HIGH SCHOOL INFLUENCES ON COLLEGE ENROLLMENT AND COLLEGE GRADUATION OF DALLAS INDEPENDENT SCHOOL DISTRICT 2002 GRADUATES

by

LINDA K. JOHNSON

Presented to the Faculty of the Graduate School of

The University of Texas at Arlington in Partial Fulfillment

of the Requirements

for the Degree of

DOCTOR OF PHILOSOPHY

THE UNIVERSITY OF TEXAS AT ARLINGTON

August 2011

ACKNOWLEDGEMENTS

The passion, intellect, and dedication of my UTA professors guided me through the entire doctoral process. In particular, I would like to acknowledge Dr. Edith J. Barrett, the Chair of my committee. Her two seminal classes opened my eyes to both the realities of and inequity in our policy-making system, and her excellent critiques improved this research project tremendously. Dr. Richard Cole provided inspiring expert understanding of the complex American federal system. Dr. Maria Martinez-Cosio provided knowledge about sociological theories, and invaluable support through both the comprehensive exam and dissertation writing processes.

Due to the generosity of my key Dallas ISD supporter, Dr. Leng Fritsche, I was able to join a small cadre of thinkers under a grant from the Bill & Melinda Gates Foundation. I am especially indebted to Dr. Mike Dryden for his insatiable curiosity and brilliant understanding of patterns (and partial least squares regression). Dr. Dean Spitzer, Dr. Shane Hall, and Dr. Dorothea Weir proved to be the most supportive colleagues. I am incredibly grateful to, and humbled by, the support from college-readiness expert Dr. David Conley and his team.

July 12, 2011

ABSTRACT

HIGH SCHOOL INFLUENCES ON COLLEGE ENROLLMENT

AND COLLEGE GRADUATION OF DALLAS

INDEPENDENT SCHOOL DISTRICT

2002 GRADUATES

LINDA K. JOHNSON

The University of Texas at Arlington, 2011

Supervising Professor: Edith Barrett

The overarching goal for American education under President Barack Obama has been to increase college enrollment and completion rates. The pressure to achieve this goal has been keenly felt in the postsecondary community, especially as federal and state funding have become increasingly tied to achieving higher college completion rates. Yet the adequate preparation of students lies primarily in the secondary system, and the literature contains many statistics that support the view that few students are adequately prepared, especially those who are educated in urban public school systems. The challenge

was to determine actions that can be implemented by school districts that will significantly improve students' ability to enroll in and graduate from college.

This research study examines the college enrollment and graduation rates, and variables linked to those rates, for the class of 2002 of the Dallas Independent School District (Dallas ISD) in order to uncover actions high school leaders can take to improve the college-going behavior of their graduates. The Dallas ISD is the nation's fourteenth largest public school district and has a very high proportion--eighty-seven percent--of low socioeconomic status students. Additionally, nearly one-third of the entire student body of 155,000 is composed of English language learners, the majority of whom were born in Mexico or whose parents were born in Mexico.

The literature suggests that several high school factors are correlated with student success in college. These include student achievement, teacher quality, and the school environment. This study explores policies and practices that a district, or high school, can implement to improve student college preparation. Therefore, while it does provide statistics on student ethnicity for the class of 2002 graduates, the statistical analyses examine actionable variables, including teacher education levels and years of experience, and high school-level factors of percent of students taking advanced courses and college entrance exams.

To explore the college enrollment and graduation rates of the class of 2002 Dallas ISD high school graduates, two types of analysis were conducted. The

first provides descriptive analysis of the 6,509 class of 2002 high school graduates at the student-level. The second approach focuses on the high school as the unit of analysis. Partial least squares path modeling was used to compute the standardized path coefficients for a College Success Model of high school influence on college enrollment and graduation. This study uses SmartPLS, a program developed by Ringle, Wende, and Will (2005). This program for path modeling uses the partial least squares method for latent variable analysis. The latent variables in the model were high school college-going culture, teacher quality, student achievement, college enrollment, and college graduation.

The findings of this study indicate that the high school environment has a significant effect on the future college enrollment and graduation of its students. The College Success Models explain a greater proportion of variance in college enrollment and graduation than any of the predictive factors taken alone. Students in high schools that promote a college-going culture—in particular one with an emphasis on academic rigor—and employ experienced, well-educated teachers were more likely to enroll in and graduate from college. School districts can take action to increase their high schools' college-going cultures and to encourage the professional development and further education of their teachers in pursuit of achieving higher levels of student college success.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

CHAPTER 1

THE PROBLEM

Statement of the Problem

Graduates of urban public high school districts complete postsecondary degrees at low rates as compared to national statistics. Analysis is needed to identify high school factors that increase student postsecondary achievement in order to increase their earnings, and reduce costs for college remediation required by lack of postsecondary preparation. This study examined the effect of high school practices and environments on postsecondary success for the 2002 graduates of the Dallas Independent School District (Dallas ISD).

Background of the Problem

In three July 2010 speeches, U.S. Education Secretary Arne Duncan outlined the White House's call to action about education: "The North Star guiding all our efforts is President Obama's goal that America should once again have the highest college completion rate in the world by the end of the decade….A high school should be a place where all students are prepared with the knowledge and skills necessary to enter postsecondary education and pursue meaningful careers" (Duncan, 2010a). In order to reach this goal, the Secretary declared that "K-12 and higher education must continue to expand their

collaboration" through "development of rigorous college-ready standards…rethinking teacher preparation programs and professional development; and…developing comprehensive cradle-to-career data systems" (Duncan, 2010c). Data systems "…are a vital ingredient of a statewide reform system. But having data isn't enough. It's essential to use data to drive student achievement" (Duncan, 2010b). This research project focuses on K-16 data systems, teacher quality, and college-readiness standards and practices to improve student success in college.

Within the public education community, college readiness is considered to be the equivalent of career readiness. The basis for this equivalency is a 2006 American College Testing (ACT) report that provided evidence that a student's minimum level of attainment of reading and mathematics skills were the same for college success as for workforce training program success (ACT, 2006). ACT's resulting recommendations called for rigorous preparation of all high school students. The ACT report provided the basis for creating high school curricula that meets both college and career readiness (CCR) goals. This study focuses on college readiness and success.

Many public school students who do attend college often require remediation. A June 2010 reports states that the national college readiness gap is "huge" with 75 percent of nonselective two-year college students requiring remediation, as well as nearly half of students enrolled in less selective four-year

colleges (National Center for Public Policy and Higher Education [NCPPHE] & Southern Regional Education Board [SREB], 2010).

The cost of remediation to the student is in tuition and time: remedial classes do not count toward degrees and delay graduation (Alliance for Excellent Education [AEE], 2006 and Kirst & Venezia, 2004). Programs that bridge the education systems between high school and college such as Advanced Placement (AP), dual/concurrent enrollment (Hoffman, 2007), and International Baccalaureate (IB) have only reached a minority of college bound students (Conley, 2005). Consequently, many first year college students are not performing at an adequate level in college and a majority of these students are taking at least one remedial, or developmental education, course (National Center for Education Statistics [NCES], 2004; NCPPHE & SREB, 2010). Of Dallas ISD graduates from 1998 to 2003, only 15.2% had completed any certificate or Associate degree or higher (Hall & Johnson, 2011). According to the 2011 U.S. Statistical Abstract (Table 225), in 2009 the national percentage of adults 25 years and older with a college degree or higher was 29.5%. The disparity of college degree attainment by race and Hispanic origin was marked: 52.3% for Asians, 29.9% for whites, 19.3% for blacks, and 13.2% for Hispanics (NCES, 2011).

There exists a strong connection between the level of education completed and future earnings. The variation in mean earnings by highest degree attained was even more striking when examined by race and ethnicity. As reported in the

2011 U.S. Statistical Abstract (Table 228), in 2008 a Hispanic adult over 18 years of age with only a high school degree had mean earnings of $27,020, as compared to $27,265 for a black adult and $32,126 for a white adult, which was a 15% difference between black and white adults. For adults with some college, but no degree, the mean earnings were $29,610 for Hispanics, $28,570 for blacks, and $33,298 for whites. For those with a Bachelor's degree, the mean earnings were $48,081 for Hispanics, $46,527 for blacks, and $59,866 for whites, or a 22% difference between black and white adults.

Given that college and career readiness is a critical goal of the nation, state, and the Dallas ISD, much needs to be addressed. In particular, the Dallas ISD's ethnically diverse (95.4% ethnic minorities) and poor (87% low socioeconomic status, as defined by participation in the federal free and reduced lunch program) student body is being left far behind in the nation's quest for equitable postsecondary achievement.

Purpose of the Study

The purpose of the study was to identify high school-level factors that both impact student readiness for college and can be affected by school leadership. The variables included in the study, including measures of teacher quality and a high school college-going culture, were selected based on their ability to be implemented by a school. Although controlled for, the analysis does not include factors that cannot be changed by school administrators or teachers

such as student demographics. The dependent variables for college success were defined as enrolling in and graduating from college.

CHAPTER 2

THE REVIEW OF LITERATURE

Background

This research study seeks to identify measurable actions that high school leaders can take to improve the postsecondary educational success of their students. The objectives of this chapter are to examine the literature regarding (a) the history of American public high schools; (b) the importance of college readiness today; (c) alignments between K-12 and higher education systems that aid in preparing students for college; (d) definitions of college readiness; (e) studies that measured attributes of teaching that affect student academic outcomes; (f) definitions of high school college-going cultures; and (g) case studies that measure urban public school district graduates' postsecondary success.

History of American Public High Schools

American public education is closely tied to sentiments expressed by Thomas Jefferson in 1779: "…[I]t is believed that the most efficient means of preventing [tyranny] would be, to illuminate, as far as practicable, the minds of the people at large, and more especially to give them knowledge of those facts, which history exhibiteth…they may be enabled to know…" (NCES, 1993, p. 5).

Eighty-eight years later, in 1867, the federal Department of Education was created with the goal to collect and report the "condition and progress of education" (NCES, 1993) annually to Congress.

The Department of Education's first report in 1870 noted enrollment of seven million children in elementary schools and 80,000 in secondary schools, and that 9,000 college degrees had been awarded. A comparison with the department's 1990 report showing elementary enrollment of 30 million, secondary enrollment of 11 million, and number of college degrees awarded of 1.5 million provides proof of enormous growth in secondary, and consequently postsecondary, enrollment over a 120-year time period. As a percent of elementary enrollment, secondary enrollment grew from just over one percent of elementary enrollment to nearly 37% between 1870 and 1990. College enrollment as a percent of elementary enrollment grew from less than one percent to five percent, but as a percent of high school it grew from 11% to almost 14%--closely tracking the growth in high school enrollment (NCES, 1993).

The proportion of 5- to 19-year-olds enrolled in elementary and secondary schools in the late nineteenth century was just over 50% for whites, and grew from 10% in 1870 to 34% in 1880 for blacks after the Civil War. From 1900 to 1940, the overall enrollment rate rose from 51% to 75% and the difference between white and black enrollment shrunk from 23 points to 7 points. While the enrollment rate for elementary students stabilized at 99% in the twentieth century,

it rose for secondary students from less than 5% in 1890 to 83% in 1950, and to 96% in the late 1980s (Ravitch, 2000). College-going rates also rose along a curve similar to that of high school enrollment: from 1.3% in 1870 to 2.8% in 1910, and to 10% for the first time in 1945-46. College enrollment rates more than doubled from the end of World War II to 22% in 1957, and topped 30% in 1966; 40% in 1975; and 50% in 1989 (NCES, 1993, Table 24).

American educational completion rates have also risen dramatically. One hundred years ago, most adult Americans had only completed eighth grade. Between 1870 and 1910, the high school attainment rate rose from 2% to 9%. In 1940 the rate of high school graduates hit 50% for the first time and rose to 80% for whites and just under 70% for blacks and other races by 1990 (NCES, 1993, Figures 3 and 11, Table 19). College completion rates rose from 5% in 1940 to less than 20% in 1990 (NCES, 1993, Figure 4).

The American educational landscape at the end of the nineteenth century reflected an economy slowly moving away from its agrarian roots to becoming one driven by industrial growth, especially in manufacturing (NCES, 1993). The primary demand of employers was for workers with literacy skills gained in elementary school (Ravitch, 2000). Nearly every community across America had an elementary school, governed by local authorities and in harmony with the values of parents and local churches, but few public high schools (NCES, 1993). For most of the nineteenth century, private academies focused on classical

curriculum and provided most secondary education (Ravitch, 1983). By 1890, however, public high schools outnumbered private schools, 2,526 to 1,632, respectively (NCES, 1993). American goals of equality were just beginning to be realized, especially with the emergence of high schools, a critical rung in the educational ladder between the "gutter and the university" and "Unlike Europe, which was burdened with rigid class barriers, in America it was believed that the public school could enable any youngster to rise above the most humble origins and make good on the nation's promise of equal opportunity for all" (Ravitch, 2000, p. 19).

The lack of a national, organized educational structure during the initial stages of population and economic growth in the late nineteenth century created serious alignment problems between secondary and postsecondary institutions. Individual private and public high schools focused on specific and unique curricula, as did colleges. Colleges each had their own admission standards and exams. The lack of commonality created confusion among all parties, and certainly the students and their families (Ravitch, 1983 and 2000). In 1891 the National Council of Education heard a report from Committee Chairman James Baker, Principal of Denver High School, who stated the need for "uniformity in school programmes and in requirements for admission to college" (NEA, 1894). Baker's committee held a conference in Saratoga, New York, the following year and on July 9, 1892, the National Educational Association, representing

professional educators, appointed a Committee of Ten to create recommendations for improved alignment.

The Committee of Ten was chaired by Harvard president Charles Eliot and included William Harris, Commissioner of Education; presidents of the universities of Colorado, Michigan, Missouri, and Oberlin College; a professor at Vassar College; a principal of the High School of Albany; and headmasters of Lawrenceville School, and Girls' High School and Girls' Latin School of Boston. The Committee of Ten met in November 1892, and determined a list of 11 questions for nine conferences focused on Latin; Greek; English; other modern languages; mathematics; physics, astronomy, and chemistry; natural history; history, civil government, and political economy; and geography to consider. Ninety conference members (47 of whom were connected with postsecondary institutions, 42 with schools, and one government official) met in nine groups in locations across the country in winter 1892, and issued reports by April 1893 (NEA, 1894).

The nine conference committees recommended four "programmes" of study: Classical; Latin-Scientific; Modern Languages; and English. The chief difference between the four was the number of years and type of foreign language required (NEA, 1894, pp. 45-47). Otherwise, the curricula were comprehensive. Committees proposed detailed schedules, including recommendations for minutes of study per subject per day and per week, and even suggestions for Saturday

outdoor classes. All committees recommended enhanced study of topics in elementary school as well (NEA, 1894).

There were three landmark declarations issued by the Committee of Ten. The first was that all students, regardless of their educational destination, should be provided the same education; second, that teachers needed to be more highly trained to achieve this goal (p. 17); and third, that college admission examinations needed to be more uniform (p. 51). The first proclamation of equal access to education was based on all nine committees' unanimous responses to questions 7 and 8: "7. Should the subject [in high school] be treated differently for pupils who are going to college, for those who are going to a scientific school, and those who, presumably, are going to neither?" and "8. At what age should this differentiation begin, if any be recommended?" (NEA, 1894). The response to question 7 was negative and therefore no response was required to question 8. The Committee of Ten wrote in their final report: "Ninety-eight teachers, intimately concerned either with the actual work of American secondary schools, or with the results of that work as they appear in students who come to college, unanimously declare that every subject which is taught at all in a secondary school should be taught in the same way and to the same extent to every pupil so long as he pursues it, no matter what the probable destination of the pupil may be, or at what point his education is to cease" (NEA, 1894, p. 17).

With regard to increased teacher training, the conference committees suggested additional pedagogical and subject matter education. Committees identified three sources for this training: expansion of university "Summer Schools;" local colleges and universities that could provide subject matter programs to local teachers; and well-educated superintendents to instruct their teachers (NEA, 1894, pp. 53-54).

Specific recommendations were made from each of the nine committees in reference to college admission exams. The Committee of Ten's final report requested that "uniform dates" be set (even suggesting days of specific months) for college examinations. Further, the Committee asked other institutions of higher learning, "Schools of Law, Medicine, Engineering, and Technology," to set admission requirements for graduates of "high schools, academies, and preparatory schools" (NEA, 1894, p. 55).

On the one hand, the Committee of Ten's report led to the 1900 creation of the College Examination Board, and its resulting college-preparation syllabi and college admission standardization (Hoffman, Vargas, Venezia, & Miller, 2007), and on the other, the backlash against the Committee's call for reform was immediate and harsh (Ravitch, 1983, 2000). Critics ranged from classicists who opposed the dilution of admission requirements for their respective disciplines, to those who claimed that the report was the "work of aristocrats" suggesting

coursework "too difficult for most students" that would lead to the "overeducation of those bound for the labor force" (Ravitch, 2000, p. 44).

The first two decades of the twentieth century brought many, mostly European, immigrants to America to work in factories (Ravitch, 1983). This rush of immigrants, combined with the rise of the study of public and business administration (Goodnow, 1900; Taylor, 1911; and Wilson, 1887) which relied on a scientific, or measurement-oriented, management philosophy, produced an education emphasis on efficiency, work training, acculturation of immigrants, and the emerging field of psychology, especially under John Dewey's progressive influence (Ravitch, 2000, pp. 51-87).

The effect of the turn-of-the-century changes in American demographics, economic foundations, and the Progressive movement culminated in the 1918 release of the National Education Association's Commission on the Reorganization of Secondary Education report titled "The Cardinal Principles of Secondary Education" (Ravitch 1983, 2000). This Commission was composed chiefly of professors of education. Gone was the Committee of Ten's emphasis on rigorous education for all. In its place were the essentials of what would come to be called "life adjustment" education: the importance of health, citizenship, and family life. It called for differentiated instruction depending upon the future likely occupation of the student (Hoffman, et al., 2007; Ravitch, 1983, 2000).

One new product of the measurement-oriented Progressive Era was the proliferation of intelligence testing (Ravitch, 2000). Originally an outgrowth of the European eugenics movement, intelligence tests were widely used during World War I to efficiently classify 1.7 million recruits (Ravitch, 2000, pp. 132-137). In its first year of release, the National Intelligence Test for third to eighth graders sold more than 400,000 copies. By the mid-1920s four million students were tested annually in order to determine the ideal program of study for each student. Debate about the use of these tests was intense and, as Ravitch points out, the underlying issue was whether one believed in predetermination or that students could learn through "sustained effort by teachers and students" (2000, p. 161).

The issuance of truancy and child labor laws increased enrollment in high schools in the first decades of the twentieth century, placing additional pressure on the accurate assessment of student potential (Ravitch, 1983). Congress enacted the first federal vocational, or manual, education legislation in 1917. At a 1945 U.S. Office of Education conference, Charles Prosser, the first director of the Federal Board for Vocational Education, made opening comments in support of life adjustment education. Known as the Prosser Resolution, his remarks were: "It is the belief of this conference…the vocational school of a community will be able better to prepare 20 percent of its youth of secondary school age for entrance upon desirable skilled occupations; and that the high school will continue to

prepare 20 percent of its students for entrance to college. We do not believe the remaining 60 percent of our youth of secondary school age will receive the life adjustment training they need and to which they are entitled as American citizens—unless and until the administrators of public education with the assistance of the vocational education leaders formulate a similar program for this group" (Ravitch, 1983, pp. 64-65).

High schools continued to offer increasingly differentiated instruction until the 1957 launch of the Russian satellite, Sputnik 1, caused Americans to realize that they were no longer leading international technological advancements (NCES, 1993; Ravitch 2000). Congress passed the National Defense Education Act in 1958 to provide funding for school construction and for higher education students to study math, science, and foreign languages (Brookings, 2000). Admiral Hyman Rickover became a key spokesperson for enhancing American education when he argued that "life in a modern industrialist state demands a great deal more 'book learning' of everyone who wants to make a good living for himself and his family" and that "the average child now needs almost as good an education as the average middle- and upper-class child used to get in the college-preparatory schools" (Ravitch, 2000, p. 362). At the same time the debate continued over whether a high-level of education for all was the American goal as life adjustment proponent and former Harvard president James Conant proclaimed in his best-selling 1959 book, *The American High School Today*, that only 15

percent of high school students had the mental ability to take the rigorous courses recommended by Rickover (Ravitch, 2000, pp. 363-65).

The 1960s in America were marked by increasing racial tensions and the growth of federal powers. The 1954 Supreme Court decision in *Brown v. the Board of Education of Topeka*, the Civil Rights Act of 1964, and the heavily-funded 1965 Elementary and Secondary Education Act (ESEA) shifted more power to the federal government with regard to public education (NCES, 1993). In a 1967 federal report, *The Concept of Equality of Educational Opportunity,* known as the Coleman Report, sociologist James Coleman argued that family environment and classmate-composition heavily influenced academic outcomes (Coleman, 1967; Gamoran & Long, 2006). This report became the basis upon which school-busing to achieve racial school balance was based (Gamoran & Long, 2006). Interestingly, Coleman lamented in 1975 "that court-ordered busing was causing white flight and leading to more racial segregation" (Ravitch, 2000, p. 417).

As America struggled with civil rights issues, post-World War II international education focused on the academic goals espoused by Rickover in the 1950s. In 1983, Secretary of Education Terrell Bell appointed the National Commission on Excellence in Education to address business leaders' concern about the perceived lack of progress being made in American education (National Center for Education Excellence [NCEE], 1983). The Commission's report, *A*

Nation at Risk, spurred states to establish higher academic standards for high school graduation, but adoption of higher standards was uneven (NCEE, 1983).

In 1989 President George H.W. Bush invited the nation's governors to participate in a national summit on education so as to encourage states to set higher academic standards in an effort to compete in the increasingly globalized and technology-based economy (Ravitch, 2010). The resulting National Education Goals Panel's job was to assess progress on agreed upon goals—goals which were in large part written by then Arkansas governor Bill Clinton (Ravitch, 2010). President Clinton's 1997 request to the Republican Congress, however, to authorize voluntary national testing failed (Ravitch, 2010, p. 149).

This goal of national assessment of state education goals was realized in the new administration of President George W. Bush. Days into his presidency, he convened 500 educators to consider an initiative called No Child Left Behind (NCLB). NCLB promised to measure student achievement at the federal level in terms of state-determined and -mandated assessments to achieve 100% proficiency in reading and mathematics by the 2013-14 school year (Ravitch, 2010). States had authority to determine how to stair step annual goals to reach Adequate Yearly Progress (AYP) in pursuit of 100% proficiency. Additionally, states would agree to participate in the National Assessment of Education Progress, a set of federal assessments in reading and math targeting fourth and eighth graders (Ravitch, 2010). In the wake of the September, 11, 2001 disaster,

the legislation passed in the House and Senate quickly, and NCLB was signed into law in January 2002 (Ravitch, 2010).

National assessment of student achievement pushed curriculum standards back into the forefront. The National Governors Association and Achieve, Inc. joined together in 2005 to sponsor the third National Education Summit, this time focused on improving secondary schools (Duncan, 2010a). Microsoft founder and philanthropist Bill Gates delivered a keynote address labeling the American high school "obsolete" and in great need of a curriculum that made the U.S. competitive in the global marketplace (Duncan, 2010a and Hoffman, et al., 2007). Alluding to the curriculum differentiation begun during the Progressive Era, Gates said, "In district after district, wealthy white kids are taught Algebra II while low-income minority kids are taught to balance a check book!" (Ravitch, 2010, p. 206). Gates encouraged governors to set high curricular standards for all students; publish data to assess student progression to college; and provide interventions to failing schools (Ravitch, 2010).

