson, especially if on the first day I saw that they didn’t get it, I might go back and do it again; but the GT kids might pick it up that first day and they’ve moved on.” With the reading curriculum, the goal is that they are a year ahead, beginning in second grade; thus, in the first grade they begin with the first-grade curriculum and move to the second grade curriculum. With math, the goal is that they are a grade-level ahead by the end of the third grade. So, in the second grade, they cover the second-grade curriculum and half of the third-grade curriculum, and in third grade, they do the other half of the third-grade curriculum and the fourth-grade curriculum. However, as one teacher noted, not all of the students in the gifted and talented classrooms are highly gifted and talented, and they may be reading at a high level but may not be at a higher level in math, or vice versa.
Apart from the pacing, the teachers point out that both classes have to deal with some amount of behavioral issues, and both have some students that are at different levels, so they still need to monitor student progress, group students appropriately, and differentiate as necessary. With regard to expectations, “every teacher has the same high expectations for their kids. . . . In terms of growth, in terms of achievement and having every kid meet the standards, I think that is the same.” Some of the teachers who have experience in both gifted and talented classrooms and general education classrooms, suggested there are some additional differences of which they need to be aware. With regard to student engagement, Ms. Webb reports that she does not give points for participation because, overall, her students are very engaged and she focuses on drawing out the quiet students. The other difference she notes between gifted and talented classrooms and general education classes is that the students are more independent.

One thing I notice about this class that is different, they don’t need me as much as the other classes. The other classes are like ‘I love my teacher.’ These kids are so independent and such high-level thinkers, so they don’t really think on that same wave length. . . . They are very much ‘I’m-here-to-get-stuff-done’-kind-of-kids, which is fine. It took a while to get used to though. Initially, I didn’t think the class liked me, and then I realized it’s just them.

The other teacher with experience in both types of classrooms reiterated that the major difference is the pacing:

It must be high energy—moving, moving, moving. . . . They finish their work like that, and they think they are going to goof off. Oh, no. You have to have things, so you move and you do this, and do this. I’ll have a list and the ones who do it buy into that. I have two little girls that are very high achievers, and they are always doing little projects. I set them up for that. So they come up to me and say “Can we work on this after we’ve done this?” “Can we make a book?” “Can we do this?”
Thus, it is crucial to differentiate appropriately in ways that take into account their interests and their passion because “you want to make them love to work.” The teachers, as well as the principal, pointed out that teachers in the gifted and talented classrooms also need to understand some of the characteristics of the gifted and talented population, including that they can be perfectionistic and may need more social support. In addition, they may need support when something is hard for them, because they haven’t experienced that before and it can be extremely frustrating for them.

One of the teachers in the general education classrooms indicated that one of the differences in the two populations of students is that the students in the gifted and talented classrooms often have more opportunities and experiences than the students in the general education classrooms. The principal also confirmed that there are lower numbers of low SES and Hispanic families in the gifted and talented classrooms. This is attributable to the fact that it is an opt-in program. Thus, parents who want to have their kids tested can choose to do so, and then they also choose to have their children attend this school. There are probably a number of reasons, including knowledge of the program and financial concerns, why fewer low SES and Hispanic families elect to opt-in to the program.

With regard to effective teaching in gifted and talented classrooms and effective teaching in the general education classrooms, the principal suggests that there is no difference. Rather, she states, “I think an effective teacher is an effective teacher.” She points out that the teaching strategies are similar, and that it is important for teachers to have relationships with their students, monitor their progress and be able to challenge
them based on where they are, and be able to understand and to respond to their emotional and personality needs.

**Students of Color**

According to the state Department of Education statistics, Gilbert Elementary has approximately over 45% students of color, and 38% of the students are Hispanic. The state school performance data reports that Gilbert Elementary is meeting state expectations in academic achievement and academic growth, and they are approaching meeting expectations in academic growth gaps. The data also reveals that the greatest gaps are in mathematics in which the school does not meet expectations for FRL, minority students, English Language Learners, or students needing to catch up. The Principal of the school expressed her concern about the lingering gaps in achievement, and the school’s goals for addressing the gaps:

My hope is that 90% of our students leave fifth grade with every opportunity in the world available to them. Whether they go to college or not, they have the opportunity to do so because they have the academics they need, the problem-solving skills they need, and the social skills they need to get there. We did not have that, and we aren’t totally there yet. But, I think we are asking the right questions and doing the right work to get there. We do have gaps between our White children and our Hispanic children. We do have gaps between our middle-class children, and our children that come from more impoverished situations. I think we are putting the systems in place and having the discussions to address them so that all kids leave with the same opportunities, educational experiences, and knowledge.

As mentioned earlier, two of the teachers specifically mentioned the district’s required ELA trainings, and thought that they were valuable because although they do not have many English Language Learners at this time, they expect that they will have them in the future and they want to ensure that they are prepared to address their needs:
I’ve only had one ELL in my classroom, and she actually exited the program because she was proficient. I still take [various ELA classes], because I know I’m going to have them and I need to be ready for those learners. I think [the trainings] are important, not only for English Language Learners, but those classes teach you good strategies that are good for everybody.

Ms. Collins described the strategies covered in the district trainings that she implements in her classroom: using visuals, word walls, labels, realia (real objects to help students understand word meanings), content area word walls, checking for understanding, and the modeling of correct usage by teachers and peers. In order to be culturally and linguistically sensitive, teachers are taught to model correct usage, rather than to correct students’ mistakes as a means of being culturally and linguistically sensitive. Ms. Collins indicated that students who are corrected all the time may be discouraged from speaking or reading. She went on to say that these strategies, as well as others “I have developed from my own experience are effective with a culturally, ethnically, linguistically, and academically diverse class.” These strategies were evident in many of the classrooms I observed. More importantly, I noticed there were culturally diverse books in the classrooms, and a number of students—both White and Hispanic and in both the general education and gifted and talented classes—were reading and discussing these texts.

Ms. Webb, who has teaching experience in a larger inner-city high-needs environment, related that the district trainings were “just not very impactful for me at all. It was just kind of hoops to jump through. I think the biggest thing is the experience and what you take away from it is what can make you a better teacher.” She described that in her first year of teaching “the poverty was so high in the school that I understood how to teach students who didn’t have anything to eat at night.” She said that being “forced out
of my comfort zone so much” helped to prepare her for teaching in different environments and meeting the needs of her students.

The principal cautioned that one cannot assume that the achievement gaps in highly diverse or Title I schools are related to ineffective teaching:

But, I will tell you, so I was [assistant principal at the Title I school] down the street, and the instruction going on in those classrooms was gorgeous—the use of technology, the use of data, guaranteed curriculum, strong RtI model, the belief in kids—by 90% of that staff. We have 35% FRL and Hispanic kids; they have 60%. They are right down the street—still kind of diverse, they have a middle-class population and an involved community—they just now hit 70% proficient in reading in third grade. . . . Those teachers were fighting for kids. And the number of kids not hitting grade level was pretty shocking, and they were super effective teachers. And I wish we could say—I would love to know—here are the bang-for-the-buck pieces. And I think we know some of them, but I would walk in some of those classes and they were brilliant instructionally. They were on. And, did 90% of the kids leave proficient—no. How frustrating for teachers that teach in inner cities.

The Principal went on to say that as an educational community we do not fully understand this phenomenon, and thus we have not yet figured out the answers or perhaps even the most important components of teaching that will help us close the achievement gaps. So, in the meantime, again she stresses the need for teachers to know their students and use data analysis and differentiated instruction to meet the needs of each individual student.

**Researcher Perspective**

Several years ago, I was eating my lunch at a table on the patio of a university building. A teacher from the gifted and talented school associated with the university and her students for the upcoming year came out to share the patio. The students appeared to be about eight years old. The teacher inquired about what the students wanted to learn that year. One boy said he wanted to learn about rocket ships, and the
teacher inquired about what they would need to know in order to study rocket ships. They created an extensive list of items they would need to know about, such as how to calculate volume and rates of fuel usage, gravity, etc. After finishing that list, another student said that she wanted to learn about paleontology, specifically dinosaurs, and they made a similar list of items to study. I was intrigued by this interchange, and I found myself speculating about the potential effect of such instructional planning if such strategies were more broadly practiced with other populations of students. This interchange sparked my interest in teacher effectiveness, so it is only fitting that circumstances led me to conduct this study at a school with a gifted and talented magnet program even though that was not my original intention.

As mentioned earlier, when I began this study I was interested in the work of scholars who asserted that contrary to prior research focused on the effects of teacher background characteristics on student achievement, the key to understanding teacher effects on student achievement is investigation into what happens in the classroom. Although an overall and in-depth investigation of teacher effectiveness is beyond the scope of this study, I anticipated that this study might provide information about the relative influence of background characteristics, teacher attitudes, and instructional practices on student achievement. Moreover, by incorporating the qualitative phase of the study, I thought it was possible that the teachers observed and interviewed might illuminate practices and attitudes that might have an impact on student achievement that were not represented in the ECLS-K database.

As I analyzed the observations and interviews conducted in this study, I found that I needed to remind myself to avoid making inappropriate analytical assumptions.
Specifically, I was aware that I needed to keep in mind that (1) teaching mastery and teacher effectiveness are not synonymous; (2) not all classrooms with an effective teacher look alike; and (3) the fact that a teacher is in a gifted and talented classroom or has more years of experience does not imply that s/he is necessarily a superior teacher.

Although this study did not provide information to definitively distinguish teaching mastery from teaching effectiveness, it appeared that one teacher stood apart in terms of relationships with students, classroom culture, engagement and motivation of students, and levels of differentiation. While the practices of the teachers looked different in the various classrooms, my task in this study was not a matter of concluding that certain teachers were “effective” or “ineffective.” Indeed, as the principal reported, the data shows that all of the teachers interviewed in this case study were highly effective in fostering student growth in their classrooms this year.

With the intense focus on teacher effectiveness, it sometimes seems that the search for the instructional practices that will truly enhance student learning is like a search for the Holy Grail. As the principal noted, “it would be so great if we figured out the answer or the most important pieces.” However, she also suggested that in order for public education to meet the needs of its students, it is not necessary for all teachers to be exemplary teachers:

I don’t think that every teacher needs to be that master teacher, but I think every teacher needs to be an average decent functioning teacher. And, if every teacher were, and we had two master teachers, we would be flying and I think we would be at 90% proficient.

While I saw remarkable practices in the classrooms of experienced teachers and in the gifted and talented classrooms, I also saw strong practices in the classrooms of
young teachers and in general education classrooms. As the teachers pointed out, I did notice that there were differences in the pacing of the gifted and talented classes, but I also saw evidence in general education classes that most students were on task, that they were motivated and engaged, and that they were eager to learn—particularly in reading. I also noticed that the general education classes did have more diversity, both in terms of ethnicity and in skill levels.

Finally, although the teachers often used similar language to describe effective practices, their implementation in the classroom looked different. For example, in some classes there was little movement of students, in others the movement was for the most part limited to students getting books or materials, and in one classroom the teacher orchestrated a lot of movement in the classroom with an exercise having them “verbally rehearse” before sitting down to write. The teacher noted that that class, in particular, had a lot of energy so she had found it extremely helpful to channel some of that energy before having them sit down to write, and then the students were better able to focus on the task.

As I observed and interviewed these teachers, I gained a sense of how complex the job is and I glimpsed some of the nuances of the profession. I also was able to see how committed and dedicated these teachers are to their students and to the profession. I could appreciate their distress with the scrutiny they feel and with the portrayal of the profession in the media. At the same time, while not wanting to put teachers “under the microscope” even more than they currently are, I felt the compelling need to continue the work to understand more about teacher effectiveness.
Summary

The background characteristics that teachers suggested may contribute to student achievement were their dispositions with regard to children, their prior experiences working with children, and participating in activities related to instruction, such as tutoring. A few teachers also mentioned the benefit of having an understanding of teaching from parents or other relatives who were teachers. Several teachers also mentioned the relevance of their graduate degrees, although for the most part they did not lead with the importance of their degree or their years of experience.

Each of the teachers in the case study emphasized the importance of having a positive attitude toward students, the school, and the teaching profession. They described how important teaching is to them and their commitment and dedication to the profession and to their students. They also described their feelings that the politicization and negative portrayal of teaching in the media are hurtful and destructive.

