IMPACT OF CORE KNOWLEDGE CURRICULUM ON READING ACHIEVEMENT

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The purpose of this study was to examine the impact of Core Knowledge curriculum, a Comprehensive School Reform model, on the reading achievement of elementary students located in a north Texas suburban school district.

A repeated measures, matched-comparison design was employed using longitudinal data over a three year period. Repeated measures analyses of variance (ANOVA) were conducted to determine if there were any significant differences in student achievement scores as measured by the Texas Assessment of Knowledge and Skills (TAKS) test. The experimental and control school were examined for student achievement gains overall, for advantaged versus disadvantaged students and for achievement gap differences.

Although the results of the statistical analyses indicated that there were no significant differences in the reading TAKS scores of students participating in the study, experimental school students consistently had higher mean scores when compared to the control school in all areas. The evaluation of the achievement gap revealed that although the Core Knowledge school did not close the achievement gap between advantaged and disadvantaged students, the disadvantaged students' scores rose in proportion to the advantaged students, thus preventing an increase in the achievement gap between students.

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CHAPTER 1

INTRODUCTION

Despite many years of school reform, an achievement gap persists between advantaged and disadvantaged students that handicaps poor and minority children in their pursuit of higher education, good jobs, and a better life (Bennett et al., 1998). According to Brent Keltner of the RAND Corporation, dissatisfaction with the effectiveness of schools and frustration with piecemeal reform efforts led to the emergence of a new type of reform, one that offers an integrated vision across all grade levels, all students, and all elements of school practice (Bodilly, 1998). This type of comprehensive reform approach has many advantages over previous reform models. First, its adoption encourages the end of single-focus reform and thus prevents fragmentation associated with traditional reform efforts (Glennan, 1998). Second, it provides schools with access to external expertise and assistance (Keltner, 1998). Third, it introduces quality control mechanisms often lacking in previous reform efforts (Keltner, 1998). Comprehensive reform designs include blueprints for changing a school's educational standards, curriculum, and instructional practices. The blueprints give schools a path for improvement and also make it easier for educational researchers to evaluate the effects of reform on educational outcomes (Bodilly, 1996; Fashola & Slavin, 1998).

Recognizing these benefits, the U.S. Congress, in 1997, passed legislation intended to promote comprehensive reform efforts (Riley, 1995; Smith & Scoll, 1995; Smith, Scoll, & Link, 1996). Known as the Obey-Porter legislation (P.L. 105-7) after the two sponsoring representatives, the law established a new federal program to provide individual schools with $50,000 a year for up to three years to help them adopt comprehensive reform models. In 1997, $150 million was committed to help the first round of approximately 2,500 schools adopt various comprehensive school reform models. The Comprehensive School Reform Program (CSRP) has been incorporated into the No Child Left Behind Act of 2001 (HR 1-P.L. 107-110-Title 1 part F) signed by President George W. Bush on January 8, 2002. Essential to the policies and practices of these reform efforts is the belief that gains in student outcomes require a reconceptualization of traditional notions of teaching and learning (Slavin, 1995).

Although there is lively debate among scholars and practitioners as to the desirable locus of educational improvement, there is presently, through the Comprehensive School Reform Demonstration, considerable impetus for implementing reforms through whole-school change models. Support of comprehensive school reform (CSR) was derived from “decades of research on effective schools” (Glennan, 1998, p. 2) as well as from a growing body of research on how organizations change (Office of Elementary and Secondary Education, 2000). Notwithstanding the apparent progress in design implementation (Bodilly, 1998), a long-term question remains whether these reforms result in enhanced academic achievement for all students. Convincing evidence of the effectiveness of individual models varies considerably. As described by the Consortium for Policy Research in Education (1998), evidence ranges from merely “plausible” support suggested by theory and prior research, to “promising” support obtained in nonexperimental studies of a selected school, to “proven” support provided by independent evaluators using experimental research designs.

Although much of the CSR research focuses on implementation, there is some information about student outcomes based on both previous related research and recent CSR studies. The effective schools literature cites specific characteristics of successful schools, such as school-level management, academic leadership, high expectations for all students, an articulated curriculum and organization, school-wide staff development, parent involvement and support, school-wide recognition of academic success, maximized learning time, alignment of resources to school vision, and district support (Purkey & Smith, 1993). Most of the practices encompassed by CSR models are comprised of these components, which have been shown to positively impact student learning. Thus, although the effective schools literature did not specify the methods by which schools could become successful, the research-based components may provide underlying empirical support for CSR models (Wang, Haertel, & Walberg, 1993).

Since the publication of *A Nation at Risk* (U.S. Department of Education, 1983), a number of school-wide reform initiatives, including comprehensive school reform, have been undertaken at the local, state, and national levels in an effort to increase outcomes for all children. One such reform effort is the Core Knowledge curriculum developed by E. D. Hirsch and the Core Knowledge Foundation. The Core Knowledge curriculum outlines specific content to be taught in language arts, mathematics, science, geography, history, and the fine arts. The sequence is designed to reduce repetition in teaching and level the playing field among students from varying backgrounds. (Core Knowledge Foundation, 2002). The sequence also attempts to define a core of shared knowledge that children should learn in American schools.

The Core Knowledge movement is a result of the ideas expressed in *Cultural Literacy: What Every American Needs to Know* (1987), which were later developed in *The Schools We Need & Why We Don't Have Them* (1996), both written by E. D. Hirsch, an education and humanities professor at the University of Virginia. According to Hirsch, in order to be culturally literate one must posses the basic knowledge needed to communicate and thrive in today's society. Furthermore, Hirsch (1987) believes cultural literacy is the most promising avenue of opportunity for disadvantaged children because it combats social determinism that often causes these students to remain in the same economic and educational conditions as their parents.

In democratic nations, it is generally assumed that knowledge is power, and, to a large extent, that knowledge is a result of literacy. To achieve this undertaking, the function of literacy should be to enable humans to give and receive complex information orally and in writing. According to Hirsch (1987), literacy requires that humans have both the ability to decode words and a broad range of background knowledge. Those who lack the assumed knowledge are excluded from understanding messages delivered through many forms of communications.

To address this problem, the Core Knowledge curriculum was developed after extensive research that assessed the content and structure of high-performing elementary schools around the world, including Korea, Japan, France, and Denmark (Hirsch, 1996). Upon review of the data collected, a national conference was convened in 1990 to develop a draft sequence curriculum, which was subsequently revised during the first year of implementation (Core Knowledge Foundation, 2003). The Core Knowledge Sequence provides a planned progression of specific knowledge in language arts, history, geography, math, science, and fine arts that is designed so that students build on knowledge from year to year, from prekindergarten through eighth grade (Hirsch, 1996).

The most distinguishing feature of the Core Knowledge curriculum is its content specificity. While the Core Knowledge Sequence specifies content, it does not specify the process in which the material must be taught; instead, it provides general guidelines as to when and in what sequence a school might implement the specified content. According to the Core Knowledge Foundation (2003), the Core Knowledge Sequence should represent 50% of the school's curriculum, thus supplanting the existing curriculum. The four integrated components of the Core Knowledge Sequence designed to help students develop strong foundations of knowledge include solid knowledge, sequenced knowledge, specific knowledge, and shared knowledge.

First, although technology and current events are constantly changing, lasting solid knowledge remains constant in our society. Solid knowledge represents a body of lasting knowledge that should form the core of the prekindergarten through eighth grade curriculum. Such knowledge would include the basic principles of government, important world history events, essential elements of mathematics, written and oral language, and widely acknowledged art, music, stories, and poetry.

Second, Core Knowledge is sequenced knowledge (Core Knowledge Foundation, 2003). The idea is that knowledge builds on knowledge, and children learn new knowledge by building on what they have already learned. The Core Knowledge Sequence provides a clear outline of specified sequential content that students should learn at each grade level, thus preventing gaps in learning. For example, in fifth grade world history, study of the Renaissance builds on earlier studies of ancient Greece (second grade), ancient Rome (third grade), and the Middle Ages (fourth grade). In the area of science, the basic concept of the atom is introduced in first grade, and by fifth grade students develop an understanding of how atomic properties are organized in the periodic table (Core Knowledge Foundation, 2003). Sequenced knowledge not only ensures that students enter each grade level prepared for new learning, it also prevents content repetition that sometimes occurs in today's schools.

Third, Core Knowledge is specific knowledge in that the Core Knowledge Sequence clearly specifies important knowledge in the content areas of language arts, history, geography, mathematics, science, and the fine arts (Core Knowledge Foundation, 2003). For example, within the area of language arts, fifth grade students read the drama *A Midsummer Night's Dream* (Shakespeare) in conjunction with the study of the Renaissance and Reformation periods, while sixth graders read the *Iliad* and the *Odyssey* (Homer) as part of their study of ancient Greece.

Fourth, Core Knowledge is shared knowledge. Since literacy involves having a familiarity with a broad range of knowledge, the Core Knowledge curriculum provides all children, regardless of background, the shared knowledge they need in order to participate in a literate society (Core Knowledge Foundation, 2003). For example, following the study of measurement of central tendency (mean, median, and mode) in mathematics, students are able to understand the use of a sample to estimate a population parameter when reading a newspaper article regarding census reporting.

Johns Hopkins University, in conjunction with the University of Memphis, conducted a study involving 12 Core Knowledge schools across America (Stringfield, Datnow, Nunnery, & Ross, 1996). Six schools were recognized by the Core Knowledge Foundation to be relatively advanced in their implementation of the Core Knowledge curriculum, and six schools were considered promising implementation sites. All 12 schools in the study were matched with demographically similar schools within their own districts that served as controls. The qualitative component of the study relied upon the analysis of data from multiple sources, including observations, focus groups, interviews, and questionnaires. Reported benefits of the first year evaluation were as follows: (a) children gained self-confidence, (b) students were more interested in learning and reading, (c) students connected to material learned previously, (d) teaching Core Knowledge curriculum resulted in fewer discipline referrals, (e) the Core Knowledge curriculum met the needs of all students, (f) Core Knowledge increased interaction among teachers, (g) Core Knowledge made teachers' work lives more interesting, (h) teacher support for Core Knowledge increased over time, and (i) parents were satisfied with Core Knowledge.