Echoing the goals of the 1894 report from the Committee of Ten, the 2010 Common Core State Standards Initiative—an outcome of the 2005 Summit, and sponsored by the NGA and the Council of Chief State School Officers (CCSSO)—created K-12 curriculum standards for English Language Arts (ELA) and Mathematics in order that all students will be prepared for college and the workforce (Common Core State Standards Initiative [Common Core], 2011). The

standards, developed with primary, secondary, and higher education officials, were based on international best practices to ensure global competitiveness. The NGA and CCSSO received feedback from more than 10,000 people representing civil rights groups, students with disabilities, and teachers. Forty-eight states voluntarily joined to create the standards, and 42 have adopted them (Common Core, 2011). Alaska and Texas did not participate; Texas had previously adopted its own College and Career Readiness Curriculum in 2008 (Texas Higher Education Coordinating Board [THECB], 2008).

Another significant outgrowth of NCLB legislation and the 2005 Summit on high schools was the need to measure student achievement for tens of millions of students each year (Ravitch, 2010). The next two sections investigate the importance of college readiness currently and the need for complex educational data management systems that aspire to tie together K-12 and postsecondary data systems.

Importance of College Readiness Today

In the early years of the twentieth century, less than five percent of high school graduates attended college. Typically, their parents' wealth provided the resources needed for them to receive a college education (Association of American Colleges and Universities [AACU], 2007; Conley, 2005; Kirst & Venezia, 2004). The students who did attend college also received the secondary

education necessary to prepare them for college (National Education Association [NEA], 1894 and NCES 1993).

As the American economy changed from agrarian to industrial to one based on knowledge (NCES, 1993), enrollment in postsecondary education has risen. There has been a 20% increase over the past 30 years in postsecondary enrollment. In 1972, forty-nine percent of high school graduates enrolled in college, and by 2005 this figure had risen to 69%. Despite the rise in college attendance, currently, only about 52% of students enrolled in college ever complete a college degree. Of those who finish a bachelor's degree, only 34% complete it within four years, 64% within six years, and 69% within eight and a half years (Adelman, 2006; Bangser, 2008; Bowen, Chingos, & McPherson, 2009; Darling-Hammond, 2002; Garvey, 2009; Greene & Rivers, 2005; NCES, 2009, 2011).

The rise in college attainment matches the desire of businesses for workers who can compete in a global economy. The lack of adequate preparation for and attainment of a college education affects the country's economy and competitive global standing (National Commission on Excellence in Education [NCEE], 1983 and National Governors Association [NGA], 2011). Carnevale (2007, 2009) points out that support for education lies at the intersection of American domestic welfare and trade policy and business and financial interests. Increased educational attainment spurs economic development and ensures national global

competitiveness (p. 25). In contrast, the American position on the global economic stage, as measured by postsecondary educational attainment, needs improvement. In 2006, the international Organization for Economic Cooperation and Development (OECD) ranked the U.S. twentieth on college degree completion (Bowen, et al., 2009). In 2010, OECD released its third Program for International Student Assessment (PISA) for 15-year-olds in 34 member countries. The U.S. ranked sixth in reading, eighteenth in mathematics, and thirteenth in science literacy (NCES, 2010).

According to a study of 305 employers conducted by the Association of American Colleges and Universities in 2006 and 2007, college graduation is a minimum expectation of employers. The study found a majority of respondents believed half or fewer of recent college graduates had the attributes needed to advance in their companies, and 63% believed recent college graduates could not be successful in the global economy (AACU, 2007). Financial leader Deloitte conducted a 2009 survey to promote postsecondary completion as a measure to unite business and government on improving high schools as a "launch pad" to college and the workforce (Deloitte, 2009).

The increase in college enrollment and attainment has not been equally shared across the American racial and ethnic spectrum. According to a 2009 report of postsecondary enrollment for high school graduates ages 15 to 24, the following were enrolled in, or have graduated from, college: 72% of Asians; 51%

of non-Hispanic whites; 47% of blacks; and 41% of Hispanics (U.S. Census Bureau, 2009).

Two research studies using the National Educational Longitudinal Study (NELS) of 1992 found evidence of disparity among the college success rates for low socioeconomic (SES) and minority students, and noted that the lack of adequate high school preparation reduced college success. Students in the top SES quartile achieve 38% higher rates of college enrollment and 32% higher rates of college graduation. The study also found that black and Hispanic males take longer to graduate than any group: only 26% graduate within four years. Of high SES students, 77% graduate within four years (Bowen, et al., 2009). With regard to secondary college preparation, 78% of highly prepared students complete degrees, compared to 46% who were minimally prepared, and 31% who were not prepared (Chait & Venezia, 2009).

For a large number of minority students, many of whose parents did not attend college (NCES 2004, 2007, 2009), the postsecondary environment is extremely complex, and they lack the social support systems needed to be successful (Cabrera, et al., 2006; Cabrera & La Nasa, 2000, 2001; Choy, Horn, Nunez, & Chen, 2000; Kane & Spizman, 1994; Martinez & Klopott, 2003, 2005; Roderick, 2006). In particular, the nation's 65,000 undocumented students who graduate from high school each year face severe financial hardships as only eleven states, including Texas, allow them access to in-state college tuition and

none qualify for any federal grants or loans. Many high-achieving undocumented high school students are left to pursue employment that does not require the possession of a Social Security number. The DREAM Act (Development, Relief, and Education for Alien Minors) failed again in 2011 to survive its introduction on the Senate and House floors. The DREAM Act was written to allow students who have completed two years of college or military service to become eligible to apply for permanent resident status (Calefati, 2009; Chen, 2005; Conley, 2005).

Another issue facing high school students intent on attending college is the requirement to navigate a multifaceted system. The American educational environment is complex: there are more than 14,000 public school districts and 4,000 postsecondary institutions. Today, nearly 90% of high school students express the desire to attend college (Roderick, Nagaoka, & Allensworth, 2006 and Roderick, 2006). However, researchers have pointed out that many high school students mistakenly see college as an extension of high school and do not understand the varied purposes and opportunities of college, nor how to prepare for the experiences they will encounter (Conley, 2005; Kirst & Venezia, 2004).

In order to have an equitable opportunity to participate in the U.S. and global economic systems, students need to achieve at higher education levels than have yet been attained. Academic improvements in the secondary system can build bridges to college and the workforce, especially for the students who lack

adequate support systems or knowledge of the complexities that lie ahead for them.

Alignment between K-12 and Higher Education Systems

A significant sign of the disconnect between K-12 and higher education systems is the high level of college remediation, or developmental education, necessary for high school students: a 2010 report estimates that 75% of students attending nonselective two-year colleges were enrolled in remedial classes (NCES, 2004, 2009; NCPPHE & SREB, 2010). Many states, including Texas, have K-16 initiatives to bridge the gap between secondary and higher education systems and measures, although these efforts compete with well-established government systems that separate the parties at state levels (Hoffman, et al., 2007; NGA, 2011). As with the 1892 Committee of Ten's thrust (NEA, 1894), K-16 or K-20 initiatives are focused on aligning curriculum between the secondary and postsecondary environments in order to hasten student achievement. The trickle-down effect focuses on elementary and secondary alignment, too (Martinez & Klopott, 2005). The National Postsecondary Education Cooperative (NPEC), a voluntary organization established in 1995 and comprised of key postsecondary education sectors, identified four key transitions and indicators in a 2006 report. They were college readiness, evidenced by educational aspirations and academic preparations; college enrollment, measured by college access and choice; college achievement, assessed by academic performance, and transfer and

persistence rates; and post-college attainment, calculated with post Bachelor's degree enrollment, income achievement, and educational attainment (NPEC, 2006).

The 2005 National Education Summit, cosponsored by Achieve and the National Governors Association, convened political and education leaders to focus on the lack of alignment between high school and postsecondary systems (Hoffman, et al., 2007). Achieve reported five years of findings from the American Diploma Project (which later was absorbed by the Common Core program) which showed that one-third of the three-quarters of high school graduates who attend college require remediation; one-quarter of four-year colleges and nearly half of two-year colleges enrollees do not return after the first year of college; and 40% of recent high school graduates admit they have "significant gaps in the skills they need to succeed" (Hoffman, et al., 2007, p. 82).

A study based on analysis of NELS 2006 data concluded that 72% of low-income students who attended college, 227,000 students nationally, were not adequately prepared—56% were not prepared and 16% were minimally prepared (Hoffman, et al., 2007). Moreover, only 15% of unprepared and 32% of minimally prepared students completed degrees.

The ability to electronically track individual students aids in delivering interventions to promote postsecondary success. In the wake of the 2005 Summit on high schools, ten organizations formed the Data Quality Campaign to

"improve the collection, availability and use of high quality education data" (Data Quality Campaign, 2009). State or local organizations individually implement data collection systems, and "data dashboards" are maintained by the Data Quality Campaign to collect and report state metrics on secondary and postsecondary success. Addressing a 2010 data conference, Education Secretary Duncan stated "You are the people who gather the evidence that guides school reform. You can create the compass that points reform in the right direction…Just five years ago, when the Data Quality Campaign did its first survey, not a single state had all…elements of an effective statewide data system" (Duncan, 2010b).

State longitudinal data systems have grown considerably since the NGA 2005 Summit helped launch the Data Quality Campaign (Hoffman, et al., 2007, pp. 67-71, 239-247). Longitudinal systems are composed of individual Student Unit Record (SUR) systems that "tell us what has happened" to individual students over time, "not why" (Hoffman, et al., 2007, p. 239). In 2010, the State Higher Education Executive Officers (SHEEO) issued a detailed analysis of state data systems. The study named 59 SUR systems in 45 states (including the District of Columbia). The report also identified 64 data elements: 13 K-12, 36 postsecondary, and 15 workforce metrics. Measures include student demographics, academic achievement, financial and physical resource allocation,

and institutional information (State Higher Education Executive Officers [SHEEO], 2010).

Student data systems originally developed in order to gather information needed to comply with NCLB requirements (Hoffman, et al., 2007). The SUR data systems, governed by a variety of educational institutions, were designed to be linked from secondary to postsecondary, "however, few of these designs are finalized, and far too often colleges and university officials are unaware of their existence" yet SUR systems "will be an essential tool for achieving ambitious policy goals for student attainment" (Hoffman, et al., 2007, pp. 239-240, p. 247). The next section explores definitions of college readiness upon which college readiness metrics in the state data systems are based.

Definitions of College Readiness

Given the rise in desire for college attendance (NCEE, 2009; NGA, 2011; Roderick, 2006), there has been a rise in research to define college readiness in the past decade. One of the earliest operational definitions of "college readiness" was calculated by researchers at the NCES. In order to determine the percent of high school graduates ready for college, NCES first defined categories and thresholds along a continuum from "marginally or not qualified" to "very highly qualified." A student's highest assessment for criteria ranging from grade-point average, class rank, to SAT and/or ACT scores, qualified them for ranking in the highest possible category. Enrollment in rigorous academic high school courses

(defined as four years of English; three years each of a natural science, social science, and math; and two years of a foreign language) would move the student up a category, and conversely down a category if they had not completed all specified coursework (Greene & Winters, 2005).

A major problem with NCES criteria to assess college readiness was that they did not match with college criteria. Colleges have access to more student-level measures, such as essays, grades, and alumni records, than does the NCES, so the college selection process weighs factors differently. Similarly, the weighting of academic rigor does not match that of colleges (Greene & Winters, 2005).

In 2005 the Manhattan Institute proposed college readiness criteria to match minimum standards of the least selective four-year colleges. The three criteria were: students must be high school graduates with a regular diploma (not a GED); minimum academic requirements must meet the NCES rigor standards; and students must be "basically literate." The final criterion was achieved by scoring at the basic level or above on the NAEP reading assessment (Greene & Winters, 2005).

At a 2007 California education policy forum, the College Board presented its definition of college readiness. In its simplest form it was stated: "Students are 'college ready' when they have the knowledge, skills, and behaviors to complete a college course of study successfully, without remediation" (Mijares, 2007). In

2008, ACT released college readiness standards based on its EXPLORE, PLAN, and ACT tests (ACT, 2008). EXPLORE and the College Board's ReadiStep aim to measure college readiness in middle school, as do PLAN and the PSAT earlier in high school. These products were designed as indicators of future college readiness. A score of 500 on the SAT is equivalent to a 50 on the PSAT, and 5 on the ReadiStep. All these tests were developed to predict freshman college year performance (College Board, 2003).

The following definition of college readiness is the one increasingly recognized by educational policymakers across the country—including the Annenberg, Gates, and Dell family foundations (Garvey, 2009). It was developed by the University of Oregon's David T. Conley. Conley is co-chair of the Validation Committee for the Common Core State Standards Initiative, and his Educational Policy Improvement Center (EPIC) has worked in several large school districts, as well as the state of Texas to develop the Texas College and Career Readiness Standards for the Texas Higher Education Coordinating Board. He is also an informal advisor to the Dallas ISD for its longitudinal student data system which supports college readiness.

In *College Knowledge* (2005), Conley outlined his findings about college readiness at the time. Building upon his previous assessment of college curricula and their alignment with high school courses for The College Board (2003), Conley identified core content knowledge (in math, English, science, and social

studies) and two other major factors as important to college success. He named the two factors as "stumbling blocks" for many students: their lack of intellectual maturity and lack of knowledge about the purpose and opportunities of college. Conley identified the intellectual attributes, or "habits of mind," as higher-order thinking skills. These included the ability to reason, analyze, and reflect.

By 2009, in "Redefining College Readiness," Conley had developed a working definition of college readiness, and in 2010, he proposed a comprehensive definition of college readiness. This definition is:

> "the level of preparation a student needs in order to enroll and succeed—without remediation—in a credit-bearing course at a postsecondary institution that offers a baccalaureate degree or transfer to a baccalaureate program, or in a high-quality certificate program that enables students to enter a career pathway with potential future advancement. Success was defined as completing the entry-level courses or core certificate courses at a level of understanding and proficiency that makes it possible for the student to consider taking the next course in the sequence or the next level of course in the subject area or of completing the certificate" (Conley, 2010).

In Texas, working with Conley and his EPIC team, the Texas Education Agency (TEA) and the THECB joined together to form vertical teams of education professionals to develop college readiness standards in core content areas, and adopted rules that define college readiness as "being successful in entry-level credit-bearing college courses" (THECB, 2008).

Conley identified four student-level dimensions in his college readiness model (2005, 2009a, 2009b, and 2010). They include key cognitive strategies, college ready content knowledge, academic behaviors, and college contextual skills and awareness. Key cognitive strategies and college ready content knowledge were the two most important of Conley's dimensions. Key cognitive strategies were defined as patterns of thinking that lead to an individual's development of appropriate situational behavior (Conley, 2010). Conley identifies the need for high levels of high school achievement in English, math, science, social studies, world languages, and the arts in order for a student to be college ready. Academic behaviors central to college success were self-monitoring and study skills, and include time management, awareness of self-mastery, and the appropriate selection and use of learning strategies. The college context skills and awareness dimension was embodied in The College Board's suggestions for creating a college-going culture within home and school (2006).

Of Conley's four dimensions, only content knowledge is currently measured within the Dallas ISD and other school districts because content

knowledge assessments—measured through standardized state tests—are required so that government accountability standards are met. Other measures of content knowledge include high school GPA, AP, SAT, and ACT scores. Academic behaviors and college context skills and awareness may be measured with student self-assessment instruments. The most critical dimension, according to Conley, key cognitive strategies, is the most difficult to measure. Conley's EPIC research and development team has created C-PAS, which measures actual student and teacher work products with a complex hand-scored rubric. It is currently being tested in selected New York City public schools.

A variation of Conley's model is being studied by the John W. Gardner Center for Youth and Their Communities at Stanford University (Gardner, 2011). The Gardner Center model combines Conley's content knowledge and cognitive strategies under "Academic Preparedness," and college contextual skills and academic behaviors were termed "College Knowledge" and "Academic Tenacity," respectively. The Gardner Center model was announced in spring 2011 at a national convening of five large urban K-12 districts, including Dallas', that are working with the Gardner Center and the Annenberg Institute at Brown to develop K-12 college readiness indicator systems.

Defining Measurable Attributes for Teacher Quality

At the end of the nineteenth century, the Committee of Ten first proposed rigorous and aligned college readiness standards for American high schools,

followed by recommendations focused on teacher development (NEA, 1894). Nearly a century later the National Commission on Excellent Education's 1983 publication of *A Nation at Risk* stimulated research on, and the development of, indicators of teacher quality (Ehrenberg & Brewer, 1994; Quint, Akey, Rappaport, & Willner, 2007; Sanders & Rivers, 1996; Rivkin, Hanushek, & Kain, 2005; Rockoff, 2003, 2004; Rowan, Correnti, & Miller, 2002). These studies maintain that teachers were "the most important school related factor" (Chait & Venezia, 2009, p. 7). Strong links between teacher quality and student achievement exist: "…resource variables that attempt to describe the quality of teachers (teacher ability, teacher education, and teacher experience) show very strong relations with student achievement" (Greenwald, Hedges, & Laine, 1996, p. 384).

Healthy debate surrounds the value of teacher credentials, which are primarily defined as state licensure, National Board Certification, and levels of teacher education. Some argue that inconsistent quality for credentialing makes them unimportant (Goldhaber & Brewer, 1997; Kane, Rockoff, & Staiger, 2006; Walsh, 2001), and recommend hiring and promoting teachers based on assessments of teacher cognitive ability and classroom effectiveness (Kane, et al., 2006), or deregulation of licensure (Walsh, 2001). Others provide rigorous research that shows national certification does improve student success (Greenwald, et al, 1996), especially when multiple measures were used for each

student to address issues of non-random assignment (Clotfelter, Ladd, & Vigdor, 2007a, 2007b).

A key topic in teacher quality literature centers on the value of years of teaching experience. In some research, the evidence was mixed (Neild, Farley-Ripple, & Byrnes, 2009), and in other cases an increase in years of experience produces negative results (Greenwald, et al., 1996). One study found that the learning curve levels off after five years (Clotfelter, et al., 2007a).

Several studies on teaching provide analysis about teaching effectiveness and class size (Dryden, et al., 1999; Finn & Achilles, 1990; Glass & Smith, 1979; Halloran & Sorenson, 1985; Hanushek, 1992; and Hedges & Stock, 1983). Most studies support smaller class size, or lower ratios of students to teachers in all subject areas. The economic impact of smaller class sizes may not be affordable to all districts (Hanushek, 1992).

Studies on the distribution of teachers in economically disadvantaged areas show that teachers assigned to poorer schools were often less-qualified to teach the subject matter assigned, and have fewer years of experience (Peske & Haycock, 2006; Almy & Theokas, 2010). These studies also found that high-poverty schools experience a higher than average concentration of first-year teachers and teachers who lack credentials or a college education that matches the subjects taught. The research suggests hiring strategies that pay effective teachers to relocate to high poverty schools, build better data systems to identify effective

teachers, and create new teacher preparation evaluation systems. Within the past five years, the federal government created the Teacher Incentive Fund (TIF) and the state of Texas created District Awards for Teacher Excellence (D.A.T.E.) grants to provide incentives to attract teachers to high-poverty schools.

William E. Sanders (1996) at the University of Tennessee is the leading researcher on value-added assessments. These assessments attempt to measure the effect of teachers on student achievement. The Dallas ISD developed one of the earliest measures, the Classroom Effectiveness Index (CEI), two decades ago and it has been validated by Sanders. Value-added assessments were developed in order to hold teachers accountable for annual student improvement on standardized tests (Goldhaber, 2010 and Ravitch 2010). Historically, teacher compensation and performance have not been measured by student achievement, but predominantly by licensure, years of teaching experience, and level of degree attainment (Bosshardt & Watts, 1990; Clotfelter, et al., 2007a, 2007b; Ehrenberg & Brewer, 1994). Chait and Venezia (2009) maintain that "the link between teacher quality and college preparedness has not been well-explored…but it is logical to assume that teachers have a great effect on students' college preparedness" (2009, p. 7).

Creating a College-Going Culture in High Schools

Schools are primarily measured by assessments of student achievement (Ravitch, 2010), the measures of which are stored in state longitudinal data

systems. In 1989, Jeannie Oakes argued for the creation of indicator systems that provided measures for school context in addition to student outcomes. She identified "three global school conditions…access to knowledge…press for achievement…[and] professional teaching conditions" (Oakes, 1989, p. 186). "Access to knowledge" incorporates teacher qualifications; course offerings; equipment; enrichment activities; staff development; and parent involvement. The campus "press for achievement" was measured by graduation requirements; enrollment in rigorous programs; administrative involvement in academics; quantity and type of homework; and graduation rates. Teacher autonomy and flexibility issues; teacher salaries; class size; administrative support for innovation; and a collegial work environment are included in "professional teaching conditions" (Oakes, 1989, pp. 192-195).

College readiness context indicators in a high school environment would include communication to students about the college admission process; aspects of the college environment; knowledge about tuition and financial aid; and college academic expectations (Adelman, 1999, 2006; Conley, 2005, 2010; and Roderick, Nagaoka, Coca, & Moeller, 2008, 2009). Researchers have identified the attainment of a high GPA in college level high school courses—especially AP classes—as a primary indicator of college success (Boser & Burd, 2009; Callan, Finnery, Kirst, Usdan, & Venezia, 2006; Conley, 2005, 2009a; Roderick, et al., 2009; Shoenberg, 2008).

The Bill & Melinda Gates Foundation (BMGF) fueled the debate about redesigning high schools when Bill Gates declared them "obsolete" at the 2005 Summit on high schools (Ravitch, 2010) and then created funding opportunities for experimental designs, especially smaller high schools (Darling-Hammond, 2002; Gates Foundation, 2005; and Ravitch, 2010). In Texas, Gates family foundation grants are managed by the Texas High School Project which also oversees the Early College high schools. Early College programs are generally housed at community college campuses, and they allow high school students to earn either high school and college credits, or dual-credits, simultaneously. Dual credit programs exist between local community colleges and public school districts (Hoffman, et al., 2007; Karp, Calcagno, Hughes, Jeong, & Bailey, 2007, 2008; McCauley, 2007). The Dallas ISD and Dallas County Community College District (DCCCD) have a dual credit program that allows college-approved instructors access to high school campuses, as well as allowing high school students access to online and college campus classes.

In 2009, Conley's EPIC released a BMGF-funded report highlighting thirty-eight schools that were successfully preparing underrepresented students for higher education. They include alternative, charter, comprehensive, Early College, magnet, and private secondary schools. Two hundred schools were selected for site visits based upon previous research and nominations. The schools encouraged college readiness through: core, college-focused academic

programs, including AP, dual enrollment, and Early College; holding students to high expectations; assigning and grading student work as it would be in college; building partnerships with postsecondary institutions; and "creating and maintaining a college-going culture in the school" (Conley, 2009, p. 8).

The information that EPIC researchers gleaned from site visits allowed them to validate Conley's conceptual model and operationalize the concepts. The key themes uncovered in the project were the importance for secondary schools to: create and maintain a college-going culture; emphasize key cognitive strategies; have high expectations for students and design scaffolded interventions to aid them in meeting them; create an aligned core academic program; fully engage students, particularly during the senior year; implement mandatory college-focused courses, especially for first-generation college-goers; create assignments and grading policies aligned with college practices; promote self-management skill development; prepare and support students during the complex college application process; and build partnerships with postsecondary institutions (Conley, 2009).

Urban Public School District Case Studies

Few of the nation's 14,000 public school districts have examined the success of their graduates by measuring their college-going behavior. While states may track student scores on mandated assessments, school districts, like the Baltimore County Public Schools, may track student success internally, yet few

have looked at the issue in-depth. The districts that have addressed the issue through published research are Chicago (Allensworth, 2006; Roderick, et al., 2006, 2008, 2009); New York (Garvey, 2009); Boston (Sum, et al., 2008); and Denver (Buckley & Muraskin, 2009).

