Highly Qualified Public School Teacher: Its Status, Distribution, Determinants, and Relationship with Job Commitment and Job Satisfaction

Samuel Striker
Western Michigan University

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HIGHLY QUALIFIED PUBLIC SCHOOL TEACHER: ITS STATUS, DISTRIBUTION, DETERMINANTS, AND RELATIONSHIP WITH JOB COMMITMENT AND JOB SATISFACTION

by
Samuel Striker

A Dissertation
Submitted to the Faculty of The Graduate College in partial fulfillment of the requirements for the Degree of Doctor of Philosophy Department of Educational Leadership, Research and Technology Advisor, Jianping Shen, Ph.D.

Western Michigan University Kalamazoo, Michigan December 2011
HIGHLY QUALIFIED PUBLIC SCHOOL TEACHER: ITS STATUS, DISTRIBUTION, DETERMINANTS, AND RELATIONSHIP WITH JOB COMMITMENT AND SATISFACTION

Samuel Striker, Ph.D.

Western Michigan University, 2011

Highly qualified teacher (HQT) has been promoted as a policy instrument to improve our public education. In this study, I investigated the quality of public school teachers by examining the distribution pattern of highly qualified teachers across school level, urbanicity, minority student population, and core academic fields. I also investigated what teacher characteristics (age, gender, ethnicity, total years of teaching, certification, bachelor’s degree in mathematics and sciences vs. in other areas, teaching level) predict highly qualified teacher status after controlling for school characteristics (% of minority students, % of free and reduced-price lunch, school size, and school location). Finally, I investigated the relationship between highly qualified teachers and the composite variables of job commitment and job satisfaction.

In this study a highly qualified teacher holds a bachelor’s degree, a full state certification, and teaches at least 50% of classes within his or her major. I analyzed data from the 2007-2008 Schools and Staffing Survey (SASS) for public school teachers. Descriptive statistics were used to identify teacher characteristics. Chi-square tests were used to examine the distribution of HQTs. Logistical regression was used to determine the predictability of HQT status based on teacher characteristics. Lastly, hierarchal linear
modeling (HLM) was used to study the effect of HQT status on job commitment and job satisfaction.

The following were the major findings. First, results revealed secondary teachers had a significantly lower proportion of highly qualified teachers than elementary teachers. Suburban teachers, teachers of English and language arts, natural sciences, and mathematics and computer science, had high rates of HQT. The lowest HQT rate was in the vocational, career, and technical area. Second, the status of HQTs was associated with older teachers, male teachers, experienced teachers, teachers having a bachelor's degree in mathematics and sciences, and teachers with advanced, regular or provisional certification. A surprising finding within the category of school characteristics is related to the percent of minority student enrollment—the higher percentage of minority students corresponds with a higher percentage of HQTs. Finally, HQT status was not significantly predictive of teachers' job commitment, but the relationship trended such that unqualified teachers were somewhat less committed. HQT status was a significant, positive predictor of teachers' overall job satisfaction. Policy implications were discussed based on the findings.
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DEDICATION

For

Sam & Becky

Other things may change us, but we start and end with the family.

—Anthony Brandt
ACKNOWLEDGEMENTS

In a discipline that emphasizes relationships, none are more meaningful than those that touch us as we move through life. I would like to take this opportunity to express my sincere appreciation to those who helped me along the path of my dissertation. Their support, guidance, and advice made this personal goal attainable.

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CHAPTER I
INTRODUCTION

The advance of the standards movement in American society has been a process gaining momentum over the decades. Now it is a boulder of colossal proportions rumbling across the country, veritably unchecked. The No Child Left Behind Act of 2002 has brought the standards movement to the doorstep of the individual states by federal mandate with even more vigor than The Improving American Schools Act of 1994. Under the George W. Bush administration, the Elementary and Secondary Education Act of 1965 has received its latest interpretation and revision. Using standards and measurements accountability can now be more easily quantified. Now standards-based education and test-based accountability are considered the law of the land:

The past decade has witnessed extraordinary efforts to improve the quality of instruction in America's classrooms with raised expectations for students' academic work leading to increased expectations for teachers' instructional practice, expectations that imply substantial change for existing classroom instruction. To achieve these ambitious goals, national and state standards have been deployed and many states have built new assessment systems aligned with these standards. These initiatives represent an extraordinary marshaling of incentives and resources in the cause of more intellectually rigorous pedagogy. (Spillane, Diamond, & Jita, 2003, p.1)

Throughout the history of school reform in the United States the quality of teachers has been a significant and reoccurring issue in the annals of school reform. Stakeholders have long believed in a direct correlation between the quality of teachers and student achievement. This is further upheld by research demonstrating that teacher quality; especially teachers' preparation and qualifications play important roles in student
achievement (Darling-Hammond, 2000; Ferguson, 1991; Goldhaber & Brewer, 2000; Loczko-Kerr & Berliner, 2002; Mont, 1994; Sanders & Rivers, 1996; Wenglinsky, 2000). Studies continue to uphold the accuracy of the emphasis on quality teachers and its correlation to student achievement (Ingersoll, 1996; Seastron, Gruber, Henke, McGrath, & Cohen, 2002). The importance of teacher quality and its impact on student achievement is reflected in the No Child Left Behind Act which includes provisions mandating that all teachers must be highly qualified in the subject they teach by the end of 2005-06 school year (NCLB, 2002).

As quoted in Public Law 107, the goal of NCLB is direct, altruistic, and noble, “To close the achievement gap with accountability, flexibility, and choice, so that no child is left behind...”. The NCLB’s definition of a highly qualified teacher relies mainly on teachers’ preparation and qualifications, requiring teachers to obtain at least a bachelor degree, a full state certification as a teacher, demonstrate competence in each academic subject in which the teacher teaches, and have a major in the classes taught in the main teaching assignment. With these qualifiers, it is the hope that highly qualified teachers will lead to higher achievement and successful schools. There is no definition of the term in the law itself, but the purpose is explicit:

The purpose of this part is to provide grants to State educational agencies, local educational agencies, State agencies for higher education and eligible partnerships in order to—
(1) increase student academic achievement through strategies such as improving teacher and principal quality and increasing the number of highly qualified teachers in the classroom and highly qualified principals and assistant principals in schools; and
(2) hold local educational agencies and schools accountable for improvements in student academic achievement. (PL 107-110, 2001, p. 196)
In response to the policy emphasis on teacher quality, a study that inquiries into teacher quality status based on the definition of a highly qualified teacher provided by NCLB and explores the relationship between teacher quality and teacher preparedness would help better understand teacher quality issues and its subsequent impact on job satisfaction and job commitment.

Background of the Study

Teacher Quality Significance

The National Commission on Teaching and America’s Future asserts that what teachers know and can do is the most important influence on what students learn (NCTAF, 1999). As stated previously, there is little doubt as to the link between quality teaching and student success (U.S. Department of Education, 2002). The influence of teachers cannot be underestimated and very few people would disagree that the quality of teachers is of great significance to the learning environment.

Current studies and research continue to support the significance of teacher quality. One nation-wide survey found that highly qualified teachers, as defined by NCLB, appeared to be more influential in student achievement than other factors such as student demographics, class size, teacher salaries, and resource spending (Goldhaber & Anthony, 2003). Other recent research and studies also support these findings (Collias, Pajak, & Rigden, 2000; Ferguson, 1998; Goldhaber, 2002; Kaplan & Owings, 2001; Rivkin, Hanushek, & Kain, 2005; Wright, Horn, & Sanders, 1997).

In order for a teacher to be considered highly qualified under NCLB certain preparatory and operational criteria needs to be met. However, there are other factors that contribute to the effectiveness of teaching that bear mention. Teachers within the
category of HQT have differing levels of success in the ability to affect student achievement (Ferguson, 1991; Hanushek, 1992; Nye, Konstantopoulos, & Hedges, 2004); there are also other factors, such as individual teacher characteristics, preparation, classroom management skills, and the way a teacher “plans, teaches, and monitors student progress” (Stronge, 2002, p. viii).

The quality of teacher significance is further magnified as the researchers inquire into the impact of teacher quality for the disadvantaged students. Disadvantaged children, such as those from lower socio-economic status (SES) are more susceptible to the quality teacher. Studies suggest that the quality of teacher can close the achievement gap significantly over time (Nye et al., 2004; Olsen, 2003; Sanders & Rivers, 1996).

This dissertation explores the status, distribution, and determinants of HQTs in public schools, as well as the relationship between HQT status on one hand, and job commitment and job satisfaction, on the other. The review of the literature on these three concepts proves to be significant. Job satisfaction and job commitment touch many areas of education such as leadership, teacher performance, attrition and retention, student achievement, and teacher empowerment to name a few. For three decades, the pursuit of educational knowledge and understanding concerning job satisfaction and job commitment has been explored by many experts in the field of educational research. An in-depth exploration of past research and contributing literature is investigated further in chapter two. In many studies the Schools and Staffing Survey is the primary data set analyzed to discover relationships between job satisfaction and job commitment and a variety of other educational factors.
As the review of the literature shows, job satisfaction and job commitment are similar, but separate concepts. Their definitions are distinctly differing (Shin & Reye, 1991). Until the 2007-2008 SASS, no variable existed for teacher status. Due to this change now, we can directly review relationships between HQT status and the concepts of job satisfaction and job commitment.

The Challenge of Highly Qualified Teachers

Though quality teaching is a critical aspect of student achievement, there is much controversy as to exactly how quality teaching should be measured. Whether it is preparatory criteria, pedagogical knowledge, content knowledge, organizational skills, or other factors is a subject of considerable debate and as a result, the task of defining teacher quality has been difficult.

Currently, the definition of a highly qualified teacher provided by the NCLB seems to suggest subject knowledge and pedagogical knowledge are the critically important factors to student achievement. Based upon research teachers who are considered highly qualified under NCLB in their subject area can make a difference in student achievement (Darling-Hammond, 2000; Ferguson, 1991; Goldhaber & Brewer, 2000; Loczko-Kerr & Berliner, 2002; Mont, 1994; Sanders & Rivers, 1996; Wenglinsky, 2000). Specifically in the Darling-Hammond’s study, the most consistent highly significant predictor of student achievement was the proportion of highly qualified teachers, supporting the findings that certification and teaching within the major field of study are significant factors.

Under NCLB an unqualified teacher is one that does not have a teaching certificate (emergency, temporary, or provisional certificate) or does not teach within
his/her major in their main teaching assignment (Ingersoll, 2002; Laczko-Kerr & Berliner, 2002; Shen et al., 2004). Kaplan and Owings (2002) find a substantial percentage of students were taught by teachers who were unqualified in the subject they teach.

The problem of staffing schools with 100% qualified teachers remains a critical issue (Ingersoll, 2001). Nearly one-fourth of core academic classes at the secondary level nationwide are taught by unqualified teachers according to a study by Jerald and Ingersoll (2002). Furthermore, in disadvantaged schools (ones with higher poverty levels), the percentage of unqualified teachers is even higher (Bishop, 2002; Ingersoll, 1996a, 2002; Shen et al., 2004). The amount of unqualified (out-of-field) teachers in the nation remains unacceptably high in secondary schools. According to Seastrom et al. (2002), the nation has made no progress in raising the percentage of qualified teachers between 1993-1994 and 1999-2000.

Statement of the Problem

Questions concerning teacher quality and its impact on job commitment and job satisfaction continue to be valid and timely. The advent of NCLB has created the category of ‘Highly Qualified Teacher’. States have further detailed the specifics of this category and submitted their criteria to the U.S. Department of Education for approval.

The literature shows job commitment and job satisfaction concepts are extremely timely and important areas of study. It also demonstrates the diffusion of job satisfaction and job commitment throughout virtually all other education issues and concepts ranging from student achievement (Bogler, 2002; Stolp, 1994), retention (Hanushek & Rivkin, 2007; Henson & Hall, 1993; Ingersoll, 2001a; Ingersoll & Perda, 2009; Johnson et al.,
While some past studies have investigated the characteristics of teacher quality and distribution of teacher quality across schools and classroom, these previous studies tended to look at these teacher characteristic variables (i.e., degree, certification or in-field teaching) separately. For instance, how many teachers have bachelor degrees, how many teachers are fully certified and how many teachers have a major or a minor in the subject area taught respectively? Few studies have attempted to combine these teacher characteristics to estimate teacher quality. Recently studies are categorizing and combining these variables and indicators. I have also chosen to combine these indicators of teacher quality (e.g., certification and academic major) in the investigation of teacher quality and the NCLB definition of Highly Qualified Teachers.

In the past two decades, relatively few studies have focused on exploring how teacher quality influences teachers’ perceptions on their profession. In this study, I explored the relationship between the Highly Qualified Teacher and job commitment and job satisfaction in an attempt to provide research evidence in this area. The examination of teacher quality, its distribution, and its impact on job commitment and job satisfaction grows increasingly important as the need for Highly Qualified Teachers continues to grow.

Purpose of the Study

This goal of this study is to contribute to the body of knowledge by examining teacher quality based on the definition of a highly qualified teacher under NCLB. Indicators of a highly qualified teacher in this study include a bachelor’s degree, a full
state certification, and a major in their main teaching assignment. In this study, I first inquired into public school secondary and elementary teacher quality by studying the percentage of highly qualified teacher distribution across level (secondary and elementary), urbanicity (rural, suburban, urban), minority student population, main teaching assignment, all main assignment fields, and core academic subject areas (language arts, math, natural sciences, and social sciences). Second, I attempted to identify the teacher characteristics that predict Highly Qualified Teachers. Third, inquiries were made into whether highly qualified status is related to job commitment and job satisfaction. To be more specific, in this study I addressed the following issues: (a) the status (highly qualified or not highly qualified) of elementary and secondary public school teachers, (b) the distribution of quality teachers, (c) the predictors of HQTs, and (d) influence of HQ status on job commitment and job satisfaction. The study was guided by the following research questions.

Research Questions

Question 1

What are the percentages and patterns of distribution of HQTs in American public schools at the secondary and elementary levels in 2007-2008?

What is the percentage of highly qualified elementary and secondary teachers across (a) urbanicity, (b) categories of minority students (<5%, 5-19%, 20-49%, 50% or more), (c) main teaching assignment fields, (d) core academic fields (language arts, natural sciences, math, and social studies), and (e) core academic subjects (e.g., subjects under natural sciences such as chemistry, physics, earth, life and physical science)?
Question 2

What teacher characteristics predict HQT status, after controlling for school characteristics?

Question 3

Is HQ status related to job satisfaction or job commitment after controlling for individual teacher and school characteristics?