The overall instructional practices identified by teachers to enhance student achievement include building relationships with students and getting to know their needs, both academically and socio-emotionally; lesson planning and differentiation; assessment and data analysis; and classroom management, student engagement and student behavior. When asked about specific disciplines (reading, writing, and mathematics), the teachers addressed some of the items contained in the quantitative analysis. However, they seemed to suggest that while those items are important, they are not as crucial as the overarching cross-disciplinary practices mentioned above.
Chapter VI

VIGNETTES

One or more narratives or vignettes are often used in the reporting of case studies to exemplify “what is going on” in the case (Stake, 1995, p. 127), and to use a compositional style that engages the reader (Yin, 2009). They are used to highlight particular features or unique elements of a case. Reports of case studies often include an extreme or unique case to provide readers with a more in-depth understanding of the complexities related to the phenomena of interest (Stake, 1995).

In this case, two vignettes are offered to illustrate how the various aspects of teacher attitudes and instructional practices discussed by the teachers are brought together in a single classroom. In addition, the vignette of Mr. Simpson, in particular, shows not only the complexity of integrating a number of instructional practices and teacher attitudes in a classroom, but it also demonstrates that one does not necessarily have to perfectly implement every aspect of teaching as described in the literature, or as reflected in contemporary conventions, in order to be deemed an exemplary teacher and to produce excellent results.
Ms. Evans Vignette

Ms. Evans has been teaching in a general education classroom at Gilbert Elementary for several years. She is a young teacher, and she expressed her belief that coming from a family of teachers and having worked with children in various capacities since she was a teenager prepared her to have good relationships with children, to have high expectations and the conviction that all children can learn, and to have an attitude that celebrates the successes of her students. She has a very calm and kind demeanor with her students, and at the same time she gently pushes them to the next level with their learning.

Her classroom is neat and organized with spaces for a library and a listening center, an area for working on computers, and several comfortable spaces for reading. In addition to an extensive word wall, there are sections of the classroom walls devoted to reading, writing, math, science, and social studies. There are also spaces dedicated to scheduling, goals, objectives, behavioral norms, and displays of student work.

Ms. Evans believes that it is important for teachers to have knowledge of what they are teaching, to be continuously reflecting on their practice, and to constantly evaluate how they can adjust their teaching to meet the needs of all students. She emphasized the need to keep excellent records and data so that teachers can track and monitor each individual student. She also stressed that differentiation begins with lesson planning.

When you’re planning lessons, you need to think about what each particular student needs to get where they need to be. . . . I have some kids that whatever I’m teaching in Everyday Math that works for them. But it doesn’t work for every kid. So I have to think about “how can I teach?” and “what else do I need to include or change so that everybody is learning and making growth?”
Ms. Evans also described the interconnections between small groups and differentiation. “Again, that goes along with the differentiation. Knowing what their needs are, grouping them accordingly, and making sure that you are watching them. . . . The small group is important for reading so that you can really focus on each kid.” While she initially stressed the importance of small groups for reading instruction, she later indicated that they are also beneficial for writing and math.

Ms. Evans’ work with small groups was demonstrated in her class when, after completing a discussion and exercise in a guided-reading group with her students, she had them read the last chapter of the book. For several minutes she observed the strategies that each student was using. Then she went around the table, either kneeling or sitting next to each student, and talking to them about their reading. She asked questions either about their strategies or about their understandings, she helped with clarifications as needed, and she made encouraging remarks to each student. To one student who appeared to be frustrated, she said, “It’s okay. You can do this. Let’s look at this together.”

While the reading group was meeting with her, the other students around the classroom were on task for the most part. If there were momentary distractions, Ms. Evans appeared to have non-verbal expressions and mild corrections that redirected students back to their task. For example, in a soft-spoken voice she said to one excited student, “Thomas, I would appreciate it if you didn’t yell across the room.” He quickly replied in a whisper, “Sorry, Miss,” and walked over to his friend pointing to his worksheet and whispered, “Look, I got it! See how you do it.”

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The engagement of her students in reading was evident by the number of students on task and reading, and by the different strategies they used to maximize their reading time. In one case, a young girl kept reading her independent book and waited to complete her graphic organizer/worksheet until the last possible moment. When she did start to work on her graphic organizer, she sat next to two boys who had been working on theirs for quite a while and who had gone over to Ms. Evans a couple of times to ask questions. When the boys started telling the girl what she needed to do, Ms. Evans, watching this from across the room, said, “Anna can do it herself. Let her work through it and she can ask us if she has questions.”

Two other students employed the opposite strategy—“hurry, let’s finish fast so we can do buddy reading.” Another student who was asked by friends to help them with the worksheet replied, “No, I did mine fast. I can’t talk, I want to read my book,” and went to a bean-bag in the corner to read for the remainder of that time period.

Ms. Evans stated that in addition to working with small groups, she uses cooperative learning structures nearly every day in order to get 100% participation and to hold each student accountable. She reported that cooperative learning structures engage the students, and consequently it has assisted with classroom management as well. In addition, it has helped her to know what students understand, who is on topic and on target, and who can demonstrate their learning either on the whiteboards or by explaining their understanding to other students.

Ms. Evans demonstrated an awareness of how her attitudes and practices engage students and foster desired behavior patterns.
I think I had a real tough class my first year, and . . . it was a shock coming into that and it’s all on you. You’ve got to do it all yourself, and I realized how important engagement and behavior really affected kids’ learning and achievement. If I didn’t have a good class community, and if I didn’t have a good attitude, and I wasn’t positive and helping the kids be positive and working together, then it wasn’t going to work. So, I really had to change my attitude and think about how I could make the kids really come together, support each other, and be engaged so that the learning could happen for everybody.

As a result of that experience, she recognizes the need to work on the classroom environment and address behavioral issues early in the year. In addition, teachers must intervene right away if problems arise.

With regard to addressing the needs of her students, as described above, Ms. Evans indicates that her teacher preparation was not helpful in some aspects, partially because the population and needs of students were very different. She quickly learned that she needed to be reflective in her practice and constantly monitoring “student progress.” She related that between the data teams and flooding practice,

We are constantly looking at where our kids are and setting the next goals. I know exactly where every kid is because we always look at the data. And it just comes naturally now. As soon as they take a test, I am printing that sheet out looking at how much growth made. . . . I think it is has really improved my teaching, because I will look at the pieces that every kid needs. Or, “here are the pieces that some kids need, what can I do in my daily lessons to make sure those pieces are being met so that we can close the gaps?” I have felt like I am a more effective teacher that way . . . that I am really reaching every kid, and I’m really aware of every step. No kid is going to slip through the cracks.

She acknowledges that the data teams, student groupings, and lesson planning are a lot of work, but she adds, “it is good work; it is important work. It is keeping us on track.” She also indicated that this work is important because it helps to prioritize and target the components of their lessons to get the most they can from the limited time they have for instruction. Ms. Evans also believes that the focus on data teams and the
monitoring of student progress also helps students track their progress. She stated that students want to know what their goals are and what they can do to meet their objectives.

Again, Ms. Evans reiterated the impact of teacher attitudes and expectations. “Kids are always trying to meet those high expectations,” so it is crucial to support them by letting them know how they can achieve their goals, by “pushing them in a positive way,” and by celebrating their successes. She suggested that when teachers celebrate student successes, it motivates students “because they feel good about themselves, and they are proud of what they can do.” She related the story of a student whose self-esteem about his writing ability was very low:

I had this one little boy who thought, “I’m the dumbest kid in the class, I can’t do this, I can’t do this.” He just got to a point where he didn’t even want support from me, because he was just like “what’s the point? I’m never going to be as good as everybody else.” So, we pulled a small group in writing, and with the support he was able to finish a paragraph. He was so excited, and we celebrated. “That is so awesome!” He shared it with his dad, and his dad was excited. Since then he’s had such a different attitude toward his writing and his work. I see that he has made so much growth just in the last month since his attitude changed. And I see that my attitude affects their attitude.

As I observed Ms. Evans interacting with her students, her care and concern for their learning was evident. She has a calm and somewhat understated demeanor, and she balances the nurturing and encouraging of students with soft but firm redirection when needed. In talking with her, she appears to be reflective about her practice in general and with regard to each individual student. When she talked about her students, particularly when she related stories about their struggles and successes, her concern, commitment, and dedication to her work and her students was compelling.
Mr. Simpson Vignette

When I first inquired about undertaking the case study at this school, the principal and a former instructional coach told me about an exemplary teacher, Mr. Simpson, and they both enthusiastically recommended that I include him in the study. The principal told me, “If I had more teachers like Mr. Simpson, all of the students in this school would be having the growth we would like to see, and as a result they would have the opportunities we want them to have to succeed in life.” Indeed, to see Mr. Simpson in action teaching in his classroom is like watching the conductor of a world-class orchestra. He is able to monitor and guide the class progress on an overall lesson while at the same time attending to the work and individual needs of each student.

Mr. Simpson is a teacher with 25+ years of experience, and he is currently teaching in a gifted and talented classroom at the school. To say that Mr. Simpson is a character, or that he is an exemplary teacher, is to make an incredible understatement. He points out that much of his classroom practice is unique to his character and young teachers could learn from him but should not attempt to duplicate his methods per se. Instead, he encourages them to find an identity and style of teaching that works for them.

Still, so much of what Mr. Simpson does in his classroom to achieve the gains in student growth that he attains is related to the basics, which he implements in a seamless and seemingly simplistic fashion. When talking about his practice, Mr. Simpson emphasizes student motivation and engagement, student behavior, and differentiation—all of which are interrelated in his opinion. He states that he has virtually no behavior problems in his class because he keeps students engaged and interested, and he adds humor to make it entertaining. He pointed out that while his students in the GT
classroom show considerable growth, students also achieved high levels of growth when he taught in general education classrooms, both at this school and at a nearby Title I school. His principal made a similar observation, stating “Mr. Simpson is a wonderful teacher, and he teaches in a GT classroom—but it doesn’t matter where he would teach, I don’t believe—he believes in kids! It doesn’t matter where they are, he will make sure they succeed.”

My first impression of Mr. Simpson’s classroom was that the students were enthusiastic about their work. Some students were moving around the room, but it soon became clear that their movements were related to their work. Likewise, a few kids were talking, but the room was not noisy and the talk was largely collaborative work related to their lessons. Each student had a small stack of books on their desk in the space where their desk butted up against another student’s desk leaving plenty of space to work. In this initial meeting in which the principal introduced me to Mr. Simpson and we had a brief conversation, a student would occasionally ask Mr. Simpson if they could begin working on one project, or read their book, because they had finished the project they were working on. The significance of this did not become apparent until I spent more time in Mr. Simpson’s classroom.

For Mr. Simpson the year begins with establishing rituals, routines, and expectations that “train” his students to be successful. His emphasis early in the year is on building the foundations, behaviorally and conceptually, and begins by establishing norms of behavior and the accompanying incentives and deterrents. He explained his strategy:
In my first week there is a lot of laughter, but it is also mini-military school. “You don’t get up without permission.” “You don’t do this; you don’t do that.” And yet they are laughing the whole time that they are doing it because I can’t help but tell a joke. But, see, that’s the hard thing; you could not break that down—you’re grouchy, then happy; you’re firm, then joking. That’s the hardest thing I have to explain is how I get that atmosphere.

Once he has established a positive classroom environment and a culture of reading, he turns his attention to preparing students to be successful students and good test takers.

He constantly reinforces their ability to follow directions in a way that is transferrable to test situations, as well as other contexts. He asserts,

Yes, reading ability, writing ability, are important—but what good is that if they don’t know how to be a good student. And the same thing applies to taking tests. I go over six different categories and make sure that they have them engrained in their minds to be successful test takers. Have you done this, have you done this... I sound like, “oh, I’m working towards the test.” But no, I’m teaching them how to be successful test takers. A lot of kids don’t do poorly because they don’t have the information in their brain, but it is the way they sit down for that test, and they are not focused on key words or key situations.

He reinforces students’ ability to follow directions by explaining the directions, then he pulls a student’s name from a cup and has that child restate the directions, and then he selects another child’s name and has them explain the directions. This strategy encourages students to be attentive, as they never know when they will be called on.

Mr. Simpson’s incentives include treats, such as cookies and starbursts, as well as public acknowledgements of their achievements. “My number one thing is I’m the Starburst man.” On the day of my visit, Mr. Simpson gave students a single cookie twice throughout the day, as they completed assignments. The Starbursts, however, were reserved for students who had successfully completed all of their work for the unit and successfully completed the unit assessment, so only a few students received Starbursts that day. Thus, although he is generous with the treats, they are stratified and he ensures
that they encourage students along the way and that they celebrate milestones of achievement.