The Johns Hopkins third year evaluation reported on the achievement outcomes of students in the study (Stringfield & McHugh, 1998). The three year study examined achievement data from five Core Knowledge schools and five matched control schools through the use of two tests: the Comprehensive Test of Basic Skills (CTBS) and the Maryland School Performance Assessment Program (MSPAP). The results of the study showed that a majority of the Core Knowledge schools posted academic gains in reading comprehension relative to their matched control schools. Furthermore, during the three year period, the third grade students in the Core Knowledge schools showed greater gains on the MSPAP than the third grade students in the control schools or the mean of the third grade test scores statewide.

Based on this academic achievement research, a superintendent and several principals in a school district located in a large metropolitan area in north central Texas decided to implement the Core Knowledge curriculum within several elementary school campuses. The district researched information pertaining to the effectiveness of the Core Knowledge curriculum and found that many schools reported the curriculum had contributed to narrowing the learning gaps of their students. The superintendent and principals therefore viewed the Core Knowledge curriculum as a possible means for narrowing student learning gaps and raising student achievement. After months of research and preparation, an elementary school piloted the first stages of the Core Knowledge curriculum during the 2001-2002 school year.

Purpose of the Study

Over the past several decades educators and policymakers at all levels have searched aggressively for ways to enhance student achievement. In 1997, Congress allocated $150 million to encourage schools interested in implementing comprehensive school reform models. The purpose of this study is to examine the impact of one such model: the Core Knowledge curriculum developed by E. D. Hirsch.

This study examines four educational elements:

1. To determine the impact of the Core Knowledge curriculum on achievement, statistical analyses will be conducted to compare achievement as measured by the Texas Assessment of Knowledge and Skills (TAKS) test. The analyses will compare

students who were taught using the Core Knowledge curriculum in the fourth, fifth, and sixth grades with students taught a traditional curriculum in the same grades.

2. To determine the impact of the Core Knowledge curriculum on the achievement of advantaged students, statistical analyses will be conducted to compare achievement as measured by the TAKS test. The analyses will compare students who were taught using the Core Knowledge curriculum in the fourth, fifth, and sixth grades with students taught a traditional curriculum in the same grades.

3. To determine the impact of the Core Knowledge curriculum on the achievement of students of a lower socioeconomic status, statistical analyses will be conducted to compare achievement as measured by the TAKS test. The analyses will compare students who were taught using the Core Knowledge curriculum in the fourth, fifth, and sixth grades with students taught a traditional curriculum in the same grades.

4. To examine the differences in the achievement gap for advantaged and disadvantaged students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to the advantaged and disadvantaged students who were not taught the Core Knowledge curriculum in the same grades.

Research Questions

Research question 1: As measured by the TAKS test, how do the achievement test scores of sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Research question 2: As measured by the TAKS test, how do the achievement test scores of advantaged sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Research question 3: As measured by the TAKS test, how do the achievement test scores of disadvantaged sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Research question 4: As measured by the TAKS test, how does the achievement gap for advantaged and disadvantaged students taught the Core Knowledge curriculum differ from comparable advantaged and disadvantaged students who were not taught the Core Knowledge curriculum?

Research Hypotheses

Hypothesis 1: There is a statistically significant difference in the reading achievement of sixth grade students when immersed in a Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to sixth grade students who were not taught the Core Knowledge curriculum in the same grades.

Hypothesis 2: There is a statistically significant difference in the reading achievement of advantaged sixth grade students when immersed in a Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to advantaged sixth grade students who were not taught the Core Knowledge curriculum in the same grades.

Hypothesis 3: There is a statistically significant difference in the reading achievement of disadvantaged sixth grade students when immersed in a Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to disadvantaged sixth grade students who were not taught the Core Knowledge curriculum in the same grades.

Hypothesis 4: There is a statistically significant difference in the achievement gap for advantaged and disadvantaged students taught the Core Knowledge curriculum when compared to the advantaged and disadvantaged students who were not taught the Core Knowledge curriculum.

Importance of the Study

It is the responsibility of educators to ensure that all children receive the best education possible in order to be successful in society. For this reason, the Core Knowledge Foundation was created. The Core Knowledge Foundation has developed coherent and sequential curriculum that is being implemented in hundreds of schools across the nation (Core Knowledge Foundation, 2003). The importance of this study is to add to the growing body of research regarding the impact of the Core Knowledge curriculum on the achievement of identified sixth grade students.

Justification of the Study

The poor performance of American students in middle school and high school can be traced back to shortcomings inherited from elementary schools that have not imparted to children the specific knowledge they need for further learning (Hirsch, 1993). The justification for this study is twofold. First, there has been a lack of scientific research studies regarding the impact of the Core Knowledge curriculum on the achievement of 6th-grade students after the implementation of the new TAKS test. The TAKS test was designed to assess student achievement levels on the TEKS objectives set forth by the state of Texas. Second, there has been a lack of scientific research regarding the impact of the Core Knowledge curriculum on student achievement among students of lower socioeconomic status. There is, therefore, a need for additional research.

Limitations of the Study

This section lists limitations important to this study. These limitations represent this particular study and are presented to provide additional understanding.

1. This study will be conducted in two public elementary schools located in a large metropolitan area in north central Texas.

2. The study is limited to the reading achievement portion of the TAKS test to determine student academic growth. Other types of achievement measures may show other results.

3. The study is limited to the sixth grade students from the selected schools within one district.

Definition of Terms

This section includes definitions of the terms important to this study. These definitions represent this particular study and are presented to provide a common understanding.

Achievement: The act of performing as measured by the TAKS test.

Achievement gap: The test score gap that exists between advantaged and disadvantaged students. It is based on performance on achievement tests.

Advantaged students: Those students who do not participate in the federal free and reduced-price lunch programs.

Comprehensive school reform: Comprehensive school reform is a systematic approach to reorganizing and revitalizing an entire school (New American School, 1998).

Comprehensive school reform model: Programs that schools adopt that are research-based and designed by external developers. The Core Knowledge curriculum is considered a comprehensive reform model as defined by the CSRP.

Control school: A school not implementing the Core Knowledge curriculum.

Core Knowledge curriculum: The Core Knowledge curriculum provides a planned progression of specific knowledge in language arts, history, geography, mathematics, science, and fine arts. The curriculum is designed so that students build on knowledge from year to year and represents the first major effort to specify a common core curriculum for children in American schools (Core Knowledge Foundation, 2002).

Cultural literacy: The notion that people must possess the basic information needed to communicate effectively through reading, writing, and speaking (Hirsch, 1987).

Disadvantaged students: Those students who participate in the federal free and reduced-price lunch program.

Experimental school: A school implementing the Core Knowledge curriculum.

Free and reduced-price lunch: A federally subsidized school lunch program based on family income.

Obey-Porter Legislation, P.L. 105-7: The bill passed by the U.S. Congress that allocated new federal funds to help states support comprehensive school reform efforts.

Texas Assessment of Knowledge and Skills (TAKS): An achievement test designed to measure student achievement in grades 3-12 in the state of Texas. The TAKS test is aligned with the state-mandated curriculum as stipulated in the Texas Education Code (TEC), Chapter 28 (Texas Education Agency, 2003).

Texas Essential Knowledge and Skills (TEKS): A required curriculum, as stipulated in the Texas Education Code, Chapter 28, that consists of foundation and enrichment subjects. Districts in Texas are required to provide instruction in the essential knowledge and skills of the appropriate grade levels in the foundation curriculum (Texas Education Agency, 2003).

Traditional curriculum: Districts in Texas are required to provide instruction in the essential knowledge and skills of the appropriate grade levels as part of a planned school program (Texas Education Agency, 2003).

Summary

This chapter provided an overview of the purpose of the study, research questions, research hypotheses, importance and justification of the study, research limitations, and definitions of terms. Chapter 2 explores the literature regarding CSR and the Core Knowledge curriculum reform model. The chapter is organized into the following sections: overview of school reform, a framework of curricular reform and its effects, socioeconomic background and achievement, history of the Core Knowledge reform model, critics and proponents of the Core Knowledge reform model, research regarding the Core Knowledge reform model, and the summary. Chapter 3 provides an overview of the research design, subjects, instrumentation, data collection methods, and data analysis procedures.

Data presentation, analysis, and interpretation are provided in chapter 4. It is divided into several sections. The first section presents the descriptive statistics that were used to compare demographic and contextual characteristics of the schools and the students in the study. The second section presents the data and reviews the findings related to the research questions. In the final section, a summary is provided. Chapter 5 presents the summary, conclusions, and recommendations from this study. The first section is a brief description of the study. The second section outlines the findings and conclusions for each research question. The conclusion is discussed in section three. Implications for practice are discussed in section four. In the final section, policy recommendations and directions for future research are outlined.

CHAPTER 2

REVIEW OF SELECTED LITERATURE

This chapter explores the literature regarding Comprehensive School Reform and the Core Knowledge curriculum reform model. The chapter is organized into the following sections: overview of school reform, a framework of curricular reform and its effects, socioeconomic background and achievement, history of the Core Knowledge reform model, critics and proponents of the Core Knowledge reform model, research regarding the Core Knowledge reform model, and the summary.

Overview of School Reform

The initial attempts to reform schools in the 1960s, 1970s, and the early 1980s focused on repairing the “broken” parts of schools. Piecemeal reforms were created to improve reading, mathematics, and science curricula. Administrators then attempted to plug reforms into schools. Sometimes fixing the parts also was seen as a matter of fixing the people. The thinking was that poor student performance was a result of a “poor quality of workers and . . . the inadequacy of their tools,” which were both in need of fixing (Murphy, 1990, p. 101). These experiences demonstrated that the content and delivery of instruction were linked in important ways that affect student results. Simply repairing the parts and not focusing on the whole was not sufficient.

By the mid-1980s policymakers decided to shift the focus from piecemeal, additive reform efforts to altering school practices through decentralization and school choice (Verstegen, 1994). These reform efforts, however, had only a limited effect (Fuhrman, Elmore, & Massell, 1993; Verstegen, 1994). As some observed, reform efforts were still in the trial phase and not getting to the heart of the problem: the education system itself. In 1988, David Kearns, the chairman and CEO of Xerox Corporation, wrote that a wave of reform had “broken over the nation’s public schools, leaving a residue of incremental changes and an outdated educational structure still in place” (p. 568). Ultimately, mandated reforms did not produce the achievement results that many had anticipated.