Significance of the Study

Studying teacher quality by examining the characteristics of highly qualified teachers is unique for several reasons. First, this study is timely. Recent concerns about teacher quality and policy directives striving for a 100% highly qualified staffing make this issue ongoing and critical for compliance. Understanding distribution and trends under this topic can only increase understanding. As previously stated, teacher quality and certification status have been identified as important elements of teacher effectiveness and student achievement (National Commission on Teaching and America’s Future, 2003). By analyzing the 2007-2008 Schools and Staffing Survey national data set, this study can provide a national picture of the current status of teacher in regards to HQT status across several areas and determine a link between job commitment and job satisfaction and HQ status. The results of the study also tracked trends across previously stated categories such as urbanicity and core academic subjects. For example, researchers can compare the findings of this study with previous studies regarding HQT status and policymakers can make more informed decisions regarding the distribution and retention of HQTs.
Second, the study combines several related variables to create composite variables focused on describing HQTs, job commitment and job satisfaction and measured the relevance of each indicator of teacher quality separately. By combining indicators of teachers' full certification, degree major, main assignment this study is able to contribute to the existing body of knowledge of teacher quality and provide a new viewpoint to the understanding of the teacher quality issue and the challenges faced by administrators, teachers, policymakers and lawmakers. Relatively few studies empirically explore the HQT issue.

Third, the primary focus of this study was on the measure of highly qualified teachers and the relationship (or lack thereof) between the concepts of job commitment and job satisfaction. This differs from some of the other measures frequently used in the publications on this subject and provides a unique perspective. In addition, it adds to the body of knowledge concerning HQTs and the job commitment and job satisfaction concepts. Ideally, this study creates the basis for future studies and provides the first stage for future longitudinal analysis. Fourth, examining teacher quality by their main teaching assignment and subsequent subject areas taught can help to reveal which specific academic fields lack highly qualified teachers and can help stakeholders and policymakers evaluate current and future processes to improve and increase the percentage of HQTs in these deficient areas.

Fifth, this study utilized the 2007-2008 Public Schools and Staffing Survey national data set. As such, it is able to determine information on a national level and gives evidence to deepen knowledge of the Highly Qualified Teacher issue.
The final uniqueness is a fundamental connection between HQTs and job commitment and job satisfaction, since feeling prepared is one of the possible indicators of teacher effectiveness (Lewis et al., 1999), valuable information can be obtained by examining the extent to which teachers gravitate toward commitment and satisfaction. The lack of experience and knowledge of new teachers’ perceptions on these two categories within higher education institutions improves the curriculum design for teacher education; helps schools and school district develop new teacher-assimilation programs, and modifies mentoring programs to better address the needs of new teachers and helps school administrators as they acquire future teachers. The findings and conclusions of this study have the potential to provide knowledge and information to lawmakers, policymakers, teachers, administrators, and school educators. These stakeholders are creators, implementers, and instruments of policy; therefore, this study is policy-oriented.

Definitions

Operational Terminology

For the purpose of this study, the following definitions are used.

**Highly qualified teachers.** Indicators of a highly qualified teacher used in this study include the following: a) a bachelor degree, b) a full state certification and c) a major in the teacher’s main assignment teacher teaches.

**Bachelor's degree.** Teachers who receive a “regular” or “standard” certificate to teach a specific subject and grade level are required by all states to have at least a bachelor’s degree that includes subject matter as well as pedagogical studies (Seastrom et al., 2002).
**Full state certification.** A full state certification in this study refers to those teachers who have obtained a standard/regular, advanced or probationary certificate. In the survey questionnaire, these are five types of teacher certificates: 1) Regular/standard state certificate or advanced professional certificate, 2) certificate pending completion of a probationary period, 3) certificate requiring the completion of additional coursework, student teaching, or the passing of a test. In many states, a “probationary” certificate is provided to new teachers who have completed all requirements of the standard certificate except for the completion of the probationary period. These new teachers will earn the standard certificate in due time through full-time teaching in the school, usually within four years from the commencement of teaching (Seastrom et al., 2002).

**Major in the teacher’s main assignment.** In this study, a teacher must have a major in the majority of subjects taught to be considered as highly qualified. Therefore, operationally, teachers were identified as highly qualified if they meet the following three criteria: (1) a full certification (standard/regular, advanced or probationary certificate), (2) a major in the subject taught, and (3) teaching the majority of classes (main teaching assignment). Those teachers who do not meet these three criteria were identified as unqualified teachers.

**Main teaching assignment field.** Refers to the field/subject in which the educator teaches the most courses. According to Lewis, et al. (1999), teachers’ main teaching assignment refers to these three situations: 1) In self-contained classroom, the educator teaches all or most academic subjects to the same group of students all or most of the day; 2) The educator teaches Mathematics or Natural Sciences in a departmentalized setting, teaching the subject to several classes of different students all
or most of the day; and 3) The educator teaches Language Arts, Social Science, or a Foreign Language in a departmentalized setting, teaching the subject to several classes of different students all or most of the day. The following is the actual question in the 20007-2008 SASS for public school teachers: This school year, what is your MAIN teaching assignment field at this school (Question 15)? The answer is given in a three-digit code obtained from a reference sheet, which is also included in the survey.

Core academic subjects. Refers to Language Arts, Social Science, Mathematics, and Natural Sciences for purposes of this study.


Urbanicity. Refers to school location (urban, suburban and rural): In the SASS data file, urban schools refer to the schools in large or mid-size central city. Suburban schools refer to the schools in urban fringe of large or mid-size city and rural schools refer to the schools in small town or rural areas.

Percentage of minority students at the school. Refers to the percentage of students enrolled in the school whose race or ethnicity is classified as one of the following: American Indian or Alaskan Native, Asian, or Pacific Islander, black, or Hispanic based on data in the 1995-96 Common Core of Data (CCD). In the 2007-2008 SASS data file, the percentage of minority students at schools is classified into four groups: less than 5% students, 5%-19% students, 20%-49% students and 50% or more students.

Teacher controls. Refers to age, gender, ethnicity, teaching experience, certification, HQ status, Bachelor’s degree, and teacher levels (secondary/elementary)
School controls. Refers to percentage of minority students, Free and Reduced Lunch percentage, school size, and school location.

Job satisfaction. Refers to the composite variable derived from the questions 55a, 55l, 55k, and 55q in the 2007-2008 SASS.

Job commitment. Refers to the composite variable derived from the questions 56a, 56f, and 56g in the 2007-2008 SASS.

Conceptual Framework

For the purposes of this study, indicators of a highly qualified teacher included a full state certification, major in the subjects taught, and teaching within their major for the majority of their classes. The parameters of NCLB concerning the requirements for HQTs provided the necessary framework to examine teacher quality status and its influence on job commitment and job satisfaction. Figure 1 below provides a visual model of the conceptual framework for this study. Three research questions about teacher quality are answered. The first question concerns distribution patterns of elementary and secondary HQTs in public schools across urbanicity (urban, suburban and rural), categories of minority students (less than 5%, 5-9%, 20-40% and 50%-over), main teaching assignment (LA, Math, Social Sciences, and Natural Sciences), and the subject areas under each main assignment. After examining the distribution of HQTs the second question shifts the focus of the study to the discovery of predictors of HQTs after controlling for school context. The third question examines the relationship between job commitment and job satisfaction phenomena.
Figure 1. Conceptual Framework of Teacher Quality and Job Commitment and Job Satisfaction

Strengths and Limitations of the Study

The 2007-2008 SASS dataset was based on national representative samples of American secondary and elementary school teachers. Using this national dataset was a considerable strength of this study. This data was used to produce national estimates regarding highly qualified teachers. In addition, it was used to show the distributions of highly qualified teachers nationally.

In this study, I created the Highly Qualified Teacher (HQT), job commitment and job satisfaction composite variables. First, the HQT variable was created by combining teachers' degrees, certification status and main assignment. This variable was created based on the definition provided by the NCLB. Second, the job commitment and job satisfaction variables were created by combining specific sub-questions of questions 55...
and 56 respectively. The study has the relevance to provide a timely and accurate picture of the HQT concept related to the policy.

Policymakers can utilize the findings of unequal HQT distribution to address issues. Third, recent concern over the student achievement gap has focused attention to the teacher gap--unequal distribution of teacher quality across various types of schools. The investigation of the distribution of highly qualified teachers across schools provides updated information for in this aspect.

Lastly, few studies inquire into the relationship between HQT status and their self-assessment of job commitment and job satisfaction. The comparison between highly qualified teachers' and unqualified teachers' perceptions on job commitment and job satisfaction provides new information to help understand the link between whether highly qualified teachers and job commitment and job satisfaction.

There are several potential limitations in this study. First, the study is quantitative, focusing on certain aspects of teachers' qualifications in the investigation of teacher quality. Second, NCLB provides the limiting framework, which identifies the HQT. This makes it inherently difficult to have a deeper understanding of the complexity and richness of teacher quality issues.

The variables used to measure highly qualified teachers in this study are limited to the 2007-2008 SASS dataset. Other possible indicators of a highly qualified teacher are not able to be included. For example, according to the NCLB, teachers demonstrate competence in subject knowledge in several ways such as passing a rigorous subject exam, possessing an academic major or equivalent coursework, graduate degree, or advanced certification or credentialing in the subject taught. While, in this study, only
the teachers who possess an academic major in their subject taught are identified as highly qualified teachers regarding teachers’ competence in the subject knowledge. As a result, some of the teachers who are highly qualified may not be included in this study (p. 24).

Third, the study uses an existing dataset. Data was collected before the study was conceptualized and research questions were formulated, which also placed some limits on this study. Finally, since the latest available Schools and Staffing Public School Teachers Survey is the 2007-2008 dataset, the data from this study about teacher quality are not as recent as preferred.

**Organization of the Study**

This study is organized into five chapters. Chapter I is the introduction to the study, which provides the background of the study, the purpose of the study, the research problem, research questions, the significance of the study, operational definitions, conceptual framework, strengths and limitations of the study.

Chapter II is the review of the related literature focusing on the definition of teacher quality, research on teacher quality, indicators of teacher quality, job commitment, and job satisfaction, the status of teacher quality in public elementary and secondary schools. Chapter III describes the methodology for the study in detail, which includes the research design, sample characteristics, weighting, instrumentation, data collection methods, quality of the data and data analysis procedures. Results of the study are presented in Chapter IV, and the conclusions and implications are summarized in Chapter V.
CHAPTER II

REVIEW OF THE LITERATURE

The purpose of the study was to investigate teacher quality in elementary and secondary schools based on the definition of a highly qualified teacher under NCLB. Indicators of a highly qualified teacher in this study include a bachelor degree, a full certificate, and a major in the main teaching assignment. This study examined teacher quality in their main teaching assignment fields as well as in each subject taught and focused on the outcomes of job commitment and job satisfaction. I also investigated HQTs across core academic subjects and their sub-fields, and across level (elementary and secondary), urbanicity (urban, suburban and rural), and categories of minority students (less than 5%, 5-9%, 20-40% and 50%-over). Contained in the following section is a review of the existing literature related to the following areas: 1) how teacher quality has been defined; 2) how teacher quality has been studied; 3) how teacher quality is distributed; and 4) HQTs and its relationship to job commitment and job satisfaction (see below).
Table 1

_The Literature Map_

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<td>Shen &amp; Poppink, 2003; Lewis et al., 1999; Grossman, 1990; Spillane, J. et al., 2002</td>
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Defining Teacher Quality

According to the US Department of Education (1999), “conceptually, measuring teaching quality ought to be a high priority of any examination of teaching and learning, since, literally defined, it represents the direct effect on students by teachers as they create their classroom magic” (U. S. Department of Education, 1999, p. 1). Teacher quality is a concept that education policy has dealt with since its beginning. The measurement of teacher quality continues to remain a controversial issue. One attempt at identifying a possible solution to quantifying teacher quality is a study, which uses the peer and administrator evaluation (Kaplan & Owings, 2001; Leinhardt, 1989; Westerman, 1991). Let us make no mistake; teacher quality will forever be inexorably linked to the continued pursuit of greater student achievement, and as such should be viewed through that lens. The impact of teacher preparation and certification on student achievement remains a contentious issue and researchers recognize the need for further investigation (Darling-Hammond, Berry, & Thoreson, 2001; Gordon, Kane, & Staiger, 2006; Stronge, 2007; Toh et al., 2006; Wayne & Youngs, 2003).

Today, teacher quality tends to include standards developed by educational organizations such as the National Council of Teachers of Mathematics (NCTM), The National Council of Teachers of English (NCTE), Interstate New Teacher Assessment and Support Consortium (INTASC), and the National Board for Professional Teaching Standards (NBPTS) and the National Council for the Accreditation of Teacher Education (NCATE). Though these organizations may differ in some respects, they share many common themes regarding standards for teachers. Standards established by INTASC (1995) state that teachers should be able to understand their subject matter and relate it to
students, adopt teaching strategies that are responsive to different learners, employ
diverse instructional strategies, establish proper assessment tools to measure student
development, and engage in continual curriculum evaluation and professional
development. Each agency has proposed principles to assess competency in teaching.
"The psychometrics associated with such assessments are still undetermined, but the
demand, especially within the political arena has escalated beyond the ability to design
assessments that can realistically be administered on a large scale” (Galluzo, 1996, p. 4).
The efforts of the past are converging into the standards movement of today.

The teacher quality phenomena orbits around teacher preparation and
qualifications, and teaching practices for the most part (Lewis et al., 1999). In
understanding these two broad categories of teacher quality assessment the contributions
teachers bring to the school, such as, certification, work experiences, professional
development, demographics, and aptitude can be identified (U. S. Department of
Education, 1996a).

Teaching quality has some correlation to what teachers do to promote student
learning, including creating a positive learning climate, selecting appropriate instructional
goals and assessments, using the curriculum effectively and know how to use various
instructional methods to teach to high standards. While teacher preparedness and
qualifications may not directly address the actual quality of teaching and student learning,
they are necessary prerequisites of effective teaching (Stronge, 2003). According to
Stronge, a growing body of research concerning teacher quality has reinforced the notion
that both teacher preparation and qualification and teaching practice matter in teaching.
This study focuses exclusively on teacher qualification, more specifically, on teacher qualifications as defined by NCLB.