Similarly, his deterrents primarily consist of five minute detentions. “I mean, really, when you think about a five minute detention. It is no pain, no nothing. Yet, it stops them.” Mr. Simpson stressed that consistency is the key to being able to keep the incentives and deterrents simple and effective throughout the year. There was no drama around the five-minute detentions, neither on Mr. Simpson’s part nor on the students’ part. He simply gave a child a redirection, and if the student did not respond fairly quickly, then Mr. Simpson said softly, “Okay that’s five minutes,” wrote his name in a small section of the board, and continued with the lesson.

Mr. Simpson has a very jovial manner, though he is firm with the students when they are disruptive or off task. He says that he can get stern with the students, but his success appeared to come more from the language and the images that he built up and reinforced, as opposed to an oppressive tone. He said that “although they know me as this jolly Mr. Simpson, I tell them if you are misbehaving, you will get a visit from Volcano man.” Still, he insists that if it is warranted, “I can make children and dogs shake in their boots (chuckling).” Another metaphor used in the class was evident when I observed and one boy said to the other, “He’s got his notebook; he’s doing a drive-by! You better hurry and finish your sentences.” He later explained that the students know that when he has his notebook, he is checking on their progress—this is one of his methods of informal assessment.

Another motivation for his students was the privilege for small groups of two or three students to venture into the hall to work on a project. On a day I visited this was...
the reward for two girls who had finished their assignment first, and they were given another project to begin. Mr. Simpson later explained,

I can send kids in the hall and [the principal] or [assistant principal] can walk down that hall and ask those kids “what are you doing?” and they will state their objective and what they want to accomplish right away. “Well, actually, our objective is this, and we are trying to accomplish this. We only have 10 minutes, and we need to get back in.” But, if you ask some of the kids in the other rooms, they don’t even know what they are doing. You know the first thing when I send them out there, “If I ever hear that you don’t know what your objective is, or if you are off task, you won’t get to go out there anymore.”

Occasionally, he even holds other teachers’ students to his expectations. “I was in a room last week... I’m like, ‘You’ve got to be kidding me. I am talking to your teacher and you are goofing off right in front of me?’ That would never happen in my classroom.” While he contends that he is stricter than other teachers, he also is more fun and entertaining. He asserts that the order and structure in his classroom is appreciated by the students, including the “travelers,” as he calls the students who come into his room during flooding. “So, my travelers that come in, they say ‘I love being in here; we can actually work.’ Kids want to work most the time. They want to be motivated. They want to be successful, but they have to be engaged.”

In addition to building students’ academic skills, Mr. Simpson is absolutely driven to build their sense of self-efficacy. Again, some of his methods are a little unorthodox, but they seem to be quite effective. If he notices that a child is sensitive about something, or that they are taking themselves too seriously and being perfectionists, he uses teasing and humor to help the children relax, gain confidence, and be able to laugh at themselves. He strives to strengthen their confidence socially and academically. He said, “One of the groups I work with the best is shy kids, because by
the end of the year, they are not shy anymore.” He also related a story about one of the students who, earlier in the year, expressed that he was not a very good writer. Mr. Simpson replied by saying,

“Don’t say that. You know that will make me mad, and you don’t want to make me mad. So even if you think that, don’t tell me that, because I think of you as a good writer, and I will work with you to be a good writer.” And some of my lowest writers at the beginning of the year are now the proudest writers.

As far as building their academic skills is concerned, Mr. Simpson emphasizes reading above all else. “You might be poor in other things, but if you are a poor reader, you are going to struggle in many, many, many different areas. . . . Like I tell them, if you are a good reader, you can catch up on things you might have missed.” He contends that once students learn to read, they need to read. He believes that teachers need to inspire students to read, which he does through a variety of techniques. He finds books that are interesting to each student and that build their reading skills. He described one student who was a voracious reader but not reading books at her ability level.

Earlier in September, she was reading these second-grade level books when she has a fifth-grade level reading ability. And I asked her why she was doing that, and she said ‘there’s too many words in these books.’ And so, my intern and I set up these challenges for her to read Percy Jackson. I never heard any comment again, and she ended up in the top tier of scoring.

Mr. Simpson also integrates reading into other subjects, such as writing, which he says is more difficult even for gifted students. He talked about his favorite strategy to promote engagement in writing: “In oral reading, I’ll stop and I’ll say ‘now you are the author, write what is going to happen next.’” In doing this he reinforces whatever they are doing in the writing curriculum, such as using descriptive clauses. He uses similar strategies to integrate reading and writing with science and social studies.
The other thing that is striking when visiting Mr. Simpson’s classroom is his level of differentiation for students. Mr. Simpson contends that knowing each student’s abilities and appropriately differentiating for each student is critical for increasing student achievement and closing achievement gaps. However, Mr. Simpson distinguishes what he refers to as differentiation from the practice of many teachers.

That word is thrown out there, and if you really come down to it, what a lot of teachers are doing is not differentiating. All they are doing is giving this or that group harder work. You also have to get the interest there; you have to find their passion, because you want to make them love to work. . . . If you just give them more work, they will hate work. You would teach them to hate achievement. It’s like okay you finished your 100 problems of math, and your reward is 100 more problems of math. So, I try to be creative, and again we have so many projects that are going on that they always have something to go to.

Indeed, Mr. Simpson’s differentiation appeared effortless and seamless. He seemed to have an endless supply of projects in the queue. He walked around as the students are working, and if someone began to walk around and it didn’t appear related to their work, or if he found someone chatting about something not related to their work, he immediately asked “are you finished?” quickly followed by an explanation of the next assignment. Occasionally, the initial explanation of the next assignment generated “ohs,” “ahs,” and a flurry of activity as students finished what they were doing so that they, too, could move on to the next assignment. The end result of this was that it appeared at any one time that different students might be working on three to five, or perhaps even more, activities. It also appeared that wherever a student left off on one day is where they would begin that portion of the lesson the next day. While it looked as though Mr. Simpson tracked all of these activities and assignments, he indicated on a short break that depending on where they were in the curriculum, he didn’t always have to worry if
projects or assignments occasionally got out of order. The important thing to Mr. Simpson was retaining students’ interest while having them work on a series of projects related to different aspects of the curriculum.

In speaking about differentiating among the ability levels in his room, Mr. Simpson added that he prefers to teach to the highest level possible, “but I don’t ever ignore the low ones either, because I am really good at differentiating them and giving them tasks on which they will be successful.” He went on to say,

> It is about knowing your students and having a good background of data to know where they are and presenting a lesson at a high level with a lot of rigor and then stopping and assessing your data and differentiating for the ones who aren’t getting it. I would rather have the low rise up than the top ones go down.

At times he appeared to indicate that he understood that a teacher in a general education classroom might not be able to pursue his strategy of teaching to the top, but at other times he seemed to express frustration with the axiom of “teaching to the middle,” or worse yet with those teachers who teach to the lowest level. While his practices might change somewhat if he were teaching in a general education class, it is not difficult to believe that much of his practice would be similar and that, as he said, students would still make substantial amounts of growth.

The lasting impact of Mr. Simpson’s work is seen in two ways. First, he has a “wall of fame” next to his desk which is full of photos of prior students. Many of them are now in high school or college, and he is proud to point them out and share what they are doing now, what college they are attending, and what they are majoring in. Second, there is a stream of students who are not in his present class coming to see him on breaks and after school. I asked if the students coming in to see him over lunch is typical, and
he stated that as a matter of fact he had to institute a lunch program in which students
would sign up to join him for lunch one day a week. The students that came to see him
after school ranged from middle and high school students, to one elementary student in a
higher grade who looked to have had a tough day and came to get a cookie from Mr.
Simpson. You could tell that the cookie and a few kind words of encouragement from
Mr. Simpson went a long way toward making him feel better. Below is what one student
wrote of her experience in Mr. Simpson’s class:

I felt different after the first day of school

I slowly walked out of Mr. Simpson’s classroom, I almost fainted I had
never learned so many things in my intire [sic] life. Also the room was
sooo colorful everywhere I looked there was writing or colors. Plus I got
my own books on my own desk! That night, I told my mom all about my
first day at school. I told her about my Hilarious teacher and how funny
he was. I also told her about the new friendly friends I met. My teacher
encouraged [sic] me to read allot [sic] so I did. Little did I know I was
reading 5th grade books! I never knew I would be reading so much [sic]
books in one excellent day. After the first day of school, my brain
changed, my heart changed and my wonderous feelings changed. My
feelings became smart. My brain changed because I was becoming smart.
My heart changed for loving new things. My feelings felt more smart
then [sic] all of the years before.

With this kind of inspiration and encouragement on her first day of school, it is
not surprising that by the end of the year, she was reading at a twelfth-grade level.

While certainly this child is quite talented and likely she would have grown in
any case, I think it is also unquestionable that her growth was enhanced in many
ways by her experiences in Mr. Simpson’s class.

However, it was heartbreaking at the end of the day to hear that a teacher
of this caliber was unsure he would make the decision to pursue a career in
teaching again.

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I wonder. I love the classroom, but the expectations now. They want teachers to be everything and pay them like dirt and treat them like dirt. Every time I watch the news it just makes me so mad. I get so angry when politicians talk about teachers as though these poor teachers are ruining our children. . . . But, when did teaching become this second-rate job.

Mr. Simpson is an extraordinary teacher who implements teaching practices in a way that works for him and his students largely because they are a part of who he is. His humor and his jovial manner help him establish classroom practices in a way that sparks students’ interest but also keeps them on task.

As I mentioned earlier, some of Mr. Simpson’s practices seem a bit unorthodox. Current wisdom around best practices might not support viewing the role of a teacher as that of an entertainer, using candy as rewards, using terms such as “drive-by,” or teasing kids about areas of sensitivity. Yet he achieves truly extraordinary results by integrating all of these with extremely high expectations, extensive and individually targeted differentiation, in-depth knowledge of the curriculum, and remarkable personal responsibility for student engagement, student motivation, and most importantly student achievement.
Chapter VII

DISCUSSION

The results of the quantitative analysis revealed that generally neither teacher background characteristics nor teacher perceptions of the frequency that instructional practices are employed in their classroom have significant effects on student achievement. Teacher attitudes, on the other hand, consistently have a significant influence on student achievement. The teachers and principal in the case study agreed that teacher attitudes are crucial to increasing student achievement and closing achievement gaps. However, they also believe that instructional practices influence student performance and achievement. The teachers in the case study were surprised to learn that the quantitative results did not show significant effects of instructional practices, and they agreed that the results were likely due to the use of questions inquiring about teacher perceptions of the frequency of the practices, as opposed to questions or measures pertaining to how the practices are implemented. As a result, this study has a number of topical and methodological implications for future research.

Teacher Background Characteristics

Prior econometric studies have had mixed results about the effects of teacher background characteristics on student achievement. The results of the quantitative analysis in this study suggest that teacher background characteristics, as measured by years of teaching experience, ESL certification, type of teacher certification, and highest
degree earned generally do not have a significant impact on student achievement.

However, background characteristics may have an influence on third-grade reading and fifth-grade mathematics, but the level of significance is low for the size of the sample.

In the qualitative analysis, teachers in the case study did not emphasize their certification or years of experience. However, several of the teachers talked about the relevance of their graduate degrees. They described their desire to continue to learn, both through formal educational programs and through more targeted professional development, and to directly apply what they learn in their classroom for the benefit of their students. For example, one teacher talked about the application of her master’s degree in elementary reading and literacy to her work with Tier II literacy students. Another teacher discussed the advantage of her degree in helping to push her own practice to more fully integrate technology into her lessons, which in turn helps to increase the engagement of her students. Likewise, her degree program introduced her to internet-based resources to support students at all levels of ability, particularly in math.

As mentioned above, the teachers in the case study were identified by the principal and former instructional coach as effective, and the end-of-year achievement growth data for students in these classrooms indicated average growth in excess of one year for all of these teachers. Interestingly, 66% of the teachers in the case study had master’s degrees compared with 36% of teachers in the ECLS-K database who reported their highest level of education as a master’s degree or higher. In addition to their formal education, the teachers discussed professional development experiences that enhanced their instructional practices, particularly with regard to collaborative student learning and English language acquisition.
The teachers in the case study also identified a number of items not contained in the ECLS-K database that were related to their backgrounds and that they felt influenced their instruction, and, consequently, may have an effect on student achievement. At least half of the teachers indicated that they had family members who were teachers, and thus their orientation to children and their interest in the teaching profession was shaped by their family experiences. Several of the teachers also felt that their teaching was enriched by prior experiences they had with children, such as teaching in a summer camp and tutoring children in various subjects. In addition, the teachers identified personal characteristics that they believe affect their teaching, such as being reflective about their practices and being open to constructive criticism and feedback from their principals and peers. Some of the teachers also discussed personality traits, such as extroversion or having a sense of humor, that contribute to the formation of a positive classroom environment.