By the 1990s, it seemed clear that policymakers needed to rethink and redesign the whole education system from the classroom to the school district (Verstegen, 1994). This reform “wave” attempted to go beyond the past piecemeal efforts by integrating change in all aspects of schooling. This type of change became known as comprehensive school reform. Comprehensive school reform borrowed what was learned in the 1970s about effective curricula and teaching, combining top-down policy and bottom-up approach in the form of standards-based reform (Sashkin & Egermeier, 1993; Verstegen, 1994).

Comprehensive school reform also took into account another lesson that was learned: that change can only happen when teachers, administrators, and parents believe in change and become active participants in the process. It was not surprising that many comprehensive school reform models insist that implementation be based upon a shared vision of what the school should become. While all pieces of comprehensive school reform may not be new, the understanding of how to put the pieces together in a compressive fashion is unprecedented.

History indicates that, contrary to the adage “the more things change, the more they stay the same,” education has changed. Many aspects of education have changed for the better; statistics bear evidence that reform efforts of the past two decades have been worthwhile. For example, standards-based reform has been adopted by virtually all states (Gerald, Curran, & Olson, 1998). A majority of these states have adopted statewide content standards and assessments. In addition, as a result of reforms in the 1980s, high school students are enrolling in more rigorous courses. Between 1982 and 1994, the percentage of graduating high school seniors who took four years of English and 3 years of social studies, math, and science nearly quadrupled from 12.7% to 50% (U. S. Department of Education, 1996).

The math and science scores of 17-year-olds on the National Assessment of Educational Progress (NAEP) rose significantly between 1982 and 1996, from 298 to 307 and 238 to 296. Those increases represent gains equivalent to a year or more of learning (U.S. Department of Education, 1998). Efforts in the 1980s and 1990s to raise teachers' salaries also resulted in positive changes. The average teacher's salary rose from $32,711 in 1981 to $38,921 in 1997 (U.S. Department of Education, 1998).

Despite improvements, a cause for concern remains. Students' scores on the NAEP remain low compared to those in other countries. Achievement of urban, disadvantaged, and minority students is abysmal, as well. Most fourth graders in urban districts are not able to read simple children's books, and most eighth graders cannot use math to solve a practical problem (Gerald et al., 1998). Likewise, troubling achievement gaps persist between more or less affluent students and minority and nonminority students (Jencks & Phillips, 1998).

A Framework of Curricular Reform and Its Effects

Although there has been curricular change in the United States, there has been tremendous durability in what is actually taught (Cuban, 1992). The major issues in understanding curricular reform include: (a) the ideological struggle, power, and politics inherent in curriculum and curricular change; (b) the disconnection that occurs between theory and practice; and (c) the problem of assessing the effects of curricular reform. In order to establish a framework for this study, the remainder of this section discusses these three issues and how they pertain to Core Knowledge and Hirsch's ideals.

Since the time of the American Revolution, politics and social relations of power have played a major role in decisions about what should comprise the curriculum and who should receive access to a particular curriculum (Spring, 1990). Throughout American history, those with more power and resources have had access to higher-quality curriculum. For example, in the 1800s, basic education was available to most citizens while the advanced curricula were reserved for the wealthy (Oakes & Lipton, 1999). Today, although equal access is provided, differentiation in curriculum continues to exist. Both within and across schools, low-income and minority students typically receive a curriculum that is reduced in scope and content as compared to their higher-income, White peers (Oakes, Gamoran, & Page, 1992). This differentiation and inequity in curriculum led Hirsch (1996) to advocate a common curriculum for all students.

The ideological struggle becomes a factor in public and political debates when determining how the substance of the curriculum should be changed and whose interests should be served by a particular curricular reform (Kliebard, 1992). According to Oaks and Lipton (1999), progressive educators and sociocultural theorists argue that curriculum should build on what students know and draw on their funds of knowledge. Furthermore, they argue that a constructivist approach to teaching can be a vehicle for building a culturally democratic curriculum. In contrast, Hirsch (1996) believes that the constructivist approaches have created curricular anarchy and incoherence. Hirsch advocates a prescribed curriculum that students acquire from their teachers rather than through a construct manner. He believes that equity will only be achieved when all students have access to a common set of knowledge.

A second reform issue is the major schism that exists between theory and practice. Even when curricular reform is adopted, it is seldom implemented as planned. School reform is a nonlinear process whereby teachers implement “the innovation as developed in the classroom” (Snyder, Bolin, & Zumwalt, 1992, p. 404). Snyder and colleagues concluded that variation in curricular implementation is inevitable. Similarly, Elmore and Sykes (1992) state that “seemingly straightforward policies and content requirements for specific grade levels, for example, are often implemented very differently across localities, schools, and classrooms” (p. 6). Some of the reasons for this variation include the flexibility of policies or new curricular as well as a lack of accountability.

The fact that teachers’ habits, attitudes, and dispositions are enduring contributes substantially to the disconnection between theory and practice (Cuban, 1992). When curricular reform is adopted, teachers interpret it in terms of their own ideologies and experiences with teaching. Teachers also feel they must respond practically to their students’ needs. As a result, teachers tend to adapt curricular reform accordingly

(Helsby, 1999). For the purposes of this study, descriptive statistics were collected pertaining to years of teaching experience and teacher retention rates of those teachers directly involved with the sample population in both the experimental and control schools.

Some even argue that curricular reform policies do not actually function to change the curriculum; instead, they sustain public confidence in schooling as an important social institution. Changes in curriculum are difficult to install in the face of requirements by accrediting and testing agencies and state and federal policies (Cuban, 1992). For example, efforts to create thematic high school curricula conflict with subject-based advanced placement tests, for which some students receive credit upon college entrance. As a result, although theory might argue for thematic curricula, tradition and the policies that accompany it help to preserve existing practice.

Critics argue that Hirsch ignores the schism between theory and practice in curricular reform, assuming that progressive ideals have actually led to progressive practices in schools (Buras, 1999). Meanwhile, most schools in the United States are still dominated by textbooks and traditional instruction. Hirsch blames some of the problems of public education on constructivist teaching principles and progressive policies, which he believes have taken hold (Hirsch, 1996).

In order to minimize the discrepancy between instructional practices and curriculum, the school district represented in this study has implemented a district-wide staff development policy that requires all district teachers within the same grade to attend specified curriculum and instruction training (G. Buinger, personal communication, January 8, 2004). As a result of the training, teachers are expected to deliver the specified curriculum through the use of instructional strategies and practices learned. Similarly, the district has also implemented a student tutorial program that requires teacher training related to instructional practices prior to the delivery of tutorial services.

The Core Knowledge Foundation (2003) requires a minimum number of professional development hours conducted by a regional training center as one component of the certification process. The Core Knowledge school represented in this study required that all teachers participate in Core Knowledge staff development in addition to district-wide staff development.

Finally, there is the issue of assessing the effects of a curricular reform. It is at this point where ideology, politics, and the disconnection between theory and practice become contributing factors in the assessment process. Policymakers typically determine the success of a reform in terms of improved academic performance on standardized tests, fidelity of implementation, and popularity (Cuban, 1998). Essentially, test scores become the final determiner of the “thumbs-up or thumbs-down verdict on a reform” (Cuban, 1998, p. 471), particularly with regards to the accountability provisions of the No Child Left Behind Act.

As with all districts in the state of Texas, the district represented in this study is required to teach a state-mandated, grade-specific curriculum for all subjects, known as the Texas Essential Knowledge and Skills (TEKS). The Texas Essential Knowledge and Skills identify what Texas students should know and be able to do at every grade level and in every subject in the foundation and enrichment areas as they move through public schools. The TEKS were developed to comply with §28.002 (c) and (d) of the

Texas Education Code and are written in terms of student rather than teacher expectations. TEKS establish a clear focus to help educators, students and parents understand the alignment between the curriculum and the state mandated test.

Texas school districts must ensure that sufficient time is provided for teachers to teach and for students to learn. The school districts may provide instruction in a variety of arrangements and settings, including mixed-age programs designed to permit flexible learning arrangements for developmentally appropriate instruction for all student populations to support student attainment of the course and grade level standards as outlined in the curriculum (Texas Education Agency, 2003).

The TEKS for each grade level and course are organized by strands. For example, the social studies strands include history, geography, economics, government, citizenship, culture, science, and technology. The eight strands are intended to be integrated for instructional purposes with other content areas. For each grade level and course, there is an introduction that highlights important content and skills and offers examples of rich primary and secondary source material that might be used to support the teaching of the TEKS. Following the introduction are the knowledge and skills statements, each with several statements of student expectation. Unlike the Core Knowledge curriculum, the TEKS curriculum places emphasis on process and application in addition to acquisition of knowledge.

Each TEKS subject area was developed by a writing team composed of teachers, supervisors, campus administrators, university professors, members of the business industry, and parents. Members of each writing team were selected through a nomination process which was open to all Texans. Screening of the nominees was conducted by the staff of the Texas Education Agency and the final selections were made by the Commissioner of Education. Selections were made on the basis of subject matter expertise and grade-level background. To ensure diversity, factors such as gender, race/ethnicity, and district size and location were also considered.

Printed copies of two drafts of each subject area of the TEKS were distributed to the public, the first draft in February 1996 and a second in July 1996. In addition, the TEKS were placed on the World Wide Web. Both drafts underwent stringent review by educators and by the community at large. Feedback was compiled and summarized, and given to the writing teams for consideration and action. Also, the State Board of Education appointed a 15-member review committee to provide comments.

In the spring of 1997 a revised draft in each subject area was reviewed extensively for accuracy, comprehensiveness, rigor, and other factors by national experts. The TEKS were ultimately adopted by the Texas State Board of Education on July 11, 1997, for implementation in September of 1998. The TEKS are currently being used by districts, schools, and teachers to guide in curriculum development, materials selection, and lesson planning (Texas Education Agency, 2003).

In addition to teaching the entire TEKS curriculum, the Core Knowledge school in this study also taught the Core Knowledge Sequence developed by the Core Knowledge Foundation. As a national curriculum, Core Knowledge is designed to be implemented fifty percent of the time while state curriculum is implemented fifty percent of the time. In most states that is an option, however in Texas, schools are required to implement all of the TEKS curriculum as mandated by the Texas Education Code, thus utilizing Core Knowledge to supplement the state curriculum.