**Defining Highly Qualified Teachers**

The definition of a highly qualified teacher under NCLB relies on teacher preparation and qualifications (bachelor degree, full state certification and teaching within their major as their main assignment). Recent research has confirmed that teacher preparation and qualifications are important factors that have influence the success of schools (Darling-Hammond, 2000; Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005; Ferguson, 1991; Goldhaber & Brewer, 2000; Laczko-Kerr & Berliner, 2002; Monk, 1994; Wenglinsky, 2000). Darling-Hammond's (2000) study has found that certain factors affect teacher quality and success in schools such as: a) general academic and verbal ability; b) subject matter knowledge; c) knowledge about teaching and learning as reflected in teacher education courses or preparation experiences; d) teaching experience; and e) the combined set of qualification measured by teacher certification. Many studies have found teacher education and training, of one sort or another, to be significantly related to increases in student achievement (Goldhaber & Brewer, 2000; Greenwald, Hedges, & Laine, 1996; Hawk, Coble, & Swanson, 1985; Lourduamy, Toh, & Wong, 2001; Summers & Wolfe, 1975). Which specific indicators of teacher quality should be more emphasized over others continues to be a subject of debate. As an example, which knowledge is more important for a teacher to gain; subject matter knowledge or pedagogical? NCLB certification requirements clearly emphasize both, indicating policymakers and researchers are unwilling to state one over the other exclusively. Many argue that all teachers ought to possess strong knowledge of the
subject they teach because it is an essential element that positively affects teaching performance and student achievement (Goldhaber & Brewer, 2000) as indicated by subject matter test, such as PRAXIS I and II, and the requirement of teaching within a major. At the secondary level strong subject knowledge is particularly important due to the greater depth of subject matter taught. Ingersoll (1996a) reported that subject-specific post-secondary education in which he or she teaches is one of the most important characteristics of a qualified high school teacher. Ingersoll goes on to state at least a minor is required to teach a subject. Still other researchers suggest a major (Goldhaber & Brewer, 2000). Certainly all approved certifications programs stress the need for a major in the subject taught.

The NCLB law requires highly qualified teachers to demonstrate competence in each subject taught. The NCLB Act also defines how to demonstrate this competency. New teachers must demonstrate subject matter competence by either passing a subject exam and possess an academic major or equivalent coursework, graduate degree, or advanced certification in the subject. Obviously there are various ways for teachers to demonstrate competence in subject knowledge. This study will only include those teachers who have obtained a major in their subject taught, completed a certification program, and teach the majority of their classes within their major to be considered highly qualified teachers (HQTs). In short, those considered HQTs using NCLB criteria. The 2007-2008 SASS dataset already identifies these teachers and classifies them as highly qualified.

Under the HQT strictures of a certification program, there is an emphasis on pedagogical preparation. The topic of teaching educators how to teach has meet with
differing viewpoints and disagreements among policymakers, researchers and educators. On one side there are people who believe that the ability to teach is a function of innate talents and that teachers need minimal preparation to teach, suggesting no formal or little teacher preparation for teachers; however, the opposing view believes teaching requires multiple forms of knowledge and skill that can be taught and learned, thus suggesting highly developed forms of preparation and ongoing professional development to heighten the need for careful preparation (Shen & Poppink, 2003).

One of the stipulations of NCLB requires all teachers obtain a full state certificate and licensure to be considered highly qualified. However, according to NCLB, the state has freedom to define certification procedures (pending approval by the U. S. Department of Education). This gives individual states latitude to create more efficient certification procedures, alternative routes to certification, and emergency certification criteria. In this study, teachers who have obtained a full state certificate status refer to those teachers who have obtained regular/standard state certificate or advanced professional certificate or probationary certificate. Only teachers who have obtained a full state certificate are considered to be highly qualified. Teachers who are holding other types of certifications (alternative certification, temporary certificate, emergency certificate or waiver) are not considered to have a full state certificate and are not considered to be highly qualified (see below).
Based on the NCLB’s definition of a highly qualified teacher, pedagogical and subject matter knowledge are both important for teacher certification and subsequent highly qualified status. Both must be present for certification. As the research shows, the advantage for teachers to have strong pedagogical and subject matter knowledge is well documented. Pedagogical and subject matter knowledge predictors are strongly correlated with educational success (Darling-Hammond, 2000). Teachers who hold both full certification (pedagogical training) and a major (subject matter expertise) in the field being taught certainly exhibit these requirements. Pedagogical knowledge and training importance is emphasized by primarily qualitative research (Grossman, 1990; Grossman, Wilson, & Shulman, 1989; Shulman 1986, 1987). “A proxy for both strong disciplinary knowledge (a major in the field taught) and substantial knowledge of education (full certification)” (Darling-Hammond, 2000, p. 18) bears an accurate example of the research findings. When preparing teachers to work in secondary schools, it is important to consider both the subject matter knowledge aspect and the pedagogical aspect they will need for effective teaching (Grossman 1990). Subject knowledge alone does not provide
teachers with the pedagogical understanding necessary for teaching a wide range of
students (Ferguson & Womack; 1993; Monk, 1994).

Research on Teacher Quality

The research on teacher quality shows the diversity of viewpoint and difficulties in the
measurement of the concept. Approaches to wrestling with teacher quality have a
tendency to take one of the following forms: (1) classroom observations of teacher
practices; (2) written examinations of teachers’ basic literacy, subject matter knowledge,
and pedagogical skills; (3) student performance and achievement; or (4) large-scale
survey of teacher qualifications, attitudes, behaviors, and practices (Lewis et al., 1999).
As we can see, NCLB HQT criteria mirror these main areas to a greater or lesser extent.

Classroom Observation

Direct classroom observation has been employed to document teacher practices
and assess the quality of teaching. This is done through observation, discussions and
interviews, collection of evidence and artifacts, and other directly observable sources.
This type of assessment also includes a determination of the pedagogical knowledge of a
teacher as well (Ball & Wilson, 1996; Grossman, 1990; Grossman & Thompson, 2004;
Peterson, 1990). It also explores relationships between education policy and teacher
practices (Ball, 1990; Cohen, 1990; Grossman & Thompson, 2004; Peterson, 1990),
professional development and teaching (Ball, 1996), and subject matter and curricular
activity (Stodolsky & Grossman, 1995). Though observations give unique and detailed
information of individual teaching practices, this data collection can be very inefficient
and costly. Currently it is impossible to collect large scale data within this method.
Teacher Exams

Research has shown that the measure of teacher tests on their academic proficiency represents one of the best predictors of teacher quality (Ferguson 1990, 1991; Ferguson & Ladd 1996; Goldhaber & Anthony 2003; Strauss & Sawyer 1986; Strauss & Vogt, 2001). Tests assessing verbal ability, teacher licensure, math ability, subject matter proficiency, or college entrance exams have been used to measure a teacher's basic knowledge or overall academic proficiency. Ferguson (1990) found a correlation between teachers' scores on a test of basic literacy skills and their students' test scores. There has been positive findings linking student test scores and teacher test scores (Goldhaber & Anthony 2003). The tests only focus on the measurement of basic academic knowledge while ignoring pedagogical knowledge and, therefore, do not provide a complete picture of teacher quality.

Surveys

The central survey to this study is the 2007-2008 Schools and Staffing Survey (SASS). This is one of many surveys used to find indicators of teacher quality in a quantifiable format. Teachers across the US complete a survey, providing information on attributes such as educational background, major and minor fields of study, certification, years of teaching, and professional development experiences. Such indicators have been used to study characteristics of teacher certification (Shen, 1999; Shen & Poppink, 2003); teacher retention and attrition (Shen, 1997); out-of-field teaching (Ingersoll, 1994, 1996; Lewis et al., 1999; Seastrom et al., 2002); school characteristics and educational equity (Ingersoll, 2002; Shen et al., 2004); and certification and subject knowledge have been connected to student achievement (Darling-Hammond, 2000a;
Ferguson, 1990; Goldhaber & Brewer, 2000). Policymakers can and do utilize these findings in the formation of future policies to address teacher quality issues.

**Student Achievement**

Though this study is not central to student achievement, it would be remiss to ignore the relationship between student achievement and teacher quality. Many would argue successful students are the ultimate test of teacher quality; so much so that student achievement test scores gains have been used to assess teacher quality. Interest among educational policymakers and researchers exploring this relationship continues to grow. Many studies indicated that teacher preparation and qualification are important indicators of student achievement (Darling-Hammond, 2000; Ferguson 1991; Goldhaber & Brewer 2000; Greenwald, Hedges & Laine, 1996; Laczko-Kerr & Berliner, 2002; Monk, 1994; Sanders & Rivers, 1996; Stronge, 2007). According to Spillane and Burch (2001),

> At the core of these initiatives is an attempt to fundamentally change authority and influence patterns in schools to motivate teachers to do a better job of educating America’s children. Most research on accountability has focused on the effects of these initiatives on student achievement and, to a lesser extent, their influence on classroom instruction. (p. 3)

In the literature, most of the studies found a positive relationship between teacher qualification and student achievement. However, there are several studies showing differing or even opposite results when exploring the connection (Goldhaber & Anthony 2003; Hanushek 1986).

**Job Commitment and Job Satisfaction**

**Job Commitment and Job Satisfaction and Student Achievement**

Perhaps the single most important measurable outcome is *student achievement*. Student achievement will continue to be a glaring marker of the effectiveness of public
educational institutions. Job commitment and job satisfaction have been positively linked to student achievement. Addressing teacher concerns has numerous benefits since teacher job satisfaction impacts student academic achievement, organizational commitment, organizational performance, student behavior, student satisfaction, and teacher quality (Bogler, 2002). Also Stolp (1994) finds a strong correlation between student achievement and a variety of factors, notably teacher job satisfaction. “If teachers are dissatisfied with their work lives, not only will they suffer, but their students will suffer as well” (Bryk & Driscoll, 1988, p. 3)

Job Commitment and Job Satisfaction and Leadership

When investigating the concepts of job commitment and job satisfaction many studies include leadership as an integral part. Actions by school administrators create distinct environments that are highly predictive of the level of job satisfaction for the teaching staff (Shann, 1998). Teachers are more satisfied when the school fosters teacher involvement in school decisions, respect, encouragement, and the sharing of information with colleagues, as well as the feeling that teachers and principals are working together (Anderman et al., 1991).

Anderman et al. (1991) studied the role of principal leadership and its effect on job commitment and job satisfaction. Their study spanned three states and 757 teachers to study the impact of leadership behaviors on job commitment and job satisfaction. Findings support the notion that different kinds of environments created by leaders are highly predictive of job commitment and job satisfaction. Principal’s actions create distinct working environments which can positively or negatively affect these two concepts, “Any effective organization must be fundamentally concerned with the
personal investment of its employees" (p. 4). Findings suggest that teachers feel quite satisfied with their jobs when they are working in an environment of collegial support (affiliation). Such an environment is likely to exist when principals engage in particular activities such as promoting instructional climate that recognizes the contribution of teachers and working with and supervising teachers.

Anderman et al. (1991) found job commitment is a bit more complex. The findings are similar to job satisfaction but when “There is a decreased stress on power and competition, and when they share similar values and ideas concerning what the school is all about (strength of climate)” (p. 19), job commitment and is more positive. Job commitment strongest predictor is affiliation. Culture is strongly related to both job commitment and job satisfaction upheld by other studies (Maehr, 1989; Vanderstoep et al., 1991; Yukl 1989).

Leaders have great influence over school context and the environs where teachers must work. Ashburn (1989) finds the single largest predictor of job commitment is school context. Firestone and Rosenblum (1989) further identified five important organizational factors which influence job commitment: sense of purpose, mutual respect and affiliation, administrative support, and opportunities for decision-making. Job commitment was positively and strongly associated with a perceived stress on recognition, accomplishment, and affiliation in the school, and with a feeling of cohesiveness regarding the mission of the school- all highly influenced by leadership (Anderman et al., 1991).
Job Commitment and Job Satisfaction and Attrition/Retention

One of the most researched concepts in education is that of teacher attrition and retention. Attrition rates have been documented from 20%-30% of teachers leaving the profession in the first five years (Darling-Hammond, 2001a) to as high as 45.4% (Shen & Palmer, 2009). Losing half of the skilled teaching force every five years can be a daunting obstacle for education to overcome. It is estimated that teacher turnover cost the nation more than $7 billion in the 2003-2004 school year alone (National Commission on Teaching and America’s Future, 2007).

Attrition and retention issues have been linked with leadership in recent studies (Bogler, 2001; Hanushek & Rivkin, 2007; Ma & MacMillen, 1998; Shen, 1997). We find that job satisfaction, attrition rates, and leadership are inexorably linked (Bogler, 2001; DeBruyne, 2001; Ma & MacMillen, 1998) and also job commitment (Robinson, 2005). Related terms such as morale, teacher autonomy, career engagement, burnout, career ladders, and compassion fatigue are some terms in the literature to describe the teacher attitudes affecting job commitment and job satisfaction in education. Some studies have categorized these factors into intrinsic and extrinsic categories (Conley & Levinson, 1993; Davis & Wilson, 2000; DeBruyne, 2001; Ebmeier, & Hart, 1992; Perie & Baker, 1997; Rosenholtz, 1987). Intrinsic factors seem to hold a much stronger relationship with job satisfaction over extrinsic factors (Baughman, 1996; Johnson & Johnson, 1999; Perie & Baker, 1997).

The general heading of attrition and retention and its relationship with job commitment and job satisfaction continue to be legitimate topics of research, whether from a financial perspective (Alliance for Excellent Education, 2005; Johnson, Berg,
Donaldson, 2005), teacher attitudes perspective (Boe et al., 2006; Darling-Hammond & Youngs, 2002; Darling-Hammond et al., 2005), leadership or any other educational topic. The retention of qualified teachers will continue to be an important issue educational institutions must face.

**Job Commitment and Job Satisfaction and Teacher Characteristics**

Job commitment and job satisfaction and their relationship to teacher characteristics have a basis in past research. Researchers have studied this relationship in order to determine which teacher characteristics can be predictors of job commitment and job satisfaction. Teacher characteristics within this dissertation are age, teaching experience, gender, ethnicity, teaching level, HQT status, and degree. Any research involving the analysis of teacher characteristics and job commitment and job satisfaction is helpful to the foundational research of this study.

Brunetti (2001) conducted studies involving veteran high school teachers and job satisfaction. Comparisons between school levels (elementary vs. high school) discovered collegiality as a strong component of their overall satisfaction with teaching. However, relationships with fellow teachers tended to be more important to elementary teachers. He also drew correlations between more experienced teachers vs. less experienced teachers and found that the more experienced teachers placed less emphasis on collegiality, further supported by Marston, Brunetti, and Courtney (2005).

The exploration of the relationship between school characteristics and job commitment and job satisfaction lends insight into the attitudes held by certain groups of teachers. Klecker, and Loadman, (1999) studied job satisfaction and male teachers at different experience levels finding that teaching is largely a female pursuit. Related
studies explore the gender issue in teaching as well (Snyder et al., 1996; Wood & Hoag, 1993).