The district studies have many elements in common. Chicago studied students who graduated in 2002 and 2003, and Boston those who graduated in 2000. Denver's 2009 research considered students who had graduated from 2002 to 2007. New York, the largest school district in the country with more than one million students, concentrated on students who attended one state university system. None of the studies focused on high school graduates who did not attend college. With the exception of the Consortium on Chicago School Research's (CCSR) unique twenty-year relationship with Chicago Public Schools, these research studies were conducted by external organizations with limited access to district student information.

The findings of the previous studies primarily concern college enrollment and persistence experiences, and include analyses of gender and ethnicity for their respective districts. The findings track the national statistics: women, Asians, and whites have higher postsecondary completion rates than men, blacks, and Hispanics. CCSR's studies delved deeper and found a high correlation between: high school GPAs and ACT scores and college access and persistence; AP and advanced high school coursework and access to more selective colleges; widely

varying college access and success rates from different high schools in the same district; and an increased need for high school guidance and support for first-generation college students (Allensworth, 2006; Roderick, Nagaoka and Allensworth, 2006; Roderick, et al. 2009).

Garvey's in-depth analysis (2009) of the New York City public schools' college readiness draws upon Conley's framework (which Garvey calls "perhaps the most comprehensive") and student data from the City University of New York (CUNY) which serves more than one half million students, the majority of whom graduated from New York public high schools. Garvey completed the study in collaboration with the Annenberg Institute for School Reform at Brown University. He found the weakest indictors of college readiness to be No Child Left Behind (NCLB)-related assessments; high school graduation; and college placement testing results. The most predictive indicators were the intensity of academic experience, grades, and high school academic quality.

To improve the college readiness system, Garvey recommends systemic changes. Overall, he argues for parents, students, and education professionals to have a higher level of understanding of college success criteria. He suggests the formation of partnerships with higher education partners, and improvements within the existing system to make the college-going process more coherent. Garvey outlines four essential elements of an effective college ready system: clear signals of preparation; aligned standards and assessments; high quality of college

advisement and supports; and more opportunities for students to acquire the college knowledge and skills needed.

The Boston study was prepared by the Center for Labor Market Studies at Northeastern University for the Boston Private Industry Council and Boston Public Schools (BPS), and concentrated on the graduating class of 2000. The study's findings confirmed college enrollment and graduation information in National Student Clearinghouse BPS records with regard to type and level of college attended by race, ethnicity, and gender. It also reported on the colleges attended and the high schools from which the students graduated (Sum, et al., 2008).

The 2009 Denver Public Schools (DPS) study was conducted by The Piton Foundation and the Pell Institute for the Study of Opportunity in Higher Education. It found that 56% of DPS graduates from 2002 to 2007 enrolled in college, and 39% had earned degrees or certificates. Enrollment and graduation rates were highest for white students (71% and 52 percent, respectively) and lowest for Hispanic students (39% and 25%, respectively. Of African American students, 63% enrolled in college and 30% had graduated.

Dallas ISD Case Study

The Dallas ISD recently completed an extensive study in 2011 that examined college-going behavior of more than 75,000 graduates over an 11-year time period. The findings provide the basis for this research and are reported

below (Hall & Johnson, 2011). This section examines college degree attainment for all 75,033 Dallas ISD high school graduates from 1998 to 2009. Of the 36,139 high school graduates from 1998 to 2003—who had six years to complete a college degree at the time of this research—15.2%, or 5,493, completed college degrees. Of the highest degrees earned by Dallas ISD graduates, 9.4% were graduate/professional and 72% were four-year degrees.

For Dallas ISD graduates from 1998 to 2003, the average time to graduate from college was 4.9 years, with a standard deviation of 1.7 years. The average number of years to graduate college decreased from 1998 to 2005.

A total of 7,815 degrees were awarded to 6,893 postsecondary graduates. Of the students who received degrees, 6,016, or 87.3%, were awarded one degree; 833, or 12.1%, were awarded two degrees; 43, or 0.6%, were awarded three degrees; and one student was awarded four degrees. Most degrees earned were four-year degrees at public institutions.

From 1999 to 2008 there was a slight decrease in full-time enrollment from 62.6% to 58.4% and a corresponding increase in part-time enrollment from 4.2% to 6%. The average freshman to sophomore college year retention rate was 74%.

Regression analysis showed certain student characteristics to be significantly related to subsequent college enrollment and graduation. Significant findings included: younger students at high school graduation complete college

more successfully than older students; students who take AP, SAT, and ACT exams were more successful in college; white and Asian students complete college more successfully than African American students, and these three racial groups enroll in and graduate from college at higher rates than Hispanic students; female students were more successful in college than males; and economically disadvantaged and LEP students were not as successful in college.

The relationship between students taking AP exams and college enrollment and completion was significant in the 2011 study. Over the past seven years, the AP exam-taking rate has more than doubled from 2,685 students in 2002 to 6,127 students in 2009. The AP exam pass rate declined from 30.7% in 2006 (the first year for which data were available) to 25.4% in 2009.

The study also indicated a significant relationship between students who took ACT and SAT exams and future college enrollment and graduation. ACT scores ranged from 15.8 for high school graduates who did not attend college to 19.6 for those who graduated from college. SAT verbal and math scores ranged from 390 and 402, respectively, for those not enrolled in college to 485 and 487, respectively, for those who graduated from college. Figure 1 below shows the increase in scores associated with various levels of postsecondary achievement.

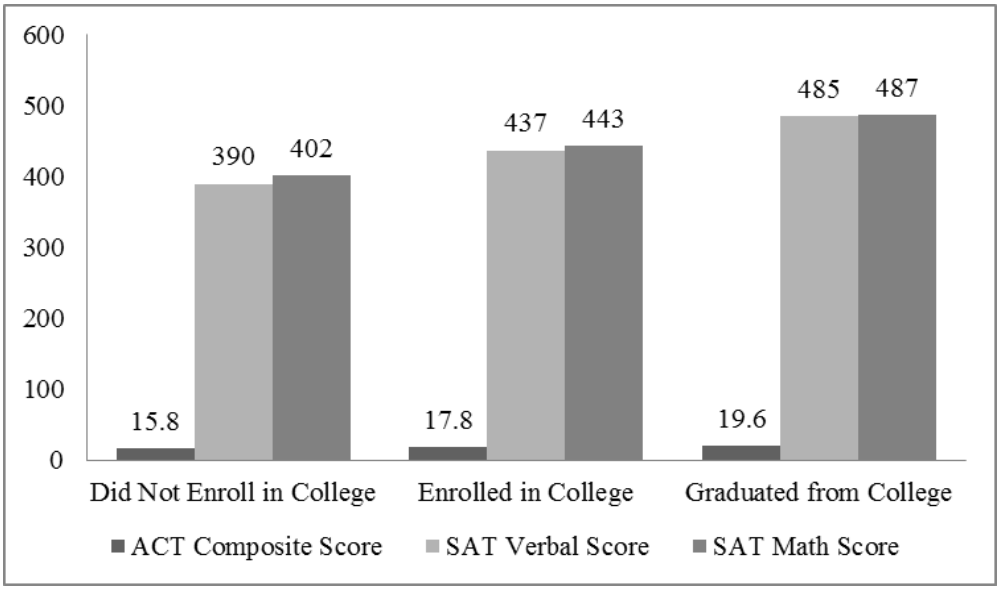
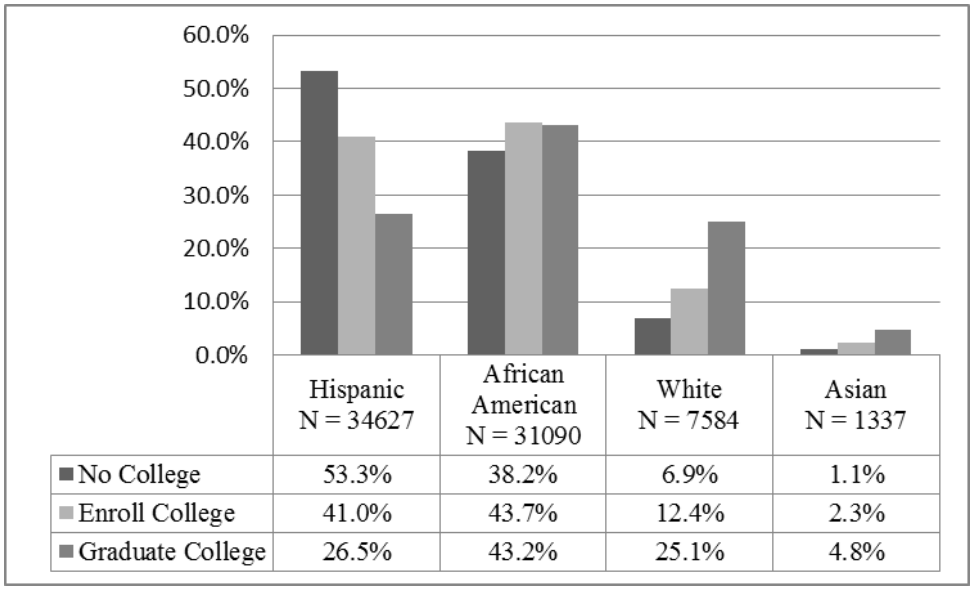


Figure 1 ACT and SAT Score Analysis Dallas ISD 1998 to 2009

A smaller percentage of Hispanics enrolled in and graduated from college as compared to other groups. A higher percentage of white and Asian students completed college. More than half the Hispanic students did not enroll in any postsecondary education. Figure 2 shows the relative enrollment in and graduation from college by race and ethnicity for the high school graduates.



	Hispanic N = 34627	African American N = 31090	White N = 7584	Asian N = 1337
No College	53.3%	38.2%	6.9%	1.1%
Enroll College	41.0%	43.7%	12.4%	2.3%
Graduate College	26.5%	43.2%	25.1%	4.8%

Figure 2 College Going by Race and Ethnicity Dallas ISD 1998 to 2009

One third of all Dallas ISD students (grades K-12) during this period were characterized as LEP. Many students exit LEP programs before high school and those students who were characterized as LEP at high school graduation (7,885) accounted for 10.5% of all Dallas ISD graduates. District LEP students enrolled in college at lower rates (37.2%) than did students who have exited LEP (56.4%) programs (by completing literacy requirements) or those who were not LEP students (62.6%). LEP students also graduated from college at lower rates (3.9%) as compared to exited LEP (5.9%) and non LEP (11.4%) students.

The Dallas ISD 2011 study found that the selection of a rigorous high school graduation plan; AP course- and AP, SAT, and ACT exam-taking and

outcomes; senior year GPA; and attendance at magnet schools to be significantly and positively related to college enrollment and graduation.

Research Questions

Recent education research has identified a disconnect between high school and college as evidenced by the high level of remedial courses taken in college and the low college completion rate (Chait & Venezia, 2009; Hoffman, et al., 2007; Howell & Grodsky, 2009). The disconnect issue was even more apparent among first-generation and minority college students (Calefati, 2009; Conley, 2005; Martinez & Klopott, 2003, 2005). Traditional programs that bridge the education systems between K-12 and college such as AP, dual/concurrent enrollment, and IB have only reached a minority of college bound students (Conley, 2005, 2009a, 2009b, 2010; Hoffman, et al., 2007). Many first year college students were not performing at an adequate level in college and at least 60 percent of these students were taking at least one remedial course (NCES 2004, Indicator 18).

The purpose of this research was to understand what practices could be implemented at the high school-level by school leaders to improve the college readiness of their students. Two questions guided this research project.

1. What practices or policies can high school leaders implement to create academic programs that adequately prepare students for postsecondary

education? What measures of academic programs, if any, were related to postsecondary success?

2. How important were teachers in creating a high school environment that adequately prepares students for higher education? What measurable attributes of teaching, if any, were related to postsecondary success?

CHAPTER 3

THE METHODS AND PROCEDURES

The purpose of this research was to identify variables that predict college success and that can be implemented by school leaders on high school campuses. College success was defined as enrolling in and graduating from college. To accomplish this, the researcher completed an analysis of the Dallas ISD graduating class of 2002.

The aim of this study was to improve knowledge of key indicators of postsecondary student success. Building upon this new knowledge, a district or high school will be able to implement new strategies and practices to enable students—with the support of teachers and administrators—to achieve higher levels of postsecondary success.

Sources of Data

All data in this study were obtained through two sources: 1) the Dallas ISD provided de-identified student demographics, and college enrollment and graduation data; and 2) the Texas Education Agency (TEA) provided data on high school characteristics, teacher experience, and teacher education. With the exception of teacher academic degree attainment data by high school, which were obtained by this researcher's written request to TEA, all other high school data

were taken from the publicly available 2002 and 2003 Academic Excellence Indicator Systems (AEIS) Campus Performance reports. The TEA's AEIS reports provide comprehensive information for each campus. Data originally were submitted by the Dallas ISD to TEA for these reports.

The 2003 AEIS campus reports were used to obtain 2002 measures for campus attendance rate, advanced courses, AP, SAT, ACT, and high school graduation program. The 2002 AEIS campus reports contained all other measures. One exception was the percent of students enrolled in advanced courses. A mean of the two years of reports, for 2000-2001 and 2002-2001 (on the 2003 AEIS report) was used to measure the seniors' participation in advanced course-taking over a two-year period. This was done to capture junior year courses that the graduating seniors may have taken. All relevant variables were input into an Excel spreadsheet.

Student and School Populations

The 2002 Dallas ISD graduating class was chosen for this study for three primary reasons. The first was that college-going information on the graduates was available from the National Student Clearinghouse (NSC) for two-year and four-year institutions. The NSC, incorporated in 1993 as a non-profit organization designed to track student loan data, has become the national repository for student-level college-going information. It currently has records for 92% of U.S. college students attending 3,300 colleges, including online and

technical colleges. The NSC data files have college information on Dallas ISD graduates from 2000 for most two-year colleges and from 2002 for most four-year colleges.

The second reason was that seven years had elapsed between high school graduation in 2002 and the postsecondary data used in this research. According to studies completed by other urban public school districts (Allensworth, 2006; Roderick, Nagaoka, & Allensworth, 2006; Roderick, et al. 2009; Sum, et al, 2008; Garvey, 2009; Buckley & Muraskin, 2009), seven years allows adequate time for a majority of students to complete college.

The third reason the class of 2002 was chosen was due to academic changes in the Dallas ISD at that time. The 2001-2002 school year was the first year that the district actively promoted a key college readiness measure, AP exam taking, to its students. This literature supports the inclusion of this variable in a study of college success (Conley 2003, 2005, 2010; Watt, et al., 2011).

The 29 Dallas ISD high schools operating in 2002 were the units of analysis for this study. These high schools included 20 comprehensive schools, seven magnet schools, one combined comprehensive/magnet school (Skyline), and one school associated with El Centro Community College (Middle College). Entrance to the magnet schools and Middle College required students to pass entrance exams, and in the case of the arts magnet, Booker T. Washington, an audition or portfolio assessment.

The high school students in the 2001-2002 school year were racially and ethnically diverse. According to the TEA data, Hispanics and African Americans accounted for 44.8% and 42.7%, respectively, of high school students. Only 12.6% were enrolled in English as a Second Language (ESL) classes. The percent of Hispanic students in high school was smaller than the 56.8% enrolled in the entire system for the 2001-2002 school year, and the percent of ESL students declines in high school as students become proficient in English, or leave the school system (Dallas ISD, 2002). Fifty-two percent of the high school students were economically disadvanted, as defined by being qualified to receive free or reduced lunch benefits. Overall, magnet schools had the lowest percent of ESL and economically disadvantaged students. Table 1 lists all 29 high schools and indicates high schools that had higher than average student populations that were Hispanic, African American, enrolled in ESL classes, and economically disadvantaged. The schools are organized alphabetically by type and number of affirmative factors.

Table 1 Dallas ISD 2002 High School Demographics

School	Type	Higher than Average Hispanic	Higher than Average African American	Higher than Average Enrolled in ESL	Higher than Average Economically Disadvantaged
Adamson	Comprehensive	Yes		Yes	Yes
Jefferson	Comprehensive	Yes		Yes	Yes
Molina	Comprehensive	Yes		Yes	Yes
North Dallas	Comprehensive	Yes		Yes	Yes
Pinkston	Comprehensive		Yes	Yes	Yes
Samuell	Comprehensive		Yes	Yes	Yes
South Oak Cliff	Comprehensive		Yes	Yes	Yes
Sunset	Comprehensive	Yes		Yes	Yes
Kimball	Comprehensive		Yes		Yes
Lincoln	Comprehensive		Yes		Yes
Madison	Comprehensive		Yes		Yes
Roosevelt	Comprehensive		Yes		Yes
Smith	Comprehensive		Yes		Yes
Spruce	Comprehensive		Yes		Yes
Wilson	Comprehensive	Yes		Yes	
Skyline	Comp/Magnet	Yes			Yes
Bryan Adams	Comprehensive			Yes	
Carter	Comprehensive		Yes		
Hillcrest	Comprehensive			Yes	
White	Comprehensive			Yes	
Health	Magnet		Yes		
Law	Magnet		Yes		
Middle College	Other	Yes			
Seagoville	Comprehensive				
Business	Magnet				
Education and Social Sciences	Magnet				
Science and Engineering	Magnet				
Talented and Gifted	Magnet				
Washington	Magnet				

Exogenous Latent Constructs and Independent Variables

This research study contains two exogenous latent constructs, Student Achievement and Teacher Quality. This section examines the variables that comprised these two latent constructs. The mean, standard deviation, standard error, range, correlations, and Cronbach's α for each variable are provided.

Table 2 contains the measures used for the Student Achievement latent construct. The three manifest variables for this construct were campus measures of mean senior ACT and SAT scores, and the percent of students in each high school who score greater than the TEA college-ready criterion (from 1998 to 2005) of 1110 on the SAT exam. They are variables still available for use by Texas high schools, unlike the Texas Assessment of Knowledge and Skills (TAKS), which will be replaced by State of Texas Assessments of Academic Readiness (STAAR) in the 2011-2012 school year. This latent construct was exogenous to control for student-level achievement in the research models. The *p*-values for all three manifest variables were less than .05. The measurement variables were standardized in SPSS.

The Cronbach's α for the Student Achievement latent construct was 0.98 which was very high and indicates strong internal consistency among the three items. High schools that tended to score high for one item also tended to score high for the others. Corrected Item-Total Correlation scores were very high, at 0.95 for mean ACT, 0.98 for mean SAT, and 0.95 for percent of students with SAT scores above the TEA college-ready criterion, and indicate that there were strong, positive correlations between the scores on any one item and the combined score of the other two items. All three Cronbach's α if Item Deleted values were slightly lower than the overall α (before rounding) which indicates that the items

appear to be useful and contribute to the overall reliability of Student Achievement.

Campus mean ACT scores ranged from 13.5 to 23.5, and SAT scores from 707 to 1222. TEA's college ready criteria were 24 and 1110, respectively. The percent of students per campus with SAT scores at or above the TEA college-ready criterion of 1110 ranged from zero to 71.2%. In 2002, the SAT was composed of only two sections (writing was added in 2007). ACT and SAT scores are indicators of future freshman year college performance (College Board, 2002, 2006; Conley 2005, 2009a). The results reported in Table 2 were from tests administered prior to high school graduation.

Table 2 Student Achievement Variables (High School Level)

	Minimum	Maximum	M	SE	SD	*p < .05	Corrected Item-Total Correlation	Cronbach's α if Item Deleted
Mean ACT of high school seniors	13.50	23.50	17	0.49	2.62	*	0.95	0.98
Mean SAT of high school seniors	707	1222	848	24.39	131.35	*	0.98	0.96
Percent of students per high school with SAT score greater than or equal to TEA criterion of 1110	0.00	71.20	11.68	3.29	17.71	*	0.95	0.98
Cronbach's α for Student Achievement = .98								
n = 29								

The literature contains a number of studies that suggest a strong link between teachers and student achievement (Rivkin, et al., 2005; Rockoff, 2004; and Sanders & Rivers, 1996). The measures used in teacher employment and advancement were years of teaching experience, licensure, and teacher education level (Bosshardt & Watts, 1990; Clotfelter, et al., 2007; and Ehrenberg & Brewer, 1994). The value of years of teaching experience was debated in the literature. Some evidence was mixed (Neild, et al., 2009); or shows that an increase in experience was tied to a decrease in student achievement (Greenwald, et al, 1996). Clotfelter (2007) found that gains in student achievement level off after five years of teaching experience.

The measures in Table 3 were used as indicators for the Teacher Quality latent construct. These 11 high school campus variables included years of teaching experience, from beginning teaching to teaching more than 20 years; years teaching and years teaching in the Dallas ISD; and teacher education levels, from holding less than a bachelor's degree to a doctorate. Four of the manifest variables were found to be negatively related to the Teacher Quality latent construct: beginning teachers and those with 1 to 5 years teaching experience, and the percent of teachers per campus with less than a Bachelor's degree or a Bachelor's degree. The *p*-values for all but two manifest variables were less than .05. The two measurement variables that were not significant, and excluded from further analysis, were the percent of teachers per campus teaching from 6 to 10

years, and from 11 to 20 years. The manifest variables were standardized in SPSS.

The Cronbach's α for the Teacher Quality latent construct was 0.88 which was high and indicates strong internal consistency among the nine items. High schools that tended to score high for one item also tended to score high for the others. Corrected Item-Total Correlation scores were high for eight variables (0.89 for average years of teaching experience; 0.83 for 20 years or more teaching experience; and 0.72 for percent of teachers with a Bachelor's degree; 0.66 for teaching 1 to 5 years; 0.65 for average years teaching in the Dallas ISD and teachers with master's degrees; 0.53 for teachers with doctorates; 0.50 for beginning teachers), and low for one variable (0.26 for teachers with less than a bachelor's degree). Eight Cronbach's α if Item Deleted values were slightly lower than the overall α (before rounding) which indicates that the items appear to be useful and contribute to the overall reliability of Teacher Quality. One value, percent of teachers with less than a Bachelor's degree, was slightly higher than the overall alpha, but was statistically significant and included in the partial least squares regression.

Teacher experience levels per high school campus ranged from no beginning teachers to 52.1% teachers on campus with more than 20 years of teaching experience. Average years of teaching experience per campus ranged from 9.9 to 18.3 years, and average years of teaching experience in the Dallas ISD

ranged from 5.3 to 13.9 years. High school levels of teacher education ranged from none with less than a Bachelor's degree to 12% with a doctorate. The percent of teachers on campus with a Bachelor's degree ranged from 41% to 72%, and from 15% to 47% with a master's degree.

Table 3 Teacher Quality Variables (High School Level)

	Minimum	Maximum	M	SE	SD	*p < .05	Corrected Item-Total Correlation	Cronbach's α if Item Deleted
Percent beginning teacher**	0.00	15.70	8.51	0.82	4.42	*	0.50	0.88
Percent teaching for 1 to 5 years**	14.70	37.40	23.05	0.98	5.26	*	0.66	0.87
Percent teaching for 6 to 10 years	8.50	27.30	15.94	0.77	4.17			
Percent teaching for 11 to 20 years	9.10	29.00	18.68	1.07	5.75			
Percent teaching for more than 20 years	18.90	52.10	33.82	1.51	8.13	*	0.83	0.85
Percent teachers on campus with less than a bachelor's degree**	0.00	8.00	2.79	0.40	2.16	*	0.26	0.89
Percent teachers on campus with a bachelor's degree**	41.00	72.00	57.97	1.37	7.37	*	0.72	0.86
Percent teachers on campus with a master's degree	15.00	47.00	34.86	1.16	6.24	*	0.65	0.87
Percent teachers on campus with a doctoral degree	0.00	12.00	4.38	0.61	3.27	*	0.53	0.88
Average years teaching experience	9.90	18.30	14.74	0.35	1.89	*	0.89	0.85
Average years teaching in Dallas ISD	5.30	13.90	10.77	0.34	1.82	*	0.65	0.87

Cronbach's α for Teacher Quality = 0.88
n = 29
NOTE: ** Indicates negative relationship with latent construct

Endogenous Latent Constructs and Variables

Three endogenous latent constructs were identified for one research model: High School College-Going Culture, College Enrollment, and College Graduation. High school culture was separated into two refined latent constructs of Curricular and Structure for the second model. The data for the high school culture latent construct variables were obtained from 2002 and 2003 TEA AEIS campus performance reports. The high school culture latent construct is measured in two ways: one with all manifest variables used and the second with the manifest variables divided into curricular and structure constructs.