Both schools participating in this study implemented the required TEKS curriculum. However, the Core Knowledge school compacted the state curriculum so that the Core Knowledge curriculum could be implemented as well. To ensure that both curriculums were implemented accordingly and that students at all grade levels were prepared to take state-mandated exams, the district developed an alignment document (Barsallo & Quinones, 2004).

The alignment document was created through a systematic approach whereby district personnel evaluated the individual attributes of each curriculum to identify areas of commonality (Appendix C). The TEKS curriculum and the Core Knowledge curriculum compared favorably in many areas with the exception of TEKS curriculum elements unique to Texas, such as the study of Texas history which is taught in fourth grade. Similarly, portions of the Core Knowledge curriculum were not found in the TEKS curriculum. A detailed review was conducted of these components in order to strategically place them with the most appropriate area of the TEKS curriculum within the alignment document. Since these Core Knowledge curriculum elements were beyond the original scope of the TEKS curriculum, they were considered enrichment curriculum. This alignment document was designed to help Core Knowledge teachers maximize the amount of time spent teaching Core Knowledge content while ensuring that state curriculum expectations were met (G. Buinger, personal communication, January 8, 2004).

Consistent with policymakers and other curricular reform developers (e.g., the Success for All Foundation), the Core Knowledge Foundation has increasingly measured the success of its reform in terms of increased student achievement. For example, the Core Knowledge Foundation's quarterly newsletter reports test score gains achieved by Core Knowledge schools across the country.

For the purposes of this study, the Texas Assessment of Knowledge and Skills (TAKS) test was administered to the sample population. The TAKS test is a state-developed test given to all 3-12th grade students in Texas to measure student learning of statewide curriculum. The TAKS test is a criterion-referenced assessment that all Texas public school students have been required to take since 2003. Prior to 2003, a similar test, the TAAS test, was administered to all students in the same manner.

The TAKS test was developed by classroom teachers, curriculum specialists, specialists in the area of test development, and personnel from the Texas Education Agency. The TAKS test is an effort to test mastery of academic skills based on the TEKS curricular guidelines. Results of the TAKS test are reported annually at the student, campus, district, regional, and state levels. All TAKS tests are then released to the public at the end of each school year.

Evaluating the effects of the Core Knowledge curriculum on student achievement may be best realized through the use of a nationally norm-referenced test such as the Stanford 9 TA. Norm-referenced tests are not curriculum-based, but based upon broad samplings. These tests are domain–specific; therefore, if the domains chosen do not have much overlap with the curriculum of early grades, the expectation is less differentiation between the schools in the primary grades. The theory of Core Knowledge is that several domains are being built upon gradually, systematically, and cumulatively, and as these domains multiply, the chances of overlap with the domains being tested becomes greater. Stringfield et al. (1999) did find consistent evidence of positive impact on norm-referenced tests when students were followed for successive years.

For the purpose of this study, achievement was measured in the area of reading only because the district represented in this study required all schools to implement the state-mandated math curriculum. Although the Core Knowledge school utilized the alignment document when teaching all other subjects, science data was not collected because the state-mandated science achievement test was first administered during the 2002-2003 school year. State-mandated social studies exams are not administered to elementary students; therefore, data was not collected in this area.

Socioeconomic Background and Academic Achievement

The question remains whether schools and reform affect achievement gains for all students. With Coleman's 1966 landmark study, *Equality of Educational Opportunity,* some researchers, practitioners, and the general public widely accepted the correlation between socioeconomic backgrounds and academic achievement. The Coleman report concluded that public schools did not make a significant difference; rather, it credited the student's family background as the main factor related to student achievement in school. The findings also suggested that children from disadvantaged families and homes, lacking the prime conditions to support education, could not learn regardless of what the school did. Many educators and others were unwilling to accept the conclusions of the Coleman report and mounted research efforts to demonstrate that the quality and quantity of schooling does make a difference in student achievement outcomes and that student achievement is not dependent on the student's social and family background (Verstegen, 1996).

Verstegen and King (1998) reported that Coleman's controversial findings and methodology were criticized for overstating the role of family background and school resources. For example, Edmonds and others refused to accept Coleman's report as conclusive, although they acknowledged that family background does indeed make a difference. As a result, researchers set out to find schools where students from disadvantaged families were highly successful and thereby prove that schools can make a difference.

Edmonds (1979) looked at achievement data in several city schools where student populations were comprised of those from disadvantaged backgrounds. Nationwide, he found schools where disadvantaged students were achieving at high levels regardless of socioeconomic background. This work yielded a body of literature generally referred to as "effective schools research" and identified correlates of successful schools (Verstegen, 1996). Edmonds' findings were generally taken to mean that schools can make a difference in student outcomes regardless of social and economic circumstances (Rossmiller, 1987).

Early research studies and surveys consistently have found a correlation between a student's level of academic achievement and his/her parent's professional, educational, and economic status (Daniels & Diack, 1956; Thorndike, 1973). Throughout the past decade, the correlation between socioeconomic background and academic achievement has continued to be well demonstrated in the literature (Anyon, 1997; Brantlinger, 1993; Crane, 1991; Metz, 1998; Natriello, McDill, & Pallas, 1990).

The significance of this correlation is that students from advantaged families perform better in school than do students from disadvantaged families (Kantor & Brenzel, 1993). Furthermore, the advantaged students' higher levels of academic achievement position them to be more prepared for their roles in society than disadvantaged students.

In 1994, the RAND Corporation reported on the relationship between socioeconomic background and academic achievement (Grissmer, Kirby, Berends, & Williamson, 1994). The findings concluded that socioeconomic background was the most important factor affecting students' academic achievement. The study also concluded that students from disadvantaged backgrounds are more likely than their advantaged peers to suffer from many conditions that impede their learning, including: (a) poor health, (b) frequent changes in residence that require transferring to new schools repeatedly, (c) lack of educational resources at home, (d) parents with lower levels of education, and (e) unstable family structure (Grissmer et al., 1994).

These factors may persist throughout the school life of disadvantaged students, causing them to drop out of school and contributing to restrictions in later economic and social opportunities (Passow, 1990). Furthermore, disadvantaged students are also twice as likely to be retained than their advantaged peers. In 1998, 58% of disadvantaged fourth graders had NAEP reading scores that the National Assessment Governing Board considered below the "basic" level of proficiency for children that age. Only 27% of advantaged fourth graders scored below "basic" proficiency (U. S. Department of Education, 1998).

A myriad of factors have been offered to account for the correlation between differences in socioeconomic backgrounds and achievement patterns (Entwisle, Alexander, & Olson, 2000). Entwisle et al. found that virtually the entire achievement gap reflects the differences in home environments. Their belief is that disparities in educational resources, academic expectations, and students' overall educational experiences lead to differences in levels of academic achievement. However, they have also been able to show that, despite advantaged and disadvantaged students' home environments, students "make comparable gains during the school year, but advantaged students make gains when they are out of school during the summer, and because of a lack of resources disadvantaged students make few gains, or even move backwards academically" (p. 9).

Additional factors are school spending or inputs, which can and do affect outcomes as determined by achievement tests and later life chances (Verstegen & King, 1998). According to the RAND Corporation, the 1996 NAEP scores for Black 17-year-olds in reading were at about the 27th percentile of White scores. The reading scores of 1996 had improved since 1971, when Black 17-year-olds had an average reading score at about the 9th percentile of White scores (Grissmer, 1996). He attributes this portion of the gains made by Black students to effective schooling and improvements in social and economic backgrounds. Resource enhancements have also been shown to narrow the gap between advantaged and disadvantaged students (Jencks & Phillips, 1998; Verstegen, 1996). In particular, class sizes and pupil-teacher ratios have declined; smaller classes and more individualized instruction may have had more of an impact on the achievement of disadvantaged students (Jencks & Phillips, 1998).

The challenge, of course, is overcoming these differences in achievement patterns in order to bring about educational improvement and to close the test score gap between advantaged and disadvantaged children and youth (Jencks & Phillips, 1998). Many educational analysts and scholars have provided a variety of explanations for the differences in achievement patterns between the advantaged and disadvantaged students and have outlined numerous proposals for change such as quality preschool, resource enhancements, quality teachers, small class sizes, and focused curriculum (Verstegen, 1996; Verstegen & King, 1998).

In conclusion, referring to the erroneous but common interpretation of the Coleman Report (1966) suggesting that schools don't matter, or to newspaper headlines suggesting that schools maintain or cause failure, researchers have proven that schools can and do matter, especially for disadvantaged students (Bracey, 2002; Edmonds, 1979; Entwisle et al., 2000; Verstegen & King, 1998).

History of the Core Knowledge Curriculum

In 1987, E. D. Hirsch entered the national educational debate with the publication of *Cultural Literacy*, an educational platform calling for the return to basic content in American schools. According to Hirsch, a core set of shared knowledge must be learned by individuals in order to become culturally literate. Hirsch also believed that the American educational system had lost its core focus and was creating a culture of incoherent learning. To further clarify his ideas, Hirsch included an extensive list of specific items drawn from the humanities and sciences that he claimed constituted the essential core of cultural literacy (Hirsch, 1987, appendix). Almost a decade later, Hirsch published *The Schools We Need and Why We Don't Have Them* (1996) as an extension of the principles espoused in *Cultural Literacy.*

Hirsch (1987) challenges educators to reverse the trend of non-substantive teaching, which he feels is prevalent in the schools today. He calls for emphasis on specified content rather than on skills and methods. Hirsch further asserts that American children are showing poor achievement levels because they do not fully understand what they read or hear. Students are able to decode words on a page, but complete comprehension is impossible because of limited background knowledge. Therefore, Hirsch believes that basic literacy—the ability to read and write—is primarily dependent upon cultural knowledge.

Hirsch's (1987) educational premise is simple: he maintains that schools, particularly elementary grades, need to focus on a core of basic knowledge—what every American needs to know in order to function in society. The Core Knowledge Foundation emerged as a result of Hirsch's belief that students are not becoming culturally literate, and because of this failure of schools, students are not able to fully participate in the literate society. In order to achieve cultural literacy in education, there must be early and continued transmission of specific information that is available to all children, not confined to just one social class. Furthermore, "cultural literacy constitutes the only sure avenue of opportunity for disadvantaged children, the only reliable way of combating the social determinism that now condemns them to remain in the same social and educational condition as their parents" (p. xiii).