Job Commitment and Job Satisfaction and School Characteristics

Job commitment and job satisfaction and their relationship to school characteristics also have a basis in past research. Researchers have studied this relationship in order to determine which school characteristics can be predictors of job commitment and job satisfaction as well. Teacher characteristics within this dissertation are: percentage of minority students, poverty level of schools, urbanicity, and school size. Studies also include a look at working conditions (Butt, & Lance, 2005; Dagenhart et al., 2005; Eberhard et al., 2000; Kelly, 2004; Sultana, 2002) and student behavior and discipline issues (Brunetti, 2001; Certo & Fox, 2002; Garrahy et al., 2005; Shann, 1998; Tye & O’Brien, 2002; Wright & Custer, 1998). According to Perie and Baker (1997), workplace conditions have a positive relationship with a teacher’s job satisfaction. Also, Schools that receive a great deal of parental support have teachers experiencing greater job satisfaction.

Kleinfeld, Williamson, and McDiarmid (1986) studied job satisfaction of teachers in rural Alaska schools. They examined the sources of job satisfaction among 304 teachers randomly selected from small isolated schools in rural Alaska. Findings include teachers feeling highly satisfied about their relationship with students as well as the extrinsic factors of pay and benefits. However teachers were dissatisfied, with community amenities, their students' academic progress, and especially, school district leadership. They feel that relationships with the district office cause them more stress than cross-cultural community relationships.
In many isolated rural schools, high teacher turnover erodes the quality of education rural students receive. Hartrick, Hills, and Wallin (1971) found that 60% of teachers employed in rural British Columbia were not teaching in the same district five years later. Since the sources of teacher dissatisfaction depend on the specific conditions of the schools in which they teach, research on rural teachers' satisfaction is important. Teachers express satisfaction with their pay and benefits and dissatisfaction with the difficulties of living in isolated villages.

With the research done in the area of job satisfaction and school characteristics some trends begin to emerge. Perie and Baker (1997) found that teacher job satisfaction decreased as the percent of students who are minority increased. Teachers in schools with 20% or more students on free or reduced-price lunch are more likely to have low levels of satisfaction (Perie & Baker, 1997). In addition, teachers at urban schools have lower levels of job satisfaction than teachers at rural schools, and teachers at suburban schools have higher levels of job satisfaction than teachers at rural schools. School size also had a negative impact on teacher job satisfaction. In contrast to other studies, Henke et al. (1996) found that the enrollment size of a school is not related to satisfaction. There is a relationship between workplace conditions (turnover, such as class size, staff turnover, school safety, teacher autonomy, and isolation of the classroom) and job satisfaction (National Center for Education Statistics, 1997a).

The NCES Report (1997a) garnered several findings related to job commitment and job satisfaction from the SASS taken in 1991. This report was extremely comprehensive in its review of teacher and school characteristics, attrition, and other topics of education. School characteristics, leadership support, student behavior and
school atmosphere are some of the factors discussed in this survey. Student behavior, school atmosphere and teacher autonomy are working conditions associated with teacher satisfaction. Private schools tended to have teachers with higher satisfaction rates than public schools (Naomi et al., 1999). Elementary teachers tended to be more satisfied than high school teachers. Teachers with higher parental support are more satisfied than teachers without (NCES Report, 1997a). Studies researching school characteristics and job satisfaction have revealed helpful findings for educational institution for further guidance and policy making. It is a topic worthy of further study.

Satisfaction and commitment with teaching as a career is an important policy issue since it is associated with teacher effectiveness which ultimately affects student achievement (Ashton & Webb, 1986; Carnegie Forum on Education and the Economy, 1986). Educators are both the largest cost and the largest human capital resource of a school system. The need for understanding factors that contribute to teacher satisfaction and commitment level is essential to improving the health of the education system. Examining the Highly Qualified Teacher status and its relationship to job commitment and job satisfaction will add to the body of knowledge and increase the depth and breadth of the knowledge of job commitment and job satisfaction enabling policymakers, lawmakers, and educational leadership to make more informed decisions toward creating a superior education system which meets the needs of students and teachers alike.

Researchers have employed many different ways to investigate teacher quality. Since teaching is a complex task and a teacher's influence within the classroom is critical, it is challenging to define what outcomes might show high teacher quality and how those outcomes should be measured. Job commitment and job satisfaction are two
composite variables which may have a strong relationship with HQT status and therefore give policymakers insights which may otherwise be invisible. Careful exploration of the research may confirm what characteristics of teachers are most significant and can indicate factors identifying HQTs in terms of the relationships between specific characteristics (degree, certification, and subject knowledge) of teachers and job commitment and job satisfaction.

Distribution of Teacher Quality

Teacher Degree and Its Distribution

The status of teacher quality and the distribution of teacher quality in public schools across many areas are exemplified in several studies (Ingersoll, 1994, 1996, 1999; Kaplan & Owings, 2002; Seastrom et al., 2002; Shen & Poppink, 2003). There is a concern that public schools are populated by an inordinate amount of unqualified teachers (Kaplan & Owings, 2002). In accordance with NCLB a teacher must have a complete certification, have a major, and teach the majority of classes (main assignment) within that major. As Ravitch (1998) reveals, there is an emphasis on teacher degree and their majors stemming from such studies showing an increase in the number of alternate certification (emergency or temporary) (Riley, 1998; Shen & Poppink, 2003). Also, we find that teacher who possess a certification and a subsequent major are not teaching within their major (out-of-field). This creates an administrative emphasis on ensuring teachers actually teach within their major (U. S. Department of Education, 1996b).

Teacher degree refers to an undergraduate degree from an institution recognized by the U. S. Department of Education in regards to HQTs. Nationally, 24% of secondary (grades 7-12) classes in core academic subjects are assigned to a teacher
lacking a major or minor in the subjects taught; in the nation’s high-poverty schools, the rate is over 34%, compared with 19% in low-poverty schools. Similarly, in high-minority schools 29% of classes are taught by out-of-field teacher, vs. 21% in low-minority schools (Jerald, 2002).

The 1998 Fast Response Survey System (FRSS) results are striking: virtually all teachers had a bachelor’s degree and 45% had a master’s degree (Lewis et al., 1999); but only 66% of high school teachers had an undergraduate or graduate major in an academic field. These findings are further supported by Goldhaber and Brewer (1998), where only 68% to 76% of teachers (depending on the subject) have at least a bachelor’s degree in their subject area. About 50% of all teachers have at least a master’s degree, but less than a 25% have advanced degree in the subject area they teach.

We also find the socio-economic status (SES) population (as measured by the percentage of students eligible for free or reduced lunch) of the students within a school is a factor related to teacher quality and degrees. NCES (1999) found that there is variability in the distribution of teacher degree level between low-and high-poverty schools when examining the allocation of teachers who hold a master’s degree by school poverty level. In low-poverty schools (less than 15% poverty) 57% of the teachers had master’s degree. In high-poverty schools (those with 60% or more poverty) only 37% of the teachers held master’s degrees. Corroborating these finding with their won study Betts, Reuben, and Danenberg (2000) find similar discrepancies between high-poverty and low-poverty schools in California.
Teacher Certification and Its Distribution

Teacher certification refers to an accepted academic program, most often administered by a college or university, which includes pedagogical studies as part of the certification. This program must be state certified. Lewis et al. (1999) found that 93% of general elementary teachers were fully certified in the field of their main teaching assignments. In contrast, findings from a study conducted by Shen and Poppink (2003) discovered a 3% overall increase nationwide in the public school teaching force over thirteen years (1987-2000). This study also examined urbanicity and reported that urban schools had a higher percentage of uncertified teachers and a higher percentage of out-of-field teachers. A study conducted in New York City Public Schools revealed that schools with a high percentage of free/reduced lunch recipients had significantly fewer certified teachers (Lavigne, 1992). The same study also found those schools with high percentages of minority students had significantly fewer certified teachers (Lavigne, 1992). The same findings can be found in California schools (Betts, Reuben, & Danneberg, 2000).

Out-of-field Teaching and Its Distribution

For the purposes of this study teachers fell into one of three categories: 1) HQTs (those teachers who have achieved highly qualified status), 2) UNQ (unqualified teachers), and 3) Out-of-Field teachers (those teachers who would be considered HQTs if they taught the majority of their classes within their major). Ingersoll (1996) found that many students were taught by out-of-field teachers: 20% in English classes, 25% in mathematics, 39% in life science or biology, 56% in physical sciences classes, and over 50% in history or world civilization. In a series of articles, Ingersoll examined out-of-
field teaching nationwide by the attribute of school size and found the percentage of out-of-field teaching across small and mid-sized schools were greater (Ingersoll, 1997). In terms of school poverty and minority student population, his findings show higher levels of out-of-field teaching (Ingersoll, 1998). Finally, findings indicate less academically stringent classes were more often taught by out-of-field teachers (Ingersoll, 1999).

The distribution patterns of qualified teachers are measured consistently and well documented across many studies. Consistent findings exploring the teacher quality issue across several attributes (urbanicity, school size, poverty level, etc...) and are ongoing issues and matters worthy of continued study (Booth & Remshaw, 2003; Ingersoll, 1996, 2002; Seastrom et al., 2002; Shen et al., 2004). Some teachers are teaching a subject in which they do not have a certification, indicating a deficiency of quality teachers as framed by NCLB in public schools. This body of literature illustrates teachers classified as unqualified or out-of-field are a significant issue in education and moving toward the eventual goal of 100% HQTs.

**Distribution of Teacher Quality by Subject Area, School Characteristics, and Teacher Characteristics**

This study explored several variables that fall under the categories of teacher controls and school controls. Variables classified as school variables are teacher level, urbanicity, core subject areas and their individual subjects, and percentage of minority students in the investigation of the distribution of teacher quality. The second research question explored links between teacher variables such as age, gender, ethnicity, teaching experience, bachelor's degree, and certification type. In the following section I discuss the rationales for the inclusion of these variables in this study.
School Controls

School Level simply refers to what level an educator teaches. There are two levels this study will explore, elementary and secondary levels. Core Subject Areas, as classified by the 2007-2008 SASS survey are Mathematics, Social Sciences, Natural Sciences, and Language Arts. Recently, the national and statewide focus of school reform efforts has centered on student achievement. In response, nearly all states have implemented rigorous standards for student achievement in the core academic subject areas. As a result, educational researchers and policy makers have begun to turn their attention to the quality of teachers in core subject areas. Using data from the School and Staff Survey, Seastrom et al. (2002) provided subject-specific estimates of out-of-field teaching, and found that at the high school level in 1999-2000 teachers who did not have certification and a major in the subject taught, particularly the natural sciences, and approximately 30% of those enrolled in mathematics, English, and social science classes had out-of-field teachers. Furthermore, another study bolsters Seastrom et al. particular to the subject area of Mathematics (Blank & Langesen 2001), finding a shortage of qualified teachers in mathematics and actually dropped 4% (from 90% to 86%) between 1990 and 2000 (Blank & Langesen, 2001). The literature shows the disparity between schools with large minority and poor populations in the area of math as well (Clewell & Forcier, 2001; Fuller, Carpenter, & Fuller, 2008; Jerald 2002).

Percentage of Minority Students at Schools refers to the categories signifying the population of minority students in a school (<5%, 5%-19%, 20%-49%, & 50% or more). Schools identified as high-need have been identified as high-poverty, high-minority, or low-performing schools (Ansell & McCabe, 2003). There are many studies which
explore the distribution of HQTs across minority populations and repeatedly find consistent links between HQT status and minority population enrollment (Haycock, 1999; Ingersoll, 1997, 2002; Lavigne, 1992; NCES, 1997; Shen & Poppink, 2003).

*Urbanicity*-School location- refers to elementary and secondary schools classified as urban, suburban, or rural. Some studies of the distribution of qualified teachers have also included school location in their examination (Harris & Ray, 2003; Shen & Poppink, 2003; Stoddart & Floden, 1995) showing a lower HQT percentage in urban schools by a factor of three to one. Urban schools had higher percentages of uncertified teachers and out-of-field teachers according to Shen and Poppink (2003). A graphic example is New York City, where more than 9,000 teachers were teaching on temporary or emergency license while the rest of the state only had 1,185 in 1997-1998 (Darling-Hommond, 2002). In Michigan, due to teacher shortages, many urban school districts have been forced to accept unqualified teachers (Shen et al., 2004) signifying the ongoing issues to conform to NCLB mandates

**Teacher Controls**

*Age, gender, ethnicity,* are demographic variables specific to individual teachers and may reveal a relationship between HQT status and job commitment and job satisfaction. *Teaching experience* refers to the number of years a teacher has specifically in the teaching arena. *Bachelor's degree* indicates whether or not the major is aligned with the majority of classes taught (main assignment). *Certification type* will reveal whether or not a teacher is eligible for highly qualified status.

The literature shows the school controls of urbanicity, minority enrollment, and free/reduced lunch percentages are linked to HQT status as well as the concepts of job
commitment and job satisfaction. Urban schools, high-minority enrollment schools, specific secondary core subjects, and high-poverty schools show a tendency to employ unqualified teachers. The research also indicates teacher quality is a critical variable affecting in public schools. Students in urban schools, high-minority enrollment schools, specific secondary core subjects, and high-poverty schools have the greatest need for highly qualified teachers (Ansell & McCabe 2003; Haycock, 2003; Prince, 2002). The literature also shows job commitment and job satisfaction to be affecting factors. This study explored the relationship between HQT status and the variables job commitment and job satisfaction in an effort to add to the body of knowledge in both depth and breadth. It is the hope that such a study gives insight to policymakers and lawmakers to enable them to make more informed decisions; further understanding of teacher perceptions for administrators to enhance their effectiveness; and set the basis of further research involving the HQTs job commitment and job satisfaction concepts.

Job Commitment and Job Satisfaction

Job commitment and job satisfaction are two composite variables which were created from the 2007-2008 SASS. This study explores the relationship between these two composite variables and HQT status in an effort to discover any correlation. Job commitment and job satisfaction have been, and continue to be, a major focus of educational research. Job commitment and job satisfaction concepts do not exist in a vacuum. They spill over into many educational issues worthy of continued research. The empirical link between job commitment and job satisfaction and HQT status has yet to be attempted. This study explores this relationship. Nothing is more important than providing teachers the best professional preparation and creating satisfactory conditions
of work in which they can be effective (The Indian Education Commission, 1964-1966). The relationship between satisfaction and effective teachers has also been established. In light of the above, the theoretical framework of teacher job satisfaction may be considered as one of the important factors, which can enhance teaching competency.

The vast majority of research links job satisfaction and commitment to a variety of topics considered to be integral components of the education process. These topics and related studies are displayed in the table below (see Table 2).

These studies are interrelated across the topics and reoccurring themes are pronounced, but the point is well established: job commitment and job satisfaction are legitimate phenomena worth exploring further. They continue to have an impact across educational issues that directly affect the success of educational institutions and policies that govern them.