While the teachers in the case study placed far more emphasis on the influence of their attitudes and instructional practices on student achievement, they nonetheless identified background characteristics, experiences, and personality traits that enhance or shape their attitudes toward teaching, and may influence their instructional practices. Thus, although the quantitative results indicate that the direct-effects model has better model fit and that background characteristics generally do not have a significant effect on student achievement, the qualitative results indicate that further investigation of the effects of teacher background characteristics on teacher attitudes and instructional practices may be useful.


**Teacher Attitudes**

The quantitative analysis revealed that teacher attitudes as measured by factors related to *collective efficacy, negative expectations, teacher engagement*, and *school climate* consistently had a significant influence on reading and math achievement. The quantitative analysis suggested that *negative expectations* may have the greatest impact on student achievement. Depending on the year of ECLS-K administration, *negative expectations* was measured by: for first grade – *child misbehavior affects teaching, children incapable of learning*, and *parents support school staff*; and for third and fifth grades – *child misbehavior affects teaching, physical conflicts are a serious problem*, and *bullying is a serious problem*.

In the qualitative analysis, teachers strongly emphasized the importance of having positive attitudes and being approachable. Moreover, when the teachers viewed the items from the quantitative analysis, they overwhelmingly agreed that the items in each of the four factors listed above have an effect on their attitudes, and they discussed these factors extensively. The teachers rated the school high on school spirit; they believed that the current staff of the school seeks new ideas and opportunities to learn, and they felt they are generally accepted by their colleagues. The teachers did not believe that physical conflicts or bullying were problems at their school. However, they acknowledged that student behavior and teachers’ beliefs that all children can learn can have an impact on their attitudes, as well as on the engagement and performance of other students in their classrooms. The teachers felt strongly that it is important for teachers to be engaged in their work, and they discussed the amount of commitment and dedication they have toward the profession and their students. In addition, they talked about the
myth that teaching is an easy job with summers off. Instead, they stressed the amount of
time on weekends and evenings that they spend on lesson planning and professional
development, and they attributed their retention in the profession to their engagement and commitment.

The teachers also discussed the effect of school climate on their attitudes. The school went through a rough transition to a new administration last year, which resulted in tensions among teachers, parents, and administrators. Consequently, some teachers left the school at the end of the year. In this second year with the new administration, however, the teachers generally agreed that the administration has a vision that is clearly articulated, it handles outside pressure and prioritizes well, and it encourages the staff. The only concern that the teachers expressed is that they would like to see the administration deal more strongly with chronic student behavioral problems.

The teachers also believe that positive attitudes and asset-based dispositions influence a teacher’s practice and student achievement. Although the teachers in the case study acknowledged that student behavior can affect teaching, they emphasized the need for teachers to minimize student behavioral problems by generating student interest and student engagement in the classroom. Several of the teachers in the case study expressly took personal responsibility for the behavior of students. If student behavior was a problem on a given day or during a given lesson, the teachers reflected on what they might have done differently to interest and engage students in the learning activity. The teachers in the case study also indicated that teachers’ perceptions of the collective efficacy of their peers, their own commitment and dedication to the teaching profession,
and the effectiveness and support of the school administration can have an effect on their attitudes and dispositions.

Overall, the teachers and the principal in the case study seemed to agree that teachers’ attitudes are crucial to increasing student achievement. As the principal noted, it is important for teachers to be efficacious and to have a “no excuses” attitude:

I think that teachers have to have the value system that all kids can learn, that all kids will learn, and that with good instruction, they can learn at very proficient rates regardless of their backgrounds, regardless of their parent support, regardless of whether they are disabled or not. Might there be differences yes, but do they have the real value system that I can impact a kid? I think that is harder to change even than management and relationships. And I have seen teachers with strong classroom management, but don’t have the value system and have a lot of excuses around why kids aren’t working or achieving. And I think if you don’t believe it, it will never happen.

The teachers and the principal agreed that a teacher might have excellent teacher preparation and strong fundamental instructional practices, but if they do not have positive attitudes and good relationships with students, student growth in their class will likely be compromised.

With regard to group comparisons, the quantitative analysis also indicated that teacher attitudes have a significant effect on student achievement for students in schools that receive Title I funds, as well as those that do not receive Title I funds, though the significance level drops for fifth-grade mathematics achievement in schools that do not receive Title I funds. This may be consistent with the literature on deficit-based teacher attitudes and thinking, which suggests that while teachers may be concerned about students and desire to help them, their “single story” about the cultural and economic
backgrounds of students and their families unwittingly affects their expectations and instructional practices related to some children (Adichie, 2009; Gay, 2000; Valencia, 1997).

While the results of the quantitative analysis showed that teacher attitudes have a significant influence on student achievement for students below the 90th percentile of reading and math achievement, they do not have a significant influence on the achievement of students at or above the 90th percentile. In contrast, as will be discussed more fully in the next section, the teachers in the case study classrooms felt strongly that their attitudes and expectations related to student behavior were important to promoting the sustained performance and growth of students in general education and in gifted and talented classrooms. Moreover, they consistently took this into consideration in the planning and delivery of instruction for both groups of students.

The quantitative analysis also revealed that teacher attitudes have a significant impact on first-grade Asian, Black, and White students, but not for Hispanic students when prior achievement is included in the model. The significance levels drop, but the pattern is similar for fifth-grade reading and for first-grade math. These findings raise questions as to why the latent variable teacher attitudes, as measured by negative expectations, collective efficacy, school climate, and teacher engagement, does not have a significant influence on Hispanic student achievement. The first question is whether the results are due to insufficient power to detect significance. However, the mean achievement score and the size of the sample of first- to fifth-grade Hispanic students in the group comparisons indicate that there is sufficient power to detect significance at
each grade level. In addition, the size of the Hispanic group at each grade level is over double that of the Asian group for whom significance is detected at each grade level.

This, then, leads to questions as to why teacher attitudes related to student behavior and school workplace environments would have a significant effect on Asian, Black and White children but not on Hispanic children. Does this suggest that Hispanic students are resilient to the negative expectations and dissatisfaction of teachers? Is this an early indicator of disenfranchised Hispanic students? There is concern among education communities and policymakers that Hispanic students in the United States continue to have the lowest achievement and graduation rates (National Center for Education Statistics, 2010; Ortiz, Valerio, & Lopez, 2012). The drop-out rates of Hispanic students are over double that of Black students and triple the rate of White students (U.S. Department of Education, 2012). As Ortiz, Valerio, & Lopez (2012) point out, this trend has persisted despite “research indicating Hispanic children enter school with similar fundamental cognitive processes and capabilities” (p. 137). Factors described as contributing to Hispanic student achievement include generational status, English language proficiency, cultural and social capital, gender and type of parental support, teacher support, discrimination, and identity and status of ethnic groups with which Hispanic students identify (Lopez, 2012; Fuller and Garcia Coll, 2010; Ortiz, Valerio & Lopez, 2012). As the principal of Gilbert Elementary indicated, the academic performance of students in top-performing suburban schools cannot be presumed to be solely due to the effectiveness of their teachers, as it is difficult to isolate and control for the contribution of parental resources and support. Similarly, the academic performance
of Hispanic students may be related, at least in part, to the layered contexts of their psychosocial and educational development (Fuller & Garcia Coll, 2010).

A recent study of classroom dynamics as predictors of academic achievement also found that a number of teacher behaviors that had significant positive or negative effects on the academic achievement of non-Hispanic students were not found to be generalizable to Hispanic students (Lopez, 2011). Lopez (2011) asserts that one should avoid conclusions that teacher behaviors do not contribute to the achievement of Hispanic students. Rather, it is likely that the variables related to teacher behaviors that affect Hispanic student achievement were not included in the data collection instruments or protocols. Thus, while the ECLS-K data indicate that the items related to teacher negative expectations and teachers’ perceptions of their school workplace environments do not have a significant effect on Hispanic student achievement, this does not mean that we should conclude that overall teacher attitudes have no impact on Hispanic student achievement. In addition to the items listed above that prior research has shown impact Hispanic student achievement, other items that might be included in future studies to aid explorations of the effects of teacher attitudes and instructional practices on Hispanic student achievement are the cultural and linguistic knowledge of teachers, their cultural awareness and beliefs, and their use of culturally responsive pedagogy (Lopez, 2011; Gay, 2000). Moreover, as the teachers in the case study discussed, school- and district-supported professional development that fails to include both cultural and language acquisition content may not provide sufficient resources for teachers to meet the academic needs and close the achievement gaps for Hispanic students.
The findings of both the quantitative and the qualitative analyses suggest that teacher attitudes consistently have a significant effect on student achievement. However, the quantitative analysis indicates that these results may differ across groups of students. Thus, further research related to the effects of teacher attitudes on the achievement of high ability students and Hispanic students is needed. In addition, teachers seemed to suggest that whereas I had hypothesized that teacher attitudes and background characteristics are mediated through instructional practices, perhaps it is reversed. Perhaps instructional practices and background characteristics are mediated through teacher attitudes to have an effect on student achievement. While the teachers contend that instructional practices are important, both the teachers and the principal suggest that teachers’ attitudes may be even more crucial to creating a classroom environment that enhances student achievement.

**Instructional Practices**

In the quantitative analysis, teacher perceptions about instructional practices generally did not have a significant influence on student achievement in reading or math. However, there were two exceptions: (1) teacher perceptions about instructional practices had a significant effect on first-grade reading for Title I students, and (2) they had a negative effect on math achievement in fifth-grade. With regard to the reading results for students in schools that receive Title I funds, further examination reveals that teacher perceptions about the frequency of two instructional practices were positively associated with first grade reading achievement: *frequency children choose books to read*, and *frequency children*
write stories or reports. Perhaps increased frequency of choosing books to read and writing stories leads to higher levels of student interest and engagement in reading for first-grade students in Title I schools. In addition, students in schools receiving Title I funds may have fewer opportunities and resources to engage in reading outside of the classroom than students in schools that do not receive Title I funds.

While it is anticipated that the frequency of specific instructional practices would have a positive effect on student achievement, it is more difficult to explain how the frequency of instructional practices might have a negative effect on achievement. Investigation of the results for fifth-grade math achievement indicates that two of the five sub-models contribute to the negative effect on student achievement: problem-solving and math disciplines. Specific variables that appear to account for the negative effects are frequency that children work on fractions, algebra, writing math solutions, and discussing math problems. Recent research sheds light on why this might be the case for at least one of these variables.

Beginning in the mid- to late-1990s, Algebra began to be seen as a “gateway” course for student success in more advanced mathematics courses, as well as for student preparation for four-year college or university attendance and for the labor market (Clotfelter, Ladd & Vigdor, 2012; National Center for Education Statistics, 2010). Consequently, some districts began to mandate that eighth-grade students take Algebra I. Another study using the ECLS-K data revealed that mathematics enrollment varied by race-ethnicity, poverty status, mother’s education, family type, region of the country, and school type (National Center for Education Statistics, 2010). Students were more likely
to take more advanced mathematics courses in eighth-grade if they were Asian or White, if they had higher SES, if their mother had a bachelor’s degree, if they were from two-parent families, and if they attended private or Catholic schools. In addition, students who scored higher on fifth-grade mathematics achievement were more likely to take Algebra in eighth-grade, and girls were more likely than boys to enroll in Algebra. As anticipated, students who enrolled in Algebra courses in eighth grade had higher ECLS-K mathematics achievement scores (National Center for Education Statistics, 2010).

However, Clotfelter, Ladd & Vigdor (2012) found that while students who take Algebra earlier in school do better in subsequent math courses, this is primarily because higher achieving students are selected for early enrollment in Algebra. “Once this selection bias is eliminated, the remaining causal effect of accelerating the conventional first course of algebra into earlier grades, in the absence of other changes in the math curriculum, is for most students decidedly harmful” (Clotfelter, Ladd & Vigdor, 2012). Students accelerated into Algebra I in eighth grade were more likely to score lower on end-of-course tests, and they were “significantly less likely to pass courses in Geometry and Algebra II on a college-preparatory schedule” (Clotfelter, Ladd & Vigdor, 2012, p. 19). Thus, it is argued that students required to take algebra before they are ready may actually fall behind peers who take more age- or level-appropriate math coursework (Clotfelter, Ladd & Vigdor, 2012; Loveless, 2008). This may explain why, in the current study, students whose teachers perceived higher frequency of algebra instruction in fifth grade had lower scores on mathematics achievement. It also may suggest a hypothesis as to why there was not a negative effect for high-ability students; this may be an indication
that high ability students were more prepared for the early introduction to Algebra so that increased frequency of Algebra content did not have a negative effect on their achievement.