The idea of American cultural literacy is not a novel idea. Thomas Jefferson believed the continuation of democracy in part depended upon the knowledge of the people. He believed that a common grade school education would not only create a literate and independent citizenry, it would also provide a foundation for future leaders (Hirsch, 1996). Jefferson encouraged the development of a common curriculum that not only educated Americans in reading, writing, and arithmetic, but also so “their memories may here be stored with the most useful facts from Grecian, Roman, European and American history” (Hirsch, 1996, p. 17).

Cultural literacy is important primarily because “the complex undertakings of modern life depend on the cooperation of many people with different specialties in different places, and where communication fails, so do the undertakings” (Hirsch, 1987, p. 2). In order to be literate, one must not only be able to grasp the surface meanings of words, but also the context. The need to possess background information is therefore essential for communication.

According to Hirsch (1987), building solid foundations of knowledge should begin in the early grades, when children are most receptive, because for a significant amount of children, academic deficiencies that permanently impair future learning often occur within the first six grades. In several experiments with children, researchers have drawn significant conclusions about the importance of background knowledge and the ability to read. One experiment conducted by Trabasso, Omanson, and Warren (1978) attributed the differences in reading ability between five and eight year olds to the difference in acquired knowledge due to age, not to differences in their memory capacities, reasoning abilities, or control of eye movements while reading. Similarly, experimental research conducted by Pearson, Hanson, and Gordon (1979) revealed that among seven year olds who scored equivalent on reading and IQ tests, those who possessed a greater knowledge relevant to the text at hand showed superior reading abilities. A lack of specific knowledge, therefore, can negatively impact one's ability to fully understand the context of a message.

Hirsch (1987, 1993) believes that one rationale for the necessity of a core curriculum is that the highest achieving elementary schools in the world, including those in countries such as Japan and Sweden, teach all students a specific core curriculum of knowledge in each of the first six grades, thus ensuring that children enter each new grade with a solid foundation needed for future learning. In America, the decline of cultural literacy in elementary schools, caused by the fragmentation and shrinking of school curriculum, has resulted in the need for the Core Knowledge curriculum for several reasons (Hirsch, 1987).

First, commonly shared knowledge would make education more effective since an instructor cannot effectively impart new knowledge to all students unless each one shares the background knowledge upon which the lesson is being built (Hirsch, 1993). Furthermore, a specifically defined core curriculum would allow teachers to identify and fill in gaps for students who do not have the knowledge elements they should have acquired in previous grades, thus allowing all students the opportunity to fulfill their potentials in later grades.

Second, commonly shared knowledge would make education more fair and democratic (Hirsch, 1993). When students enter a grade with a shared set of building blocks for knowledge, and when the teacher knows what those buildings blocks are, students are empowered to learn. Hirsch believes that within our current educational system, many disadvantaged students suffer from low expectations that result in watered-down curriculum. A core curriculum would negate this trend by offering equal access to knowledge to all students and compensating for the academic advantages some students receive from home. In a Core Knowledge school, all children, including the disadvantaged, would enjoy the benefits of important and challenging knowledge that will provide the foundation for later learning.

Third, commonly shared knowledge would create cooperation and solidarity in our schools and nation with a school-based culture that is common and welcoming to all. Having knowledge about many cultures gives all students of all backgrounds a common foundation for understanding cultural literacy.

To address the problem of curricular incoherence and cultural illiteracy, Hirsch founded the Core Knowledge Foundation, a nonpartisan, nonprofit organization dedicated to excellence and fairness in education (Hirsch, 1993) The Core Knowledge curriculum is a result of extensive research that assessed the content and structure of high-performing elementary schools around the world, including Korea, Japan, France, and Denmark (Hirsch, 1996). Groups of teachers, scholars, and scientists from around the United States were asked to create a master list of the core of knowledge children should have by the end of the sixth grade (Core Knowledge Foundation, 2003; Hirsch, 1993). These items were then consolidated into a draft master plan, and a second group of teachers and specialists were asked to agree on a grade-by-grade sequence of the items.

Upon review of the new curriculum, a national conference was convened in 1990 to decide on revisions to the draft sequence curriculum, which was further revised during the first year of implementation at a pioneering school, Three Oaks Elementary in

Lee County, Florida (Core Knowledge Foundation, 2003). Periodic updates and revisions to the sequence have been made as more schools implemented the Core Knowledge curriculum.

The Core Knowledge Sequence provides a planned progression of specific knowledge in language arts, history, geography, math, science, and fine arts and is designed so that students build on knowledge from year to year starting in prekindergarten and continuing through the eighth grade (Hirsch, 1996). In 1998, Core Knowledge was approved as a research-based reform model under the federal Comprehensive School Reform Demonstration Program, which allocated $145 million to schools adopting such models. The most distinguishing feature of the Core Knowledge curriculum when compared to other reform models is its content specificity. While the Core Knowledge Sequence specifies content, it does not specify the process in which the material must be taught. Instead, it provides general guidelines as to when and in what sequence a school might implement the specified content. According to the Core Knowledge Foundation (2003), the Core Knowledge Sequence should comprise approximately 50% of the school's curriculum, thus supplanting the existing curriculum.

A second way in which the Core Knowledge curriculum differs from some other externally developed school reform models is with regard to materials provided for student and teachers. Schools have available to them the *Core Knowledge Content Guidelines for Grades K-6* (Core Knowledge Foundation, 2003), which includes a list of topics to be taught; the *What Your* [K-6] *Grader Needs to Know* books (Hirsch, 1993), which are intended mainly for parents; and *Books to Build On* (Holdren & Hirsch, 1996), which lists suggested resources. The Core Knowledge Foundation does not specify the books, materials, or lesson plans teachers should use to teach the Core Knowledge curriculum. There are no Core Knowledge teachers' manuals or textbooks; however, teachers have the opportunity to share lesson plans at the Foundation's national conference, and some plans, developed by Core Knowledge teachers, are posted on the Internet.

Some externally developed reforms (e.g., Success for All [Slavin, Madden, Dolan, & Wasik, 1996], the New American Schools Designs [Stringfield, Ross, & Smith, 1996]) require structured professional development for schools and teachers. By contrast, the Core Knowledge Foundation historically neither required nor offered professional development for teachers. Until recently, the only professional development available to schools was an overview presentation from a Core Knowledge consultant or a workshop in writing Core Knowledge lesson plans (Datnow, Borman, & Stringfield, 2000). The Core Knowledge Foundation (2003) now requires a minimum number of professional development hours conducted by a regional training center as one component of the certification process. Regional training centers are located in St. Paul, Minnesota and San Antonio, Texas. These training centers provide early implementation training (e.g., workshops), as well as ongoing support to local sites (e.g., seminars on Core Knowledge topics). The Core Knowledge school represented in this study required that all teachers participate in Core Knowledge staff development in addition to district-wide staff development.

As for ongoing professional development, educators from around the country gather at the Core Knowledge Conference once a year. In addition to the annual Core Knowledge conference, current information relating to Core Knowledge is sent to all registered schools through a quarterly newsletter. Overall, Core Knowledge attempts school reform by focusing on curricular content, not by changing the structural arrangements of schooling, such as the schedule, the grouping of students, or staffing patterns.

Critics and Proponents of Core Knowledge

E. D. Hirsch, a leading proponent of cultural literacy, argues that cultural literacy depends on the acquisition of a broad body of general knowledge, including facts and traditions. Following the publication of Hirsch's first book, *Cultural Literacy: What Every American Needs to Know* (1987), competing views regarding Hirsch's theory and his list of cultural literacy terms that every American needs to know sparked national controversy. More than 100 consultants reported agreement on over 90% of the items listed. The items on the list were intended to establish guideposts that could be of practical use to teachers, students, and all others to enable cultural literacy (Hirsch, 1987).

Almost a decade later, the publication of Hirsch's second book, *The Schools We Need and Why We Don't Have Them* (1996), challenged educators to reverse the trend of non-substantive teaching, which he feels is prevalent in schools today. Hirsch asserts that American students are showing poor achievement levels because they do not understand what they hear or what they read. Furthermore, students are able to decode words on a page but often find comprehension impossible because of limited background knowledge. Hirsch's call for emphasis on content and information rather than on skills and methods ignited a debate over the cultural literacy content itself as well as the need to teach content over skills. The information is presented in chronological order so that the evolution of the Core Knowledge movement can be better understood.

In a special feature on cultural literacy in *Educational Leadership* (1988), several professionals offered a commentary on their likes and dislikes of Hirsch's theory. Tchudi (1988) made the following three statements in reaction to Hirsch's work: (a) Whether traditional content is socially progressive or regressive depends greatly on who gets to determine traditional content, (b) compelling students to master a traditional content has not been demonstrated to be the only avenue to social and political justice for minority as well as middle-class students, and (c) the education professor needs a deeper understanding of the processes by which materials become a part of traditional and popular culture and of the ways in which children assimilate cultural materials to become active participants in those cultures. In summation, Tchudi indicated that cultural literacy is a process of participating fully and actively in society, a product of home and schooling, of living in society, and not of something that is mastered by piling up facts independent of the child's need to participate in that culture.

Squire (1988) also agreed that there is merit in Hirsch's overall argument; however, he did not agree that the 69-page appendix Hirsch presented in *Cultural Literacy: What Every American Needs to Know* accurately or completely reflects the knowledge that every American should have about literature, language, history, and science. He commented that the list seemed arbitrary and irritating, and that the danger of this kind of list was it becoming regarded as definitive. Squire was concerned that the list may be used by the assessors of cultural literacy as the basis for the selection of test items or utilized by curriculum directors as traditional scope and sequence requirements. Additionally, Squire criticized Hirsch's willingness to accept descriptions about works of literature or events as equivalent to experiencing or understanding them.

Schwarz (1988) found highly debatable Hirsch's dismissal of cognitive development theory and his attack on the critical thinking movement. She did not agree with the implicit assumption that a core curriculum would help solve problems in American education. Schwarz also disagreed with Hirsch's list because it presented cultural concepts as unconnected, all equally important bites out of context of the disciplines from which the ideas arose and removed from the human context of individual learners and educators. Schwarz concluded that, to redesign curriculum without addressing issues of methodology and the nature of knowledge itself, the school organization, and the partnership of the school, home, and community in the educational process, is to guarantee a continued decline rather than a rise in cultural literacy.