Educational and psychological research has shown the importance of the phenomena of job satisfaction and job commitment. Many renowned scientists proposed the theories on job satisfaction such as Maslow and Herzberg (Gawel, 1997). According to Maslow, a person's satisfaction is determined by the fulfillment of his five levels of need in his well-known Hierarchy of Needs pyramid. Herzberg also addresses the importance of satisfaction in his Motivation Hygiene Theory, which assumes that two variables determine a person's satisfaction: internal factors (achievement and recognition) and external factors (salary and interpersonal relations). Lortie (1975) believed that teaching continues to be rather limited in its available extrinsic rewards and that if teacher job satisfaction is to be increased efforts are to be made to improve the
<table>
<thead>
<tr>
<th>Topic</th>
<th>Key References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Quality</td>
<td>Deery-Schmitt &amp; Todd, 1995; Lobosco &amp; Newman, 1992; Whitebook, 2003, Fuller &amp; Carpenter, 2009; Fuller, 2007; Fuller &amp; Fuller, 2008</td>
</tr>
<tr>
<td>Attrition and Retention</td>
<td>Anhorn, 2008; Billingsley, &amp; Cross, 1992; Bogler, 2001; Darling-Hammond, 2001a, 2003; Darling-Hammond et al., 2005; DeBruyne, 2001; Ebmeier &amp; Hart, 1992; Gordon, 1991; Fuller, 2007; Fuller, 2008a; Fuller Hanushek &amp; Rivkin, 2007; Henson &amp; Hall, 1993; Ingersoll, 2001b; Ingersoll &amp; Perda, 2009; Johnson et al., 2005; Lui, 2005; Ma &amp; MacMillen, 1998; Robinson, 2005; Sargent, 2003; Shen, 1997; Shen &amp; Palmer, 2009; Smith &amp; Ingersoll, 2003; Williams, 2003</td>
</tr>
<tr>
<td>Student Achievement</td>
<td>Bogler, 2002; Stolp, 1994</td>
</tr>
<tr>
<td>Job Performance</td>
<td>DeBruyne, 2001</td>
</tr>
<tr>
<td>School Characteristics</td>
<td>Brunetti, 2001; Butt, &amp; Lance, 2005; Dagenhart et al., 2005; Eberhard et al., 2000; Henke et al., 1996; Kelly, 2004; Kleinfeld et al., 1986; NCES Report, 1997; Perie &amp; Baker, 1997; Sultana, 2002</td>
</tr>
<tr>
<td>Teacher Characteristics</td>
<td>Klecker, &amp; Loadman, 1999; Marston, Brunetti, &amp; Courtney, 2005; Montecinos &amp; Nielsen, 1997; Moye, Henkin &amp; Egley, 2005; Wood &amp; Hoag, 1993</td>
</tr>
<tr>
<td>Teacher Empowerment</td>
<td>Bhandarkar, 1980; Bogler, 2001; Bogler &amp; Somech, 2004; Garett, 1999; Gonzales &amp; Short, 1996; Greenwood &amp; Soars, 1973; Ho &amp; Au, 2006; Leithwood et al., 1998; Mishra &amp; Gupta, 1995; Muijs &amp; Harris, 2003; Peck et al., 1977; Perie &amp; Baker, 1997; Shann, 1998; Shen, 1997, 2001; Short, 1998; Sylvia &amp; Hutchinson, 1985; Woods &amp; Weasmer, 2004; Zembylas et al., 2004</td>
</tr>
</tbody>
</table>
teaching situations. It is no mistake that these factors appear throughout the literature and provide much of the basis for the concepts of satisfaction and commitment in education.

Methods of defining, measuring, and evaluating job commitment and job satisfaction may differ as time and the progress of findings sharpen; also between the studies themselves. Measuring job satisfaction is a complex process because teachers are not unified in their perspectives about what makes them satisfied with their careers (Shin & Reyes, 1991; Woods & Weasmer, 2004). Generally, job satisfaction is related to the number of teacher variables such as turnover, absence, age, occupation and size of the organization in which the teacher works. The degree of satisfaction of job largely depends on satisfaction of employee variables. Employees' satisfaction and morale are attitudinal variables that reflect positive or negative feelings about particular persons or situations, satisfaction when applied to work context of teaching seems to refer to the extent to which a teacher can meet individual, personal and professional needs (Strauss, 1974).

There is one defining study that differentiates between the concepts of job commitment and job satisfaction. Shin and Rey, (1991) created a foundational study that surveyed 854 teachers and explored the relationship between the concepts of job commitment and job satisfaction. The study defined organizational commitment as “An employee’s identification with and involvement in an organization” (p. 3). Job satisfaction was defined as, “A positive emotional response to the appraisal of specific job tasks or experiences” (p. 4). Though similar, the findings showed that job commitment and job satisfaction are indeed, “Moderately correlated but separate concepts” (p. 13) and a causal relationship between the two concepts was established.
This distinction has been upheld in further studies (Anderman et al., 1991; Lester, 1988; Shin & Reyes, 1991).

The MetLife Survey of the American Teacher conducts periodic surveys. The MetLife Survey has been measuring teacher career satisfaction since 1984. Most notably, the October 2008 survey was particularly informative. Findings include: teachers today are more satisfied than earlier years (40% in 1984 vs. 62% in 2008); 66% of new teachers and 67% of highly experienced (+20yrs) are highly satisfied; and job satisfaction is linked to teacher recognition. However, there are some controversial findings such as: there is no significant difference between urbanicity categories. The MetLife 2010 Survey of 1003 public school teachers was equally revealing showing a slight drop in job satisfaction (59%) while attrition rates decreased. Trends tend to see-saw but overall remain steadily climbing. Also 75% of teachers believe their job commitment will extend them beyond traditional retirement. Job commitment and job satisfaction can be linked to several factors, which lend to the strength of job commitment and satisfaction derived from teaching. This study explores job commitment and job satisfaction as dependent outcome variables and compares the two concepts to HQT status.
CHAPTER III
METHODOLOGY

Introduction

The purpose of this dissertation is to answer the following three questions:

Question 1

What are the percentages and patterns of distribution of HQTs in American public schools at the secondary and elementary levels in 2007-2008?

What is the percentage of highly qualified elementary and secondary teachers across (a) urbanicity, (b) categories of minority students (<5%, 5-19%, 20-49%, 50% or more), (c) main teaching assignment fields, (d) core academic fields (language arts, natural sciences, math, and social studies), and (e) core academic subjects (e.g., subjects under natural sciences such as chemistry, physics, earth, life and physical science)?

Question 2

What teacher characteristics predict HQTs, after controlling for school characteristics?

Question 3

Is HQ status related to job satisfaction or job commitment after controlling for individual teacher and school characteristics?

The measurement instrument adopted for this study was a large-scale survey that is administered to a representative sample of American Teachers-the 2007-2008 SASS Public Schools Teachers Questionnaires. This chapter begins with an overview of the
participants and setting. Next, the instrumentation used in this study is detailed, including a table which integrated the variables, codes, scoring, and levels of measurement for 2007-2008 SASS data which were important to hypothesis testing. The research design and data analyses included a rationale for the choice of statistics and a table which links each hypothesis to the included variables and the appropriate statistical analysis. Sample size is justified based on power calculations. This methodology chapter ends with an overview of steps taken in compliance with ethical guidelines.

**Participants and Setting**

Participants were data from elementary and secondary school teachers who participated in the 2007-2008 SASS public school teacher survey. The 2007-2008 SASS Public School Teacher Survey is a stratified sample based on clustered probability sampling. SASS used a complex stratified sample design because the goal was to create a database that is representative of the public school teacher. The available sample included 17,610 elementary school teachers and 16,660 secondary school teachers, summing to a total sample size of 34,270 participants for statistical analyses.

**Schools and Staff Survey (SASS)**

**Instrumentation**

The 2007-2008 SASS Public Schools and Staffing Survey national data set was used in the study. This section provides an overview of the SASS, the development of the SASS, the validity and reliability of the SASS, and the rationale for the choice of SASS Public School Teacher Questionnaire. This section also provides the codes, scoring, and levels of measurement for 2007-2008 SASS variables crucial to testing the hypotheses of the present study.
Overview of the SASS. The data for this study were extracted from the Schools and Staff survey (SASS). SASS is an integrated survey collected from public, private, and public charter schools nationwide. SASS is the most comprehensive national teacher survey in the United States (United States, 1994, 2000). The Teacher Survey collected data from the nation's teachers about workload, education, experience, perceptions, and attitudes toward teachings, compensation, and demographic characteristics. SASS produces information in regards to teachers and administrators and the condition of America's elementary and secondary schools. SASS is supported by the U.S. Department of Education's National Center for Education Statistics (NCES). In the 1980s, the NCES created SASS because of the demand for information about critical aspects of teachers nationwide. While the SASS has six survey components: (1) the School District Survey, (2) the Principal Survey, (3) the School Survey, (4) the Teacher Survey, (5) the School Library Media Center Survey, and (6) the Teacher follow up Survey, the 2007-2008 SASS Public Schools and Staffing Survey data set was used in the present study.

Development of the SASS. According to Tourkin (2004), the SASS survey was mailed to teachers, principals, and administrators in the 2007-2008 school years. The teacher questionnaires were sent to sampled individuals. Data collection began with an initial mail out. Six weeks later, a second copy of the questionnaire was mailed out. The second reminder post card was mailed out within one week of the second questionnaire mail out. The NCES conducted a re-interview program to evaluate the reliability of data for selected questions on the surveys, thus measuring the consistency of responses between original surveys and re-interview surveys (Atkins, 2005). The re-interview survey was independent of the first survey. The re-interview survey used the same data
collection procedures and the administration of the survey was conducted under the same conditions as the original survey. The re-interview process included (a) selection of questions critical to the SASS survey or questions that were found to create problems and (b) the mailing of the re-interview surveys to the school principals after receiving the original survey.

**Validity and reliability of the SASS.** Validity and reliability are two important measures of a survey instrument's quality. A reliable survey instrument is consistent and a valid one is accurate (Fink, 2003). A survey instrument is valid when it serves the purpose it is intended to serve and gives correct information (Creswell, 2003). If an instrument is valid, inferences from the scores on the instrument are made (Creswell, 2003). Cronbach’s alpha and Pearson’s correlation coefficients were calculated to assess reliability for the continuous variables of the re-interview survey. The index of inconsistency and the gross difference rate were applied to measure response variance in the categorical data. The gross difference rate was the percentage of responses that were found in the first interview, but not found in the re-interview. The index inconsistency provided a ration estimate of the response variance to the total variance for questions (Bushery Schreuner, Sebron, & Kaufman, 1998 as cited in Atkins, 2005). If the index consistency was less than 20%, it was considered low, 20-50% it was considered moderate, and response variance higher than 50% was considered high (Bushery et al., 1998, as cited in Atkins, 2005). The results indicated high response variance for 42% of the 95 questions that were evaluated, thus indicating poor reliability; moderate response variance for 47% of the questions; and a low response variance for 20% of the questions (Tourkin et al., 2004). As a result, the questions that had high response variance were
flagged by NCES for possible changes to the survey. Cronbach’s alpha was conducted on each appropriate set of items in order to assess the internal consistency reliability of each construct. Cronbach’s alpha coefficient measures the extent to which a set of items is inter-related, and yields values that range from 0 to 1 (Atkins, 2005; Nunally & Bernstein, 1994). Cronbach’s alphas were higher than 0.70 for all SASS scales, which indicates acceptable internal consistency reliability (Atkins, 2005; Nunally & Bernstein, 1994).

**Choice of SASS Public School Teacher Questionnaire.** The 2007-2008 SASS Public School Teacher Questionnaire dataset was selected because the present study required measures of teacher education and training, teaching assignment, experience in teaching, certification, workload, perceptions and attitudes about teaching and workplace conditions. This data set was used because (1) the SASS dataset included the teacher qualification variables of interest for the presently proposed study, including educational level, credentials, and teaching assessments (Fabiano, 1999); (2) SASS data is stratified proportionately to be representative of the national population of American teachers, which fosters generalizability of findings; and (3) The SASS data is (a) systematic-detailed, planned and executed; (b) reflective of the population; (c) quantifiable because the data is expressed numerically; (d) comprehensive in range of measurements and (e) large in sample size, which allows for disaggregating data along a number of characteristics of schools and teachers which gives multiple responses; and is (f) a reliable description of schools and teachers nationwide (U.S. Department of Education, 2000).
**Job Satisfaction and Job Commitment.** Job satisfaction and job commitment are composite scores rather than individual SASS survey items. Job satisfaction (JS) is a 2007-2008 SASS composite of items Q55a, I, k, q, each measured on a 1-4 scale (strongly agree, strongly disagree):

- 55a- The school administration’s behavior toward the staff is supportive and encouraging.
- 55i- Most of my colleagues share my beliefs and values about what the central mission of the school should be.
- 55k. There is a great deal of cooperative effort among the staff members.
- 55q. I am generally satisfied with being a teacher at this school.

Job commitment (JC) is a 2007-2008 SASS composite of items Q57a, f, g, each measured on a 1-4 scale (strongly agree, strongly disagree):

- 55a- The stress and disappointments involved in teaching at this school aren’t really worth it.
- 55f- I don’t seem to have as much enthusiasm now as I did when I began teaching.
- 55g- I think about staying at home from school because I am just too tired to go.