The literature supports a variety of measures of a college-going culture, including student enrollment in rigorous courses, especially AP (Conley, 2005, 2009b; Roderick, et al., 2009); encouraging attendance (Hooker & Brand, 2009); a focus on teaching (Chait & Venezia, 2009); and higher graduation requirements (Hoffman, et al, 2007). The relationship between class size and student achievement has been widely researched and generally supports smaller class sizes for increased student performance (Finn & Achilles, 1990; Glass & Smith, 1979; Halloran & Sorenson, 1985; Hanushek, 1992; Hedges & Stock, 1983).

The 12 total campus-level manifest variables for high school college-going culture were: percent of students taking advanced courses and AP, SAT, and ACT exams; the percent of students enrolled in the minimum or recommended graduation program; average student attendance rate; average

number of teachers per student; average class sizes for English/language arts, math, science, and social studies; and the percent of teachers on campus compared to campus administrators. Six of these measurement variables were found to be negatively related to the High School College-Going Culture latent construct: the percent of students enrolled in the minimum graduation plan; the average number of students per teacher; and the average class sizes for English/language arts, math, science, and social studies. The *p*-values for all 12 manifest variables were less than .05. The measurement variables were standardized in SPSS.

Table 4 shows the Cronbach's α for the two High School College-Going Culture latent constructs models. For Model 1, with all manifest variables, the Cronbach's α was 0.95 which was very high and indicates strong internal consistency among the 12 items. High schools that tended to score high for one item also tended to score high for the others. Corrected Item-Total Correlation scores were high for the 12 manifest variables: 0.89 for social studies class size; 0.88 for English/language arts class size; 0.83 for math class size; 0.82 for science class size; 0.80 for percent in recommended graduation program; 0.79 for percent of teachers on campus and percent taking ACT and SAT exams; 0.72 for percent in the minimum graduation program; 0.71 for campus attendance rate; 0.69 enrolled in advanced courses; 0.67 for number of students per teacher; and 0.55 for percent taking AP exams. These scores indicate that there were strong correlations between the scores on any one item and the combined score of the

other items. All 12 Cronbach's α if Item Deleted values were slightly lower than the overall α (before rounding) which indicated that the items appear to be useful and contribute to the overall reliability of High School College-Going Culture.

Campus-level indicators of rigorous academic programs ranged widely. In 2002, the first year that the district pressed to increase AP exam taking, high school campus participation ranged from zero to 100%. Advanced course-taking ranged from 7.1% to 100%, and SAT/ACT exam-taking from 24.3% to 100%. All high school campuses had at least some students enrolled in the recommended graduation plan; the range was from 22.6% to 100% of students enrolled. Campus attendance ranged from 85.2% to 98%.

In the second model which contains two latent constructs for High School College-Going Culture—Curricular and Structure—the Cronbach's α was also very high: 0.91 for Curricular Culture and 0.97 for Structure Culture. The manifest variables included in the Curricular Culture latent construct and their respective Corrected Item-Total Correlation scores were: 0.80 for percent enrolled in advanced courses; 0.75 for percent taking ACT and SAT exams; 0.74 for percent teachers on campus and percent in recommended graduation program; 0.72 for percent taking AP exams; and 0.70 for campus attendance rate. These scores indicated strong, positive correlations between the scores on any one item and the combined score of the other items of the Curricular Culture latent construct.

The Cronbach's α for the Structure Culture latent construct in the second model was 0.97 which indicates strong internal consistency among the five items in this construct. The manifest variables included in the Structure Culture latent construct and their respective Corrected Item-Total Correlation scores were: 0.96 for science class size; 0.95 for English/language arts, math, and social science class size; and 0.74 for number of students per teacher. These scores indicate a strong correlation between the scores on any one item and the combined score of the other items. The Cronbach's α if Item Deleted values for both Curricular and Structure cultures were lower than the overall α which indicated that the items appear to be useful and contribute to the overall reliability of the latent constructs.

Table 4 High School College-Going Culture Variables (High School Level)

Model	Minimum	Maximum	M	SE	SD	*p < .05	Corrected Item-Total Correlation	Cronbach's α if Item Deleted
1 All Manifest Variables Cronbach's α for Model 1 = 0.95								
Percent of students taking any AP exam	0.00	100.00	21.82	3.83	20.64	*	0.55	0.95
Percent of students taking SAT or ACT	24.30	100.00	53.23	3.89	20.92	*	0.79	0.95
Percent of students taking advanced courses (2000-2002)	7.10	100.00	24.91	3.97	21.37	*	0.69	0.95
Percent of students in Minimum graduation program**	0.00	63.60	28.71	2.83	15.22	*	0.72	0.95
Percent of students in Recommended graduation program	22.59	100.00	64.75	3.46	18.65	*	0.80	0.94
Average campus attendance rate	85.20	98.00	92.48	0.68	3.65	*	0.71	0.95
Average number of students per teacher**	9.70	19.10	14.78	0.48	2.60	*	0.67	0.95
Average class size English/ Language Arts**	2.80	27.50	18.49	1.38	7.41	*	0.88	0.94
Average class size Math**	2.80	27.80	20.17	1.44	7.76	*	0.83	0.94
Average class size Science**	2.90	29.40	21.00	1.46	7.86	*	0.82	0.94
Average class size Social Studies**	4.60	30.10	20.91	1.65	8.89	*	0.89	0.94
Percent of teachers on campus	72.30	94.90	81.27	1.22	6.59	*	0.79	0.95
2 Curricular Cronbach's α for Model 2 Curricular Structure = 0.91								
Percent of students in Recommended graduation program						*	0.74	0.89
Average campus attendance rate						*	0.70	0.90
Percent of teachers on campus						*	0.74	0.89
Percent of students taking any AP exam						*	0.72	0.89
Percent of students taking SAT or ACT						*	0.75	0.89
Percent of students taking advanced courses (2000-2002)						*	0.80	0.88
2 Structure Cronbach's α for Model 2 Structure Culture = 0.97								
Average number of students per teacher**						*	0.74	0.99
Average class size English/ Language Arts**						*	0.95	0.95
Average class size Math**						*	0.95	0.95
Average class size Science**						*	0.96	0.95
Average class size Social Studies**						*	0.95	0.96

NOTES: **Indicates negative relationship with latent construct. $n = 29$

Data to compute measures for the other two endogenous latent constructs, College Enrollment and College graduation were obtained from the Dallas ISD Performance Management and Analytics department. In order to match Dallas ISD student records to National Student Clearinghouse data, student identifiers were used and the data were merged into one new file, and then cleaned. This researcher received cleaned, de-identified data for all students that was used to analyze the descriptive statistics in SPSS (see following section). This researcher aggregated the merged NSC-Dallas ISD college enrollment and graduation data at the high school level. Each campus was represented by the percent of its class of 2002 graduates who enrolled in and graduated from any postsecondary institution.

The percent of high school graduates per campus that enrolled in college ranged from 39.8% to 92.1%. The percent of high school graduates who graduated from college ranged from none to 55.8%. One campus, Middle College, had no college graduates. The results are shown in Table 5.

Table 5 High School Graduates Enrolled In and Graduated From College

	N	Minimum	Maximum	M	SE	SD
Percent of students on campus enrolled in college	29	39.80	92.10	62.98	3.00	16.14
Percent of students on campus graduated from college	29	0.00	55.80	16.28	2.69	14.50

National Student Clearinghouse Data

After receiving approval from both the University of Texas at Arlington Institutional Review Board (Protocol 2011-0133) and the Dallas ISD Research Review Committee, this researcher received Excel and SPSS files containing the merged NSC-Dallas ISD de-identified student-level data from Dr. Shane Hall, Senior Analyst, Dallas ISD Performance Management and Analytics. The purpose of descriptive statistics was to summarize the major trends and patterns among the class of 2002 high school graduates.

Table 6 identifies the student-level variables analyzed in this research and reported in the Findings. This research seeks to identify policies and procedures that can be implemented in high schools to improve postsecondary student performance, therefore student-level data collection did not focus on family or socioeconomic variables—variables beyond the scope of the high school's immediate locus of control. Student-level data included in the models were aggregated at the high school level.

Table 6 High School and College Variables for Descriptive Statistics

Student-Level Variable	Data Source
Graduated from Dallas ISD (between August 1, 2001 and July 31, 2002)	Dallas ISD Evaluation and Accountability department (deltademo file)
Enroll in any postsecondary school (after August 1, 2002)	National Student Clearinghouse files
Graduate any postsecondary school (or obtain certificate)	National Student Clearinghouse files
Race and ethnicity (Hispanic, African American, White, Asian, and American Indian)	Dallas ISD Evaluation and Accountability department (deltademo file)
Gender	Dallas ISD Evaluation and Accountability department (deltademo file)
Limited English Proficient (LEP) (Not LEP means the student was never categorized as LEP; Exited LEP means previously categorized as LEP, but met English language proficiency standards before high school graduation; LEP means previously categorized as LEP and did not met proficiency standards before high school graduation; Non LEP/Untestable was defined as not meeting minimum requirements for LEP testing, e.g., parents may not be fluent in English, but student was)	Dallas ISD Evaluation and Accountability department (deltademo file)
College Level (Two-year or Four-year degree predominantly offered)	National Student Clearinghouse files
College Type (public or private controlled entity)	National Student Clearinghouse files
College Location (in-Texas or out-of-Texas)	National Student Clearinghouse files
Freshman to Sophomore Retention Rate (measured as returning for a second year)	National Student Clearinghouse files
College Enrollment Status (full-time was enrolled for 12+ credit	National Student Clearinghouse files

Table 6 – *Continued*

hours; half-time was enrolled for 6 to 11 credit hours; and less than half-time was enrolled for 1 to 5 credit hours)	
Name of College: Enrolled (number of class of 2002 enrollees is greater than or equal to 20)	National Student Clearinghouse files
Name of College: Graduated (number of class of 2002 graduates who received their first degree is greater than or equal to 20)	National Student Clearinghouse files
Two-Year Degree (Certificate; A.A., or A.S.)	National Student Clearinghouse files
Four-Year Degree (B.A., B.S.)	National Student Clearinghouse files
Graduate/Professional (M.A., M.S., M.B.A., Ph.D., J.D., M.D.)	National Student Clearinghouse files

Research Design

This study's theoretical basis was action research. It seeks to define actionable variables at the high school level that predict future postsecondary success. Actionable variables include those policies and procedures that can be implemented by school leaders to improve the campus college-going culture.

Action research, as defined by William Tolbert, places "the experience and practice of human persons inquiring into their everyday lives – both individually and in relationship – at the center of inquiry" (Torbert & Reason, 2001). This research study incorporated action on the part of the teacher (gaining years of teaching experience and higher levels of education) and the high school (promoting a college-going culture). As Tolbert states: "The primary purpose of

research/practice is to enhance human flourishing. To do this it must generate valid information within action situations so that those involved can understand them more thoroughly and act in them more effectively" (Torbert & Reason, 2001). Through the combination of TEA and NSC data, this study outlined actions that can be taken at the high school level to improve future student college success.

Research Models

This study was based upon a widely accepted U.S. education theoretical model that emerged when the country began to focus on developing indicator systems. The 1983 publication of *A Nation at Risk* provided the impetus to monitor schools. During the following year the Secretary of education mounted a "Wall Chart" to compare states' performance. That led to the creation of the State Educational Assessment Center by the Council of Chief State School Officers (CCSSO). In 1987 the United States government provided support to the international Office for Economic Cooperation and Development to create a cross-national indicator system. Coincidentally, the Hawkins-Stafford Act of 1988 expanded the National Assessment for Education Progress to collect state data and created a Special Study panel on Education Indicators in concert with the National Center for Education Statistics (Bryk & Hermanson, 1993).

One of the first theoretical models containing school indicators can also be traced to this time period. Jeannie Oakes' 1986 Theoretical Model of the U.S.

Education System incorporated structural relationships between variables. Kaplan and Elliott (1997) described Oakes' model as follows: "When reviewing the extant literature on education indicators it is not uncommon to find, as a starting point, the [Oakes] theoretical model of schooling" (p. 324). The model positions theoretical relationships between inputs (fiscal resources, student background, and teacher quality); processes (curriculum quality, teaching quality, and instructional quality); and outputs (achievement, participation/dropout, and attitudes/aspirations). The model was multilevel in that the input variable of financial resources may be controlled at the district or community (taxing) level while the process variable of curriculum quality may be controlled at the district or school level. The model suggests both direct and indirect relationships between variables. For example, teacher quality has a direct effect on school quality, and an indirect effect on instructional quality and student achievement. Kaplan and Elliott determined that "the model does suggest potentially testable structural relationships among the variables" (p. 324) and demonstrated the approach using 1988 NELS data (Kaplan & Elliott, 1997). An important limitation to this approach is whether correct explanatory variables are chosen: there may exist statistical fit when no relationship exists (Kaplan & Elliott, 1997, pp. 342-343). The Oakes model is illustrated in Figure 3.

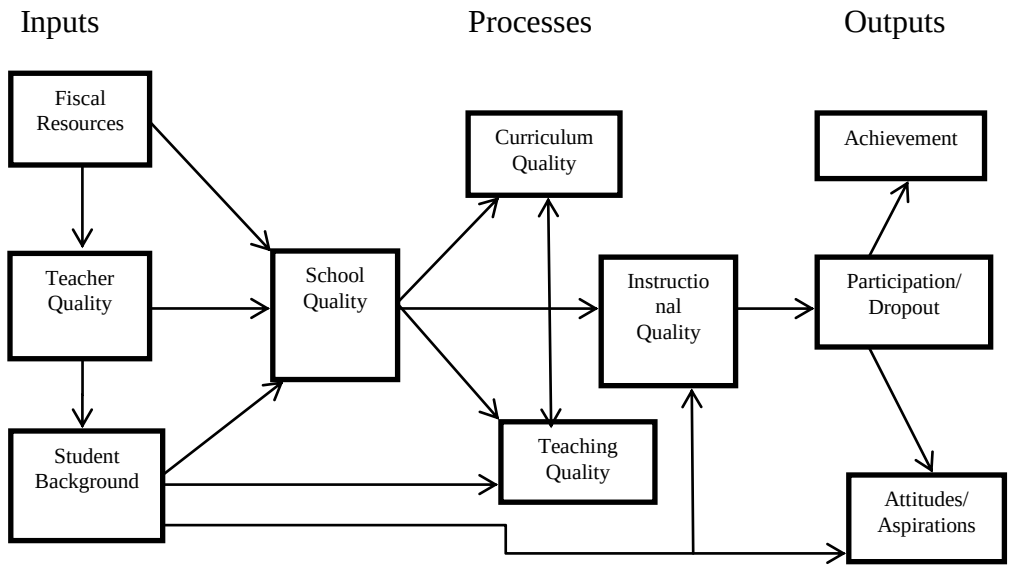


Figure 3 Oakes 1986 Theoretical Model of U.S. Educational System

The two models in this research, College Success Models 1 and 2, were built on the same premises as Oakes' 1986 theoretical model. The two exogeneous latent constructs in the College Success Models were Student Achievement and Teacher Quality. Model 1 has direct paths to the endogeneous latent construct of High School College-Going Culture, and Model 2 to Curricular and Structure Culture latent constructs. All have direct and indirect paths to the endogeneous latent constructs of College Enrollment and College Graduation. The models in this research did not include variables upon which an individual high school has little or no control, including student background and fiscal resources. The models primarily examined the effects of teacher quality and the high school's college-going culture—two variables upon which high school

procedures may have impact, and controls for individual student achievement by incorporating certain student college-readiness exam scores as exogenous variables. The College Success Models are shown in Figures 4 and 5.

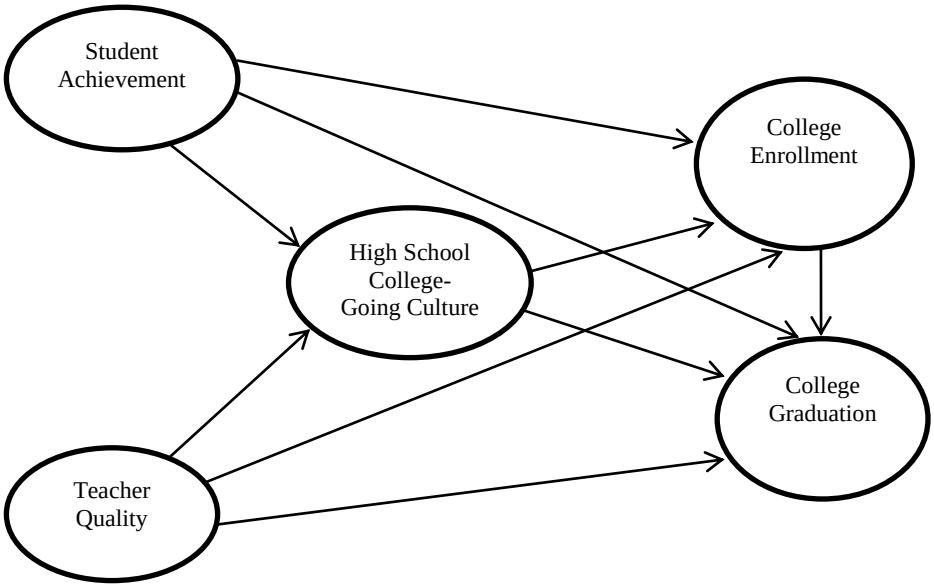


Figure 4 College Success Model 1

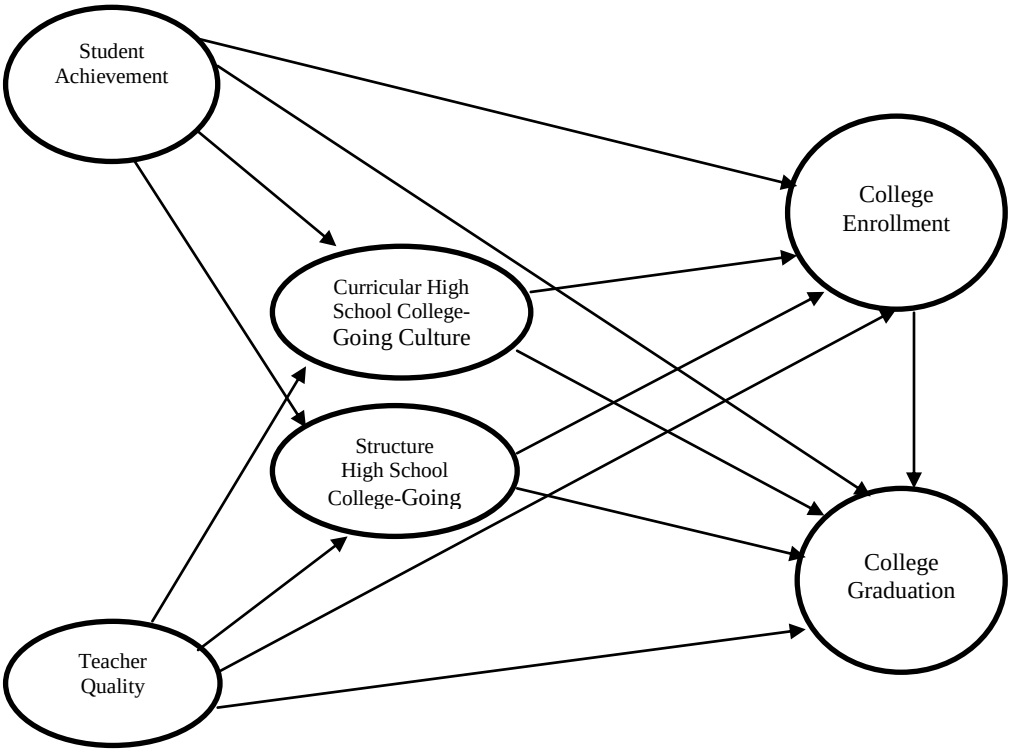


Figure 5 College Success Model 2

This study's College Success Models were further supported by the research of Kaplan and Elliott (1997) on structural equation modeling and de Neufville (1978) on the selection of variables. In particular, the definitions of indicators and concepts used in this research stem from de Neufville's work. An indicator is defined as "a construct, a set of procedures for collecting and combining data to stand for a concept…. It enables one to organize empirical observations, connect them with ideas, and give them substance" (p. 173). A

concept is “a part of language referring to shared experience of phenomenon” and an indicator “represents one of the concept’s dimensions or represents the concepts less well in some contexts than others” (p. 173).

The deNeufville paper was written before the use of structural equation modeling in education and refers to “composite indicators” and cautions that the indicator’s components must be evaluated to determine their interactions and weights. In accord with action research, validation is called a “continuous process” whereby a “validity coefficient will never be permanently attached to an indicator as its correctness will depend on contexts, uses, and users” (p. 172).

Research Method

The use of structural equation modeling to validate education indicators was first explored in depth in 1997 through a study supported by the American Education Research Association and conducted by David Kaplan and Pamela Elliott. The researchers cited both Oakes’ theoretical model and deNeufville’s indicator validation work as the basis for causal path analysis. They sought in creating structural equation models to make explicit deNeufville’s claim that “Theoretical indicators can also be validated by looking at their movements in relation to indicators of other variables when an interrelationship is presumed” (p. 177). This research study investigates the relationships between teacher quality, high school college-going environments, and student postsecondary success.

The use of partial least squares (PLS) regression was chosen for this research. PLS regression is an extension of multiple linear regression (MLR) in that it is a linear model that specifies the linear relationship between a set of predictor variables and a dependent variable. In contrast, MLR would be useful if the model contained fewer, non-redundant (collinear) variables. When using MLR with a relatively larger number of variables to observations, the manifest variables, or sampled data, can be over-fitted (Abdi, 2003). PLS extracts the latent factors that underlie the manifest variables, and is also called "projection to latent structure." Dijkstra (1983) cautioned that the PLS concept of latent structures, or vectors (Abdi, 2003), is not identical to the term "latent variables" in structural equation modeling, and does not produce consistent estimates of these.

The PLS technique was chosen because in these College Success Models: 1) the number of independent variables was high compared to the number of observations (29 high schools); 2) the independent variables were correlated; and 3) there were two dependent variables (enroll in college and graduate from college), and these dependent variables wee correlated. PLS path modeling was also chosen because these models aim to be predictive, and contain many independent variables.

As Haenlein and Kaplan (2004) state, multiple linear regression methods have other limitations that PLS regression addresses. These limitations include

the following MLR assumptions: the need for simple model structures (one dependent and several independent variables); all variables are observable (severely limits applications where only the effects of a variable can be observed); and all variables are measured without error (random error and systemic error—such as variance in the measurement method).

Other extensions of MLR analysis used in similar structural equation models with a large number of predictor variables are step-wise methods and principal components regression. Step-wise, or maximum redundancy, analysis eliminates some predictor variables. Principal component analysis solves the multicollinearity problem, yet leads to potential sub-optimal component choices. Both methods explain the factors underlying the independent variables more than the predicted ones. As Abdi states: "The main originality of PLS regression is to preserve the asymmetry of the relationship between predictors and dependent variables, whereas these other techniques treat them symmetrically" (Abdi, 2003, p. 6).

A PLS model, as in all structural equation models, represents the path relationships between the latent variables as well as between the latent variables and their indicators. Introduced in 1975 by Herman Wold for use in econometrics, PLS is now used in fields as diverse as chemical engineering and marketing (Haenlein & Kaplan, 2004). PLS accommodates both categorical and continuous predictor variables.

SmartPLS is a PLS path modeling software developed by Christian Ringle and colleagues at the University of Hamburg (Ringle, et al., 2005). It simultaneously determines the direct and indirect path influences among the latent variables.