The instructional practices that the case study teachers identified as important to enhance student achievement differed from the types of practices included in the quantitative study. The teachers in the case study contend that it is essential to get to know their students academically and socially early on in the year. The teachers indicated that getting to know students is crucial in order for other instructional practices to be effective. As illustrated in Figure 7, the teachers described a process of planning and assessment that stressed the importance of incorporating what they know about students in lesson planning, lesson delivery, and assessment. The teachers emphasized the need to regularly examine data with regard to each individual student and then to consider the specific needs of each student in their lesson planning, instructional delivery, differentiation, and assessment. A couple of the teachers also mentioned the need to think about how they would push individual students in the planning process. The teachers argued that if methods of differentiation and strategies to push students to extend their learning were not considered in the instructional planning process, it would be unlikely to happen in the moment to the extent needed to maximize student achievement for all students.
A number of teachers specifically discussed the importance of learning about individual students’ interests in order to increase student engagement. Although both the teachers and the principal indicated that teachers must have strong classroom management skills, at least a couple of the teachers pointed out that classroom management is not solely a matter of redirecting student behavior. Rather, they asserted that in order to have strong classroom management, it is necessary to have high levels of student interest and engagement. Further, they pointed out that in order to maintain student interest and engagement, it is necessary to adequately differentiate for students so that the material is neither too easy, and thus boring to students who finish quickly, nor too hard, and thus discouraging to a number of students. The case study teachers contend that if one effectively gets to know students, considers their needs in lesson planning and
differentiates appropriately, students will be engaged and behavioral problems in the classroom will be minimized. These teachers also emphasized that differentiation is not just about giving more work to some students. As Mr. Simpson noted, he always has a number of projects that students enjoy and that they can work on to reinforce what they are learning in the class. Thus, in his classroom, it appeared that after a while the students began to differentiate for themselves by requesting to work on certain activities that they enjoyed and that he had previously designed to enhance their learning.

Interestingly, the teachers stressed the importance of instructional practices, yet when they were specifically asked about the most important instructional practices in their classroom they often emphasized affective aspects of instructional practice, such as establishing relationships with students and having high expectations, as opposed to technical instructional practices related to the development of specific content or skills similar to the items contained in the ECLS-K. Teachers also discussed these items—relationships with students and high expectations—with regard to teacher attitudes that enhance student learning. However, in discussing these items in relation to their attitude, they appeared to stress the desire to get to know students and to have a positive orientation. On the other hand, when they discussed the items as instructional practices, they discussed how they intentionally and consistently fostered their relationships with, and expectations of, students to create a learning environment to promote student growth and achievement. The teachers indicated that the practices that further support this work include the continuous assessment of student learning, as well as planned and meaningful differentiation for students. Nonetheless, when responding to the questions from the
database, the teachers indicated that the majority of the instructional skills were addressed “at least once a week,” if not “daily.” This may suggest that although the teachers recognize the importance of, and frequently engage in, instructional practices related to content and skill development, they believe that they must first attend to the attitudinal or affective practices in order for the skills-based instructional practices to be effective.

Although the quantitative results indicated that teacher attitudes and instructional practices are unrelated to the achievement of high-ability students, the majority of the case study participants felt that teacher attitudes and instructional practices are important for students in gifted and talented classrooms. While two teachers suggested that student engagement and classroom management are less problematic in the gifted and talented classrooms due to students’ intrinsic levels of interest in school, it was the contention of other teachers, the principal, and the parent interviewed that this is an exaggerated stereotype of high ability students. They argued that strong instructional practices are crucial to the engagement, management, and achievement of students in gifted-and-talented classrooms, as well as in general education classrooms.

In discussing differences in instructional practices related to the gifted-and-talented classrooms compared with the general education classrooms, the teachers underscored that the pacing in the classes is different, as gifted-and-talented classrooms move through the curriculum faster. Nonetheless, they contend that there are similar expectations of teachers and students in both general education and gifted-and-talented classrooms. The teachers mentioned the importance of having rituals, routines, and
expectations that are consistently implemented. In addition, as noted above, the teachers believed that strong instructional planning, lesson delivery, and differentiation skills are as essential for teachers of gifted-and-talented students as they are for teachers in general education classrooms.

At the end of the interviews, I shared the preliminary quantitative findings with teachers by showing them summaries of the results for their grade level in reading and in math. The teachers agreed whole-heartedly with the results reflecting the effects of teacher attitudes on student achievement. However, the teachers were very surprised by the results of the effects of perceptions related to instructional practices on student achievement. One teacher responded, “Really! Wow (pause). Wow (pause). Okay, read that—say that one more time [read again]. Why!! Why is nothing significant!! (chuckling). So I could be like Robot Raleigh here and my kids would still do whatever their brains are expecting to do. Wow.” I then asked the teachers whether they thought the “frequency” of instructional practices was appropriate, and I reminded them of the questions they raised when answering the questions. The teachers typically responded with a sigh of relief. The teachers then added that while they thought frequency might be a component for some activities, such as feedback and management, it is likely not the best indicator for most instructional practices. As one teacher noted,

Yeah, maybe frequency is not the important thing—it’s how you teach it. If you’re not teaching it in the right way, it may not matter how many times you do it, they may not get there. It would probably be more about: How do you structure the lesson? How do you use data? How often do you assess growth?

Thus, although the quantitative analysis indicates that instructional practices generally do not have significant effects on student achievement, the qualitative analysis
reveals teachers’ strong beliefs that instructional practices are related to student achievement. The teachers in the case study suggested that perhaps future surveys should inquire about how teachers implement instructional practices in their classroom rather than the frequency with which they employ instructional practices.

**Limitations**

Although my initial interest in developing this study was to examine the effectiveness of teachers in a manner that included data pertaining to their attitudes and instructional practices, it became apparent that the ECLS-K data could be used to begin an exploration of the effects of teacher attitudes and instructional practices on student achievement, but the data is insufficient for an examination of teacher effectiveness, *per se*. Because the data is derived from self-report surveys, it provides information about teacher perceptions, as opposed to objective measures of, the frequency of instructional practices. Xue and Meisels (2004) point out a number of problems with data such as the ECLS-K data used in this analysis. First, the questions in the teacher questionnaire related to instructional practices inquire about frequencies of the practices as opposed to time actually spent on specific practices. Second, because the data obtained is all self-report data, it is subject to low levels of reliability and validity, and increased measurement error. Third, the data is more likely to reflect social desirability bias.

As mentioned earlier, there was a large proportion of teacher data missing for this analysis. Although listwise deletion of missing cases is not a desirable method of handling missing data, given the large amount of missing data for each grade year it was appropriate in this case. However, the use of listwise deletion for a large proportion of
the data poses a severe limitation of the analysis as no assumptions can be made about
the data being missing at random or about the generalizability of the results of the
analyses.

The data from the ECLS-K database used for this analysis is nine to thirteen years
old. While this is not uncommon in quantitative analyses to use some older datasets, it
could be that the landscape of K-12 education has changed so much in this time that it
does not align well with the qualitative analysis.

Another limitation of the data is that the ECLS-K data began with a
representative sample of children in kindergarten. However, it is not a representative
sample of subsequent grade levels due to attrition and other demographic considerations.
Likewise, it is not a representative sample of teachers. Consequently, care must be taken
in interpreting the results of the analysis. Despite these limitations, the ECLS-K data
provides an opportunity to explore the relationships among teacher background
characteristics, teacher attitudes, and teacher perceptions related to instructional
practices.

*Implications for Future Research*

This study points to a number of possibilities for future research. The study
indicates that teacher attitudes had a significant effect on student achievement at all three
grade levels. However, given the limitations of this dataset and the indications of
misspecification of the model, it would be beneficial to corroborate the results using a
different dataset, if one can be located. It also would be interesting to explore the effects
of teacher attitudes more deeply by investigating other aspects of teacher attitudes that
might influence student achievement.
While this study suggests that instructional practices, as measured in the ECLS-K, do not have a significant influence on student achievement, it would be desirable to analyze the effects of instructional practices on student achievement using a different dataset containing items related to current instructional practices measured in terms other than their frequency of use. Moreover, if we had better measures of instructional practices and we could corroborate the findings about the effects of teacher attitudes, we could further investigate potential relationships between teacher attitudes and instructional practices.

Such a study also might have implications for teacher preparation and professional development. Teacher preparation programs often attempt to screen for or provide training related to attitudes or dispositions believed to be appropriate for successful classroom teachers. The principal in the case study raises the question as to whether such attitudes or dispositions can be influenced through education or training. She indicates that it is possible for a principal to support teachers with additional tools around classroom management and instructional practices, but it is difficult to train a teacher to build relationships with students and to have a “no excuses” attitude pertaining to student achievement. If, as this study suggests, teacher attitudes have a significant effect on student achievement, and if attitudes are found to influence the effectiveness of instructional practices, it will be incumbent upon teacher education programs to place increased emphasis on screening and/or training related to teacher attitudes and dispositions. This will become particularly important as states move forward with initiatives to link data related to student achievement, teacher evaluation, and teacher preparation programs.
In the future, the study of the effects of teacher attitudes and instructional practices might be enriched by including interviews of students and parents. After observing and interviewing these teachers, I had the opportunity to interview a former student of Mr. Simpson, as well as a parent of the student. When I asked the student what it was like to have Mr. Simpson as a teacher, the child replied “He was nice and he was fun. We would mess around at times, but then we would get back to work. We learned a lot in his class, and it was fun.” In describing the learning further, he said “We wouldn’t just sit down and look at a textbook, we would actually do stuff. If we were learning about science, or electricity, we would try to make a light bulb.”

The parent of this child also reinforced some of the findings about teacher attitudes. He said he thought it was important to the students that Mr. Simpson developed relationships with each of them.

I think that what made Kenneth enjoy the class is that Ms. Simpson enjoyed all of the different personalities. He rejoiced in the differentness, and he did not want every kid to fit into the same box, which is important because not all kids can fit into the same box. We had a couple of teachers before that that were not that way. So, I think it was a big relief for him to feel accepted and valued and special.

This parent also talked about the influence of Mr. Simpson on this child’s academic development. He said that, contrary to the assumption about students in that program, Kenneth was not “an excited reader” when he entered Mr. Simpson’s classroom, but he got much more engaged in reading in that class. He went on to say that having Mr. Simpson “happened at the right time for Kenneth. I think he was on the verge of being fed up with school, but he loves it now.” I suspect that information from parents and
students could particularly shed light on what they observe about teachers that inspires, motivates, and engages students in learning.

With regard to the qualitative analysis, Gilbert Elementary School has some unique characteristics. It is a gifted and talented magnet school with a relatively new administration that has undergone substantial changes over the last two years. In addition, the new administration is implementing innovative practices, such as data teams and homogeneous ability grouping of students across grade levels, which are new to the school and the teachers. Thus, it would be beneficial to conduct the qualitative analysis in other contexts, including Title I schools.

The interviews with teachers in the case study suggest the possibility of other items that might be used in research regarding background characteristics, including the prior experiences teachers have working with children and what type of professional development is relevant. The interviews with teachers also pointed toward a number of additional items related to instructional practices that might be investigated in future research, such as methods and amounts of differentiation, the use of data teams, and techniques for enhancing student interest and engagement and reducing distracting student behaviors. In addition, a question raised for me in this analysis is, how are classroom management and behavior related to student self-efficacy?

In addition to the above topical considerations for future research this study has methodological implications for the use of large, national datasets in mixed-methods research. Early taxonomies of mixed-methods research required the sample for the qualitative phase of the study to be a subset of the sample for quantitative phase of the study. Teddlie and Tashakkori (2009) raised the possibility of conducting parallel
mixed-methods designs, which do not require that the qualitative sample be drawn from the quantitative sample. While one cannot say that the findings of the qualitative phase of this study “explain” the results of the quantitative phase, this study shows how a local case study can be used to explore and inform the results of the quantitative analysis of a large, national dataset.

**Summary**

In the past, econometric studies of the impact of teacher effects on student achievement have focused largely on teacher background characteristics. The results of these studies have been mixed. Palardy and Rumberger (2008) included teacher attitudes and teacher instructional practices in their analysis of first-grade student achievement.