In the *Journal of Reading* (1987), Spooner addressed the cultural literacy debate in the United States. Spooner stated that one problem being discussed concerning cultural literacy involved defining exactly what constitutes the shared cultural background. He reported that an approach like Hirsch's would have the potential to encourage passivity as students learn an extensive body of facts and words with no interaction with the actual work from which the facts originated. Spooner cautioned against the potential ethnocentrism of a national reading list. According to Spooner, "to avoid instilling an unconscious ethnocentrism and to ensure that learning is taking place in the most profitable manner, we need a lucid and defensible conception of learners and their relation to what is being learned" (p. 736).

In an article in *Change*, Booth (1988) agreed with Hirsch's theories on several points. He agreed that America has educational problems, and he agreed that nations that are ethnically and linguistically monolithic have relatively simple educational problems. But Booth also stated that Hirsch made crucial mistakes that were likely to deter any effort to achieve the goal of a literate citizenry. Booth contended that Hirsch gave too much prominence to the minimal goal of processing the basic information needed to thrive in the modern world and either ignored or mislead the reader about what it means to thrive as a human being in this or any other culture. He also disagreed with the list of cultural literacy terms, arguing that the list was misguided from the start and would provide many educators with one more way of avoiding a solid education in literature, rhetoric, history, language, math, and science. Booth's primary concern was that the list would be turned into a test, which in turn would be used by the very elitists Hirsch is hoping to combat to separate those who are educable from those who are not.

Booth (1988) further disagreed with Hirsch's belief that children only learn information by being taught information: "The truth is that nobody learns anything by being taught it unless by teaching we mean discovering how to turn passive indifference into an active grasping of some corner of the world's riches" (p. 18). He commented that even if knowledge of a vast range of specified background information was required for any complex reading activity, it did not follow that such necessary information could be treated as a sufficient cause of literacy or that studying it could take care of more than a fraction of what causes deficiencies in learning. In conclusion, Booth stated that even though both he and Hirsch desired a democratic education, their ideas as to what it constituted were different. For Hirsch, it meant a nation of knowers who can talk with each other about what they know. For Booth, it meant a nation where teachers, students, parents, and the public are all engaged in self-education by eagerly reading and speaking about items that matter.

In an article in *Social Education*, Newmann (1996) agreed with the need to teach specific background information, especially in order to empower educationally disenfranchised students, but he found Hirsch's proposal for cultural literacy seriously flawed in terms of clarity, rationale, feasibility, and opportunity. In terms of clarity, he stated that the concept behind the curriculum should be reasonably clear, but the specificity of Hirsch's list alone did not establish the clarity of the concept of cultural literacy. And, even if there was agreement on the inclusion of a specific item on Hirsch's list, then he questioned how much information should be taught about the item.

In terms of the rationale for the curriculum being taught, Newmann (1996) stated that Hirsch offered a significant, convincing, and general rationale for the need to teach specific information, but his rationale relied on a number of dubious claims. Newmann reported that scholars and practitioners registered strong disagreement on the following issues regarding Hirsch's rationale for the need to teach specific information: (a) Hirsch claimed that most of the items on the list were not taught in schools, but according to educators they were in fact being taught extensively, especially at the high-school level; (b) Hirsch claimed that young children enjoy memorizing facts, but many educators believe that students will tolerate only so many mindless activities; (c) Hirsch claimed that the cultural vocabulary needed to be learned largely in the earlier grades, but according to scholars most literate readers probably learned this information much later in high school and college; (d) Hirsch claimed that declines in NAEP and SAT scores reflected a decline in cultural literacy, but according to scholars these tests were not designed to test this vocabulary; and (e) Hirsch attributed what he called the “doctrine of educational formalism” to Rousseau and Dewey, but according to scholars he overestimated both the extent of the doctrine and the influence of the individuals upon the doctrine (Newmann, 1996).

In terms of the feasibility of implementing the curriculum, Newmann (1996) predicted that Hirsch’s approach would fail. He commented that it is extraordinarily difficult to begin with a list of unrelated items of information and then, after the fragments have been selected, transform them into a meaningful message. He also stated that there was not enough time to represent in the curriculum all of the 5,000 pieces of information through culturally meaningful messages, and even when such items of information were included in the study of literature, history, or science much of it was quickly forgotten. In terms of the opportunity cost, Newmann believed that one opportunity cost of cultural literacy was the toll it could take on helping students understand and appreciate non-Western culture and nondominant culture in the United States. He maintained that a curriculum aimed primarily in this direction could pose two serious threats to students. First, if instructional time was used primarily to communicate the content of the dominant culture, there would be little opportunity to develop sensitivity to alternative perspectives. Second, some items in the cultural vocabulary could evoke entirely different connotations depending on the reader’s experience with mainstream culture, which could undermine the educational goal of tolerance and respect for a plurality of cultures.

There have been as many educators and scholars who agreed with Hirsch as those who took exception to his ideas. Byrne (1989) agreed with Hirsch's contention that there existed a cultural deficiency among teenagers that prevented them from comprehending what they were reading and trying to learn at school. Therefore, Byrne was involved in designing a course in cultural literacy at Dewey High School in Brooklyn, New York—a multiethnic, multiracial, public school of over 3,000 students who ranged in ability from very bright to very slow learners. The class chosen to take the cultural literacy course was a group of 34 ninth grade students, and the method utilized to teach Hirsch's list of terms was to present a list of terms to the students for homework. The students researched 10 to 15 items each night and were required to make one copy of the homework for themselves and one copy for the teacher.

Byrne (1989) reported that the class had positive results. Not only did it further a cooperative spirit among the staff members who aided in gathering and teaching the material to the class, but the effects on the students were outstanding: (a) The students gained a sense of self-confidence, (b) they gained a sense of the importance of homework, (c) their research skills improved, (d) they became more aware of the application of schoolwork to the outside world and the interdisciplinary relationship of different subjects, (e) they were able to understand more of their reading material compared to other ninth graders, and (f) they all stayed in school. Byrne reported that all of the students indicated they were glad to participate in the experiment.

Kerewsky (1989) noticed that, in his English classes, eleventh and twelfth grade students had noticeable gaps in their knowledge. He used Hirsch's cultural literacy list as a tool for a research project in which students learned to locate and use the references and stores of information that allowed them to understand and use terms, which, in turn, relied upon a body of background information. Kerewsky developed a two-part game of research and play. In the research phase, he divided students into groups; each group received a list of several hundred terms from Hirsch's list. The group had 4 days to research as many terms as possible, and the members of the team with the greatest number of accurate definitions won paperback reference books. The students were then charged with creating a reinforcing game to play with the terms.

Kerewsky (1989) and his students then participated in an exercise to check the relevance of Hirsch's list using the front pages of *The New York Times*, the local evening paper, and *USA Today*. The students worked together to record any of Hirsch's terms they could find in these periodicals. On one day, the front page of *The New York Times* used 151 terms, the local paper 99 terms, and *USA Today* 123 terms. Kerewsky stated that this exercise provided confirmation that these terms were in use in contemporary cultural texts and provided the basis for an interesting discussion on why the number of terms varied in the different papers. In conclusion, Kerewsky remarked that both he and his students agreed that background knowledge or cultural literacy was essential to literate reading, communication, and participation in society as an informed citizen. Furthermore, he commented that a list such as Hirsch's could be approached and taught in many ways and had the potential to be a wonderful and satisfying game without trivializing its contents.

Rist (1992) wrote that, while memorizing might be criticized as a learning tool, it could be challenging and fun to exercise the memory and test knowledge, and it was part of the appeal of the Core Knowledge curriculum. As for the critics who complained that the Core Knowledge approach depended on rote memorization, Rist noted that many educators disagreed, such as Jones (1991), the principal of Three Oaks Elementary School in Fort Myers, Florida, the school that piloted the Core Knowledge curriculum.

According to Jones, there was a place for rote memorization because some things had to be memorized to enable students to achieve the next goal, but it was important to understand the difference between methodology, such as memorization, and specific content. Jones (1991) stated that "knowledge and understanding of specific content is what makes more complex levels of thinking and analysis possible" (p. 19), and that sometimes this must be accomplished by rote memorization.

Munro (1993) agreed with Hirsch's belief that students were not sufficiently grounded in the historical, literary, and scientific facts that members of American western culture should share. According to Munro, students spent the majority of classroom time learning skills that prepared them to process information on current topics in the business and technological world and were losing the historical and cultural perspective of their society, which would result in the depreciation of western social and cultural values. Munro concluded that if the role of public school education was to prepare young people to live in a society and communicate with its members, then teachers must instruct students in literary texts and their historical background. Amidst all of the articles generated from Hirsch's work, many schools decided to adopt Hirsch's ideas and the Core Knowledge Sequence developed by the Core Knowledge Foundation.

Research Regarding the Core Knowledge Curriculum

Kosmoski, Gay and Vockell (1990) conducted a study to determine if there was a significant correlation between cultural literacy and the achievement levels of students. The subjects of the study were 611 fifth grade students who attended schools in a mid-sized industrial city in Indiana for three consecutive semesters. Participants of the study had scores reported from the reading and mathematics sections of the California Test of Basic Skills (CalTBS) and the California Language Achievement Test (CLAT). The ethnicity of students in the sample included 69.2% White, 17% Hispanic, and 13.8% African American. There were approximately 7% more boys than girls, and 34.9% of the students were classified as low socioeconomic status (SES) (Kosmoski et al., 1990).

The data recorded for each student included the CalTBS reading section, which measures achievement in the areas of vocabulary and comprehension, and the mathematics section, which measures computation and mathematical concepts and application (Kosmoski et al., 1990). Additional data collected included IQ scores on the Cognitive Skills Inventory (CSI) of the CLAT, which were used for comparison with the achievement scores. This data was used in determining the significance of the correlation of cultural literacy and achievement. To determine if there was a relationship between cultural literacy and achievement, Kosmoski et al. utilized Pearson correlation coefficients, comparison of means, and one-way analyses of variance.