Indicators in PLS models are either reflective or formative. The indicators in this research were reflective, they were exchangeable. Indicators, or measures, are "observable, quantifiable scores obtained through empirical means" (Bollen & Lennox, 1991). Latent constructs are abstractions that describe phenomenon (Teacher Quality, High School College-Going Culture, etc. in this research). For reflective constructs, changes in the constructs create changes in the indicators. For formative constructs, changes in the measures cause changes in the construct.

Petter, Straub, and Rai (2007) created decision rules to identify a reflective structural equation model. This study's variables fit the decision rules outlined below concerning direction of causality, and interchangeability of and covariation among variables. Table 7 shows the decision rules for a reflective model.

Table 7 Decision Rules for Reflective Model

Decision Rule	Reflective Model
Direction of causality implied by conceptual definition	▪ Direction of causality is from construct to items ▪ Indicators are manifestations of the construct ▪ Changes in the indicators should not cause changes in the construct ▪ Changes in the construct do cause changes in the indicators
Interchangeability of indicators	▪ Indicators should be interchangeable ▪ Indicators should have the same or similar content or share a common theme ▪ Dropping an indicator should not alter the conceptual domain of the concept
Covariation among the indicators	▪ Indicators are expected to covary with each other (a change in one of the indicators should be associated with changes in the other indicators)
Nomological net of the construct indicators	▪ Indicators are required to have the same antecedents and consequences

Limitations, Assumptions, and Range of Validity

This research relied entirely on secondary data sources, primarily from the Dallas ISD, TEA, and the National Student Clearinghouse. While these sources provided large data files to be manipulated, it was not possible for this researcher to judge if clerical mistakes were made in preparing the data. Numerous or large clerical errors would render the research unreliable. It was assumed that the

Dallas ISD has had ample time to correct TEA submission errors for 2002 and 2003, and that it would have been to the advantage of numerous high school administrators to correct such data errors. National Student Clearinghouse data were collected to report when student loans need to be repaid, and it would be to the college student's advantage to report any college-going behavior that might have been under-reported. Because these data sets were assumed to have been viewed and corrected by either school administrators or college students, the data were presumed to be reliable.

The sample size for the PLS regression was 29 Dallas ISD high schools which poses a threat to statistical conclusion validity. Although the data were reliable, and the inferential statistics method selected was appropriate to this size population, power can be increased by analyzing more schools. A research study that included a greater number of high schools would increase statistical conclusion validity. The descriptive statistics analysis of student college enrollment and graduation outcomes used a sample of 6,509 records which provided sufficient power.

With PLS regression a threat to construct validity is realized when the full domain of the construct is not captured (Petter, et al., 2007). The literature review supports the constructs included in the College Success Models, but additional variables, not available for the class of 2002, and additional constructs in the literature (Conley, 2003, 2005, 2009a, 2010) would add to construct validity. The

paucity of 2002 variables available for the latent constructs (except for College Enrollment and Graduation) could create mono-operational bias, thus threatening construct validity.

The low power of the inferential statistical analysis combined with the changes in indicators available today as compared to 2002, limit the generalizability of this research study. Further research, with additional high schools and latent construct variables would increase internal and external validity.

Finally, another concern using PLS regression is an error in categorizing measures as reflective or formative. Table 8 shows a chart created by Diamantopoulos and Siguaw (2006) to determine Type I (false positive) and II (false negative) errors. If this researcher made a mistake in selecting to treat the latent construct variables as reflective when they were actually formative, then a Type I error, where the null hypothesis is rejected when it is true, would have occurred. This research appears to have correctly determined the latent construct measures as reflective and avoided these errors.

Table 8 SEM Type I and II Error Determination

		"Correct" Auxiliary Theory	
		Reflective	Formative
Researcher Choice of Measured Perspective	Reflective	Correct Decision	Type I Error
	Formative	Type II Error	Correct Decision

CHAPTER 4

THE FINDINGS

Research Overview

The purpose of this research was to determine if significant relationships exist between practices school districts implement and subsequent student enrollment in and graduation from college. This chapter presents descriptive statistics for the Dallas ISD 2002 high school graduates and results of inferential statistics analysis, used to determine college enrollment and completion statistics. Then, it examines partial least squares models composed of latent variables of high school campus college-going culture, teacher quality, and student academic achievement.

This section describes the characteristics of the graduating class of 2002 derived from analysis of the merged Dallas ISD student demographic and NSC data files from fall 2009. Of the 6,509 high school graduates, 60.3% enrolled in postsecondary education and 13.3%, or 865, completed college by fall 2009. In fall 2009, 641 students, or 9.8% of the high school graduates were still currently enrolled in a postsecondary institution. College enrollment in this study was defined as enrolling in at least one credit-bearing postsecondary class for at least one semester at any time between 2002 and fall semester 2009. College

completion was measured as the completion of a certification program or an associate degree or higher. Fall 2009 enrollment was calculated as beginning after August 1, 2009. Table 9 shows the college going results for the class of 2002.

Table 9 Dallas ISD 2002 Graduates Postsecondary Enrollment and Graduation

Category	Number	Percent
Graduate Dallas ISD class of 2002	6509	100.0
Enroll in any postsecondary	3927	60.3
Graduate any postsecondary	865	13.3

College Enrollment Analyses

The findings show a disparity between the racial, ethnic, and gender makeup of college enrollees. This finding was supported in the literature (Black & Sufi, 2002; Bowen, et al, 2009; Cabrera & La Nasa (2000); Chen, 2005; Choy, 2002; Dounay, 2008; Kirst & Venezia, 2004; Roderick, Nagaoka, & Allensworth, 2006; Sum, et al, 2008). A greater percent of Asian, white, American Indian, and African American Dallas ISD students, 72.9%, 70.9%, 66.7%, and 64%, respectively, enrolled in college than did Hispanic students, of whom 53.7% enrolled in college. Hispanics comprised 43.4% of all high school graduates, but 50.6% of those who did not attend college. A slightly higher percent of females enrolled in college, 62.5%, than did males at 58%. Males account for 45% of high school graduates and 47.7% of students who did not enroll in college.

Nearly 39% of the 2002 graduating class was classified as LEP, and this group made up 45.1% of the group that did not attend college. Of the LEP students, those who had exited LEP (by completing language acquisition requirements in high school) and those who were classified non-LEP or Untestable (due to their ability to pass language requirements even though the language primarily spoken in their homes was not English), attended college at higher rates than those who were still classified as LEP at the time of high school graduation. Only 36.8% of the LEP high school graduates attended any college. Table 10 illustrates demographic characteristics for the class of 2002 high school graduates who enrolled in any postsecondary institution.

Table 10 College Enrollment by Ethnicity, Gender, and LEP

Characteristic	No Postsecondary Enrollment	Percent Across	Enrolled in Postsecondary	Percent Across	All Graduates	Percent
Ethnicity						
Unknown	41	48.8	43	51.2	84	1.3
Hispanic	1306	46.3	1516	53.7	2822	43.4
African	982	36.0	1745	64.0	2727	41.9
American						
White	203	29.1	494	70.9	697	10.7
Asian	42	27.1	113	72.9	155	2.4
American	8	33.3	16	66.7	24	0.4
Indian						
Total	2582	39.7	3927	60.3	6509	100.0
Gender						
Unknown	41	48.8	43	51.2	84	1.3
Female	1309	37.5	2185	62.5	3494	53.7
Male	1232	42.0	1699	58.0	2931	45.0
Total	2582	39.7	3927	60.3	6509	100.0
Limited English Proficient						
Not LEP	1418	35.6	2561	64.4	3979	61.2
Exited	671	41.3	952	58.7	1623	24.9
LEP						
LEP	359	63.2	209	36.8	568	8.7
Non-	134	39.5	205	60.5	339	5.2
LEP/Untest						
Total	2582	39.7	3927	60.3	6509	100.0

The literature states that a relationship exists between high school senior year GPAs and AP course-taking and college enrollment and graduation (Boser & Burd, 2009; Garvey, 2009; Roderick, et al., 2006, 2008, 2009; Sum, et al., 2008). An analysis of GPAs for the class of 2002 shows a significant difference in the

mean GPA for students who did not attend any college (79.8), those who enrolled in college (82.8); and those who completed college (86.5).

The 2001-2002 school year was the first in which the Dallas ISD encouraged students to take AP exams, and in which test scores were recorded. In that school year, 2,685 students completed 5,188 exams. According to AP data provided by College Board to the district, the number of students taking and passing AP exams had more than doubled by the 2008-2009 school year. This focus on increasing academic rigor through exposure to AP classes and exams was supported by the literature (Boser & Burd, 2009; Callan, et al., 2006; Conley, 2005, 2009a; Jackson, 2009; Jeong, 2009; Keng & Dodd, 2008; Klopfenstein & Thomas, 2009; McCauley, 2007; Roderick, et al., 2009; Solorzano & Ornelas, 2002).

National research indicates that students who enroll within the first two years of high school graduation and return for a second year were more likely to graduate from college (NCES, 2004, 2005, 2007, 2008, and 2009). Of Dallas ISD graduates, 38% enrolled in college the fall following high school completion. Eighty-four percent of these immediate enrollees attended public schools, 55.3% first attended two-year colleges, and 86.8% first attended in-state colleges.

Students who delayed entering college until one or two years following high school tended to attend a higher proportion of two-year colleges. Nearly 62% of both of these cohorts first enrolled in two-year colleges. Of those students

who delayed college entrance for up to two years after high school, nearly 90% attended public colleges and 92% attended in-state schools.

Freshman to sophomore college retention rates are an indicator of future college graduation (NCES, 2004, 2005, 2007, 2008, 2009). A higher percent of students who attended four-year schools returned for a second year, 87% as compared to 64% for two-year schools. The same holds true for those who attended private versus public schools at 82% to 71%, and those who attended out-of-state schools (83%) compared to in-state (72%). The literature suggests this may be due to a combination of available financial resources and the higher cost of private, out-of-state education (NCES, 2008) which may pressure students to graduate more quickly than those attending public, in-state schools. Additionally, many students who attend two-year schools also work which delays their college completion (Adelman, 2006; Callan, et al., 2006; Choy, et al., 2000; Garvey, 2009; Hoffman, et al., 2007; Kane & Spizman, 1994; Karp, et al., 2007, 2008; Martinez & Klopott, 2003, 2005; Roderick, et al., 2006, 2008, 2009; Sum, et al., 2008). Table 11 shows the enrollment timing and type of degree-granting postsecondary institutions in which the high school class of 2002 enrolled. This data was received directly from the NSC by the Dallas ISD and reported in fall 2009 for the class of 2002.

Table 11 Timing of College Enrollment and Retention Rates

Enrollment Period	Percent
Enrolled in college the fall immediately following high school	
All Institutions	38
Public	32
Private	6
Two-Year	21
Four-Year	17
In-State	33
Out-of-State	5
Enrolled in college at any time during the first year after high school	
All Institutions	47
Public	42
Private	5
Two-Year	29
Four-Year	18
In-State	43
Out-of-State	4
Enrolled in college at any time during the first two years after high school	
All Institutions	52
Public	47
Private	5
Two-Year	32
Four-Year	20
In-State	48
Out-of-State	4
Returned for a second year (Freshman to Sophomore retention rate)	
All Institutions	73
Public	71
Private	82
Two-Year	64
Four-Year	87
In-State	72
Out-of-State	83

NOTE: Percentages are cumulative for the enrollment periods, and actual for the Freshman to Sophomore year retention rates

The majority of Dallas ISD students enrolled in college, and 66.9%, were enrolled as full-time students. Students enrolled half-time account for 28.9% of the total, and those enrolled less than half-time for 4.2%. Full-time students were enrolled for 12 or more credit hours; half-time students were enrolled for 6 to 11 credit hours; and less than half-time students were enrolled for one to five credit hours. Table 23 in Appendix B contains information on postsecondary enrollment by college.

College Graduation Analyses

Of the 6,509 Dallas ISD graduates in the class of 2002, 13.3% earned a college degree or certification by fall 2009. Of degrees completed, 75.7% were four-year degrees, 14.9% were two-year certificates or degrees, and 8.7% were not identified in the NSC data file. The 865 high school graduates who completed college earned 1,048 degrees, ranging from certificates to master's degrees.

On average, it took 4.9 years for these students to complete a certificate or degree, with a standard deviation of 1.5 years. Two-year degrees took 4.1 years on average to complete, and four-year degrees were completed in 5.1 years on average. This length of time to complete a degree, taking into consideration the standard deviation, was supported by the literature (Garvey, 2009; Roderick, et al., 2006, 2008, 2009; NCES, 2004, 2007, 2009; Sum, et al., 2008). Table 12 shows the first degree earned, the mean number of years it took to earn the

degree, and the standard deviation. Table 24 in Appendix C shows postsecondary graduation by college.

Table 12 First Degree Earned, Mean Years to Graduate, and Standard Deviation

Type of Degree	Number	Mean	Standard Deviation
Two-Year (Certificate, A.A., A.S.)	129	4.1	1.9
Four-Year (B.A., B.S.)	655	5.1	1.4
Master's	6	5.2	1.6
Unknown	75	4.5	1.3
Total	865	4.9	1.5

NOTE: Some of the four-year colleges in this study award two-year degrees or certificates.

Slightly more than one-in-five of the class of 2002 high school graduates who enrolled in college, or 22%, completed a certificate or a degree during the period of this research. Although nearly sixty percent of the high school graduates first enrolled in two-year colleges, only 11.7% earned a degree from a two-year college. Eighty-eight percent of the first degrees earned were earned at four-year colleges (some of which award certificates or two-year degrees). This suggests that a high percentage of students who initially enrolled in two-year colleges do not complete a degree. Table 13 shows the first degrees earned at different types and levels of colleges.

Table 13 First Degree Earned by Institution Level and Type

Institution Level and Type	Number	Percent
Two-Year College	101	11.7
Four-Year College	764	88.3
Public College	629	72.7
Private College	236	27.3

A higher percentage of white and Asian students completed college degrees as compared to African American and Hispanic students. Whites and Asians represented twice as many college graduates as high school graduates: whites and Asians comprised 10.7% and 2.4%, respectively, of the high school graduation class and completed 23.9% and 4.9%, respectively, of the college degrees. The ratio for African Americans was slightly positive. African American students comprised 41.9% of the high school graduation class and 45% of college degree completers. Hispanic students completed at the lowest rates: they represented 43.4% of the high school class, and only 25.8% of the college degrees holders.

Females completed college degrees at a higher rate than males. Females comprised 53.7% of the high school class and 64.2% of the college graduates. Males completed college at much lower rates. They made up 45% of the high school class and 35.6% of the college completers.

Less than one-third of the students who graduated high school characterized as LEP completed college degrees. LEP students comprised 8.7%

of the high school class and only 2.7% of the college graduates. Students who exited LEP programs before high school graduation comprised a quarter of the graduating class and completed 17.1% of the college degrees earned. Conversely, 61.1% percent of the student body not characterized as LEP completed 74.7% of college degrees. Table 14 shows the race and ethnicity, gender, and LEP status for the class of 2002 Dallas ISD graduates.

Table 14 College Graduates by Ethnicity, Gender, and LEP

Characteristic	Graduated College	Percent
Ethnicity		
Hispanic	223	25.8
African American	389	45.0
White	207	23.9
Asian	42	4.9
American Indian/Unknown	4	0.4
Total	865	100.0
Gender		
Unknown	2	0.2
Female	555	64.2
Male	308	35.6
Total	865	100.0
Limited English Proficient		
Not LEP	646	74.7
Exited LEP	148	17.1
LEP	23	2.7
Non-LEP/Untestable	48	5.5
Total	865	100.0

Analysis of college completion rates by high school revealed racial, ethnic, and economic disparities in college completion. The high schools that graduated a higher percent of college completers were the least diverse. Only one high school that graduated a high percentage of future college graduates was economically disadvantaged (Skyline). Among the 12 high schools that graduated students above the mean college graduation rate of 13.3% were seven magnet schools and the one comprehensive/magnet school. Interestingly, the one school that produced no college graduates in this time period was Middle College, a school located on the campus of El Centro College in the Dallas County Community College District. Middle College graduated 27 students in 2002, of which 19 enrolled in college, and none graduated. This study did not reveal data to support conclusions about this occurrence. Table 15 shows college degree attainment by high school.

Table 15 College Degree Attainment by High School

School	Percent Graduated College	Type	Higher than Average Hispanic	Higher than Average African American	Higher than Average Enrolled in ESL	Higher than Average Economically Disadvantaged
Talented and Gifted	55.8	Magnet				
Education and Social Sciences	44.7	Magnet				
Science and Engineering	43.8	Magnet				
Booker T. Washington	38.2	Magnet				
Law	33.7	Magnet		Yes		
Health	31.5	Magnet		Yes		
Business	25.7	Magnet				
White	18.7	Comprehensive			Yes	
Hillcrest	17.3	Comprehensive			Yes	
Wilson	15.8	Comprehensive	Yes		Yes	
Skyline	15.7	Comp/Magnet	Yes			Yes
Bryan Adams	13.7	Comprehensive			Yes	
Study Mean	**13.3**					
Carter	12.3	Comprehensive		Yes		
Lincoln	11.5	Comprehensive		Yes		Yes
Kimball	10.5	Comprehensive		Yes		Yes
Jefferson	8.8	Comprehensive	Yes		Yes	Yes
Roosevelt	8.5	Comprehensive		Yes		Yes
Sunset	8.5	Comprehensive	Yes		Yes	Yes
Seagoville	7.8	Comprehensive				
North Dallas	7.7	Comprehensive	Yes		Yes	Yes
South Oak Cliff	7.0	Comprehensive		Yes	Yes	Yes
Samuell	5.8	Comprehensive		Yes	Yes	Yes
Molina	5.6	Comprehensive	Yes		Yes	Yes
Madison	5.2	Comprehensive		Yes		Yes
Adamson	5.1	Comprehensive	Yes		Yes	Yes
Pinkston	5.1	Comprehensive		Yes	Yes	Yes
Spruce	4.5	Comprehensive		Yes		Yes
Smith	3.7	Comprehensive		Yes		Yes
Middle College	0.0	Other	Yes			

The College Success Models

The following section outlines the findings from the partial least squares (PLS) path modeling. The PLS technique was chosen to accommodate the relatively high number of independent variables compared to the number of

observations; the multicollinearity of the latent construct variables; and the two correlated endogenous variables (enrolled in college and graduated from college). As a structural equation modeling technique, PLS path modeling is able to concurrently test both the measurement and structural models.

The program used for this research, SmartPLS version 2.0, does not calculate goodness-of-fit values. For this study *t*-values, two-tailed, were examined to determine the strength of the various paths. Then, R^2 values were calculated to assess the ability of the proposed relationships to predict a significant degree of explanatory power in each of the latent constructs.

After loading the indicator variables into each latent construct, a bootstrapping procedure was run to determine the significance of each of the variables within the latent constructs. Bootstrapping is a procedure used for assessing the significance of parameter estimates. Then a PLS algorithm was calculated to determine the path. With the exception of two measures of Teaching Quality (teaching experience of 6 to 10 years and 11 to 20 years where the two-tailed *t*-values were under 1.96), the construct variables, which control for each other within the latent construct, were significant at 0.05.

Table 16 shows the PLS latent variable correlations between the five latent constructs in Model 1. The correlations between the latent variables suggest strong relationships between High School College-Going Culture and College Enrollment (0.90), and Graduation (0.88); between College Enrollment and

Graduation (0.88); between Teacher Quality and College-Going Culture (0.77) and College Graduation (0.78); and between Student Achievement and College Graduation (0.76).

Table 16 Model 1 PLS Latent Variable Correlations

	College Enrollment	High School College-Going Culture	College Graduation	Student Achievement	Teacher Quality
College Enrollment	1	0	0	0	0
High School College-Going Culture	0.896	1	0	0	0
College Graduation	0.875	0.878	1	0	0
Student Achievement	0.651	0.578	0.762	1	0
Teacher Quality	0.669	0.767	0.774	0.577	1

Table 17 shows the PLS latent variable correlations between the six latent constructs in Model 2. The correlations between the latent variables suggest strong relationships between Curricular High School College-Going Culture (Curricular Culture) and College Graduation (0.92) and Enrollment (0.89); between College Enrollment and Graduation (0.88); between Teacher Quality and College Graduation (0.77) and Curricular Culture (0.71); between Structure High School College-Going Culture (Structure Culture) and College Enrollment (0.75),

Teacher Quality (0.74), and Curricular Culture (0.70); and between Student Achievement and College Graduation (0.76) and Curricular Culture (0.74).

Table 17 Model 2 PLS Latent Variable Correlations

	College Enrollment	College Graduation	Curricular Culture	Structure Culture	Student Achievement	Teacher Quality
College Enrollment	1	0	0	0	0	0
College Graduation	0.875	1	0	0	0	0
Curricular Culture	0.891	0.916	1	0	0	0
Structure Culture	0.751	0.685	0.700	1	0	0
Student Achievement	0.651	0.762	0.738	0.295	1	0
Teacher Quality	0.666	0.770	0.710	0.740	0.574	1

The PLS reflective College Success Models were assessed with regard to reliability and validity. Internal consistency reliability is typically measured by Cronbach's α, an estimate for reliability based on indicator intercorrelations. However, Cronbach's α assumes that all indicators are equally reliable and can underestimate the internal consistency reliability in PLS where indicators are prioritized according to their reliability. Therefore, the composite reliability measure, which takes into account different indicator loadings, is used in PLS. Internal consistency reliability values above 0.80 are satisfactory (Henseler, et al., 2009). The composite reliability values for Model 1 were: 0.96 for High School College-Going Culture; 0.99 for Student Achievement; and 0.91 for Teacher Quality. The composite reliability values for Model 2 were: 0.93 for Curricular

Culture; 0.98 for Structure Culture; 0.99 for Student Achievement; and 0.91 for Teacher Quality. To assess convergent validity, an Average Variance Extracted (AVE) value of at least 0.50 is a sufficient criterion (Henseler, et al., 2009). The AVE values in Model 1 were: 0.65 for High School College-Going Culture; 0.96 for Student Achievement; and 0.53 for Teacher Quality. The AVE values for Model 2 were: 0.68 for Curricular Culture; 0.89 for Structure Culture; 0.96 for Student Achievement; and 0.53 for Teacher Quality.

In PLS path models, the outer model specifies the relationships between the latent constructs and their measurement variables. (Each manifest variable in a reflective model is assumed to be generated as a linear function of its latent variables and the residual.) The outer loadings for College Success Model 1 manifest variables are shown in Table 18. Outer loadings should be higher than 0.70 for the manifest variables; manifest variables should be eliminated if smaller than 0.40 as they cause a decrease of composite reliability (Henseler, et al., 2009). The manifest variables in Model 1, with the exception of teachers holding less than a Bachelor's degree, met these criteria. The manifest variable of teachers' with less than a Bachelor's degree was kept in Model 1 because its two-tailed *t*-value was significant and its exclusion did not affect the model.

In Model 1, the outer loadings for the three Student Achievement manifest variables were all above 0.97 and reliable. Teacher Quality outer loadings for experience were: 0.64 for beginning teachers; 0.70 for teachers with one to five

years teaching experience; and 0.86 for teachers with more than 20 years teaching experience. Outer loadings for average years teaching were 0.90, and 0.69 for teaching in the Dallas ISD. In terms of teacher education levels, the outer loadings were 0.38 for teachers with less than a bachelor's degree; 0.81 for teachers with a Bachelor's degree; 0.72 for teachers with a master's degree; and 0.71 for teachers with a doctorate. Outer loadings for High School College-Going Culture manifest variables for class size were: 0.72 for number of students per teacher; and ranged from 0.86 for science to 0.91 for social studies. Outer loadings for graduation program were 0.77 for the minimum program and 0.84 for the recommended program. In terms of rigor, the outer loadings were 0.62 for percent tested for AP; 0.74 for enrolled in advanced courses; and 0.83 for percent tested for ACT or SAT. The outer loadings for campus attendance rate were 0.77 and for percent teachers on campus were 0.83.