This two-phase parallel mixed-methods design examined the relative influences of teacher background characteristics, teacher attitudes, and teacher instructional practices on student achievement. In the quantitative phase of the study, I used structural equation modeling in a secondary analysis of ECLS-K data of students in first, third, and fifth grades. In the qualitative phase of the study, I conducted a collective case study to explore teachers’ perspectives about their influences on student achievement.

The quantitative analysis revealed that teacher background characteristics and teacher attitudes are not mediated through instructional practices as measured in the ECLS-K database. In addition, teacher background characteristics and teacher perceptions related to instructional practices do not generally have a significant influence on student achievement. Teacher attitudes, on the other hand, typically do have a significant impact on student achievement.
The qualitative analysis revealed that teachers in the case study emphasized the importance of having a positive attitude. Likewise, they also felt that the items related to teacher attitudes in the quantitative analysis were important influences on their attitudes as a teacher. Whereas teacher perceptions of instructional practices were not significant in the quantitative analysis, the teachers in the case study believe that a teacher’s instructional practices have a strong effect on student achievement. It is likely that the measure of instructional practices in terms of teacher perceptions of frequency of the practice, as was done the ECLS-K, is not a sufficient measure for assessing the effect of these instructional practices on student achievement. In addition, while the teachers thought that some of the instructional practices mentioned were important, they also stressed additional, and perhaps, more current practices that were not included in the ECLS-K database. The qualitative case study also showed that exemplary teaching is an art form requiring a great deal of dedication and commitment. The teachers and the principal emphasized that not all teachers must be an exemplary teachers in order to be effective. Further, an exemplary teacher is not necessarily a perfect teacher. Exemplary teachers are human, they differ in their techniques and personalities, and they do not perform every practice as it might be prescribed by external frameworks of best practices. Nonetheless, many effective teachers and exemplary teachers do truly amazing work to enhance student learning.
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Appendix A

Factor Analysis Results
### Factor Analysis Results

Table 48  
*Exploratory Factor Analysis – Teacher Background Characteristics*

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<th>Background Characteristics</th>
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Exploratory Factor Analysis – Teacher Attitudes

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5th Grade - Math
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**Exploratory Factor Analysis: Instructional Practices—Reading**

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Table 51
Exploratory Factor Analysis: Instructional Practices—Math

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Table 52
Teacher Background Characteristics – Descriptive Statistics

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<th>Skewness</th>
<th>Kurtosis</th>
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Table 53
*Teacher Attitudes – Descriptive Statistics*

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<td>Children Incapable of Learning</td>
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<td>-0.844</td>
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<td><strong>Teacher Engagement</strong></td>
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<tr>
<td>Teacher Enjoys Teaching</td>
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<td>10,732</td>
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<td>-1.148</td>
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<td>Staff Have School Spirit</td>
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<td>3.837</td>
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<td>1.413</td>
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<td>0.983</td>
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<td>0.557</td>
<td>-0.319</td>
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<td>99.2%</td>
<td>-1.098</td>
<td>1.144</td>
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<td>-0.958</td>
<td>0.912</td>
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Table 54  
*Teacher Instructional Practices - Reading – Descriptive Statistics*

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<th>SD</th>
<th>N</th>
<th>Valid %</th>
<th>Skewness</th>
<th>Kurtosis</th>
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<td>1.035</td>
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<td>4.762</td>
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<td>1.156</td>
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<td>0.909</td>
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<td>1.354</td>
<td>2.051</td>
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<td>96.9%</td>
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<td>N</td>
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<td>Skewness</td>
<td>Kurtosis</td>
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<td>10,760</td>
<td>98.7%</td>
<td>-0.447</td>
<td>-0.458</td>
</tr>
<tr>
<td>Evaluate class behavior</td>
<td>3.32</td>
<td>0.759</td>
<td>10,756</td>
<td>98.6%</td>
<td>-0.899</td>
<td>0.392</td>
</tr>
<tr>
<td>Evaluate completion of homework</td>
<td>3.30</td>
<td>0.740</td>
<td>10,727</td>
<td>98.4%</td>
<td>-0.923</td>
<td>0.993</td>
</tr>
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</table>
Table 55  
*Teacher Instructional Practices - Math – Descriptive Statistics*

<table>
<thead>
<tr>
<th>Grade 1</th>
<th>Solving Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency explain/solve math</td>
<td>4.85</td>
</tr>
<tr>
<td>Frequency solve math partner</td>
<td>3.95</td>
</tr>
<tr>
<td>Frequency mixed group math</td>
<td>4.05</td>
</tr>
<tr>
<td>Frequency solve real life prob</td>
<td>4.34</td>
</tr>
<tr>
<td>Frequency peer tutoring</td>
<td>3.53</td>
</tr>
<tr>
<td>Frequency prob w/ several solutions</td>
<td>3.70</td>
</tr>
</tbody>
</table>

| Measuring/Estimating Quantities |
| Frequency use measuring instrument | 3.04 | 1.133 | 14,206 | 94.1% | 0.840 | 0.342 |
| Frequency recognizing fractions | 3.83 | 1.288 | 14,128 | 93.6% | 0.333 | -0.596 |
| Frequency recognize ordinal #s | 4.03 | 1.215 | 13,994 | 92.7% | 0.163 | 0.780 |
| Frequency use measuring instr. | 5.34 | 1.390 | 14,094 | 93.3% | -0.420 | -0.422 |
| Frequency telling time | 4.50 | 1.274 | 13,897 | 92.0% | -0.009 | 0.304 |

| Sorting and Ordering |
| Frequency geometric shapes | 4.27 | 1.252 | 14,173 | 93.9% | 0.346 | -0.048 |
| Frequency sort in subgroups | 4.30 | 1.158 | 14,136 | 93.6% | 0.127 | 0.318 |
| Frequency ordering objects | 4.18 | 1.125 | 14,068 | 93.2% | 0.292 | 0.236 |
| Frequency copying patterns | 4.68 | 1.292 | 14,190 | 94.0% | 0.192 | -0.394 |

| Evaluation |
| Evaluate effort | 3.68 | 0.503 | 14,360 | 95.1% | -1.243 | 0.604 |
| Evaluate class participation | 3.34 | 0.644 | 14,295 | 94.7% | -0.484 | -0.557 |
| Evaluate attendance | 3.53 | 0.705 | 14,357 | 95.1% | -1.801 | 4.327 |
| Evaluate class behavior | 3.54 | 0.655 | 14,335 | 94.9% | -1.348 | 1.804 |
| Evaluate cooperativeness | 3.44 | 0.663 | 14,364 | 95.1% | -1.004 | 1.087 |
| Evaluate ability to take directions | 3.67 | 0.523 | 14,354 | 95.1% | -1.388 | 1.947 |
| Evaluate completion of homework | 3.07 | 0.908 | 14,339 | 95.0% | -1.039 | 1.328 |

| Grade 3 |
| Math Skills |
| Frequency geometry | 2.03 | 0.665 | 11,296 | 95.7% | 0.292 | 0.184 |
| Frequency data analysis | 2.15 | 0.778 | 11,291 | 95.6% | 0.268 | -0.345 |
| Frequency algebra | 2.25 | 0.900 | 11,273 | 95.5% | 0.378 | -0.583 |
| Frequency recognize shape prop | 1.93 | 0.718 | 11,290 | 95.6% | 0.334 | -0.329 |
| Frequency fractions | 2.12 | 0.793 | 11,292 | 95.6% | 0.316 | -0.360 |

<p>| Tools and Manipulatives |
| Frequency calculator | 3.28 | 0.793 | 11,271 | 95.5% | -0.809 | -0.136 |
| Frequency manipulative | 2.26 | 0.792 | 11,263 | 95.4% | 0.113 | -0.500 |</p>
<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>N</th>
<th>Valid %</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Talking through math problems</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Frequency meas instruments</td>
<td>2.44</td>
<td>0.767</td>
<td>11,259</td>
<td>95.5%</td>
<td>-0.329</td>
<td>-0.493</td>
</tr>
<tr>
<td>Frequency use computer</td>
<td>3.01</td>
<td>0.979</td>
<td>11,315</td>
<td>95.8%</td>
<td>-0.484</td>
<td>-0.988</td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluate effort</td>
<td>3.65</td>
<td>0.539</td>
<td>11,621</td>
<td>98.4%</td>
<td>-1.340</td>
<td>1.746</td>
</tr>
<tr>
<td>Evaluate class participation</td>
<td>3.32</td>
<td>0.670</td>
<td>11,627</td>
<td>98.5%</td>
<td>-0.580</td>
<td>-0.226</td>
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<tr>
<td>Evaluate attendance</td>
<td>3.38</td>
<td>0.800</td>
<td>11,637</td>
<td>98.6%</td>
<td>-1.391</td>
<td>2.157</td>
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<tr>
<td>Evaluate class behavior</td>
<td>3.42</td>
<td>0.729</td>
<td>11,640</td>
<td>98.6%</td>
<td>-1.257</td>
<td>1.739</td>
</tr>
<tr>
<td>Evaluate ability to take directions</td>
<td>3.57</td>
<td>0.592</td>
<td>11,628</td>
<td>98.5%</td>
<td>-1.236</td>
<td>1.845</td>
</tr>
<tr>
<td>Evaluate completion of homework</td>
<td>3.29</td>
<td>0.747</td>
<td>11,629</td>
<td>98.5%</td>
<td>-0.982</td>
<td>1.318</td>
</tr>
<tr>
<td><strong>Grade 5</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>Concepts and Operations</strong></td>
<td></td>
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</tr>
<tr>
<td>Frequency numbers and operations</td>
<td>1.08</td>
<td>0.304</td>
<td>5,355</td>
<td>99.7%</td>
<td>4.043</td>
<td>17.857</td>
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<tr>
<td>Frequency math facts/concepts</td>
<td>1.17</td>
<td>0.434</td>
<td>5,353</td>
<td>99.7%</td>
<td>2.700</td>
<td>7.351</td>
</tr>
<tr>
<td>Frequency solve problems</td>
<td>1.19</td>
<td>0.453</td>
<td>5,353</td>
<td>99.7%</td>
<td>2.493</td>
<td>6.328</td>
</tr>
<tr>
<td><strong>Problem Solving</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency math in groups</td>
<td>1.88</td>
<td>0.836</td>
<td>5,342</td>
<td>99.5%</td>
<td>0.817</td>
<td>0.209</td>
</tr>
<tr>
<td>Frequency write math solution</td>
<td>2.47</td>
<td>0.926</td>
<td>5,352</td>
<td>99.6%</td>
<td>0.130</td>
<td>-0.836</td>
</tr>
<tr>
<td>Frequency discuss math problem</td>
<td>1.87</td>
<td>0.879</td>
<td>5,343</td>
<td>99.5%</td>
<td>0.792</td>
<td>-0.130</td>
</tr>
<tr>
<td>Frequency real life math problem</td>
<td>1.91</td>
<td>0.795</td>
<td>5,337</td>
<td>99.4%</td>
<td>0.524</td>
<td>-0.340</td>
</tr>
<tr>
<td><strong>Math Disciplines</strong></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Frequency geometry</td>
<td>2.06</td>
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<td>5,342</td>
<td>99.5%</td>
<td>0.467</td>
<td>0.171</td>
</tr>
<tr>
<td>Frequency data analysis</td>
<td>2.14</td>
<td>0.807</td>
<td>5,350</td>
<td>99.6%</td>
<td>0.326</td>
<td>-0.380</td>
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<tr>
<td>Frequency algebra</td>
<td>2.14</td>
<td>0.801</td>
<td>5,351</td>
<td>99.6%</td>
<td>0.337</td>
<td>-0.328</td>
</tr>
<tr>
<td>Frequency fractions</td>
<td>1.79</td>
<td>0.828</td>
<td>5,345</td>
<td>99.5%</td>
<td>0.893</td>
<td>0.243</td>
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<tr>
<td><strong>Math Tools</strong></td>
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<td></td>
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<tr>
<td>Frequency manipulatives</td>
<td>2.62</td>
<td>0.815</td>
<td>5,330</td>
<td>99.2%</td>
<td>-0.075</td>
<td>-0.515</td>
</tr>
<tr>
<td>Frequency calculator</td>
<td>2.87</td>
<td>0.973</td>
<td>5,333</td>
<td>99.3%</td>
<td>0.350</td>
<td>-0.966</td>
</tr>
<tr>
<td>Frequency measuring instruments</td>
<td>2.57</td>
<td>0.710</td>
<td>5,339</td>
<td>99.4%</td>
<td>-0.157</td>
<td>-0.201</td>
</tr>
<tr>
<td>Frequency use computer</td>
<td>3.20</td>
<td>0.913</td>
<td>5,337</td>
<td>99.4%</td>
<td>-0.808</td>
<td>-0.446</td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluate effort</td>
<td>3.67</td>
<td>0.528</td>
<td>5,322</td>
<td>99.1%</td>
<td>-1.362</td>
<td>1.545</td>
</tr>
<tr>
<td>Evaluate class participation</td>
<td>3.27</td>
<td>0.666</td>
<td>5,323</td>
<td>99.1%</td>
<td>-0.406</td>
<td>-0.591</td>
</tr>
<tr>
<td>Evaluate class behavior</td>
<td>3.32</td>
<td>0.756</td>
<td>5,315</td>
<td>99.0%</td>
<td>-0.932</td>
<td>0.512</td>
</tr>
<tr>
<td>Evaluate homework</td>
<td>3.34</td>
<td>0.731</td>
<td>5,312</td>
<td>99.9%</td>
<td>0.947</td>
<td>0.901</td>
</tr>
</tbody>
</table>
Table 56
Student Achievement – Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>$M$</th>
<th>$SD$</th>
<th>$N$</th>
<th>Valid %</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1 Reading IRT Scale Score</td>
<td>77.74</td>
<td>23.63</td>
<td>14,743</td>
<td>97.6%</td>
<td>0.726</td>
<td>0.470</td>
</tr>
<tr>
<td>Grade 1 Math IRT Scale Score</td>
<td>61.58</td>
<td>17.92</td>
<td>15,004</td>
<td>99.4%</td>
<td>0.511</td>
<td>0.374</td>
</tr>
<tr>
<td>Grade 3 Reading IRT Scale Score</td>
<td>128.03</td>
<td>27.61</td>
<td>11,639</td>
<td>98.6%</td>
<td>-0.193</td>
<td>-0.481</td>
</tr>
<tr>
<td>Grade 3 Math IRT Scale Score</td>
<td>99.69</td>
<td>24.41</td>
<td>11,706</td>
<td>99.1%</td>
<td>-0.065</td>
<td>-0.679</td>
</tr>
<tr>
<td>Grade 5 Reading IRT Scale Score</td>
<td>150.23</td>
<td>26.33</td>
<td>10,813</td>
<td>99.2%</td>
<td>-0.491</td>
<td>-0.139</td>
</tr>
<tr>
<td>Grade 5 Math IRT Scale Score</td>
<td>123.54</td>
<td>24.93</td>
<td>5,347</td>
<td>99.6%</td>
<td>-0.586</td>
<td>-0.253</td>
</tr>
</tbody>
</table>
Appendix B