Alpha tests were conducted for JS and JC to ensure that the composite means for Q55 and Q57 are valid to use in an HLM test. Table 3 links the 2007-2008 SASS data variable names to the coding and level of measurement for each variable to be used in the presently proposed study.
Table 3

*Variable Codes, Scoring, and Levels of Measurement for 2007-2008 SASS Data*

<table>
<thead>
<tr>
<th>SASS Variable</th>
<th>Label</th>
<th>Level</th>
<th>Code/Scoring</th>
<th>SASS Survey item</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE_T</td>
<td>Age</td>
<td>Interval/Ratio</td>
<td>Teacher Age</td>
<td>Q71</td>
</tr>
<tr>
<td>TLEV2_03</td>
<td>Secondary vs. Elementary</td>
<td>Nominal</td>
<td>Secondary = 1, Elementary = 2</td>
<td>Q12</td>
</tr>
<tr>
<td>TOTYREXP</td>
<td>Total Experience</td>
<td>Interval/Ratio</td>
<td>Years of Teaching Experience</td>
<td>Q10a Whole number</td>
</tr>
<tr>
<td>MALE</td>
<td>Male (vs. Female)</td>
<td>Nominal</td>
<td>Gender Male = 1, Female = 2</td>
<td>Q67</td>
</tr>
<tr>
<td>WHITENH</td>
<td>Ethnicity</td>
<td>Nominal</td>
<td>White Non-Hispanic = 1, All Others = 2</td>
<td>Q68, 69</td>
</tr>
<tr>
<td>HQT</td>
<td>Highly Qualified</td>
<td>Nominal</td>
<td>Teacher considered HQT = 1, Unqualified = 2</td>
<td>Q35a</td>
</tr>
<tr>
<td></td>
<td>Advanced/regular/probationary certification (vs. all others)</td>
<td>Nominal</td>
<td>Yes/no</td>
<td>Q35a</td>
</tr>
<tr>
<td></td>
<td>Bachelor’s Degree</td>
<td>Nominal</td>
<td>Yes/no</td>
<td>Q23a</td>
</tr>
<tr>
<td>TRLWGHT</td>
<td>Teacher relative weight</td>
<td>Interval/Ratio</td>
<td>Scale value</td>
<td>TRLWGHT</td>
</tr>
<tr>
<td>MINENR</td>
<td>Percentage of Minority Student</td>
<td>Ordinal</td>
<td>Four categories</td>
<td>MINENR</td>
</tr>
<tr>
<td>ENR100</td>
<td>Student Enrollment x100</td>
<td>Interval/Ratio</td>
<td>Counts of students</td>
<td>ENR100</td>
</tr>
</tbody>
</table>
Table 3—Continued

<table>
<thead>
<tr>
<th>SASS Variable</th>
<th>Label</th>
<th>Level</th>
<th>Code/Scoring</th>
<th>SASS Survey item</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRL</td>
<td>% Free/reduced lunch</td>
<td>Ordinal</td>
<td>Four categories</td>
<td>FRL</td>
</tr>
<tr>
<td>TJBCMTM</td>
<td>Job commitment</td>
<td>Interval/Ratio Composite</td>
<td>Composite of SASS Q57a, f, g on a 1-4 scale (strongly agree, strongly disagree)</td>
<td>Composite of Q57a, f, g on the 2007-2008 SASS</td>
</tr>
<tr>
<td></td>
<td>Job satisfaction</td>
<td>Interval/Ratio Composite</td>
<td>Composite of SASS Q55a, I, k, q on a 1-4 scale (strongly agree, strongly disagree)</td>
<td>Composite of Q55a, I, k, q on the 2007-2008 SASS</td>
</tr>
</tbody>
</table>

**Research Design**

This quantitative study employs a cross sectional design and a secondary dataset to examine possible relationships between HQT status and job commitment and between HQT status and satisfaction among elementary and secondary public school teachers. A quantitative cross sectional design is appropriate because the purpose of the study is to quantify relationships at one point in time, rather than looking at changes over time in a longitudinal study. This study is retrospective and not prospective, in that existing national data was used for investigation. By definition, a secondary database is the reexamination of previously collected data (Primary and Secondary Research, 2008). The key characteristic of secondary analysis is the data being used was originally
collected for purposes other than to answer the research question under current consideration.

**Data Analyses**

This section provides the analysis plan for the present study. Each research question is followed by the corresponding null hypotheses. The analysis plan for each hypothesis is detailed. A table is provided to link the independent (IV), dependent (DV), and control variables (covariates) to the statistical analysis for testing each hypothesis.

**Research question 1.** What are the percentages and patterns of distribution of HQTs in American public schools at the secondary and elementary levels in 2007-2008?

**Null hypothesis 1.** There is no difference in the proportion of highly qualified teachers between elementary and secondary levels; there is no difference in the proportion of highly qualified teachers across all elementary and secondary levels.

To test Hypothesis 1, analyses included calculating the percentages of elementary and secondary teachers who were HQTs across school level, urbanicity, minority student population, and core subject areas. Results were presented in table form as frequencies and percentages. Differences in the frequencies were assessed using the Chi Square tests. The magnitude of the relationship was determined using Cramer’s V tests. To interpret Cramer’s V, 0.30 represents a small effect magnitude, 0.30-.050 represents a medium effect magnitude, and any magnitude of a Cramer’s V greater than 0.50 is considered a large effect size. To test Null Hypothesis 1, differences and relationship were considered statistically significant at a threshold of p < .05. Table 4 links the independent (IV), dependent (DV), and control variables (covariates) to the statistical analysis to test Hypothesis 1, Hypothesis 2, Hypothesis 3.
Table 4

*Statistical Analysis for Testing Hypotheses*

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>IV</th>
<th>Covariates</th>
<th>DV</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null H1: There is no difference in the proportion of highly qualified teachers between elementary and secondary levels</td>
<td>School Level, Urbanicity, minority student population, and core subject area</td>
<td>HQT Status</td>
<td>Chi Square Cramer’s V</td>
<td></td>
</tr>
<tr>
<td>Null H2: Teacher characteristics do not significantly predict HQT status after controlling for school context</td>
<td>Teacher age, gender, ethnicity, total years of teaching, certification, STEM for Bachelors</td>
<td>Urbanicity, minority student population, F/R Lunch %, school size, school location</td>
<td>HQT Status</td>
<td>Logistic Regression</td>
</tr>
<tr>
<td>Null H3: HQ status is not significantly related to job satisfaction or job commitment after controlling for teacher and school characteristics</td>
<td>HQT Status</td>
<td>Teacher Level: age, gender, ethnicity, total years of teaching, certification, BA degree</td>
<td>Job Satisfaction or Job Commitment</td>
<td>Hierarchal Linear Modeling</td>
</tr>
</tbody>
</table>
Research question 2. What teacher characteristics predict HQT status after controlling for school context?

Null hypothesis 2. Teacher characteristics do not significantly predict HQT status after controlling for school context.

Hypothesis 2 was assessed using logistic regression analysis, with HQT status serving as the dichotomous dependent variable, and with teacher characteristics serving as the predictor variables (age, gender, ethnicity, total years of teaching, certification, Bachelors degree, teacher levels), and with school context variables (% of minority students, F/R Lunch %, school size, school location) serving as control variables. Null Hypothesis 2 was rejected if and only if, above any effects of school context variables, teacher characteristics are significantly predictive of HQT status at a statistical significance threshold of p < .05.

Research question 3. Is HQT status related to job satisfaction or job commitment after controlling for individual and school characteristics?

Null hypothesis 3. HQT status is not significantly related to job satisfaction or job commitment after controlling for individual and school characteristics.

Null Hypothesis 3 was tested using Hierarchal Linear Modeling (HLM). Hierarchal Linear Modeling (HLM) was chosen because the goal of the analysis is to determine whether HQT status is significantly related to (predictive of) either job satisfaction or job commitment, while accounting for individual level teacher variables and school level variables. For the analysis to assess Hypothesis 3, HQT status served as the dichotomous predictor (independent variable), and with two levels of HLM control variables: at the individual level, teacher control variables include age, gender, ethnicity,
total years of teaching, certification, BA degree, teacher levels). At the school level, context control variables included percentage of minority students, F/R Lunch percentage, school size, and school location. The HLM dependent variable was either job satisfaction or job commitment, conducted in parallel analyses because these dependent variables represent two parallel sub-hypotheses. Null Hypothesis 3 was rejected if and only if, above any effects of school context variables or teacher characteristics, HQT status is significantly predictive of job satisfaction or of job commitment, at a statistical significance threshold of $p < .05$.

Sample Size and Power of the Study

Sample size was determined based on three criteria: tests of power, the relationship between the number of predictors and sample size in regression, and the availability of sample. For multiple linear regression analysis, power depends on the two factors: the number of independent variables that were used in the regression and the sample size. Calculations using G Power (Buchner, Erdfelder, & Faul, 1997) statistical software revealed that, assuming a 95% confidence interval, a moderate effect size ($f^2 = .15$), and 15 independent variables were included in each regression, statistically significant results would be obtained 80% of the time ($Power = .80$) with as few as 132 participants. Green (1991) suggests the minimum sample size for regression is 50 plus 8 times the number of predictor variables. For this study, Green's minimum would be $50 + 8(15 \text{ predictors}) = 50 + 120 = 170$. The available sample population for this study 34,270, which exceeds the minimum sample size required by statistical tests of power and by Green's formula. For these reasons, the sample size is adequate for the proposed study.
Compliance with Ethical Guidelines

After the successful defense of the research proposal, all proper documentation was sent to the Human Subjects Institutional Review Board (HSIRB, see Appendix B). The HSIRB is comprised of a committee that exists to protect human subjects and requires students to submit their research proposal for review (Western Michigan, 2011). Because this proposal is based on secondary data, there is no human contact. Confidentiality is assured because no names are associated with the data; only research codes were used at all phases of the study.
CHAPTER IV

RESULTS

The purpose of this study was to answer three questions: (1) What are the percentages and patterns of distribution of HQTs in American public schools at the secondary and elementary levels in 2007-2008? (2) What teacher characteristics predict HQT status after controlling for school context? and (3) Is HQ status related to job satisfaction or job commitment after controlling for individual and school characteristics? The measurement instrument adopted for this study is a large-scale survey that is administered to a representative sample of American Teachers—the 2007-2008 SASS Public Schools Teachers Questionnaires. HQ status was defined under NCLB and the criteria set forth in Lu (2005; Table 4, p. 71).

Research Question 1

What are the percentages and patterns of distribution of HQTs in American public schools at the secondary and elementary levels in 2007-2008?

Research Question 1 asked, “What are the percentages and patterns of distribution of HQTs in American public schools at the secondary and elementary levels in 2007-2008?”

Null Hypothesis 1: There is no difference in the proportion of highly qualified teachers between elementary and secondary levels.

To test Hypothesis 1, the percentages of elementary and secondary teachers who were HQTs across school level, urbanicity, minority student population, and core subject
areas were calculated using the 2007-2008 SASS database. Chi Square was utilized to test for statistical significance and the effect magnitude was estimated using Cramer's V. Differences were considered statistically significant at a threshold of $p < .05$.

Null Hypothesis 1 was rejected. Within Elementary school teachers, 91% were Highly Qualified Teachers (HQTs) compared to 88% of Secondary school teachers. This difference was statistically significant, $X^2 (df = 1) = 66.6, p < .001$, although the effect size was small (Cramer's V = 0.04) (see Table 5).

Table 5

*Elementary and Secondary Public School Teachers Classified as Highly Qualified (2007-2008)*

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Elementary</th>
<th>Secondary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>17,610*</td>
<td>16,660</td>
<td>34,270</td>
</tr>
<tr>
<td>HQT%</td>
<td>90.9%</td>
<td>88.3%</td>
<td>89.6%</td>
</tr>
<tr>
<td>Chi Sq</td>
<td>66.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>&lt;.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cramer's V</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*All counts have been rounded to the nearest ten per NCES's rule of using restricted data.

Secondary Question 1.2: *Is there an association between the phenomenon of HQT and school location?*

Table 6 reveals that suburban schools had a higher HQT rate among Elementary and Secondary teachers compared to rural and urban schools. While these effects were statistically significant at the elementary level ($X^2 (df = 2) = 45.1, p < .001$) and at the secondary level ($X^2 (df = 2) = 10.9, p < .01$) teachers, the effect sizes were small (Cramer's V = 0.02 for the elementary; 0.05 for the secondary).
Table 6

**Distribution of HQ Teachers across Urban, Suburban, and Rural Public Schools (by the Whole Sample, the Elementary Level, and the Secondary Level, 2007-2008)**

<table>
<thead>
<tr>
<th>Level</th>
<th>Urban %</th>
<th>Suburban %</th>
<th>Rural %</th>
<th>Total %</th>
<th>X^2</th>
<th>p</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>88.1%</td>
<td>90.4%</td>
<td>89.5%</td>
<td>89.6%</td>
<td>41.7</td>
<td>&lt;.001</td>
<td>0.03</td>
</tr>
<tr>
<td>Elementary</td>
<td>88.6%</td>
<td>91.8%</td>
<td>91.5%</td>
<td>90.9%</td>
<td>45.1</td>
<td>&lt;.001</td>
<td>0.05</td>
</tr>
<tr>
<td>Secondary</td>
<td>87.6%</td>
<td>89.0%</td>
<td>87.4%</td>
<td>88.3%</td>
<td>10.9</td>
<td>0.004</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Secondary Question 1.3: *Is there an association between the phenomenon of HQT and rate of minority students?*

No clear pattern was evident between HQTs and rate of minority students (Table 7).

Table 7

**Distribution of Highly Qualified Teachers across School Levels (Whole Sample, the Elementary Level, and the Secondary Level) with Categories of Minority Students, 2007-2008**

<table>
<thead>
<tr>
<th>Level</th>
<th>&lt;5%</th>
<th>5-19%</th>
<th>20-49%</th>
<th>50+%</th>
<th>Total</th>
<th>X^2</th>
<th>p</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>88.1%</td>
<td>90.4%</td>
<td>89.5%</td>
<td>89.5%</td>
<td>89.6%</td>
<td>14.23</td>
<td>.003</td>
<td>0.02</td>
</tr>
<tr>
<td>Elementary</td>
<td>88.6%</td>
<td>91.8%</td>
<td>91.5%</td>
<td>91.5%</td>
<td>90.9%</td>
<td>10.34</td>
<td>.016</td>
<td>0.02</td>
</tr>
<tr>
<td>Secondary</td>
<td>87.6%</td>
<td>89.0%</td>
<td>87.4%</td>
<td>87.4%</td>
<td>88.3%</td>
<td>6.71</td>
<td>.082</td>
<td>0.02</td>
</tr>
</tbody>
</table>

At the elementary level, the HQT rates were lowest for schools with <5% minority enrollment, followed by schools with 20-49% or 50+% minority enrollment, and the highest for schools with 5-19% minority enrollment. While this difference at the elementary level was statistically significant, $X^2 (df = 3) = 10.3$, $p < .02$, the effect size
was small ($V = 0.02$). At the secondary level, percentages of HQTs were not significantly different across categories expressing the rate of minority students ($p > 0.05$) (Table 7).

Secondary Question 1.4: What are the percentages of teachers who are HQ in their main teaching assignments at the secondary level?

Table 8 reveals that HQTs varied significantly by Main teaching Assignment within secondary teachers ($X^2 (df = 9) = 279.8, p < .001; V = 0.12$). The highest HQT rates were measured in English & Language Arts (92%), Natural Sciences (92%) and in Mathematics & Computer Science (91%). Vocational, Career, & Technical had the lowest HQT rate (80%).