Table 18 Model 1 Outer Loadings for Manifest Variables

Manifest Variable	Student Achievement Outer Loadings	Teacher Quality Outer Loadings	High School College-Going Culture Outer Loadings
Mean ACT of high school seniors	0.975		
Mean SAT of high school seniors	0.991		
Percent of students per high school with SAT score greater than or equal to TEA criterion of 1110	0.977		
Percent beginning teacher		0.641	
Percent teaching for 1 to 5 years		0.704	
Percent teaching for more than 20 years		0.857	
Percent teachers on campus with less than a bachelor's degree		0.383	
Percent teachers on campus with a bachelor's degree		0.810	
Percent teachers on campus with a master's degree		0.718	
Percent teachers on campus with a doctoral degree		0.708	
Average years teaching experience		0.897	
Average years teaching in Dallas ISD		0.691	
Percent of students taking any AP exam			0.616
Percent of students taking SAT or ACT			0.825
Percent of students taking advanced courses (2000-2002)			0.741
Percent of students in Minimum graduation program			0.765
Percent of students in Recommended graduation program			0.835
Average campus attendance rate			0.768
Average number of students per teacher			0.716
Average class size English/ Language Arts			0.903
Average class size Math			0.862
Average class size Science			0.857
Average class size Social Studies			0.912
Percent of teachers on campus			0.834

The outer loadings for the manifest variables in College Success Model 2 are shown in Table 19. The outer loadings for Teacher Quality and Student Achievement are identical to Model 1, and the outer loadings for Curricular Culture and Structure Culture were all higher than 0.70 (Henseler, et al., 2009) and reliable. Outer loadings for Curricular Culture manifest variables were: 0.86 for enrolled in advanced courses; 0.83 for percent tested for ACT or SAT and percent teachers on campus; 0.82 for the recommended program; and 0.80 for campus attendance rate and percent tested for AP. Structure Culture manifest variable outer loadings were: 0.98 for English/language arts and science class size; 0.97 for social studies and math class size; and 0.82 for number of students per teacher.

Table 19 Model 2 Outer Loadings for Manifest Variables

Manifest Variable	Student Achievement Outer Loadings	Teacher Quality Outer Loadings	Curricular Culture Outer Loadings	Structure Culture Outer Loadings
Mean ACT of high school seniors	0.975			
Mean SAT of high school seniors	0.991			
Percent of students per high school with SAT score greater than or equal to TEA criterion of 1110	0.977			
Percent beginning teacher		0.641		
Percent teaching for 1 to 5 years		0.704		
Percent teaching for more than 20 years		0.857		
Percent teachers on campus with less than a bachelor's degree		0.383		
Percent teachers on campus with a bachelor's degree		0.810		
Percent teachers on campus with a master's degree		0.718		
Percent teachers on campus with a doctoral degree		0.708		
Average years teaching experience		0.897		
Average years teaching in Dallas ISD		0.691		
Percent of students taking any AP exam			0.798	
Percent of students taking SAT or ACT			0.832	
Percent of students taking advanced courses (2000-2002)			0.859	
Percent of students in Recommended graduation program			0.823	
Average campus attendance rate			0.802	
Percent of teachers on campus			0.833	
Average number of students per teacher				0.816
Average class size English/ Language Arts				0.975
Average class size Math				0.974
Average class size Science				0.975
Average class size Social Studies				0.970

Figure 6 and Table 20 show the path coefficients for College Success Model 1 and direct and total effects. The R-Square, or coefficient of determination, for each of the model's endogenous latent constructs suggests that the model explains 62% of the variability of High School College-Going Culture; 84% of the variability of College Enrollment; and 89% of the variability of College Graduation.

One of the key findings was that the High School College-Going Culture has a significant and positive direct effect on both student College Enrollment (0.86) and Graduation (0.35). The High School College-Going Culture's indirect effect via College Enrollment to College Graduation was also positive (0.22), and the total effect on College Graduation (0.57) was positive.

This study suggests that a high school's ability to offer and enroll its students in rigorous academic offerings such as AP courses, provide appropriately sized classes that promote student engagement, and mandate that its students take college entrance exams, has a positive effect on the students' ability to enroll in and complete postsecondary education programs.

Another finding was the significant, positive, direct effect of Teacher Quality on the High School College-Going Culture (0.65). The direct effect of Teacher Quality on College Enrollment, however, was negative (-0.12) and not significant. The total effect of Teacher Quality on College Enrollment via High School College-Going Culture is the sum of the indirect effect (0.56) and the

direct effect (-0.12), and was positive (0.44). The total effect of Teacher Quality on College Graduation via High School College-Going Culture and College Enrollment was also positive (0.50). This suggests that the independent variables contained within the quality teacher latent construct—years of teaching experience and teacher college degrees—have a positive total effect on College Enrollment and Graduation.

Student Achievement had a significant and positive direct effect on the High School College-Going Culture (0.20), College Enrollment (0.22), and College Graduation (0.30). The Student Achievement indirect effect via High School College-Going Culture on College Enrollment was positive (0.17), as was the total effect of Student Achievement on College Enrollment (0.40). Student Achievement was similarly related to College Graduation: the indirect effect via High School College-Going Culture and College Enrollment was positive, as was the total effect of Student Achievement on College Graduation (0.47).

In Model 1 two sets of factors were very highly related: 1) Teacher Quality and High School College-Going Culture, and 2) High School College-Going Culture and College Enrollment and Graduation. The other relationships in the model were more weakly associated, and one, between Teacher Quality and College Enrollment, was negative. These findings suggest that well-educated, experienced teachers have a positive effect on a High School's College-Going

Culture. In turn, a strong high school college-going culture has a positive effect on student enrollment in college.

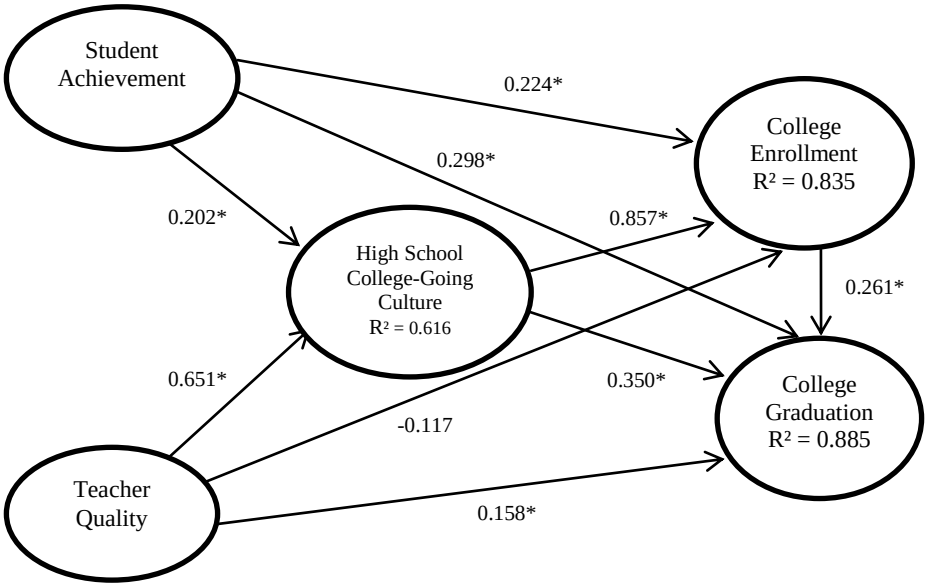


Figure 6 College Success Model 1 with Path Coefficients

NOTE: *$p < .05$

Table 20 Model 1 Direct and Total Effects

	High School College-Going Culture	College Enrollment	College Graduation
Student Achievement	0.202	0.397	0.472
Teacher Quality	0.651	0.440	0.501
High School College-Going Culture	0	0 0.857	0.574
College Enrollment	0	0	0.261
College Graduation	0	0	0

Model 2 allowed for a deeper analysis of high school college-going culture through the separation of culture into two latent constructs of Curricular and Structure. Figure 7 and Table 21 show the path coefficients for College Success Model 2 and direct and total effects. The R-Square, or coefficient of determination, for each of the model's endogenous latent constructs suggests that the model explains 67% of the variability of Curricular Culture; 57% of the variability of Structure Culture; 84% of the variability of College Enrollment; and 89% of the variability of College Graduation.

A key finding of Model 2 is that Curricular Culture, which contained manifest variables for advanced, rigorous coursework, had a larger total effect on College Enrollment and Graduation, 0.56 for both, than did Structure Culture, which contained manifest variables for class size. The total effect of Structure Culture on College Enrollment was 0.41, and on Graduation was 0.10. These four total effects were positive. The Curricular Culture indirect effect via College Enrollment to College Graduation was positive (0.15), as was the direct effect of Curricular Culture on College Graduation (0.41). The indirect effect of Structure Culture via College Enrollment to College Graduation was positive (0.11), but the direct effect of Structure Culture on College Graduation was not significant and negative (-0.01).

Another finding was the significant, positive, direct effect of Teacher Quality on Structure Culture (0.85) and Curricular Culture (0.43). The direct

effect of Teacher Quality on College Enrollment in Model 2 was significant and negative (-0.15). The direct effect of Teacher Quality on College Graduation was positive and significant (0.21). The total effect of Teacher Quality via Structure Culture and Curricular Culture on College Enrollment was positive (0.44), as was the total effect on College Graduation (0.50). This suggests that the independent variables contained within the quality teacher latent construct—years of teaching experience and teacher college degrees—have a greater direct effect on Structure Culture than Curricular Culture, and a positive total effect on both College Enrollment and Graduation.

Student Achievement had a significant and positive direct effect on Curricular Culture (0.50), and a significant and negative effect on Structure Culture (-0.19). The direct effect of Student Achievement in Model 2 was significant and positive on both College Enrollment (0.20) and College Graduation (0.17). The total effect of Student Achievement via Structure Culture and Curricular Culture on College Enrollment was positive (0.40), as was the total effect on College Graduation (0.48).

In Model 2 the factors that were most highly related were Teacher Quality and Structure Culture (0.85), and Curricular Culture and College Enrollment (0.56) and Graduation (0.56). Only one relationship was not significant (Structure Culture and College Graduation), and two were negative (Student Achievement and Structure Culture, and Structure Culture and College Graduation). This study

suggests that a high school's ability to offer and enroll its students in rigorous academic offerings, and provide and mandate that its students take college entrance exams, has a greater positive effect than class size on student ability to complete college.

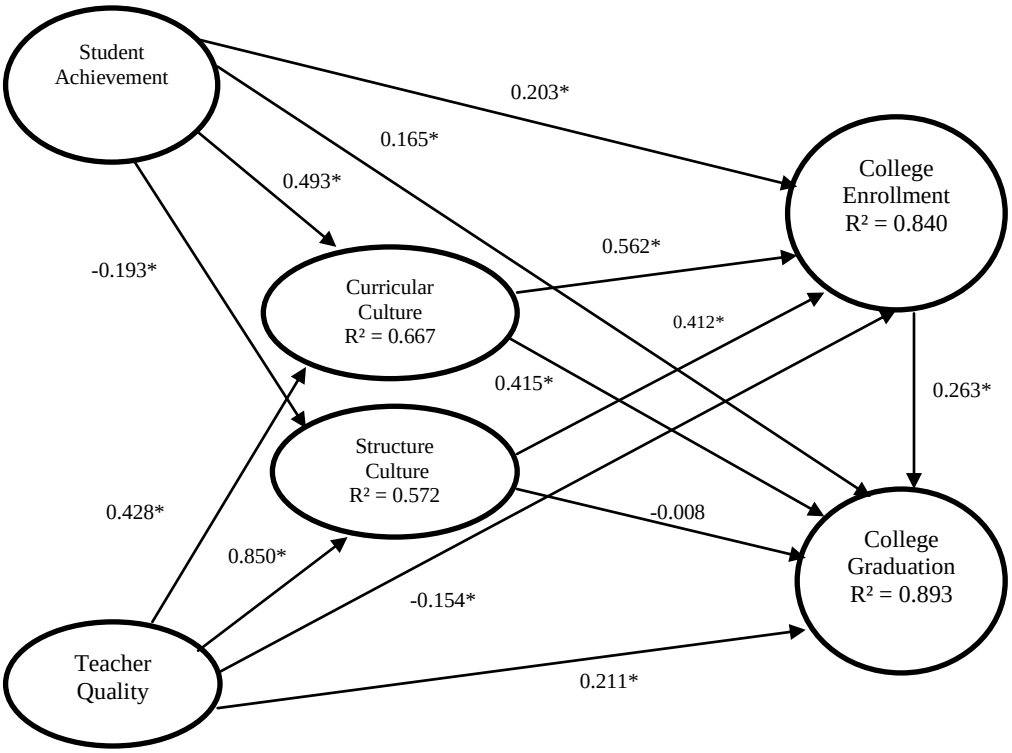


Figure 7 College Success Model 2 with Path Coefficients

NOTE: *$p < .05$

Table 21 Model 2 Direct and Total Effects

	Curricular Culture	Structure Culture	College Enrollment	College Graduation
Student Achievement	0.493	-0.193	0.401	0.477
Teacher Quality	0.428	0.850	0.437	0.496
Curricular Culture	0	0	0.562	0.563
Structure Culture	0	0	0.412	0.100
College Enrollment	0	0	0	0.263
College Graduation	0	0	0	0

CHAPTER 5

THE DISCUSSION

The aim of this research was to determine significant high school-level measures that promote college enrollment and graduation. The PLS regression clearly suggests that students who experience highly educated and experienced teachers while pursuing rigorous courses of study in high school will succeed in college. High quality teachers have a significant effect on creating a college-going culture on the high school campus. High school campuses that promote college-going cultures positively affect students' ability to enroll in and graduate from postsecondary educational institutions.

Key Findings

Two key areas where school districts and high schools can take action were indicated by the results of this research. They were related to improving teacher quality, as defined by this study as level of teacher education and years of teaching experience (Clotflelter, et al., 2007; Darling-Hammond, 2002; Eisner, 2001; Goldhaber & Brewer, 1997, 2000; Jackson, 2009; Jeong, 2009; Rivkin, et al., 2005; Rockoff, 2004), and improving the high school college-going culture. A high school college-going culture was defined in the literature as one which provides an aligned core academic curriculum, implements mandatory college-

focused classes, such as AP and dual-enrollment (Adelman, 1999, 2006; Allensworth, et al., 2008; Attewell & Domina, 2008; Choy, et al., 2002; College Board, 2006; Conley, 2009; Dounay, 2008; Hallinan & Sorenson, 1985; Hedges & Stock, 1983; NCEE, 2009; Robinson, et al., 2005); encourages attendance (Conley, 2008; Hooker & Brand, 2009), and provides for teacher-student engagement (Darling-Hammond, 2002; Dryden, et al., 1999; Quint, et al, 2007, 2008). The literature states that urban, economically disadvantaged students require additional school supports that were lacking in their homes, due to factors such as absent parents or the students being first-generation high school and/or college enrollees (Cabrera, et al, 2006; Cabrera & La Nasa, 2000, 2001; Gates Foundation, 2005; Kirst & Venezia, 2004; Martinez & Klopott, 2003, 2005).

With regard to teacher quality, this study examined two key metrics: education level of the teacher and the number of years of teaching experienced accumulated. Concerning the education level of the teacher, this study suggests that an increase in a teacher's education level was positively related to an increase in the college-going culture of a high school campus. The literature supports that a district also assign teachers with degrees to teach classes related to their content knowledge (Clotfelter, 2007).

The second significant variable associated with the latent construct of teacher quality was number of years of experience. The results of this research suggest that teaching experience of zero up to six years was significant and

negatively correlated with a high school college-going culture and college graduation. This study suggests that teaching experience between six and twenty years was not a significant correlation. Teaching experience of more than twenty years, however was significant and positively related to a high school's college-going culture and college success. The literature contains conflicting reports about the level of teaching experience and various measures of student success, especially at more than five years teaching experience (Clotfelter, 2007; Greenwald, et al., 1996; Hanushek, 1986; Neild; 2009). In the current economic climate, with Texas school district layoffs, the Dallas ISD is not experiencing a teacher shortage. It has the option to be more selective of the teachers it hires and promotes.

This research study suggests that a high school's college-going culture, influenced by latent constructs of student achievement and teacher quality, has a significant effect on a student's college enrollment and graduation. Variables related to academic press, which included student enrollment in advanced courses and in a rigorous graduation plan; campus staffing levels that emphasize teaching; and high rates of student attendance were more significantly related to college enrollment and graduation than was class size. A high school's focus on academic rigor was highly related to indicators of college success. It was evidenced in this study by a higher percent of students enrolled in the recommended graduation plan and advanced courses, as well as taking AP, SAT,

and ACT exams (ACT, 2007, 2008; College Board, 2006). These are the essential elements for high school academic rigor.

School district allocations for staffing influenced the high school college-going culture. Campus personnel include teachers, administrators, and education aides, as defined by the TEA data set. This study showed a significant and positive correlation between college success and a higher percentage of teachers on campus, relative to other campus personnel (Burton, et al., 2002; Darling-Hammond, 2002; Rowan, et al., 2002).

This research suggests there exists a significant and positive correlation between high school student attendance and college success. The literature supports this finding: schools that promote strategies to improve attendance improve the opportunity for their students to learn (Adelman, 1999, 2006; Allensworth & Easton, 2005; Quint, 2008; Roderick, et al., 2006).

This study found there to be a negative and significant correlation between high school class size and college outcomes. This was true for all classes: English/language arts, mathematics, science, social studies, and number of students per teacher. The literature is mixed on this finding (Dryden, et al., 1999; Finn & Achilles, 1990; Hallinan & Sorenson, 1985; Hedges & Stock, 1983), and there are likely other factors for which to control in further studies, including matching student-teacher variables.

Implications for Policy

One key assumption that underlies this study was that all students can learn, regardless of situations beyond their control like poverty or unstable family support. This assumption also undergirds the policy discussion herein.

This study supports professional development to increase teachers' content knowledge through the attainment of master's and doctoral degrees. The literature supports recruitment and training for AP teachers (Hargrove, et al., 2008; Jackson, 2009; Jeong, 2009; Keng & Dodd, 2008; Klopfenstein & Thomas, 2009; Solorzano & Ornelas, 2002).

This research suggests that high schools should implement increasingly rigorous courses of study for their students to increase their students' ability to succeed in college. Better high school preparation would reduce the need for remediation at the college level, thus reducing the years needed to obtain postsecondary certification or degrees (Allenworth, et al., 2008; Attewell & Dormina, 2008; Dougherty, et al., 2006; Dounay, 2006; Guthrie & Guthrie, 2002; NCEE, 2009).

Of course, increased high school academic rigor means that appropriate preparation for high school must be accomplished by increasing rigor at the elementary and middle school levels. Since elementary objectives are focused on literacy and knowledge of basic math concepts, the pressure to increase rigor lies at the middle school, or junior high, level. Middle school students most likely

need the same supports suggested by this study: access to rigor and to teachers who have acquired adequate teaching experience and are educated in various fields to which they are assigned to teach (Christie & Zinth, 2008).

Dual-enrollment programs, typically offered at the two-year college level, are another path for students (Karp, et al., 2007, 2008; McCauley, 2007). The Dallas ISD and many other urban districts provide this learning opportunity for students. In some cases, students may graduate high school with many, if not all, credits needed for an associate's degree.

Another finding from this study was that students who enroll in four-year colleges tend to graduate at higher rates. Factors that may influence this that were not measured in this research could be access to financial support (Greenwald, et al., 1996) as well as social support systems. Adequate college counseling assists in helping students navigate the college world (College Board, 2006; Perna, et al., 2008). The literature states that students whose parents do not have postsecondary educations were less confident in assisting their children with the college context skills needed (Adelman, 2006; Balfanz, et al., 2002; Bangser, 2008; Black & Sufi, 2002; Bowen, et al., 2009; Cabrera & La Nesa, 2000, 2001; Cabrera, et al. 2006; Callan, et al., 2006); Conley, 2005, 2009, 2010; Darling-Hammond, 2002; Garvey, 2009; Hossler, et al., 1999; Kane & Spizman, 1993; Martinez & Klopott, 2003, 2005; Mehan, 1996; NCES, 2005; Robinson, et al., 2005).

The need for community businesses and organizations, whose members are college graduates, to mentor urban high school graduates who lack sufficient college knowledge support was made clear by this research. While the focus of this research was on actions that could be taken by high schools to improve college success, postsecondary institutions could initiate or increase efforts by their graduates to mentor enrolled college students. Electronic technology makes it possible to encourage long distance relationships as well. The relatively high level of college degree attainment by the Dallas ISD's class of 2002 African American students may be due in part to relationships built by historic black colleges between their alumni and enrolled students. Table 24 in Appendix C shows that five percent of class of 2002 initially enrolled in two historically black colleges: Texas Southern and Texas A&M, Prairie View.

Business and community organizations could take an increased role in mentoring both high school and college students through the college rite of passage. In early high school years, younger business employees, who are closer in age to the high school students, could speak about their struggles to stay focused on long term goals while in high school. The literature shows that ninth grade expectations to complete college were very high compared to reality (Roderick, et al., 2008, 2009). The opportunity to hear about the struggles of older youth, perhaps through community organizations, who were not well prepared and therefore unsuccessful in college, could be as motivating as listening

to school staff who support measures that research provide evidence is helpful (Choy, et al, 2000; Hooker & Brand, 2009).

Recommendations for Future Studies

The goal of this study was to evaluate potential early indicators of future college success to determine actionable responses by Dallas ISD administrators and teachers. The study revealed very strong relationships between rigorous secondary academic achievement—through participation in rigorous graduation plans, AP courses, ACT or SAT exams, and advanced courses—and future college success. Secondary students' decisions to pursue rigorous academic work are dependent upon their previous achievement and the recommendations of those who advise them.

While considerable light has been shed on college-going patterns of Dallas ISD graduates with this study, additional research could reveal significant information to improve students' academic performance. The current study does not include variables not measured for all students before 2002, but that were explicit in the literature.

The following data would improve a high school's ability to build college-going cultures on their campuses. Types of information that would provide a deeper understanding of relevant factors include: secondary student survey answers as proxies for key cognitive strategies, academic behaviors, and college context skills and awareness; teacher survey answers as proxies for student key

cognitive strategies; analysis of secondary student course taking patterns; counseling department information on college admission/enrollment indicators, including FAFSA preparation while still in high school (newly available to Dallas ISD directly from the College Board in 2010); workforce information from the Texas Workforce Commission; and data from the U.S. military related to former Dallas ISD students to bridge the gap between K-16 systems and other postsecondary pursuits.

The research suggests measuring a student's progress during the first years of college by tracking information such as remedial course enrollment, college grade point average, and use of accessible college support systems and resources. The secondary public school systems do not have resources to provide postsecondary advisement, and this work falls on the shoulders of colleges. Recent legislation to improve college graduation rates, especially at the community college-level, spurs postsecondary institutions to focus on these metrics.

An area for further investigation is the lower percentage of enrollment in and graduation from college by Dallas ISD Hispanic students, as compared to other ethnicities during the period of this study. Influential factors may include first generation college barriers (lower levels of college context skills and awareness), and language barriers (Cabrera, et al., 2006; Cabrera & la Nasa, 2000, 2001; Choy, et al., 2000; Douney, 2008; Hooker & Brand, 2009; Hossler, et al.,

1999; Howell, et al., 2009; Kane & Spizman, 1994; Martinez & Klopott, 2003, 2005; Mehan, 1996; NCES, 2005).