Parameter Estimates
Table 57
Parameter Estimates for the Grade 1 Direct-Effects Model – Reading

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>p</th>
<th>Bayesian Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Achievement</td>
<td>-0.022</td>
<td>0.034</td>
<td>-0.654</td>
<td>0.513</td>
<td>-0.021</td>
</tr>
<tr>
<td>Reading Achievement</td>
<td>2.746</td>
<td>0.324</td>
<td>8.464</td>
<td>***</td>
<td>2.746</td>
</tr>
<tr>
<td>Reading Achievement</td>
<td>1.873</td>
<td>0.958</td>
<td>1.855</td>
<td>0.051</td>
<td>1.939</td>
</tr>
<tr>
<td>Reading Achievement</td>
<td>0.898</td>
<td>0.009</td>
<td>104.48</td>
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<tr>
<td>Collective Efficacy</td>
<td>1.000</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Negative Expectations</td>
<td>-0.762</td>
<td>0.021</td>
<td>-</td>
<td>***</td>
<td>-0.761</td>
</tr>
<tr>
<td>Teacher Engagement</td>
<td>0.714</td>
<td>0.016</td>
<td>44.249</td>
<td>***</td>
<td>0.713</td>
</tr>
<tr>
<td>School Climate</td>
<td>0.984</td>
<td>0.022</td>
<td>45.490</td>
<td>***</td>
<td>0.983</td>
</tr>
<tr>
<td>Reading/Predictable Text</td>
<td>1.000</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Writing Practices</td>
<td>2.853</td>
<td>0.137</td>
<td>20.798</td>
<td>***</td>
<td>2.861</td>
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<tr>
<td>Work on Projects</td>
<td>3.561</td>
<td>0.176</td>
<td>20.241</td>
<td>***</td>
<td>3.580</td>
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<tr>
<td>Years Teaching</td>
<td>1.000</td>
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<tr>
<td>Type of Teaching Cert</td>
<td>0.069</td>
<td>0.002</td>
<td>29.292</td>
<td>***</td>
<td>0.069</td>
</tr>
<tr>
<td>Highest Degree Earned</td>
<td>0.087</td>
<td>0.003</td>
<td>28.947</td>
<td>***</td>
<td>0.086</td>
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<tr>
<td>Staff has School Spirit</td>
<td>1.000</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Staff Acceptance</td>
<td>0.611</td>
<td>0.011</td>
<td>57.206</td>
<td>***</td>
<td>0.610</td>
</tr>
<tr>
<td>Staff Learn/Seek Ideas</td>
<td>0.790</td>
<td>0.013</td>
<td>60.905</td>
<td>***</td>
<td>0.790</td>
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<tr>
<td>Misbehavior is a Problem</td>
<td>1.000</td>
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<td></td>
</tr>
<tr>
<td>Children Not Capable</td>
<td>0.712</td>
<td>0.021</td>
<td>33.372</td>
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<td>0.712</td>
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<tr>
<td>Parent Support</td>
<td>-0.905</td>
<td>0.023</td>
<td>-</td>
<td>***</td>
<td>-0.906</td>
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<tr>
<td>Teacher Enjoys Position</td>
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<tr>
<td>Teacher Makes a Diff</td>
<td>0.534</td>
<td>0.009</td>
<td>57.545</td>
<td>***</td>
<td>0.534</td>
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<tr>
<td>Teacher Choose Teaching</td>
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<td>0.015</td>
<td>59.238</td>
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<tr>
<td>Variable</td>
<td>Estimate</td>
<td>S.E.</td>
<td>C.R.</td>
<td>p</td>
<td>Bayesian Estimate</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------</td>
<td>-------</td>
<td>--------</td>
<td>-----</td>
<td>-------------------</td>
</tr>
<tr>
<td>Adm Handles Pressure</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adm Comm Vision</td>
<td>.928</td>
<td>.008</td>
<td>114.726</td>
<td>***</td>
<td>.929</td>
</tr>
<tr>
<td>Adm Prioritizes Well</td>
<td>1.005</td>
<td>.008</td>
<td>126.429</td>
<td>***</td>
<td>1.005</td>
</tr>
<tr>
<td>Adm Encourages Staff</td>
<td>.928</td>
<td>.009</td>
<td>107.005</td>
<td>***</td>
<td>.929</td>
</tr>
<tr>
<td>Freq Cont Vocabulary</td>
<td>1.000</td>
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<tr>
<td>Freq Phonetic Patterns</td>
<td>1.456</td>
<td>.023</td>
<td>64.361</td>
<td>***</td>
<td>1.457</td>
</tr>
<tr>
<td>Freq Patterned Text</td>
<td>1.112</td>
<td>.017</td>
<td>66.373</td>
<td>***</td>
<td>1.112</td>
</tr>
<tr>
<td>Freq Work Rel to Book</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Freq Publish Work</td>
<td>1.032</td>
<td>.019</td>
<td>54.532</td>
<td>***</td>
<td>1.033</td>
</tr>
<tr>
<td>Freq Perform Skits</td>
<td>.525</td>
<td>.011</td>
<td>46.479</td>
<td>***</td>
<td>.525</td>
</tr>
<tr>
<td>Freq Small Groups</td>
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<td>.019</td>
<td>48.568</td>
<td>***</td>
<td>.941</td>
</tr>
<tr>
<td>Freq Long Projects</td>
<td>.704</td>
<td>.016</td>
<td>43.527</td>
<td>***</td>
<td>.705</td>
</tr>
<tr>
<td>Freq Invent Spellings</td>
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</tr>
<tr>
<td>Freq Choose Book</td>
<td>.512</td>
<td>.012</td>
<td>41.982</td>
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<td>Freq Write Stories</td>
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<td>58.981</td>
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<td>.028</td>
<td>54.895</td>
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<td>1.560</td>
</tr>
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</table>
Table 58
*Standardized Regression Weights – Grade 1 Direct-Effects Model –Reading*

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
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Table 60
Parameter Estimates the Grade 3 Direct-Effects Model – Math

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Parameter Estimates the Grade 5 Direct-Effects Model – Reading

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### Table 63
**Parameter Estimates the Grade 3 Direct-Effects Model –Math**

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Appendix C

Sample Models
Figure 8
Direct-Effects Model With Covariate
Grade 1 – Reading
Figure 9
Direct-Effects Model With Covariate
Grade 1 - Math
Appendix D

Observation Note-catchers
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- **Classroom Setting/Space:**

- **Grouping of Students:**

- **Interactions of Students/Language/Nonverbals:**

- **Engagement of Students:**

- **Lesson Content:**

- **Lesson Delivery:**

  - Items/Math Quantitative Analysis
  - Use textbooks
  - Solve problems
  - Measurement instruments
  - Manipulatives/Calculator
  - Tests
  - Write math solution
  - Discuss math problem
  - Real-life math problem
  - Use of computer
  - Visual representations
  - Numbers and operations
  - Measurement
  - Geometry
  - Algebra
  - Data analysis
  - Math facts/concepts
  - Developing reasoning
  - Communicate math ideas
  - Place value
  - Operations
  - Estimate quantities

- **Teacher Interaction w/ Students/Lang/Nonverbals:**

  - Teacher Attitudes:
    - School climate
    - (expectations, impact on students, community)
    - Teacher engagement
    - (satisfaction, enjoyment, ability to make a difference)
    - Perceptions of school administration
    - Ratings of class behavior
## Observation Protocol

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<th>Date/Time: ___________</th>
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### Reflective Notes

#### Classroom Setting/Space:

#### Grouping of Students:

#### Interactions of Students/Language/Nonverbals:

#### Engagement of Students:

#### Lesson Content:

#### Lesson Delivery:

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#### Teacher Interaction w/ Students/Lang/Nonverbals:

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Appendix E

Interview Protocol
INTERVIEW PROTOCOL

Purpose:

As we discussed when I contacted you about observing your class and interviewing you, the purpose of this study is to explore teachers’ perspectives related to teacher influences (teacher background characteristics, teacher attitudes, and teacher practices) on student achievement.

Review Consent Form:

Audio Recording
Confidentiality

Section I: First Impressions

- When you think of teacher effectiveness, what comes to mind?
- When you think of student achievement, what comes to mind?
- Does student achievement differ from student learning? (Probe: if yes, what are the distinctions?)

Section II: Teacher Practice

This next set of questions will help me to understand teacher practices:

- What do you think are the most important practices to which a teacher must attend in order to promote student learning and/or student achievement?
- (Ask teacher to complete survey question #47 - reading
- What instructional practices are most important to develop student learning or achievement in reading?
• What instructional practices are most important to develop student learning or achievement in writing?

• (Ask teacher to complete survey question #51 - math

• What instructional practices are most important to develop student learning or achievement in math?

• (Ask teacher to complete survey question #55 - evaluation

• How can a teacher’s evaluation practices contribute to student learning?

• How have your teacher practices developed or changed over time?

• How do teachers create a learning environment that promotes student learning?

• How much homework do you generally assign, and how do you believe it contributes to student learning and/or achievement?

• How do you group students in literacy? In Math? How often do they meet in their groups? How do these groups contribute to student learning and/or achievement?

Section III: Teacher Attitudes and Background Characteristics

Teacher Attitudes

This next set of questions will explore the effects of teacher attitudes and background characteristics:

• Can you tell me about a time when your attitudes affected your practice, or the practice of a teacher you know?

(Ask teacher to complete survey questions, Pt. B – p. 3, #5; p. 4, #8 and #9)
• What attitudes might a teacher have that would enhance student learning/student achievement?
• What attitudes might a teacher have that would impede student learning/student achievement?
• How important is the school climate or school environment in shaping your attitudes in the classroom?
• How important is the collective efficacy of teachers in the school in shaping/influencing your attitudes toward teaching?
• How do your expectations impact student learning?
• How does your engagement in the teaching profession impact your teaching practices?
• How have your attitudes as a teacher developed or changed over time?