Three major findings emerged from the study: (a) There was a significant positive relationship between cultural literacy and each area of achievement measured in the study; (b) it appeared that cultural literacy was affected by ethnicity, SES, and type of school attended; and (c) the pattern of the relationship between cultural literacy and achievement did not appear to be affected by ethnicity, sex, SES, and school attended. According to Kosmoski et al. (1990), the students that scored the highest in cultural literacy did not attend a Chapter I school and were not classified as low SES. Those who scored low in cultural literacy were identified as low SES African American students who attended Chapter I schools. Hispanic students scored in the range between White and African American students. An additional finding of the study was that, regardless of the ethnicity of the student, those who scored high in cultural literacy also tended to score high in academic achievement. The inverse was also found: that students scoring low in cultural literacy also tended to score low in achievement. The overall result of the data analysis demonstrated a significant positive correlation between cultural literacy and achievement; however, no causal relationship could be determined due to the correlational design of the study (Kosmoski et al., 1990).

The findings of this study indicated that ethnicity, SES, and type of school attended affected cultural literacy (Kosmoski et al., 1990). Furthermore, Kosmoski et al. stated that Hispanics, African Americans, low SES students, and students attending Chapter I schools may be at an educational disadvantage by not knowing cultural literacy content, assuming that the CalTBS is a valid measure of student achievement, and that a lack of cultural knowledge causes lower performance on the CalTBS.

Schubnell (1996) examined student achievement at Hawthorne Elementary School and investigated the effects of the implementation of the Core Knowledge Sequence on student achievement. Hawthorne Elementary, located in the San Antonio Independent School District, was considered an inner city school with a student population of 85% Hispanic, 5% Black, 8% White, and 2% Asian. Of the overall student population, 96% of students were eligible for free or reduced lunch prices and 28% of students were designated as limited English proficient. As part of a total school reform movement, Hawthorne Elementary decided to adopt the Core Knowledge curriculum and began implementation of the Core Knowledge Sequence at the beginning of the 1992-1993 school year (Schubnell, 1996).

Schubnell (1996) presented comparisons of Hawthorne Elementary's 1994 and 1995 criterion-referenced achievement data from the Texas Assessment of Academic Skills (TAAS) for third, fourth, and fifth grade students. Information regarding the aggregation of the achievement results for all other elementary schools in the San Antonio ISD was also provided. The TAAS test, adopted in 1994, was a state-administered exam designed to assess higher order thinking skills as well as problem-solving abilities in writing, reading, and mathematics. Hawthorne Elementary was among the lowest achieving schools in the district. Furthermore, Hawthorne Elementary ranked 41st of 65 elementary schools on the Basic Battery Composite score of the Metropolitan Achievement Test (Schubnell, 1996).

Schubnell (1996) utilized two methods of analysis in the study. First, longitudinal views of achievement variables assessed on the TAAS test were presented for Hawthorne Elementary and the aggregated student performance data of all other elementary schools in the San Antonio ISD were presented. A second analysis utilized the same cohort of students who took the TAAS test in 1994 and 1995. Data from this analysis was categorized into three areas. The first area reported annual snapshots of the percentages of students by grade level meeting the TAAS minimum passing standards in 1994 and 1995. Second, the Texas Learning Index (TLI) scale score growth calculations were reported for matched samples of students who took the TAAS in 1994 and 1995. The third area reported the percentages of 1994 nonmastery students who made TLI gains on the 1995 TAAS.

The results of the data analysis indicated that Hawthorne Elementary had a significant increase in the reading pass rate at consecutive grade levels (Schubnell, 1996). In fifth grade, Hawthorne's 67% reading pass rate exceeded the district's 56% pass rate in 1994 and 1995. The TAAS reading results also showed that Hawthorne's 3rd-grade students achieved a higher pass rate of 51% in 1995 compared with the 34% pass rate the previous year. Hawthorne also showed improved student performance from 1994 to 1995, and exceeded the district's math pass rate for all grade levels. Overall, Hawthorne students showed a positive increase of $M = 4.8$ TLI units in reading, whereas the district's average gain was $M = .7$ TLI units in reading. This difference was statistically significant at the $p < .01$ level of significance. There were no statistically significant gains reported in mathematics (Schubnell, 1996).

Schubnell (1996) stated that the gains for Hawthorne students in third through fifth grade in reading, writing, and mathematics were encouraging, as were the results of the study which indicated that Hawthorne was successful in exceeding the performance levels of all other elementary schools in the district. Schubnell suggests that these findings support Hirsch's claim that a sequenced curriculum would lead to increased student performance in that achievement builds upon itself at successive grade levels. Schubnell made the following conclusion:

> The findings of this study appear to indicate that despite the early deprivation that makes itself apparent to the teachers of the children who enter school far below the academic standing of more advantaged peers, potential failure to thrive over time can be ameliorated for children of teachers committed to the principle put simply by Hirsch that knowledge does, in fact, build on knowledge in rather dramatic ways. (p. 39)

In Oklahoma City, Gary Taylor and George Kimball of the Oklahoma City Public Schools completed a study of the effects of Core Knowledge. This carefully controlled independent study investigated the effects of implementing Core Knowledge after one year in grades three through five using the well-validated Iowa Test of Basic Skills. The study paired 300 students from the experimental and control schools on certain variables. Based upon the variables, a computer was used to randomly select the 300 control students. The Core Knowledge students made significantly greater first year gains in reading comprehension, vocabulary, science, math concepts, and social studies. This study was performed during the 1999-2000 academic year (Taylor & Kimball, 2000).

In 1995, researchers at the Center for Social Organization at Johns Hopkins University and the College of Education at the University of Memphis began a three-year longitudinal evaluation to determine the effects of the implementation of the Core Knowledge Sequence (Stringfield et al., 1996). The researchers conducted a study of six schools deemed by the Core Knowledge Foundation to be relatively advanced in their implementation of the Core Knowledge curriculum and six schools deemed as promising implementation sites. The schools in the study were located in Colorado, Florida, Ohio, Maryland, Tennessee, Texas, and Washington, and were reflective of various communities, racial, and socioeconomic contexts. The study followed the 1995-1996 first through third grade cohorts at all schools. The first grade cohort data provided information on the relationship of the Core Knowledge Sequence at the beginning years of students' lives. The third grade cohort data allowed for overlap in analyses with the first grade cohort and allowed for analyses of students' progress as they moved into the middle academic grades (Stringfield et al., 1996).

The three-year evaluation included both quantitative and qualitative components. The qualitative component of the study relied upon the analysis of data from whole school observations, classroom observations of each teacher at each grade level, focus groups, interviews, and questionnaires (Stringfield et al., 1996). Low-inference classroom observations were conducted at all implementation sites and were scored on an instrument from the Stallings Observation System. The instrument gathered data on students' time on task rates, questioning procedures, student motivation levels, and the extent to which Core Knowledge content is covered during instruction. The qualitative report contained findings regarding the benefits of teaching Core Knowledge, the factors that affect successful implementation, and the challenges involved.

Stringfield et al. (1996) reported that, although schools had varying reasons for implementing the Core Knowledge Sequence, the educators that implemented Core Knowledge articulated clear benefits that were common to all schools in the study. The academic benefits of Core Knowledge showed an increase in student self-confidence and interest in learning. Anecdotal teacher records suggested that the implementation of Core Knowledge had a positive effect on students' reading abilities and served to inspire lower-achieving students. At a number of schools, educators cited the fact that students were more interested in reading nonfiction as a primary benefit of Core Knowledge. Another reported benefit of Core Knowledge was that the curriculum met the needs of all students. Schools found that Core Knowledge works well with students who are below grade level and not able to read on the same level as their peers; they are able to grasp Core Knowledge material that is presented through hands-on projects and activities. A number of schools reported that a greater interest in student learning of Core Knowledge also resulted in fewer classroom discipline problems (Stringfield et al., 1996).

Other benefits that related to teacher satisfaction were also reported. Teachers in the study reported that Core Knowledge increased the interaction among teachers as well as accountability for the curriculum. Data collected at many of the schools indicated that teachers felt that Core Knowledge made their work lives more interesting and exciting as a result of Core Knowledge planning and preparation. Data in this area also suggested that teacher support and enthusiasm for Core Knowledge appears to increase over time as teachers attain mastery of the curriculum. Schools in the study also reported an increased level of parent satisfaction as a benefit of Core Knowledge (Stringfield et al., 1996).

From the data collected, researchers found a number of factors that greatly facilitated successful early implementation of the Core Knowledge curriculum: (a) extra funding for start-up costs, (b) common planning time, (c) parent and community support, (d) site-based management, (e) district support, (f) a staff interested in teaching the Core Knowledge curriculum, (g) team teaching, (h) sharing lessons and experiences with teachers at other Core Knowledge schools, (i) assistance in locating and securing Core Knowledge materials, and (j) local adaptations to better serve diverse populations (Stringfield et al., 1996).

Stringfield et al. (1996) also discovered several factors that tended to slow implementation or create dissatisfaction in teachers attempting to implement Core Knowledge: (a) teachers found that implementation took a lot of hard work; (b) some teachers lacked the background knowledge contained in the curriculum; (c) regardless of funding, teachers continued to spend their own money on resources; and (d) teachers reported difficulty finding age-appropriate materials for teaching the Core Knowledge curriculum. Several emerging implementation issues were discovered by researchers, including the fast versus slow phase-in of the curriculum, the degree of specificity of implementation, and the degree to which Core Knowledge was integrated with other programs and instructional approaches already in use.

The quantitative component of the three year evaluation examined the relationships between the level of implementation and academic gains, differences in gain by cohort, experimental control differences in gains over three years, and differences between advanced implementation and new implementation sites (Stringfield et al., 1996). The achievement outcomes were measured through the Comprehensive Test of Basic Skills, 4th Edition (CTBS/4) and the Maryland School Performance Assessment Program (MSPAP). Stringfield et al. (1996) reported that neither test was designed for, nor deliberately aligned with, the Core Knowledge curriculum. In addition to the standardized achievement tests, the researchers developed Core Knowledge achievement tests with the help of the Core Knowledge

Foundation, which were administered to all participating third through fifth grade students in the Core Knowledge and control schools (Stringfield, Datnow, Borman, & Rachuba, 1999).