Conley advised the Dallas ISD to concentrate on building and/or deepening relationships with higher education institutions that its graduates attend. Because sixty percent of Dallas ISD graduates initially enroll in Dallas County Community College District (DCCCD) colleges, the district has negotiated a data sharing agreement with DCCCD. This will allow the Dallas ISD and the DCCCD to share information on concurrently and formerly enrolled students. Agreements like this with the Texas Higher Education Coordinating Board, the Texas Workforce Commission, and the military, for example, would yield valuable information on Dallas ISD graduates, and could potentially lead to measures that would reduce the need for remediation.

The Dallas district's Teaching and Learning division has focused on the need to include student-level well-being factors. The Dallas ISD's Student Services department had conducted several years of training on Search Institute's Developmental Asset Profile (DAP). Given the district's investment, the DAP has been chosen as its well-being assessment. The DAP is an individual or group assessment that measures young people's strengths across eight asset categories in five context areas: personal, social, family, school, and community. The 58-item survey is administered to secondary students annually. For research purposes, this information could be tied to college success metrics.

A significant limitation that has previously hindered similar postsecondary research is that nearly all public school districts collect student information, yet few have developed the data warehouse and business intelligence systems that allow them to organize and analyze massive amounts of data. Additionally, the lack of coordination between public school district and postsecondary systems that exist prevent in-depth analysis to identify issues that support and/or hinder student postsecondary achievement.

Additional research to assess learning environments is also suggested. The BMGF is currently funding several grants across the country under its Measures of Effective Teaching (MET) Project (which includes Dallas ISD middle schools). Through videotapes of classroom teachers and journals, analysis will be conducted that will hopefully yield new insights about engaging teaching. Above all, public school environments provide hope for a better future to many in urban communities. This work has shed light on the path to create meaningful measures that promote educational equity.

APPENDIX A

COLLEGE SUCCESS METRICS BY HIGH SCHOOL

Table 22 College Success Metrics by Dallas ISD High School

High School	Total Campus Graduates	Number Enrolled Any College	Total College Graduates	College Graduates with Unknown Degree Type	College Graduates with One Degree	College Graduates with Two or Three Degrees	Number Enrolled Any College /Total Campus Graduates (Percent)	Total College Graduates/ Number Enrolled Any College (Percent)	Total College Graduates/ Total Campus Graduates (Percent)
Bryan Adams	415	251	57	5	57	8	60.5	22.7	13.7
Adamson	196	92	10	0	10	2	46.9	10.9	5.1
Smith	134	63	5	0	5	0	47.0	7.9	3.7
Molina	391	223	22	1	22	0	57.0	9.9	5.6
Hillcrest	226	143	39	6	39	6	63.3	27.3	17.3
Jefferson	239	125	21	3	21	1	52.3	16.8	8.8
Kimball	276	177	29	3	29	2	64.1	16.4	10.5
Lincoln	226	136	26	3	26	7	60.2	19.1	11.5
Pinkston	118	47	6	1	6	0	39.8	12.8	5.1
Roosevelt	142	79	12	0	12	2	55.6	15.2	8.5
Samuell	258	112	15	0	15	0	43.4	13.4	5.8
Seagoville	206	86	16	1	16	2	41.7	18.6	7.8
South Oak Cliff	242	129	17	0	17	1	53.3	13.2	7.0
Spruce	265	120	12	2	12	1	45.3	10.0	4.5
Sunset	271	145	23	1	23	6	53.5	15.9	8.5
White	369	260	69	2	69	7	70.5	26.5	18.7
Wilson	265	172	42	5	42	6	64.9	24.4	15.8
Carter	383	233	47	5	47	6	60.8	20.2	12.3
North Dallas	297	148	23	3	23	1	49.8	15.5	7.7
Skyline	803	550	126	12	126	14	68.5	22.9	15.7
SEM	89	82	39	2	39	5	92.1	47.6	43.8
Madison	96	47	5	0	5	0	49.0	10.6	5.2
Business	109	94	28	2	28	9	86.2	29.8	25.7
Arts Magnet	152	123	58	11	58	7	80.9	47.2	38.2
Health Mag	111	100	35	3	35	2	90.1	35.0	31.5
Educ Magnet	47	42	21	1	21	4	89.4	50.0	44.7
Law Magnet	98	78	33	3	33	3	79.6	42.3	33.7
TAG Magnet	52	47	29	0	29	6	90.4	61.7	55.8
Middle College	27	19	0	0	0	0	70.4	0.0	0.0
Hosp/Buck	6	4	0	0	0	0	66.7	0.0	0.0
Total	6509	3927	865	75	865	108	60.3	22.0	13.3

APPENDIX B

POSTSECONDARY ENROLLMENT BY COLLEGE

Table 23 Postsecondary Enrollment by College

College Name	Level	Number	Percent
El Centro College, DCCCD	Two	515	13.1
Mountain View College, DCCCD	Two	477	12.1
Eastfield College, DCCCD	Two	437	11.1
Richland College. DCCCD	Two	258	6.6
Brookhaven College, DCCCD	Two	251	6.4
Cedar Valley College, DCCCD	Two	161	4.1
University of North Texas	Four	111	2.8
Texas Southern University	Four	102	2.6
University of Texas at Dallas	Four	96	2.4
Prairie View A&M University	Four	94	2.4
University of Texas at Arlington	Four	80	2.0
Texas Woman's University	Four	60	1.5
Southern Methodist University	Four	51	1.3
University of Texas at Austin	Four	50	1.3
ITT Technical Institute	Two	45	1.1
Texas A&M University	Four	45	1.1
University of Phoenix	Four	44	1.1
North Lake College DCCCD	Two	39	1.0
DeVry University	Four	38	1.0
Navarro College, Corsicana	Two	34	0.9
Bryman College (Everest College)	Two	30	0.8
Stephen F. Austin State University	Four	29	0.7
Collin County Community College	Two	27	0.7
North Central Texas College, Corinth	Two	23	0.6
University of Houston	Four	21	0.5
Northwood University, Cedar Hill	Four	20	0.5
Other postsecondary schools		789	20.1
Total		3927	100.0

NOTE: $n \geq 20$

APPENDIX C

POSTSECONDARY GRADUATION BY COLLEGE

Table 24 Postsecondary Graduation by College

College Name	Level	Number	Percent
University of North Texas	Four	104	12.0
University of Texas at Dallas	Four	76	8.8
Texas A&M, Commerce	Four	48	5.5
University of Texas at Arlington	Four	47	5.4
Southern Methodist University	Four	43	5.0
University of Texas at Austin	Four	40	4.6
Texas A&M University	Four	37	4.3
Texas Woman's University	Four	36	4.2
Prairie View A&M University	Four	35	4.0
Stephen F. Austin State University	Four	25	2.9
Other postsecondary schools		374	43.2
Total		865	100.0

NOTE: $n \geq 20$

REFERENCES

ACT. (2007). *Rigor at risk: Reaffirming quality in the high school core curriculum*. Retrieved from http://www.act.org/research/policymakers/pdf/rigor_report.pdf

ACT. (2008). *College readiness standards for EXPLORE, PLAN, and the ACT.* Retrieved from http://wvde.state.wv.us/downloads/sli2010/data/ACT%20college%20readiness%20Standards.pdf

Association of American Colleges and Universities. (2007). *College learning for the new global century.* Washington, DC: AACU.

Abdi, H. (2003). "Partial least squares (PLS) regression." In Lewis-Beck, M., Bryman, A., & Futing, T. (Eds.) *Encyclopedia of social sciences research methods.* Thousand Oaks, CA: Sage.

Achieve. (2011). *Closing the expectations gap 2011: Sixth annual 50-state progress report.* Washington, DC: American Diploma Project Network. Retrieved from http://www.achieve.org/ClosingtheExpectationsGap2011

Adelman, C. (1999). *Answers in the tool box: Academic intensity, attendance patterns and bachelor's degree attainment*. Washington, DC: U.S. Department of Education, Office of Educational Research and

Improvement.

Adelman, C. (2006). *The toolbox revisted: Paths to degree completion from high school through college.* Washington, DC: U.S. Department of Education.

Allensworth, E. M. (2006). *From high school to the future update.* Chicago: Consortium on Chicago School Research. Retrieved from http://ccsr.uchicago.edu/publications/PostsecondaryUpdate.pdf

Allensworth, E., & Easton, J.(2005). *The on-track indicator as predictor of high school graduation.* Chicago: Consortium on Chicago School Research. Retrieved from http://ccsr.uchicago.edu/content/publications.php?pub_id=10

Allensworth, E., Nomi, T., Montgomery, N., & Lee, V. E. (2008). *College preparatory curriculum for all: Consequences of ninth grade course taking in algebra and English on academic outcomes in Chicago.* Chicago: Consortium on Chicago School Research. Retrieved from http://epa.sagepub.com/content/31/4/367.abstract

Alliance for Excellent Education. (2006). *Paying double: Inadequate high schools and community college remediation.* Retrieved from http://www.all4ed.org/files/archive/publications/remediation.pdf

Alliance for Excellent Education. (2009). *Reinventing the federal role in education: Supporting the goal of college and career readiness for all students*. Retrieved

from http://www.all4ed.org/files/PolicyBriefReinventingFedRoleEd.pdf

Almy, S. & Theokas, C. (2010*). Not prepared for class: High-poverty schools continue to have fewer in-field teachers.* Washington, DC: The Education Trust. Retrieved from http://www.edtrust.org/dc/publication/not-prepared-for-class-high-poverty-schools-continue-to-have-fewer-in-field-teachers

Attewell, P., & Domina, T. (2008). Raising the bar: Curricular intensity and academic performance. *Educational Evaluation and Policy Analysis*, *30*(1), 51–71. Retrieved from http://epa.sagepub.com/content/30/1/51.full.pdf+html

Balfanz, R., Legters, N., & Jordan, W. (2003). *Catching up: Impact of the Talent Development ninth grade instructional interventions in reading and mathematics in high poverty high schools*. Baltimore: Center for Social Organization of Schools, Johns Hopkins University. Retrieved from http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED484524&ERICExtSearch_SearchType_0=no&accno=ED484524

Bangser, M. (2008). *Preparing high school students for successful transitions to postsecondary education and employment.* Retrieved from http://www.betterhighschools.org/docs/PreparingHSStudentsforTransition_073108.pdf

Black, S., & Sufi, A. (2002). *Who goes to college? Differential enrollment rates*

by race and family background (Working Paper 9310). Cambridge, MA: National Bureau of Economic Research. Retrieved from http://www.nber.org/papers/w9310

Bollen, K. & Lennox, R. (1991). Conventional wisdom on management: A structural equation perspective. *Psychological Bulletin 110(2),* 305-314.

Boser, U., & Burd, S. (2009). *Bridging the gap: How to strengthen the PK-16 pipeline to improve college readiness.* Washington, DC: New America Foundation. Retrived from http://www.newamerica.net/files/NAF%20Bridging%20the%20Gap.pdf

Bowen, W. G., Chingos, M. M., & McPherson, M. S. (2009). *Crossing the finish line: Completing college at America's public universities.* Princeton, NJ: Princeton University Press.

Brookings Institution. (2000). *Brookings papers on education policy 2000.* Washington, DC: Brookings Institution.

Bryk, A.S. & Hermanson, K.L. (1993). "Educational indicator systems: Observations on their structure, interpretation, and use." In *Review of Research in Education.* American Education Research Association. Retrieved from http://web.me.com/yerrick/UB_Science_Education_Goes_to_School/21C_Literaure_files/Bryk%20%26%20Hermanson,%201993.pdf

Buckley, P., & Muraskin, L. (2009). *Graduates of Denver public schools: College*

access and success. Denver: The Piton Foundation and The Pell Institute for the Study of Opportunity in Higher Education. Retrieved from http://www.piton.org/content/documents/PostsecondaryExSum.pdf

Burton, N.W., Whitman, N.B., Yepes-Baraya, M., Cline, F., & Myung-in Kim, R. (2002). *Minority student success: The role of teachers in advanced placement (AP) courses* (Research Report No. 2002-8). New York: The College Entrance Examination Board. Retrieved from http://www.ets.org/Media/Research/pdf/RR-02-17-Burton.pdf

Cabrera, A. F., Deil-Amen, R., Prabhu, R., Terenzini, P. T., Lee, C., & Franklin, R. E., Jr. (2006). Increasing the college preparedness of at-risk students. *Journal of Latinos and Education, 5*(2), 79–97. Retrieved from http://inpathways.net/increasing-report.pdf

Cabrera, A. F., & La Nasa, S. M. (2000). *Understanding the college choice of disadvantaged students*. San Francisco, CA: Jossey-Bass.

Cabrera, A. F., & La Nasa, S. M. (2001). On the path to college: Three critical tasks facing America's disadvantaged. *Research in Higher Education, 42*(2), 119–149.

Calefeti, J. (2009, September). Chasing the college dream. *U.S. News and World Report.* Retrived from http://www.usnews.com/topics/author/jessica_calefati

Callan, P. M., Finnery, J. E., Kirst, M. W., Usdan, M. D., & Venezia, A. (2006).

*Claiming common ground: State policymaking for improving college readiness and succes.*Washington, DC: National Center for Public Policy and Higher Education. Retrieved from http://www.highereducation.org/reports/common_ground/index.shtml

Camara, W. (2003). *College persistence, graduation and remediation* (College Board Research Notes RN-19). New York: College Entrance Examination Board. Retrieved from http://professionals.collegeboard.com/data-reports-research/cb/college-persistence-graduation-remediation

Carnevale, A.P. (2007). Confessions of an education fundamentalist: Why grade 12 is not the right end point for anyone. In Hoffman, et al., (Eds.), *Minding the gap: Why integrating high school with college makes sense and how to do it* (pp. 15-26). Cambridge, MA: Harvard Education Press.

Carnevale, A.P., Smith, N. & Strohl, J. (2009). *Help wanted: Projections of jobs and education requirements through 2018.* Washington, DC: Georgetown University Center on Education and the Workforce. Retrieved from http://www9.georgetown.edu/grad/gppi/hpi/cew/pdfs/Help_Wanted_Technical_Appendix.pdf

Chait, R. & Venezia, A. (2009). *Improving academic preparation for college: What we know and how state and federal policy can help.* Washington, DC: Center for American Progress. Retrieved from http://www.americanprogress.org/issues/2009/01/academic_preparation.ht

ml

Chen, X. (2005). *First-generation students in postsecondary education: A look at college transcripts.* Washington, DC: National Center for Education Statistics. Retrieved from http://nces.ed.gov/pubs2005/2005171.pdf

Choy, S. P. (2002). *Access & persistence: Findings from 10 years of longitudinal research on students.*Washington, DC: American Council on Education. Retrieved from http://www.acenet.edu/bookstore/pdf/2002_access&persistence.pdf

Choy, S. P., Horn, L. J., Nunez, A., & Chen, X. (2000). Transition to college: What helps at-risk students and students whose parents did not attend college. *New Directions for Institutional Research, 107,* 45–63. Retrieved from http://onlinelibrary.wiley.com/doi/10.1002/ir.10704/abstract

Christie, K., & Zinth, K. (2008). *Ensuring successful student transitions from the middle grades to high school*. Denver, CO: Education Commission of the States. Retrieved from http://www.ecs.org/html/Document.asp?chouseid=7891

Chronicle of Higher Education. (2008, July 31). *Analysis finds substantial overlap in how states define college readiness.* Retrieved from http://www.chronicle.com/news

Chronicle of Higher Education. (2009, January 7). *More states now define college*

readiness. Retrieved from http://www.chronicle.com/news

Clotfelter, C.T., Ladd, H.F., & Vigdor, J.L. (2007a). *How and why teacher credentials matter for student achievement.* National Center for Analysis of Longitudinal Data in Education Research. Retrieved from http://www.caldercenter.org/pdf/1001058_teacher_credentials.pdf

Clotfelter, C.T., Ladd, H.F., & Vigdor, J.L. (2007b). *Teacher credentials and student achievement in high school: A cross-subject analysis with student fixed effects.* Duke University: Sanford Institute of Public Policy. Retrieved from http://www.nber.org/papers/w13617.pdf

Coleman, J.S. (1968). The concept of equality of educational opportunity. *Harvard Educational Review, 38*, 7-22. Retrieved from http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED015157&ERICExtSearch_SearchType_0=no&accno=ED015157

College Board. (2002). *A historical perspective on the SAT 1926-2001.* New York: College Entrance Examination Board. Retrieved from http://professionals.collegeboard.com/profdownload/pdf/rr20027_11439.pdf

College Board. (2003). *A brief history of the Advanced Placement program.* New York: College Entrance Examination Board. Retrieved from

http://www.collegeboard.com/prod_downloads/about/news_info/ap/ap_history_english.pdf

College Board. (2006). *Creating a college-going culture guide.* New York: College Entrance Examination Board. Retrieved from http://www.collegeboard.com/prod_downloads/collegeed/collegeEd-create-college-going-culture.pdf

College Success Foundation. (2010). *Unleashing America's Potential: The college success foundation's 10th anniversary report.* Washington, DC: College Success Foundation. Retrieved from http://www.collegesuccessfoundation.org/Document.Doc?id=24

Common Core State Standards Initiative. (2010). *The Standards.* Retrieved from http://www.corestandards.org/the-standards

Conley, D. T. (2003). *Understanding university success: A project of the Association of American Universities and The Pew Charitable Trust.* Eugene, OR: Educational Policy Improvement Center.

Conley, D. T. (2005). *College knowledge: What it really takes for students to succeed and what we can do to get them ready.* San Francisco: Jossey-Bass.

Conley, D. T. (2009a). *Redefining college readiness, volume 3.* Eugene, OR: Educational Policy Improvement Center. Retrieved from https://www.epiconline.org/files/pdf/RedefiningCR_Vol3.pdf

Conley, D. T. (2009b). *Creating college readiness: Profiles of 38 schools that know how.* Eugene, OR: Educational Policy Improvement Center. Retrieved from https://www.epiconline.org/files/pdf/doclibrary/AERA_2010_CRPractices.pdf

Conley, D. T. (2010). *College and career ready: Helping all students succeed beyond high school.* San Francisco: Jossey-Bass..

Coghlan, D. & Brannick, T. (2005). *Doing action research in your own organization.* Thousand Oaks, CA: Sage.

Dallas Achieves Commission. (2007). *The road to Broad and the Dallas Achieves commission.*

Dallas Independent School District. (2002). *2001-2002 Facts.* Retrieved from www.dallasisd.org

Darling-Hammond, L. (1992). Educational indicators and enlightened policy. *Educational Policy, 6,* 235-265. doi: 10.1177/0895904892006003001

Darling-Hammond, L. (2002a). *Redesigning high schools: What matters and what works.* Palo Alto: Stanford University Publications.

Darling-Hammond, L. (2002b). Research and rhetoric on teacher certification: A response to "teacher certification reconsidered." *Education Policy Analysis Archives,10*(36). Retrieved from http://epaa.asu.edu/epaa/v10n36.html.

Data Quality Campaign. (2009). *The next step: Using longitudinal data systems to*

improve student success. Retrieved from http://www.dataqualitycampaign.org/resources/details/384

Diamantopoulos, A. & Siguaw, J.A. (2006). Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration. *British Journal of Management 17*(4), 263-282. doi: 10.1111/j.1467-8551.2006.00500.

de Neufville, J.I. (1978). Validating policy indicators. *Policy Sciences, 10,* 171-188. Retrieved from http://www.springerlink.com/content/k808m65v01618035/

Deloitte. (2009). *Redefining high school as a launch pad.* Deloitte 2009 Educational Survey Overview. Retrieved from http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/us_leadership_EducationSurvey120109.pdf

Dougherty, C., Mellor, L., & Jian, S. (2006). *The relationship between Advanced Placement and college graduation.* Austin, TX: National Center for Educational Accountability. Retrieved from http://www.nc4ea.org/files/relationship_between_ap_and_college_graduation_02-09-06.pdf

Dounay, J. (2006). *Ensuring rigor in the high school curriculum: What states are doing*. Denver, CO: Education Commission of the States. Retrieved from

http://www.ecs.org/html/Document.asp?chouseid=6667

Dounay, J. (2008). *Improving outcomes for traditionally underserved students through early college high schools*. Denver, CO: Education Commission of the States.

Retrieved from http://www.ecs.org/html/Document.asp?chouseid=7863

Dijkstra, T. (1983). Some comments on maximum likelihood and partial least squares methods. *Journal of Econometrics, 22*(1-2), 67-90. Retrieved from

http://www.sciencedirect.com/science/article/pii/0304407683900945

Duncan, A. (2010a). "The three myths of high school reform: Secretary Arne Duncan's remarks at the College Board AP conference." Retrieved from http://www.ed.gov/news/speeches/three-myths-high-school-reform-secretary-arne-duncans-remarks-college-board-ap-confere

Duncan, A. (2010b). "Unleashing the power of data for school reform: Secretary Arne Duncan's remarks at the STATS DC 2010 data conference." Retrieved from

http://www.ed.gov/news/speeches/unleashing-power-data-school-reform-secretary-arne-duncans-remarks-stats-dc-2010-data-

Duncan, A. (2010c). "The win-win solution: Secretary Arne Duncan's remarks at the Council of Chief State School Officers and State Higher Education Executive Officers' 2010 joint summer meeting." Retrieved from

http://www.ed.gov/news/speeches/win-win-solution-secretary-arne-duncans-remarks-council-chief-state-school-officers-an

Dryden, M., Webster, W.J., & Fraser, B.J. (1999). *Rethinking the effects of classroom environments on student learning in a large school system.* Retrieved from http://www.dallasisd.org/eval/research/articles/Dryden-Rethinking-the-Effects-of-Classroom-Environments-on-Student-Learning.pdf

Eckel, P.D. & King, J.E. (2004). *An overview of higher education in the United States: Diversity, access, and the role of the marketplace.* Washington, DC: American Council on Education. Retrieved from (http://www.acenet.edu/bookstore/pdf/2004_higher_ed_overview.pdf

Ehrenberg, R. G. & Brewer, D.J. (1994). Do school and teacher characteristics matter? Evidence from high school and beyond. *Economics of Education Review 13*(1), 1 - 17. Retrieved from http://www.sciencedirect.com/science/article/pii/0272775794900191

Eisner, C. (Ed). (2001). *Advancing excellence in urban schools: A report on advanced placement examinations in the great city schools.* Washington, D.C.: Council of Great City Schools and The College Board. Retrieved from http://0-www.eric.ed.gov.novacat.nova.edu/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED452281&ERICExtSe

arch_SearchType_0=no&accno=ED452281

Family Educational Rights and Privacy Act. (2011). U.S. Department of Education. Retrieved from http://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html

Finn, J.D. & Achilles, C.M. (1990). Answers and questions about class size: A statewide experiment. *American Educational Research Journal 27*(3). 557-572. Retrieved from http://aer.sagepub.com/content/27/3/557.short

Gamoran, A. & Long, D.A. (2006). *Equality of educational opportunity: A 40-year retrospective* (WCER Working Paper No. 2006-9). Madison: University of Wisconsin-Madison, Wisconsin Center for Education Research. Retrieved from http://www.wcer.wisc.edu/publications/workingPapers/papers.php

Gardner Center. (2011). "Tri-level college readiness indicator systems (CRIS)." Presented on April 4, 2011, at CRIS Convening, Dallas, TX.

Garvey, J. (2009). *Are New York City's public schools preparing students for success in college?* Providence: Annenberg Institute for School Reform. Retrieved from http://www.annenberginstitute.org/pdf/Garvey_Report.pdf

Gates Foundation. (2005). *High-performing school districts.* Retrieved from

http://www.broadprize.org/symposium/2006BroadSymposiumHighPerformingSchoolDists.pdf

Greene, J.P. & Winters, M.A. (2005). *Public high school graduation and college-readiness rates: 1991-2002.* Manhattan Institute Education Working Paper. Retrieved from http://www.manhattan-institute.org/cgi-bin/apMI/print.cgi

Goldhaber, D. and D. J. Brewer (1997b). *Evaluating the effect of teacher degree level on educational performance. Developments in School Finance 1996.* J. William Fowler. Washington, D.C., National Center for Education Statistics: 197 - 210.