Table 8

<table>
<thead>
<tr>
<th>Subject Areas</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts &amp; Music</td>
<td>1,200</td>
<td>88.3</td>
</tr>
<tr>
<td>English &amp; Language Arts</td>
<td>3,150</td>
<td>91.9</td>
</tr>
<tr>
<td>ESL</td>
<td>200</td>
<td>89.7</td>
</tr>
<tr>
<td>Foreign Language</td>
<td>770</td>
<td>88.1</td>
</tr>
<tr>
<td>Health</td>
<td>1,150</td>
<td>85.6</td>
</tr>
<tr>
<td>Mathematics &amp; Computer Science</td>
<td>2,700</td>
<td>90.9</td>
</tr>
<tr>
<td>Natural Sciences</td>
<td>1,980</td>
<td>90.1</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>2,140</td>
<td>91.6</td>
</tr>
<tr>
<td>Vocational, Career, &amp; Technical</td>
<td>1,480</td>
<td>79.8</td>
</tr>
<tr>
<td>Misc/Other</td>
<td>1,880</td>
<td>83.4</td>
</tr>
<tr>
<td>Overall</td>
<td>16,650</td>
<td>88.4</td>
</tr>
</tbody>
</table>

| Chi Square                        | 279.84 |
| $p$                                | <.001  |
| Cramer's V                         | 0.12   |
Secondary Question 1.4.1: *Among those who teach English as their main assignment at the secondary level, what percentages of them are HQ?*

No significant differences were detected among categories of main assignment within English language arts secondary teachers in percentage of HQTs, $X^2$ (df = 6) = 11.8, $p = .07$; $V = 0.06$. HQTs ranged from 85% for Composition teachers to 93% for LA teachers (Table 9).

Table 9

*Distribution of Highly Qualified Secondary Public Teachers by Main Teaching Assignment in Language Arts, 2007-2008*

<table>
<thead>
<tr>
<th>Subject Areas</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>40</td>
<td>87.2</td>
</tr>
<tr>
<td>Composition</td>
<td>20</td>
<td>84.6</td>
</tr>
<tr>
<td>English</td>
<td>1,560</td>
<td>91.6</td>
</tr>
<tr>
<td>LA</td>
<td>1,050</td>
<td>93.1</td>
</tr>
<tr>
<td>Reading</td>
<td>420</td>
<td>89.3</td>
</tr>
<tr>
<td>Speech</td>
<td>30</td>
<td>86.1</td>
</tr>
<tr>
<td>Overall</td>
<td>16,620</td>
<td>88.4</td>
</tr>
</tbody>
</table>

Chi Square   11.83

$p$ .067

Cramer's V 0.06

Secondary Question 1.4.2: *Among those who teach Math as their main assignment at the secondary level, what are the percentages which are HQ?*
No significant differences were detected among categories of main assignment within Math secondary teachers in percentage of HQTs, $X^2 (df = 10) = 10.6, p = .34; V = 0.06$. HQTs ranged from 87% for Computer Science teachers to 95% for Calculus and Pre-calculus teachers (Table 10).

Table 10

Distribution of Highly Qualified Secondary Public Teachers by Main Teaching Assignment in Mathematics, 2007-2009

<table>
<thead>
<tr>
<th>Subject Areas</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algebra I</td>
<td>640</td>
<td>90.1</td>
</tr>
<tr>
<td>Algebra II</td>
<td>260</td>
<td>90.5</td>
</tr>
<tr>
<td>Algebra III, Business and Applied Mathematics,</td>
<td>80</td>
<td>94.8</td>
</tr>
<tr>
<td>and Statistics and Probability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic and General Mathematics</td>
<td>680</td>
<td>90.5</td>
</tr>
<tr>
<td>Calculus and Pre-calculus</td>
<td>170</td>
<td>95.4</td>
</tr>
<tr>
<td>Computer Science</td>
<td>110</td>
<td>87.0</td>
</tr>
<tr>
<td>Geometry</td>
<td>330</td>
<td>92.5</td>
</tr>
<tr>
<td>Pre-Algebra</td>
<td>380</td>
<td>90.8</td>
</tr>
<tr>
<td>Trigonometry</td>
<td>40</td>
<td>87.8</td>
</tr>
<tr>
<td>Overall</td>
<td>2,690</td>
<td>90.9</td>
</tr>
</tbody>
</table>

Chi Square: 10.63

$p$ = 0.34

Cramer's V = 0.06
Secondary Question 1.4.3: Among those who teach Natural Science as their main assignment at the secondary level, what percentages of them are HQ?

Table 11 reveals that percentages of HQTs varied significantly by Natural Science teaching assignment within secondary teachers ($X^2$ (df = 6) = 24.7, p < .001; V = 0.11). The highest HQT rates were measured in Chemistry (94%) and in Biology or Life Sciences (92%). General Science had the lowest HQT rate (85%).

Table 11

*Distribution of Highly Qualified Secondary Public Teachers by Main Teaching Assignment in Natural Sciences, 2007-2008*

<table>
<thead>
<tr>
<th>Subject Areas</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Science</td>
<td>400</td>
<td>84.8</td>
</tr>
<tr>
<td>Biology or Life Sciences</td>
<td>690</td>
<td>92.4</td>
</tr>
<tr>
<td>Chemistry</td>
<td>260</td>
<td>93.5</td>
</tr>
<tr>
<td>Earth Sciences</td>
<td>190</td>
<td>89.6</td>
</tr>
<tr>
<td>Integrated Science</td>
<td>120</td>
<td>91.4</td>
</tr>
<tr>
<td>Physical sciences</td>
<td>240</td>
<td>90.5</td>
</tr>
<tr>
<td>Physics</td>
<td>90</td>
<td>86.3</td>
</tr>
<tr>
<td>Overall</td>
<td>1,990</td>
<td>90.1</td>
</tr>
</tbody>
</table>

Chi Square 24.71

p <.001

Cramer’s V 0.11
Secondary Question 1.4.4: Among those who teach Social Sciences as their main assignment at the secondary level, what percentages of them are HQ?

Table 12 reveals that percentages of HQTs varied significantly by Social Sciences teaching assignment within secondary teachers ($X^2$ (df = 7) = 25.5, $p < .001; V = 0.10$). The highest HQT rates were measured in Sociology (100%). Psychology had the lowest HQT rate (90%). Note that all included Social Sciences teaching assignment categories were at or in excess of 90% HQTs.

Table 12

<table>
<thead>
<tr>
<th>Distribution of Highly Qualified Secondary Public Teachers by Main Teaching Assignment in Social Sciences, 2007-2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Areas</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Social studies, general</td>
</tr>
<tr>
<td>Anthropology</td>
</tr>
<tr>
<td>Economics</td>
</tr>
<tr>
<td>Geography</td>
</tr>
<tr>
<td>Government or civics</td>
</tr>
<tr>
<td>History</td>
</tr>
<tr>
<td>Psychology</td>
</tr>
<tr>
<td>Sociology</td>
</tr>
<tr>
<td>Overall</td>
</tr>
<tr>
<td>Chi Square</td>
</tr>
<tr>
<td>$p$</td>
</tr>
<tr>
<td>Cramer’s V</td>
</tr>
</tbody>
</table>
Summary of Research Question 1

Null Hypothesis 1 was rejected because secondary teachers had a significantly lower proportion of highly qualified teachers than elementary teachers. Further, suburban teachers, teachers of in English & Language Arts, Natural Sciences and in Mathematics & Computer Science, had high rates of HQ. All participating sub-groups of main teaching assignments within the Social Sciences have 90% or greater HQTs. The lowest HQ rates were in the Vocational, Career, & Technical, main areas of teaching. Combined, these finding indicate that the majority of participating teachers were HQ, and that there are significant differences in the rate of HQ teachers between elementary and secondary levels of teaching and among areas of teaching.

Research Question 2

Research Question 2 asked, “What teacher characteristics predict HQT status after controlling for school context?”

Null Hypothesis 2: Teacher characteristics do not significantly predict HQT status after controlling for school context.

Hypothesis 2 was assessed using logistic regression analysis, with HQT status serving as the dichotomous dependent variable, and with teacher characteristics serving as the predictor variables (age, gender, ethnicity, total years of teaching, certification, Bachelor’s degree in STEM vs in other areas, teacher levels), and with school context variables (% of minority students, % F/R Lunch, school size, school location) serving as control variables.

Null Hypothesis 2 was rejected because teacher characteristics were significantly predictive of HQT status above the effects of school context variables. Overall, 89.9 % of
teachers were correctly classified in HQT status using only teacher demographics and school characteristics as predictor variables (Table 13), which was statistically significant, \( X^2 (df = 11) = 1581, p < .001 \). It is important to note that HQ status was coded as Qualified and Unqualified (UNC) such that Qualified = 1 and Unqualified = 2, so positive beta slopes in the logistic regression results in Table 13 indicate increases in UNC status and negative slopes indicate positive prediction of Qualified status.

### Teacher Characteristics

Some Teacher Characteristics were significant predictors of HQT status, including Age, Gender, Total Years of Teaching Experience, Education level (Bachelor’s Degree in STEM vs. in other areas), teaching level (Secondary vs. Elementary), and certification. Ethnicity was not significantly predictive of HQT status Table 13).

**Age.** Age was significantly predictive of HQT status \( (p < .001) \), such that increasing age by one year reduced the odds ratio of being UNQ by 1% \((1 - .991)\). This finding was not consistent with Null Hypothesis 2.

**Gender.** Gender was significantly predictive of HQT status \( (p < .001) \), such that the odds ratio for being UNC was 24% higher for males \((1.244, \text{Table } 13)\). This finding was not consistent with Null Hypothesis 2.
Table 13

Logistical Regression Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Effects SE</th>
<th>Exponent</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.009</td>
<td>0.002</td>
<td>0.991</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Male (vs. Female)</td>
<td>0.219</td>
<td>0.041</td>
<td>1.244</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>White, Non-Hispanic (vs. Other)</td>
<td>0.03</td>
<td>0.048</td>
<td>1.03</td>
<td>0.54</td>
</tr>
<tr>
<td>Total Years of Teaching Experience</td>
<td>-0.01</td>
<td>0.003</td>
<td>0.991</td>
<td>0.001</td>
</tr>
<tr>
<td>Bachelor’s Degree in STEM (vs. Bachelor’s Degree in other areas)</td>
<td>-0.161</td>
<td>0.053</td>
<td>0.851</td>
<td>0.002</td>
</tr>
<tr>
<td>Secondary (vs. Elementary)</td>
<td>0.197</td>
<td>0.042</td>
<td>1.218</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Advanced/regular/probationary certification (vs. all other)</td>
<td>-1.67</td>
<td>0.046</td>
<td>0.188</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Urban (vs. Suburban)</td>
<td>0.119</td>
<td>0.054</td>
<td>1.126</td>
<td>0.028</td>
</tr>
<tr>
<td>Urban (vs. Rural)</td>
<td>-0.128</td>
<td>0.049</td>
<td>0.88</td>
<td>0.01</td>
</tr>
<tr>
<td>Minority Student Enrollment (x100)</td>
<td>-0.007</td>
<td>0.003</td>
<td>0.993</td>
<td>0.037</td>
</tr>
<tr>
<td>% Free/reduced lunch</td>
<td>-0.002</td>
<td>0.001</td>
<td>0.998</td>
<td>0.014</td>
</tr>
<tr>
<td>Nagelkerke R Square</td>
<td>0.085</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall &amp; correct prediction</td>
<td>89.9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ethnicity.** Ethnicity was not significantly predictive of HQT status \( (p = .54, \text{Table 13}) \). This finding failed to reject Null Hypothesis 2.

**Total Years of Teaching.** Total Years of Teaching was significantly predictive of HQT status \( (p < .001) \), such that increasing teaching years by one year reduced the odds ratio of being UNQ by 1% \( (1 - .991) \). This finding was not consistent with Null Hypothesis 2.

**Certification.** Having an advanced, regular, or provisional certification will
decreased the odds ratio of being UNQ teacher by 81% (1 - .188) \( (p < .001) \). This finding was not consistent with Null Hypothesis 2.

*Bachelor’s Degree in STEM vs. in Other Areas.* Having a STEM degree for bachelor’s education decreased the odds ratio of UNQ by 15%, which was statistically significant \( (p < .002) \). This finding was not consistent with Null Hypothesis 2.

*Teaching Levels.* Compared to Secondary teachers, being an Elementary teacher increased the odds ratio of UNQ by 21.8% \( (p < .001) \). This finding was not consistent with Null Hypothesis 2.

**Summary of Research Question 2**

Null Hypothesis 2 was rejected because teacher characteristics were significantly predictive of HQT status above the effects of school context variables. In general, the status of HQTs was associated with (a) older teachers, (b) male teachers, (c) experienced teachers, (d) having a Bachelor’s degree in STEM vs. in other area, and (e) teacher with advanced, regular or provisional certification. A finding of note within the category of school characteristics is the percent of minority student enrollment; the higher the percentage of minority students corresponds with a higher percentage of highly qualified teachers \( (p < .037) \). This finding appears to contradict the literature.

**Research Question 3**

Research Question 3 asked, "Is HQ status related to job satisfaction or job commitment after controlling for individual and school characteristics?"  

Null Hypothesis 3: HQ status is not significantly related to job satisfaction or job commitment after controlling for individual and school characteristics
Null Hypothesis 3 was tested using Hierarchal Linear Modeling (HLM). Hierarchal Linear Modeling (HLM) was chosen because the goal of the analysis is to determine whether HQT status is significantly related to (predictive of) either job satisfaction or job commitment, while accounting for individual teacher level variables and school level variables.

To test Hypothesis 3, HQT status served as the dichotomous predictor independent variable. Two levels of HLM control variables we included: individual teacher level control variables and school level, context control variables. At the individual level, the teacher control variables were age, gender, ethnicity, total years of teaching, certification, BA degree in STEM vs in other areas, and teaching levels (Secondary vs. Elementary). At the school level, context control variables include % of minority students, % Free/Reduced Lunch, school size, and school location.

The HLM dependent variable was either job satisfaction (Hypothesis 3a) or job commitment (Hypothesis 3b), conducted in parallel analyses because these dependent variables represent two parallel sub-hypotheses. Null Hypothesis 3 was rejected if and only if, above any effects of school context variables or teacher characteristics, HQT status is significantly predictive of job satisfaction or of Job Commitment, tested at a statistical significance threshold of p < .05.

**Job Satisfaction**

HQT status was significantly predictive of Teachers’ Overall job satisfaction (p < .03) above any effects of school context variables or teacher characteristics, such that UNQ were less satisfied than HQTs. This finding was not consistent with Null Hypothesis 3a.
Table 14

HLM Results of the Conditional Model Regarding the Impact of HQT Status on Teachers’ Overall Job Satisfaction after Controlling for Teacher Demographics and School Characteristics

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Coefficient</th>
<th>SE</th>
<th>T-Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
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<td>Bachelor’s Degree in STEM vs. in Other areas</td>
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<tr>
<td>% Free/reduced lunch</td>
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<td>Within-School Variability</td>
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Within this HLM model, significant teacher control variables included Age ($p < 0.001$), Secondary (vs. Elementary) ($p < 0.001$), and certification ($p = 0.003$). Age was
significantly predictive of Teachers’ Overall job satisfaction, such that older teachers were more satisfied. Elementary teacher and teachers without Advanced/regular/probationary certification were more satisfied. Non-significant teacher control variables included Total Experience, gender, Ethnicity, and Bachelor’s Degree (each $p > 0.05$). Within school level control variables, lower satisfaction was associated with higher percentage of minority students ($p < 0.001$), larger schools ($p < 0.001$), and higher percent free or reduced lunch ($p < 0.001$). Table 14 shows the coefficients for the fixed effects and the random effects in the HLM model predicting Teachers’ Overall job satisfaction.