Teacher Background Characteristics

Teacher background characteristics are typically described in the literature as including type of teacher certification, number of years of teaching, ESL courses or certification, highest education level, content area of undergraduate or graduate degrees, and type of teacher preparation program.

• Has there ever been a time when you were aware that your background characteristics—either those I mentioned or others you might think of— influenced your practice as a teacher?
• How has your teacher education influenced your practice as a teacher?
Section IV: Improving Teacher Effectiveness

We have talked about teacher practices, teacher attitudes, and teacher background characteristics. So, now I would like to get your thoughts about improving teacher effectiveness and enhancing student achievement.

- What factors contribute to enhancing your effectiveness as a teacher?
- What can be done to improve teacher effectiveness in public education?
  - Probes:
    - What could be done in your school/district to improve teacher effectiveness?
    - What kinds of supports are helpful in increasing teacher effectiveness?
    - What do you think is needed in your school/district to improve student achievement?
    - What resources are needed?
- Are there any other influences we have not discussed which you believe are important for enhancing student achievement?
- Is there anything else you would like to add before we close?
- Thank you…
- Next steps… (follow-up observation/review of transcript) Any questions?
Appendix F

Consent Form
Informed Consent Form--Teacher
Dissertation Study
Teacher Effectiveness: Mixed Methods Analysis of the Influence of Teacher
Background Characteristics,
Teacher Attitudes, and Teacher Instructional Practices on Student Achievement

You are invited to participate in a research study related to teacher
effectiveness conducted by Deborah Isabell (Belle) Faust, doctoral candidate at the
University of Denver. The goal of the study is to understand teacher perspectives of
the influence of their background, attitudes, and instructional practices on student
achievement. Your participation is completely voluntary, but it is very important.
Your participation is part of a formal research study that is part of my doctoral
dissertation.

As researcher, I will conduct an interview, as well as observe a math lesson
and reading lesson in your classroom. If possible, I also would like to review your
plans for the reading and math lessons observed. It is estimated that the interview will
take approximately 45 minutes to an hour. Participation in this study is strictly
voluntary. You may choose not to participate in the study, and you are free to
withdraw from the study at any time. Refusal to participate or withdrawal from
participation involves no negative consequences whatsoever.

As the researcher, I will treat all information gathered for this study as
confidential. Reports of the findings will contain no identifying information of the
participants or school involved in the case study. The interview will be audiotaped, but
only the researcher will have access to the tapes and lesson plans you provide. The
audiotapes will be destroyed upon completion of the project. Transcripts and
memoranda will not contain any identifying information.

There are two exceptions to the promise of confidentiality. Although no
questions in this interview address it, I am required to tell you that any information
you reveal concerning suicide, homicide, or child abuse and neglect is required by law
to be reported to the proper authorities. In addition, should any information contained
in this study be the subject of a court order, the University of Denver might not be able
to avoid compliance with the order or subpoena.

The benefits of being involved in this study include being able to investigate
and discuss how teacher background, attitudes, and instructional practices are
measured in a national dataset, as well as to articulate how your perceptions are similar
to or different from the constructs represented in such large-scale studies. You may
also enjoy the ability to provide information about your own experiences. You also
will receive cash compensation of $50, in addition to a $50 gift certificate from a
company that provides classroom texts, resources, and manipulatives. You will be
provided with an opportunity to review and revise the transcript of your interview, and
you will be provided with a summary of the findings of the study. Potential risks of
being involved include the possibility that discussing certain issues about your experience may be upsetting to you. If this occurs, I will arrange for supportive care from an appropriate professional in your area.

If you have any questions at all about this study of the influence of teacher background characteristics, attitudes, and instructional practices on student achievement, please feel free to contact me at debifaust@msn.com, or call me at 303.838.6908, or you may contact my advisor/professor Nicholas Cutforth at ncutfort@du.edu. If you have any concerns or complaints about how you were treated during the research sessions please contact Paul Olk, Chair, Institutional Review Board for Human Subjects, University of Denver, 303-871-4531, or you may email du-irb@du.edu, Office of Research and Sponsored Programs or call (303) 871-4050 or write to either at the University of Denver, Office of Research and Sponsored Programs, 2199 S. University Blvd., Denver CO 80208-2121.

You may keep this page for your records. Please sign the next page if you understand and agree to the above. If you do not understand any part of the above statement, please ask the researcher any questions you have.

By signing below, I acknowledge that I have read and I understand the foregoing descriptions of the study. I have asked for and received a satisfactory explanation of any language that I did not fully understand.

☐ I agree to participate in this study, and I understand that I may withdraw my consent at any time. I have received a copy of this consent form.
☐ I DO NOT agree to participate in this study.
☐ I agree to be audiotaped.
☐ I DO NOT agree to be audiotaped.

______________________________________________    ____________________
Signature        Date

______________________________________________
Print Name
Informed Consent Form--Principal
Dissertation Study
Teacher Effectiveness: Mixed Methods Analysis of the Influence of Teacher
Background Characteristics,
Teacher Attitudes, and Teacher Instructional Practices on Student Achievement

You are invited to participate in a research study related to teacher
effectiveness conducted by Deborah Isabell (Belle) Faust, doctoral candidate at the
University of Denver. The goal of the study is to understand teacher perspectives of
the influence of their background characteristics, attitudes, and instructional practices
on student achievement. Your participation is completely voluntary, but it is very
important. Your participation is part of a formal research study that is part of my
doctoral dissertation.

As researcher, I will conduct an interview with you. It is estimated that the
interview will take approximately 45 minutes to an hour. Participation in this study is
strictly voluntary. You may choose not to participate in the study, and you are free to
withdraw from the study at any time. Refusal to participate or withdrawal from
participation involves no negative consequences whatsoever.

As the researcher, I will treat all information gathered for this study as
confidential. Reports of the findings will contain no identifying information of the
participants or school involved in the case study. The interview will be audiotaped, but
only the researcher will have access to the tapes and lesson plans you provide. The
audiotapes will be destroyed upon completion of the project. Transcripts and
memoranda will not contain any identifying information.

There are two exceptions to the promise of confidentiality. Although no
questions in this interview address it, I am required to tell you that any information
you reveal concerning suicide, homicide, or child abuse and neglect is required by law
to be reported to the proper authorities. In addition, should any information contained
in this study be the subject of a court order, the University of Denver might not be able
to avoid compliance with the order or subpoena.

The benefits of being involved in this study include being able to investigate
and discuss how teacher background, attitudes, and instructional practices are
measured in a national dataset, as well as to articulate how your perceptions are similar
to or different from the constructs represented in such large-scale studies. You may
also enjoy the ability to provide information about your own experiences. You also
will receive cash compensation of $50, in addition to a $200 donation for the school.
You will be provided with an opportunity to review and revise the transcript of your
interview. Other potential risks of being involved include the possibility that
discussing certain issues about your experience may be upsetting to you. If this
occurs, I will arrange for supportive care from an appropriate professional in your
area.

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If you have any questions at all about this study of the influence of teacher background characteristics, attitudes, and instructional practices on student achievement, please feel free to contact me at debifaulst@msn.com, or call me at 303.838.6908, or you may contact my advisor/professor Nicholas Cutforth at ncutfort@du.edu. If you have any concerns or complaints about how you were treated during the research sessions please contact Paul Olk, Chair, Institutional Review Board for Human Subjects, University of Denver, 303-871-4531, or you may email du-irb@du.edu, Office of Research and Sponsored Programs or call (303) 871-4050 or write to either at the University of Denver, Office of Research and Sponsored Programs, 2199 S. University Blvd., Denver CO 80208-2121.

You may keep this page for your records. Please sign the next page if you understand and agree to the above. If you do not understand any part of the above statement, please ask the researcher any questions you have.

By signing below, I acknowledge that I have read and I understand the foregoing descriptions of the study. I have asked for and received a satisfactory explanation of any language that I did not fully understand.

☐ I agree to participate in this study, and I understand that I may withdraw my consent at any time. I have received a copy of this consent form.
☐ I DO NOT agree to participate in this study.
☐ I agree to be audiotaped.
☐ I DO NOT agree to be audiotaped.

________________________________________________________________________   __________________________________________________________________________
Signature                      Date
________________________________________________________________________

Print Name
Informed Consent Form
Dissertation Study -- Parent
Teacher Effectiveness: Mixed Methods Analysis of the Influence of Teacher
Background Characteristics,
Teacher Attitudes, and Teacher Instructional Practices on Student Achievement

You are invited to participate in a research study related to teacher
effectiveness conducted by Deborah Isabell (Belle) Faust, doctoral candidate at the
University of Denver. The goal of the study is to understand the influence of teacher
background characteristics, teacher attitudes, and instructional practices on student
achievement. Your participation is completely voluntary, but it is very important.
Your participation is part of a formal research study that is part of my doctoral
dissertation.

As researcher, I will conduct an interview of you as the parent of child who
was formerly in the classroom of a teacher included in this study. I also would like to
conduct an interview of your son as a child in this teacher’s classroom. Participation
in this study is strictly voluntary. You may choose not to participate in the study, and
you are free to withdraw from the study at any time. Refusal to participate or
withdrawal from participation involves no negative consequences whatsoever.

As the researcher, I will treat all information gathered for this study as
confidential. Reports of the findings will contain no identifying information of the
participants or school involved in the case study. The interview will be audiotaped, but
only the researcher will have access to the tapes and lesson plans you provide. The
audiotapes will be destroyed upon completion of the project. Transcripts and
memoranda will not contain any identifying information.

There are two exceptions to the promise of confidentiality. Although no
questions in this interview address it, I am required to tell you that any information
you reveal concerning suicide, homicide, or child abuse and neglect is required by law
to be reported to the proper authorities. In addition, should any information contained
in this study be the subject of a court order, the University of Denver might not be able
to avoid compliance with the order or subpoena.

The benefits of being involved in this study include being able to reflect on and
discuss how a teacher’s attitudes and instructional practices impacted your child’s
learning. You and your son may enjoy the ability to provide information about your
own experiences. Each of you also will receive cash compensation of $50. You will
be provided with an opportunity to review and revise the transcript of your interview,
and you will be provided with a summary of the findings of the study. Potential risks
of being involved include the possibility that discussing certain issues about your
experience may be upsetting to you. If this occurs, I will arrange for supportive care
from an appropriate professional in your area.
If you have any questions at all about this study of the influence of teacher background characteristics, attitudes, and instructional practices on student achievement, please feel free to contact me at debifaust@msn.com, or call me at 303.838.6908, or you may contact my advisor/professor Nicholas Cutforth at ncutfort@du.edu. If you have any concerns or complaints about how you were treated during the research sessions please contact Paul Olk, Chair, Institutional Review Board for Human Subjects, University of Denver, 303-871-4531, or you may email du-irb@du.edu, Office of Research and Sponsored Programs or call (303) 871-4050 or write to either at the University of Denver, Office of Research and Sponsored Programs, 2199 S. University Blvd., Denver CO 80208-2121.

You may keep this page for your records. Please sign the next page if you understand and agree to the above. If you do not understand any part of the above statement, please ask the researcher any questions you have.

By signing below, I acknowledge that I have read and I understand the foregoing descriptions of the study. I have asked for and received a satisfactory explanation of any language that I did not fully understand.

☐ I agree to participate in this study, and I understand that I may withdraw my consent at any time. I have received a copy of this consent form.

☐ I DO NOT agree to participate in this study.

☐ I give consent for my son to participate in this study, and I understand that I may withdraw my consent at any time. I have received a copy of this consent form.

☐ I DO NOT give consent for my son to participate in this study.

☐ I agree that the interviews may be audiotaped.

☐ I DO NOT agree that the interviews can be audiotaped.

_____________________________________________    ____________________
Signature        Date

_____________________________________________
Print Name
Child Assent Form

Your father knows we are going to ask you to participate in this interview. I want to know about your experience in a teacher’s classroom, in this case the classroom of Mr. __________. This interview will take about a half an hour to complete. Your name will not be written anywhere on the reports of this research. No one will know these answers came from you personally.

If you don’t want to participate, you can stop at any time. There will be no bad feelings if you don’t want to do this. You can ask questions if you do not understand any part of the study.

Do you understand? Is this okay.

Name (please print): ____________________________________________

Signature: ____________________________________________________

Date:___________

Researcher’s signature: ___________________________ Date:________________