Goldhaber, D. and D. J. Brewer (2000). Does teacher certification matter? High school teacher certification status and student achievement. *Educational Evaluation and Policy Analysis, 22*(2): 129-145. Retrieved from http://epa.sagepub.com/content/22/2/129.abstract

Goldhaber, D. (2010). *When the stakes are high, can we rely on value-added?* Center for American Progress. Retrieved from http://www.americanprogress.org/issues/2010/12/pdf/vam.pdf

Goodnow, F.J. (1900). *Politics and administration: A study in government.* New York: Macmillan.

Greene, J. P., & Rivers, M. A. (2005). *Public high school graduation and college-readiness rates: 1991-2002.* New York: Manhattan Institute for Policy

Research. Retrieved from http://www.manhattan-institute.org/html/ewp_08.htm

Greenwald, R., Hedges, L., & Laine, R. (1996). The effect of school resources on student achievement. *Review of Educational Research, 66*(3). 361-396. doi:10.3102/00346543066003361

Guthrie, L. F., & Guthrie, G. P. (2002). *The magnificent eight: AVID best practices study.* Burlingame, CA: Center for Research, Evaluation and Training in Education. Retrieved from http://www.avid.org/dl/res_research/research_magnificenteight.pdf

Hallinan, M.T. & Sorenson, A.B.. (1985). Class size, ability group size and student achievement. *American Journal of Education 94*(1), 71-89. Retrieved from http://psycnet.apa.org/psycinfo/1987-26536-001

Hamilton, L., Halverson, R., Jackson, S., Mandinach, E., Supovitz, J., and Wayman, J. (2009). *Using student achievement data to support instructional decision making* (NCEE 2009-4067). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance. Retrieved from http://ies.ed.gov/ncee/wwc/pdf/practiceguides/dddm_pg_092909.pdf

Haenlein, M. & Kaplan, A.M. (2004). A beginner's guide to partial least squares. *Understanding Statistics*, *3*(4), 283-297. Retrieved from

http://www.stat.umn.edu/~sandy/courses/8801/articles/pls.pdf

Hall, S. & Johnson, L.K. (2011). *Early indicators of future college success for Dallas Independent School District graduates: 1998 to 2009.*

Hanushek, E.A. (1992). The trade-off between child quality and quantity. *The Journal of Political Economy, 100*(1), 84-117. Retrieved from http://edpro.stanford.edu/Hanushek/admin/pages/files/uploads/child%20quality.JPE.pdf

Hargrove, L., Godin, D., & Dodd, B. (2008). *College outcomes comparisons by AP and non-AP high school experiences* (Research Rep. No. 2008-3). New York: College Entrance Examination Board. Retrieved from http://professionals.collegeboard.com/profdownload/pdf/08-1574_CollegeOutcomes.pdf

Hedges, L.V. & Stock, W. (1983). The effect of class size: An examination of rival hypotheses. *American Educational Research Journal 20*(1), 63-85. Retrieved from http://www.jstor.org/pss/1162675

Henseler, J., Ringle, C.M., & Sinkovics, R.R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing*, 20, 277-319. Retrieved from http://www.php.portals.mbs.ac.uk/Portals/49/docs/rsinkovics/pubs/2009-AIM-Henseler-Ringle-Sinkovics-PLS.pdf

Hoffman, N. V., Vargas, J., Venezia, A., & Miller, M.S. (Eds.) (2007). *Minding*

the gap: Why integrating high school with college makes sense and how to do it. Cambridge: Harvard Education Press.

Hooker, S. & Brand, B. (2009). *Success at every step: How 23 programs support youth on the path to college and beyond.* Washington, DC: American Youth Policy Forum. Retrieved from http://www.aypf.org/publications/documents/RevisedExecutiveSummary.pdfhttp://www.aypf.org/publications/documents/RevisedExecutiveSummary.pdf

Hossler, D., Schmit, J., & Vesper, N. (1999). *Going to college: How social, economic, and educational factors influence the decisions students make*. Baltimore, MD: The Johns Hopkins University Press.

Howell, J. S., Kurlaender, M., & Grodsky, E. (2009). *Postsecondary preparation and remediation: Examining the effect of the early assessment program at California State University*. Davis, CA: University of California–Davis. Retrieved from http://www.airweb.org/images/Kurlaender%20Revised%20Proposal.pdf

Ishitani, T. T., & Snider, K. G. (2004, May). *Longitudinal effects of college preparation programs on college retention.* Paper presented at the 44th Annual Forum of the Association for Institutional Research, Boston. Retrieved from

http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED491012&ERICExtSearch_SearchType_0=no&accno=ED491012

Jackson, C. K. (2009). *A little now for a lot later: A look at a Texas Advanced Placement incentive program.* Ithaca, NY: Cornell University, School of Industrial and Labor Relations. Retrieved from http://works.bepress.com/c_kirabo_jackson/1/

Jeong, D. W. (2009). *High school completion, college entrance, and Advanced Placement programs in U.S. secondary schools.* New York: Teachers College at Columbia University, Community College Research Center. Retrieved from http://ccrc.tc.columbia.edu/ViewStaff.asp?uid=253

Kane, J., & Spizman, L.M. (1994). Race, financial aid and college attendance: Parents and geography matter. *American Journal of Economics and Sociology, 53,* 85-97. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/j.1536-7150.1994.tb02677.x/abstract

Kane, T.J., J.E. Rockoff, & D.O. Staiger. (2006). *What does certification tell us about teacher effectiveness? Evidence from New York City.* Working Paper. Retrieved from http://www0.gsb.columbia.edu/faculty/jrockoff/certification-final.pdf

Kaplan, D. & Elliott, P. (1997). A model-based approach to validating education indicators using multilevel structural equation modeling. *Journal of Educational and Behavioral Statistics, 22*(3), 323-347. Retrieved from http://www.jstor.org/pss/1165288

Karp, M. M., Calcagno, J. C., Hughes, K. L., Jeong, D. W., & Bailey, T. R. (2007). *The postsecondary achievement of participants in dual enrollment: An analysis of student outcomes in two states*. St. Paul, MN: University of Minnesota, National Research Center for Career and Technical Education. Retrieved from http://ccrc.tc.columbia.edu/Publication.asp?UID=547

Karp, M. M., Calcagno, J. C., Hughes, K. L., Jeong, D. W., & Bailey, T. (2008). *Dual enrollment students in Florida and New York City: Postsecondary outcomes* (CCRC Brief No. 37). New York: Columbia University Teachers College, Community College Resource Center. Retrieved from http://ccrc.tc.columbia.edu/Publication.asp?UID=578

Keng, L., & Dodd, B. G. (2008). *A comparison of college performances of AP and non-AP student groups in 10 subject areas* (Research Rep. No. 2008-7). New York: College Entrance Examination Board. Retrieved from http://professionals.collegeboard.com/profdownload/pdf/08_1789_RD.ResearchReport_Web_081230.pdf

Kirst, M., & Venezia, A. (2004). *From high school to college: Improving*

opportunities for success in postsecondary education. San Francisco: Jossey-Bass.

Kline, R.B. (2011). *Principles and practice of structural equation modeling.* New York: The Guilford Press.

Klopfenstein, K., & Thomas, M. K. (2009). The link between advanced placement experience and early college success. *Southern Economic Journal, 75*(3), 873–891. Retrieved from http://ideas.repec.org/a/sej/ancoec/v753y2009p873-891.html

Lloyd, S. (2009, June 11). "Consensus on meaning of 'readiness' remains elusive." *Education Week.*

Lozano, A., Watt, K. M., & Huerta, J. (2009). *A comparison study of 12th grade Hispanic students' college anticipations, aspirations, and college preparatory measures*. Manuscript submitted for publication. Retrieved from http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=EJ862704&ERICExtSearch_SearchType_0=no&accno=EJ862704

MacAllum, K., Glover, D. M., Queen, B., & Riggs, A. (2007). *Deciding on postsecondary education: Final report* (NPEC 2008-850). Washington, DC: National Postsecondary Education Cooperative. Retrieved from

http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED499339&ERICExtSearch_SearchType_0=no&accno=ED499339

Martinez, M., & Klopott, S. (2003). *Improving college access for minority, low income, and first-generation students.* Washington, DC: Pathways to College Network Clearinghouse. Retrieved from http://www.pathwaystocollege.net/pdf/ImprovingCollegeAccess.pdf

Martinez, M., & Klopott, S. (2005). *The link between high school reform and college access and success for low-income and minority youth.* Washington, DC: American Youth Policy Forum & Pathways to College Network. Retrieved from http://www.pathwaystocollege.net/pdf/HighSchoolReform_execSum.pdf

McCauley, D. (2007). *The impact of Advanced Placement and dual enrollment programs on college graduation.* San Marcos, TX: Texas State University. Retrieved from http://ecommons.txstate.edu/cgi/viewcontent.cgi?article=1208&context=arp&seiredir=1#search=%22McCauley%2C%20D.%20%282007%29.%20impact%20Advanced%20Placement%20dual%20enrollment%20programs%20college%20graduation%22

Mehan, H. (1996). *Constructing school success: The consequences of untracking low-achieving students.* New York: Cambridge University Press.

Mendro, R. & Adundis, M. (2008). *Post-graduate educational pursuits of DISD graduates: 1998 to 2005.* EAO6-107-4. Retrieved from http://www.dallasisd.org/inside_disd/depts/evalacct/data/reports/2005-06/Dallas%20ISD%20Post%20Graduate%20Pursuits%20Report.pdf

Mihares, A. (2007). *Defining college readiness*. Presented October 19, 2007, at California Education Policy Convening. Retrieved from http://www.edsource.org/assets/files/convening/CollegeBoard_brief.pdf

National Center for Educational Accountability. (2006). *Identifying appropriate college-readiness standards for all students, Issue 2.* Retrieved from http://www.nc4ea.org/files/appropriate_college-readiness_standards_for_all_students-05-03-06.pdf

National Center for Education Evaluation. (2009). *Helping students navigate the path to college: What high schools can do*. Washington, DC: Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/wwc/pdf/practiceguides/higher_ed_pg_091509.pdf

National Center for Education Statistics. (1993). *120 years of American education: A statistical portrait.* Washington, DC: U.S. Government Printing Office, U.S. Department of Education. Retrieved from http://nces.ed.gov/pubs93/93442.pdf

National Center for Education Statistics. (2005). *First-generation students in postsecondary education: A look at their college transcripts*. Washington,

DC: U.S. Government Printing Office, U.S. Department of Education. Retrieved from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2005171

National Center for Education Statistics. (2004). *The condition of education 2004, Indicator 18.* Washington, DC: U.S. Government Printing Office, U.S. Department of Education. Retrieved from *The condition of education 2004, Indicator 18.*

National Center for Education Statistics. (2007). *The condition of education 2007*. Washington, DC: U.S. Government Printing Office, U.S. Department of Education. Retrieved from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007064

National Center for Education Statistics. (2009). *The condition of education 2009.* Washington, DC: U.S. Government Printing Office, U.S. Department of Education. Retrieved from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2009081

National Center for Education Statistics. (2010). *Highlights from PISA 2009: Performance of U.S. 15-year-old students in reading, mathematics, and science literacy in an international context.* Washington, DC: U.S. Government Printing Office, U.S. Department of Education. Retrieved from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011004

National Center for Education Statistics. (2011). *The condition of education 2011.*

Washington, DC: U.S. Government Printing Office, U.S. Department of Education. Retrieved from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011034

National Center for Public Policy and Higher Education & Southern Regional Education Board. (2010). *Beyond the rhetoric: Improving college readiness through coherent state policy*. Retrieved from http://publications.sreb.org/2010/Beyond%20the%20Rhetoric.pdf

National Commission on Excellence in Education. (1983). *A nation at risk: The full account*. Portland, OR: USA Research. Retrieved from http://www2.ed.gov/pubs/NatAtRisk/index.html

National Commission on Teaching and America's Future (NCTAF). (1996). *What matters most: teaching for America's future.* Retrieved from http://www.teaching-point.net/Exhibit%20A/What%20Matters%20Most%20Exec%20Summary.pdf

National Education Association. (1894). *Report of the committee of ten on secondary school studies.* New York: The American Book Company. Retrieved from http://books.google.com/books/download/Report_of_the_Committee_of_ten_on_second.pdf?id=PfcBAAAAYAAJ&hl=en&capid=AFLRE73LF82SVLNGXTIPToBdhtz4HaoHk9vHm4uKUllxqmhWy_L2Ylv9a_DjLgXXw

UMH379GvmMghyOgjzy_DHGtnTLF0fw&continue=http://books.google.com/books/download/Report_of_the_Committee_of_ten_on_second.pdf?id=PfcBAAAAYAAJ&output=pdf&hl=en

National Governors Association. (2011). *Return on investment: Strategies for improving remedial education.* Washington, DC: National Governors Association Center for Best Practices. Retrieved from http://www.nga.org/Files/pdf/C2CBriefingPaperRemedialEd.pdf

National Postsecondary Education Cooperative. (2006). *A framework for reducing the college success gap and promoting success for all.* Washington, DC: U.S. Government Printing Office, U.S. Department of Education. Retrieved from http://nces.ed.gov/npec/pdf/Perna_Thomas_Report.pdf

Neild, R.C., Farley-Ripple, E.N., & Byrnes, V. (2009). The effect of teacher certification on middle grades achievement in an urban district. *Educational Policy 23*(5), 732-760. Retrieved from http://epx.sagepub.com/content/23/5/732.short

Oakes, J. (1989). What educational indicators? The case for assessing the school context. *Educational Evaluation and Policy Analysis*, *11*(2), 181-199. doi: 10.3102/01623737011002181

Odden, A. (1990). Educational indicators in the United States: The need for analysis. *Educational Researcher 19*, 24-29. Retrieved from http://www.jstor.org/pss/1176103

Perkins, R., Kleiner, B., Roey, S., & Brown, J. (2004). *The high school transcript study: A decade of change in curricula and achievement, 1990–2000* (NCES No. 2004- 455). Washington, D.C.: U.S. Department of Education, National Center for Educational Statistics. Retrieved from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2004455

Perna, L., Rowan-Kenyon, H. T., Thomas, S. L., Bell, A., Anderson, R., & Li, C. (2008). The role of college counseling in shaping college opportunity: Variations across high schools. *The Review of Higher Education, 31*(2), 131–160. Retrieved from http://muse.jhu.edu/login?uri=/journals/review_of_higher_education/v031/31.2perna.pdf

Peske, H.G. & Haycock, K. (2006). *Teaching inequality: How poor and minority students are shortchanged on teacher quality.* Washington, DC: The Education Trust. Retrieved from http://www.edtrust.org/dc/publication/teaching-inequality-how-poor-and-minority-students-are-shortchanged-on-teacher-qualit

Petter, S., Straub, D., & Rai, A. (2007). Specifying formative concepts in Information systems research. *MIS Quarterly 31*(4), 625-656. Retrieved from http://aisel.aisnet.org/misq/vol31/iss4/2/

Quint, J., Akey, T., Rappaport, S. & Willner, C. (2007). *Instructional leadership,*

teaching quality, and student achievement: Suggestive evidence from three urban school districts. New York: Manpower Demonstration Research Corporation. Retrieved from http://www.mdrc.org/publications/470/overview.html

Quint, J., Thompson, S. L., & Bald, M. (2008). *Relationships, rigor and readiness: Strategies for improving high schools.* New York: Manpower Demonstration Research Corporation. Retrieved from http://www.mdrc.org/publications/498/preface.html

Ravitch, D. (1983). *The troubled crusade; American education, 1845-1980.* New York: Basic Books.

Ravitch, D. (2000). *Left back: A century of battles over school reform.* New York: Simon & Schuster.

Ravitch, D. (2010). *The death and life of the great American school system: How testing and choice are undermining education.* New York: Basic Books.

Ringle, C.M., Wende, S., and Will, S. (2005). SmartPLS 2.0 (M3). Hamburg. Retrieved from http://www.smartpls.de.

Rivkin, S.G., Hanushek, E.A. & Kain, J.F. (2005). Teachers, schools and academic achievement. *Econometrica*, 79, 418-458. Retrieved from http://www.nber.org/papers/w6691

Rockoff, J.E. (2003). The impact of individual teachers on student achievement: Evidence from panel data. *Public Economics*, 0304002. Retrieved from

http://129.3.20.41/eps/pe/papers/0304/0304002.pdf

Robinson, S., Stempel, A. & McCree, I. (2005). *Gaining traction, gaining ground: How some high schools accelerate learning for struggling students.* Washington, DC: The Education Trust. Retrieved from http://www.edtrust.org/dc/publication/gaining-traction-gaining-ground-how-some-high-schools-accelerate-learning-for-struggl

Rockoff, J.E. (2004). The impact of individual teachers on student achievement: Evidence from panel data. *American Economic Review Papers and Proceedings*, May 2004, 247-252. Retrieved from http://129.3.20.41/eps/pe/papers/0304/0304002.pdf

Roderick, M. (2006). *Closing the aspirations-attainment gap: Implications for high school reform.* Chicago, IL: Consortium on Chicago School Research. Retrieved from http://www.studentclearinghouse.org/highschools/pdfs/MDRC_CPSstudy.pdf

Roderick, M., Nagaoka, J., & Allensworth, E. (2006). *From high school to the future: A first look at Chicago public school graduates' college enrollment, college preparation, and graduation from four-year colleges.* Chicago, IL: Consortium on Chicago School Research. Retrieved from http://ccsr.uchicago.edu/content/publications.php?pub_id=7

Roderick, M., Nagaoka, J., Coca, V., & Moeller, E. (2008). *From high school to the future: Potholes on the road to college*. Chicago, IL: Consortium on Chicago School Research. Retrieved from http://ccsr.uchicago.edu/downloads/1835ccsr_potholes_summary.pdf

Roderick, M., Nagaoka, J., Coca, V., & Moeller, E. (2009). *From high school to the future:Making hard work pay off.* Chicago, IL: Consortium on Chicago School Research. Retrieved from http://ccsr.uchicago.edu/publications/Making%20Hard%20Work%20Pay%20Off.pdf

Rowan, B., Correnti, R., & Miller, R. (2002). *What large-scale, survey research tells us about teacher effects on student achievement: Insights from the Prospects study of elementary schools.* University of Pennsylvania: Consortium for Policy Research in Education. Retrieved from http://cw.marianuniversity.edu/mreardon/755/document%20repository/Teacher%20Effects%20on%20Student%20Achievement.pdf

Sanders, W.L. & Rivers, J. (1996). *Cumulative and residual effects of teachers on future student academic achievement.* Knoxville: University of Tennessee Value-Added Research and Assessment Center. Retrieved from http://www.mccsc.edu/~curriculum/cumulative%20and%20residual%20effects%20of%20teachers.pdf

Schumacker, R.E., & Lomax, R.G. (2010). *A beginner's guide to structural equation modeling.* New York: Routledge.

Seldon, R.W. (1990). Developing educational indicators: A state-national perspective. *International Journal of Educational Research 14*(4), 383-393. Retrieved from http://www.sciencedirect.com/science/article/pii/088303559090009W

Shoenberg, R. (2008). *What will I learn in college? What you need to know now to get ready for college success.* Washington, DC: Association of American Colleges and Universities. Retrieved from https://secure.aacu.org/source/Orders/index.cfm?section=unknown&task=3&SKU=WHATWILL&DESCRIPTION=&FindSpec=&CFTOKEN=54123280&continue=1&SEARCH_TYPE=

Solorzano, D. G., & Ornelas, A. (2002). A critical race analysis of advanced placement classes: A case of educational inequity. *Journal of Latinos and Education, 1,* 215-229. Retrieved from http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=EJ654445&ERICExtSearch_SearchType_0=no&accno=EJ654445

Spitzer, D. R. (2007). *Transforming performance measurement: Rethinking the way we measure and drive organizational success.* New York: American Management Association.

Starr, A. & Torbert, W. (2005). Timely and transforming leadership inquiry and action: Toward triple-loop awareness. *Integral Review I*. Retrieved from http://www.integral-review.org/documents/Toward%20Triple-Loop%20Awareness%201,%202005.pdf

State Higher Education Executive Officers. (2010). *Strong foundations: The state of state postsecondary data systems.* Retrieved from http://www.sheeo.org/sspds/StrongFoundations_Full.pdf

Sum, A., Fogg, N., Khatiwada, I., McLaughlin, J., Palma, S., Motroni, J., et al. (2008). *Getting to the finish line: College enrollment and graduation, a seven year longitundinal study of the Boston public schools class of 2000.* Boston: Center for Labor Market Studies and Boston Private Industry Council. Retrieved from http://www.bostonpic.org/resources/getting-finish-line-seven-year-longitudinal-study-boston-public-schools-class-2000

Taylor, F.W. (1911). *The prinsiples of scientific management.* New York: Harper and Brothers.

Texas Education Agency. (2010). *Academic Excellence Indicator System Campus Performance Reports 2002 and 2003*. Retrieved from http://ritter.tea.state.tx.us/cgi/sas/broker

Texas Higher Education Coordinating Board. (2008). *Texas college and career readiness standards.* Austin: Texas Higher Education Coordinating Board. Retirved from http://www.thecb.state.tx.us/collegereadiness/crs.pdf

Tobias, R.D. (2011). An introduction to partial least squares regression. Cary, NC: SAS Institute Inc. Retrieved from http://support.sas.com/techsup/technote/ts509.pdf

Torbert, P. & Reason, W. (2001). The action turn: Toward a transformational social science. *Concepts and Transformation, 6*(1), 1-37. Retrieved from http://www.bath.ac.uk/carpp/pdf/THE_ACTION.pdf

U.S. Census Bureau. (2005). *College degree nearly doubles annual earnings.* Retrieved from http://www.census.gov/newsroom/releases/archives/education/cb05-38.html

U.S. Census Bureau. (2009). *School enrollment: Social and economic characteristics of students.* Retrieved from http://www.census.gov/population/www/socdemo/school/cps2009.html

U.S. Census Bureau. (2011). *Educational attainment in the United States: 2008* (Census Bureau reports). Retrieved from http://www.census.gov/compendia/statab/2011/tables/11s0229.pdf

U.S. Government. (2011). *America COMPETES act keeps America's leadership on target.* The White House Blog. Retrieved from http://www.whitehouse.gov/blog/2011/01/06/america-competes-act-keeps-americas-leadership-target

Venezia, A., & Kirst, M. W. (2005). Inequitable opportunities: How current education systems and policies undermine the chances for student persistence and success in college. *Educational Policy, 19*(2), 283–307. Retrieved from http://epx.sagepub.com/content/19/2/283.abstract

Walsh, K. (2001). *Teacher certification reconsidered: Stumbling for quality.* Baltimore: Abell Foundation. Retrieved from http://www.nctq.org/p/publications/docs/ed_cert_1101_20071129024241.pdf

Watt, K.M., Huerta, J.J., Alkan, E. (2011). Graduates' college preparatory achievements identifying predictors of college success through an examination of AVID. *Journal of Hispanic Higher Education, 10,* 120-133. Retrieved from http://libproxy.uta.edu:2197/content/10/2/120.full.pdf+html

Wilson, W. (1887). The study of administration. *Political Science Quarterly, (2)*2, 197-222.

Wimberly, G. L., & Noeth, R. J. (2005). *College readiness begins in middle school: ACT policy report.* Iowa City, IA: ACT, Inc. Retrieved from http://www.act.org/research/policymakers/pdf/CollegeReadiness.pdf

BIOGRAPHICAL INFORMATION

Linda K. Johnson began her career in business management and moved to the nonprofit sector in 1982. Since 1995 she has held chief executive positions at a variety of educationally-oriented nonprofits, including science and history museums. She has participated in a number of regional and national organizations and planning projects, and worked with all sectors of communities—social services, government, corporate, educational, philanthropic, and religious. She earned a M.B.A. from the University of Dallas. Her goal is to make contributions that help to create equity for all.