**Job Commitment**

HQT status was not significantly predictive of Teachers’ job commitment above any effects of school context variables or teacher characteristics, but the relationship trended ($p = .09$) such that UNC were somewhat less committed. This finding failed to reject Null Hypothesis 3b.

Within this HLM model, significant teacher control variables included Age ($p < 0.001$), Secondary (vs. Elementary) ($p < 0.005$), Total Teaching Experience ($p < 0.005$), certification ($p < 0.001$), and holding a Bachelor’s Degree in STEM vs. in other areas ($p < 0.02$). Age was significantly predictive of Teachers’ Overall job commitment, such that older teachers were more committed. Elementary teachers, teachers with less Total Teaching Experience, teachers without Advanced/regular/probationary certification, and teachers without a Bachelor’s Degree in STEM were more committed.
Table 15

**HLM Results of the Conditional Model Regarding the Impact of HQT Status on Teachers’ Overall Job Commitment after Controlling for Teacher Demographics and School Characteristics**

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<td>Advanced/regular/probationary certification (vs. all others)</td>
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<td>Bachelor’s Degree</td>
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<td>Random Effects</td>
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<tr>
<td>Percentage of Minority Student</td>
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<td>&lt;.001</td>
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<td>.777</td>
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<td>% Free/reduced lunch</td>
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<td>Within-School Variability</td>
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<td>.48243</td>
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Non-significant teacher control variables included, Ethnicity (p > 0.05). Within school level control variables, lower satisfaction was associated with higher percentage of
minority students (p < 0.001) and higher percent free or reduced lunch (p < 0.001).

School size was not significantly predictive of commitment. Table 15 shows the
coefficients for the fixed effects and the random effects in the HLM model predicting
Teachers' Overall job commitment.

Summary of Research Question 3

Hypothesis 3 findings were equivocal. Null Hypothesis 3a was rejected because
HQT status was significantly predictive of Teachers' Overall job satisfaction above any
effects of teacher characteristics and school context variables. However, Null Hypothesis
3b was not rejected because HQT status was not significantly predictive of Teachers’
Overall job commitment above any effects of teacher characteristics and school context
variables.

Summary of Results

The present study of 36,710 elementary and secondary teachers revealed that the
majority had Highly Qualified (HQ) status. Unqualified (UNC) rates varied significantly
by teaching level and by main teaching assignment. These findings rejected Null
Hypothesis 1. Furthermore, some teacher characteristics were significantly predictive of
HQT status above and beyond the effects of school context variables, findings which
rejected Null Hypothesis 2. HQT status was predictive of job satisfaction above and
beyond the effects of teacher and school context variables, which was not consistent with
Null Hypothesis 3a, but no relationship was found between HQT status and job
commitment, consistent with Null Hypothesis 3b.

These findings suggest that, in general, older teachers, male teachers, experienced
teachers, and teachers holding a Bachelor's degree in STEM or an advanced, regular, and
provisional certificate had higher rates of HQ, as did teachers of English & Language Arts, Natural Sciences, Mathematics & Computer Science, and Social Science, but not teachers with Vocational, Career, & Technical as their main assignment. HQ status appears to be related to job satisfaction, but not to job commitment.
CHAPTER V
DISCUSSION

The No Child Left Behind Act of 2002 (NCLB) mandates that all teachers are high quality teachers (HQTs), "...to ensure that all children have a fair, equal, and significant opportunity to obtain a high-quality education and reach, at a minimum, proficiency on challenging State academic achievement standards and state academic assessments" (PL 107-110, 2001, p. 115). NCLB requires that HQTs obtain at least a bachelor’s degree, a full state certificate, demonstrate competence in each academic subject in which the teacher teaches, and have a major in the classes taught in the main teaching assignment.

While fostering teacher qualifications is important, we do not have a full picture about the percentage of HQTs along various variables; we know even less about the relationship between HQT status, on one hand, and teacher job commitment and teacher job satisfaction, on the other. Feeling prepared, committed, and satisfied is one of the possible indicators of teacher effectiveness (Lewis et al., 1999), so it is crucial that we understand commitment and satisfaction to help inform stakeholders, policymakers, and teacher leaders towards fostering the mandates of NCLB.

For these reasons, the present study was designed to answer three questions: (1) What are the percentages and patterns of distribution of HQTs in American public schools at the secondary and elementary levels in 2007-2008?; (2) What teacher characteristics predict HQT status after controlling for school context?; and (3) Is HQ
status related to job satisfaction or job commitment after controlling for individual and school characteristics? This chapter begins with a summary of results, organized by hypothesis. For each hypothesis, the evaluation of the null hypothesis is followed by brief details of the why the null hypothesis was or was not rejected. The general discussion section includes interpretation of present findings and a reflection of how present findings fit with the findings of others in the context of theory.

Summary of Results

Research Question 1

“What are the percentages and patterns of distribution of HQTs in American public schools at the secondary and elementary levels in 2007-2008?”

Null Hypothesis 1

There is no difference in the proportion of highly qualified teachers between elementary and secondary levels.

Percentages of HQTs varied significantly by teaching level and by main teaching assignment. These findings rejected Null Hypothesis 1. Null Hypothesis 1 was rejected because secondary teachers had a significantly lower proportion of highly qualified teachers than elementary teachers did. Further, suburban teachers, teachers in English & Language Arts, Natural Sciences and in Mathematics & Computer Science, had high rates of HQTs. All participating sub-groups of main teaching assignments within the Social Sciences had 90% or greater HQTs. The lowest HQ rates were in the Vocational, Career, & Technical main areas of teaching where the percentage is 83.4%. All these findings indicate that the majority of participating teachers were HQ, and that there are
significant differences in the rate of HQ teachers between elementary and secondary levels of teaching and among areas of teaching.

**Research Question 2**

"What teacher characteristics predict HQT status after controlling for school context?"

**Null Hypothesis 2**

Teacher characteristics do not significantly predict HQT status after controlling for school context.

Null Hypothesis 2 was rejected because some teacher characteristics were significantly predictive of HQT status above and beyond the effects of school context variables. Age, gender, total years of teaching, certification status, and teaching level were each significantly predictive of HQT status. Logistic regression analysis revealed that older teachers were more likely to be HQTs, as were teachers with more teaching experience, female teachers, and teachers with advanced, regular or provisional certification. Secondary teachers were significantly less likely than elementary teachers to be HQTs. While ethnicity was not significantly predictive of HQT status, these findings were not consistent with the null hypothesis of no significant prediction of HQT status by Teacher characteristics after controlling for school context. Therefore, Null Hypothesis 2 was rejected.

**Research Question 3**

"Is HQ status related to job satisfaction or job commitment after controlling for individual and school characteristics?"
Null Hypothesis 3

HQ status is not significantly related to job satisfaction or job commitment after controlling for individual and school characteristics.

Hypothesis 3 findings were equivocal. Null Hypothesis 3a was rejected because HQT status was significantly predictive of Teachers’ overall job satisfaction above and beyond any effects of teacher characteristics and school context variables. However, Null Hypothesis 3b was not rejected because HQT status was not significantly predictive of Teachers’ overall job commitment above any effects of teacher characteristics and school context variables.

General Discussion

HQTs: The bottle is half-empty, half-full. NCLB mandates that all teachers be classified as Highly Qualified in the subject they teach by the end of 2005-06 school year (NCLB, 2002), but the present data reveal that this mandate has not yet been fully honored. Present findings indicate roughly 90% of teachers are classified as HQTs. While short of the goals of NCLB, this finding is hopeful, in that Ingersoll (1996) found that many students were taught by out-of-field teachers fifteen years ago, including one-quarter of mathematics students and more than half of physical science students. More recently, Kaplan and Owings (2002) found a substantial percentage of students were taught by teachers who were unqualified in the subject. The present finding of 90% HQTs in the academic year 2007-2008 shows that improvement is being made to foster this mandate of NCLB.

HQTs have a higher level of job satisfaction. Job satisfaction was higher in HQTs than in unqualified teachers (UNQ) in the present study. This finding is important in light
of the findings of the MetLife Survey (2010), which linked decreases in job satisfaction with increased attrition in public school teachers. According to Maslow, fulfillment of the hierarchy of needs pyramid determines a person's satisfaction. The present finding of a significant, positive relationship between HQT status and job satisfaction may suggest that a perceived need is met when HQT status is achieved. However, longitudinal studies that track the job satisfaction of teachers before and after achieving HQT status will be required to test this conjecture.

Because teaching continues to be limited in available extrinsic rewards, improving job satisfaction may improve the teaching quality and sustainability (Lartie, 1975). Herzberg’s Motivation Hygiene Theory suggests that satisfaction is determined by both internal factors (achievement and recognition) and external factors (salary and interpersonal relations). The present finding of a link between HQT status and satisfaction may be reflective of the achievement and recognition (internal factors) that comes with HQT status. It is also possible that salary and interpersonal relations (external factors) change when a teacher becomes a HQT, presenting an open question for future research.

_HQTs are more likely to be found in disadvantaged schools where percentage of minority students and students on free-or-reduced price lunch are higher._ Urban schools show a significant difference between suburban and rural which contradicts previous findings. Several factors may contribute to the apparent shift in findings from previous studies. There are several factors which may have contributed to this apparent shift. Definitions of HQT are influenced by state and not subject to a standardized nationwide definition. Changes in the way HQT is defined by state and/or changes within the
SASS measurement instrument from previous years may have an effect on this finding. Urban schools certainly contend with unique issues specific to their location and population. School teacher selection criteria, time elapse between study findings—especially those predating 2001 (before NCLB), location of districts and the emphasis urban administrations have placed on the HQT issue to work towards 100% compliance are all possible factors influencing the seeking out and hiring of HQTs. There are also factors stemming from changing definition, measurement and accountability of the HQT. However, these factors falls outside of the scope of this dissertation but may prove worthy of future investigation.

**There is no difference between white teachers and minority teachers in regards to HQT.** The public school education world seems to be moving toward ethnic equality in the teaching ranks as indicated by the findings in this study. Further study would illuminate factors affecting this positive trend. Racially neutral assessment, measurement, and accountability procedures are one such group of possibilities. Policy changes regarding racial equity (such as Affirmative Action), increased minority populations entering the teacher ranks, economic trends, and other possible driving forces bear investigation; however, this phenomena falls outside of the scope of this dissertation but may prove to be of value in future studies.

**Areas for Future Research**

For future studies, scholars should consider replicating the present study using additional measures and methodologies to validate the reliability of the present findings. While one of the strengths of the present study was the use of the 2007-2008 SASS Public Schools and Staffing Survey (SASS) Public School Teacher Questionnaire which
yielded a nationally representative sample of public schools teachers, this dataset relies on self-reporting for measures of job satisfaction and job commitment with no behavioral measures included. Future scholars should strive to include multiple measures of important constructs. For example, adding an objective behavioral measure like job retention could provide important insights regarding job satisfaction and job commitment that are not limited by the subjectivity of self-reporting. Further, the present study only included academic year 2007-2008. Future scholars should use multiple years of data whenever possible to guard against making inference that may be due to the particulars of a cohort.

For future studies, scholars should explore the amelioration of the impact of teacher variables on fully achieving the mandates of NCLB. The present study determined that age, gender, total years of teaching, and teaching level were each significantly predictive of HQTs, but this data provides no proof of the causes and no remedy for these disparities. Given the diversity of teachers, future studies will be required to determine how to best foster this NCLB mandate.

For future studies, scholars may choose to investigate the relationship between HQT status and job satisfaction. HQT status was significantly predictive of overall job satisfaction above and beyond any effects of school context variables or teacher characteristics, such that HQTs were more satisfied. However, the present study was cross-sectional and not longitudinal, so it remains unclear whether achieving HQT status causes higher satisfaction or whether teachers who are inherently more satisfied are more likely to achieve HQT status. By using longitudinal design for an appropriate sample of teachers and with appropriate control comparisons, scholars can determine whether
achieving HQT status improves teacher job satisfaction.

HQT status was not predictive of job commitment in the present study. This finding implies that leaders can expect similar commitment amongst HQTs and UNQ alike. However, while the relationship between teacher commitment and qualifications is informative, the present study focused on exploring teacher variables, without regard for differences amongst students. Therefore, the relationship between teacher satisfaction, HQT status, and student outcomes is unclear. Future studies of the predictive value of teacher variables on student outcomes may prove fruitful. Are HQTs actually empirically ‘better’ at teaching than UNQ teachers? And what are the effects of the shift from UNQ teachers to HQTs mandated by NCLB towards improving standardized test scores and graduation rates? Future leaders should look beyond commitment, qualification, and satisfaction to explore teacher quality as inferred from student-based outcomes.

Retention of quality teachers is paramount for every school, school district, county, and state. It is possible that some teachers are particularly gifted at teaching in areas outside of their area of qualification. Future research is needed to determine the optimal path to HQT status for these valuable teachers.

Conclusion

The present study of the 2007-2008 SASS Public Schools and Staffing Survey national data set revealed that HQT status was achieved by 90% of elementary and secondary school teachers. Differences were found amongst teaching specialties, with English & Language Arts, Natural Sciences and in Mathematics & Computer Science showing the highest HQT rates and with Vocational, Career, & Technical main areas of teaching demonstrating the greatest need. Job satisfaction was related to HQT status, but
HQT status and job commitment were statistically independent of each other. Combined, these findings indicate that the mandates of NCLB have not been fully realized, that progress is being made towards 100% HQT status, and that leaders must be aware of teacher characteristics and qualifications to ensure that no child is left behind.
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Appendix A

Descriptive Statistics and Variable Codes
### LEVEL-1 DESCRIPTIVE STATISTICS

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<td>MINENR</td>
<td>Minority Enrollment broken into four categories</td>
</tr>
<tr>
<td>SRLWGHT</td>
<td>School Relative Weight</td>
</tr>
<tr>
<td>ENR100</td>
<td>Student Enrollment / 100</td>
</tr>
<tr>
<td>FRL</td>
<td>Free and Reduced Lunch Percentage</td>
</tr>
</tbody>
</table>
Appendix B

HSIRB Approval Letter
Date: July 19, 2011

To: Jianping Shen, Principal Investigator
Sam Striker, Student Investigator for thesis

From: Amy Naugle, Ph.D., Chair

Re: HSIRB Project Number 11-07-08

This letter will serve as confirmation that your research project titled "Highly Qualified Public School Teacher: Its Status, Distribution, Determinants, and Relationship with Job Commitment and Job Satisfaction" has been approved under the exempt category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may only conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: July 19, 2012