The first series of analyses included three newly implemented Core Knowledge schools along with four advanced Core Knowledge schools and their matched comparison schools (Stringfield et al., 1999). Univariate analyses of covariance were conducted for the following outcomes: (a) standard reading achievement, (b) standardized math achievement, (c) Core Knowledge language arts achievement, and (d) Core Knowledge science and social studies achievement. The second analytical design also employed analysis of covariance, with the pretest as the covariate. Each analysis contrasted the outcomes for a cohort of students who attended an advanced Core Knowledge school with a cohort of students from the matched comparison school (Stringfield et al., 1999).

For the analysis of covariance for the first through third grade cohort students' reading achievement, the spring 1998 reading Normal Curve Equivalent (NCE) was the dependent measure, and the pretest reading NCE served as the covariate (Stringfield et al., 1999). The results of the analysis indicated that the main effect of Core Knowledge was not statistically significant at $p < .001$; however, significance tests for the Core Knowledge by site interaction and for the site main effect both revealed statistically significant results. The results of the analysis of covariance for third through fifth grade students' reading achievement indicated that the main effect of Core Knowledge was not statistically significant at $p < .001$. However, significance tests for the Core

Knowledge by site interaction and for the site main effect both revealed statistically significant results (Stringfield et al., 1999).

For the analysis of covariance for the first through third grade cohort students' math achievement, the spring 1998 reading NCE was the dependent measure and the pretest math NCE served as the covariate (Stringfield et al., 1999). The analysis revealed nonsignificant results for both the main effect of Core Knowledge at $p < .001$ and for the Core Knowledge by site interaction effect; however, the main effect of site was significant. The analysis of covariance for third through fifth grade students' math achievement indicated that the main effect of Core Knowledge was not statistically significant at $p < .001$, but significance tests for the Core Knowledge by both site interaction and for site main effect revealed statistically significant results (Stringfield et al., 1999).

Analyses of first through third grade cohort and of third through fifth grade cohort students' outcomes on the spring 1998 Core Knowledge language arts test, Core Knowledge science test, and Core Knowledge social studies test were conducted (Stringfield et al., 1999). Analysis of the first grade cohort students on the Core Knowledge language arts subtest indicated a significant Core Knowledge main effect at $p < .001$, a significant Core Knowledge by site interaction. For the analysis of covariance of third grade cohort students' Core Knowledge language arts subtest scores, the results showed that the main effect of Core Knowledge by site interaction did not reveal statistically significant results (Stringfield et al., 1999).

The results for the Core Knowledge science subtest for both the first and third grade cohorts appeared to have a significant Core Knowledge main effect at $p < .001$, a significant site main effect, and a significant Core Knowledge by site interaction (Stringfield et al., 1999). The results of the Core Knowledge social studies subtest for the first through third grade cohort indicated that the main effects for Core Knowledge, for site and for Core Knowledge by site interaction, were significant at $p < .001$. The findings of the Core Knowledge Social Studies subtest for the third through fifth grade cohort revealed that the main effect of Core Knowledge was statistically significant at $p < .001$, as was the main effect of size. There was no statistically significant Core Knowledge by site interaction effect found (Stringfield et al., 1999).

In conclusion, the analyses of the Core Knowledge students' scores on norm-referenced basic skills achievement tests did not reveal statistically significantly greater outcomes than those of students from comparison schools. The effects on the norm-referenced test became statistically significant when schools with moderate to high implementation were contrasted with low implementing sites as controls (Stringfield et al., 1999). Furthermore, researchers report that the gain difference on standardized tests between low and high implementing schools varied from 8.83 NCEs to 16.28 NCEs. The difference resulted in an average rise of 12 NCEs over the control schools, revealing more than half a standard deviation gain (Stringfield et al., 1999).

Researchers from Texas Tech University conducted a qualitative study to determine the impact of the Core Knowledge curriculum on teachers' work and thinking (Johnson, Janisch, & Morgan, 2001). Specifically, researchers wanted to determine whether the prescriptive nature of Core Knowledge stifled or constrained teacher planning, and to what extent teachers make connections between their study of literacy development theory and their creation of units for Core Knowledge. A group of 31 teachers, all employed in the same large urban school district in Texas, participated in a two-year program called Connecting Literacy with Content Knowledge (CLICK). The purpose of the CLICK project was to connect literacy to Core Knowledge. The teachers in the study were employed in six lower socioeconomic elementary schools (Johnson et al., 2001).

Teachers participating in the project were divided into primary and intermediate groups and were enrolled in graduate classes at a nearby university. The coursework focused on literacy and curriculum development. Funds from the local foundation allowed both groups of teachers to purchase texts and other materials needed to implement the curricular content of Core Knowledge. Teachers worked collaboratively with instructors and their colleagues to create their own instructional units that combined literacy strategies and Core Knowledge content. Participating teachers selected topics from the science or social studies Core Knowledge content (Johnson et al., 2001).

Johnson et al. (2001) reported that data were gathered from 18 teachers involved in the CLICK project at one elementary school. Several different sources provided data for this study, including weekly meetings with teachers, observer field notes, copies of teachers' lessons and unit plans, and student work samples (e.g., inquiry projects, written reports, and journal entries). At the conclusion of the two-year study, teacher interviews were conducted and transcribed. Data were analyzed by using the constant comparative method of content analysis, first separately and then jointly, in order to make interpretations.

Results of the qualitative study were reported in terms of teacher planning and connecting literacy and the Core Knowledge curriculum (Johnson et al., 2001). It was revealed that the teachers in this study adapted the Core Knowledge curriculum rather than adopting the curriculum as a whole. Teachers reported that they did not find the curriculum to be prescriptive, nor did the curriculum stifle teacher planning or student inquiry. In general, participating teachers found the Core Knowledge content to be a useful curricular tool as they structured and organized content for their individual classrooms. Furthermore, the Core Knowledge content served as a springboard for lively and sustained teacher discussion and decisions about appropriate curriculum for students (Johnson et al., 2001).

In conclusion, Johnson et al. (2001) found that studying literacy theory proved to be an important part of the teachers' professional development. By studying literacy theory, beliefs, and practices, Johnson et al. also noted that teaching both literacy and cognitive strategies helped students learn the content. Teachers reported that strong, interesting content enabled the children to become more skilled in literacy. The background knowledge that children had developed about the topics under study scaffolded their comprehension of texts on the topics.

In summary, while early reports presented encouraging findings, the only two independent evaluations of Core Knowledge with adequate controls produced inconsistent evidence of positive impacts on student achievement (Stringfield et al., 1999; Taylor & Kimball, 2000). Although there were strong program affects on curriculum-specified tests, Core Knowledge students did not make educationally significant gains on certain curriculum-general, norm-referenced tests, with the exception of one cohort in the Oklahoma Public Schools.

Summary of Core Knowledge Research

A child’s mind desires knowledge, stimulation, and the excitement of learning, and schools should provide these things; however, many American schools do not (Hirsch, 1996). Hirsch contends that the American public education system is among the worst in the developed world because of the faulty beliefs of some educators, such as the belief that the learning process should be emphasized over the facts taught. Furthermore, research has shown that if children are taught in ways that emphasize hard work, the learning of facts, and rigorous testing, then enthusiasm for learning will grow, test scores will rise, and students will become successful citizens (Hirsch, 1996).

In the world today, it is an unacceptable failure of schools that children from poor and illiterate homes tend to remain poor and illiterate (Hirsch, 1987). Hirsch contends that this has occurred not because teachers are incompetent, but mainly because they are compelled to teach a fragmented curriculum based on faulty educational theories: “History, not superior wisdom, shows us that neither the content-neutral curriculum of Rousseau and Dewey nor the narrowly specified curriculum of Plato is adequate to the needs of the modern nation (p. xvi).

Hirsch (1999) stated that, with the Core Knowledge curriculum, schools have the opportunity to provide students with more equal life opportunities, regardless of race, class, or ethnicity because “giving everybody more knowledge makes everybody competent, and creates a more just society” (p. 16). Therefore, advocates of the Core Knowledge curriculum believe that all school systems that seek fair and equitable education for all children should adopt the Core Knowledge curriculum (Hirsch, 1999).

Summary

This chapter explored the literature regarding CSR and the Core Knowledge curriculum reform model. The chapter was organized into the following sections: (a) overview of school reform, (b) a framework of curricular reform and its effects, (c) socioeconomic background and achievement, (d) history of the Core Knowledge reform model, (e) critics and proponents of the Core Knowledge reform model, (f) research regarding the Core Knowledge reform model, (g) and the summary.

CHAPTER 3

RESEARCH METHODOLOGY AND PROCEDURES

This chapter explores the procedures to gather and analyze data and to test the hypotheses posed in this research study. The chapter is organized into the following sections: (a) purpose of the study, (b) context, (c) research design, (d) hypotheses, (e) subjects, (f) instrumentation, and (g) data analysis.

Restatement of the Purpose

The purpose was examined from four points of view. First, to determine the impact of the Core Knowledge curriculum on achievement, statistical analyses were conducted to compare achievement, as measured by the TAKS test, between students who were taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades and students taught a traditional curriculum in the same grades. Second, to determine the impact of the Core Knowledge curriculum on the achievement of advantaged students, statistical analyses were conducted to compare achievement, as measured by the TAKS test, between students who were taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades and students taught a traditional curriculum in the same grades. Third, to determine the impact of the Core Knowledge curriculum on the achievement of students of a lower socioeconomic status, statistical analyses were conducted to compare achievement, as measured by the TAKS test, between students who were taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades and students taught a traditional curriculum in the same grades. Fourth, to examine the differences in the achievement gap between advantaged and disadvantaged students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades and advantaged and disadvantaged students who were not taught the Core Knowledge curriculum in the same grades.

All data relating to student academic achievement and demographics were collected from district records after seeking and attaining approval from the University of North Texas Institutional Review Board and the administrative council of one suburban school district in north Texas.

Context

The study was conducted in a north Texas suburban school district. The district is home to 19 elementary campuses, 5 junior high schools, and 2 high schools. The total 2003-2004 enrollment of the district (19,684 students) is comprised of 10,890 elementary students, 4,526 junior high students, and 4,268 high school students. The ethnic composition of the district is 10.5% African American, 17.3% Hispanic, 61.8% White, 9.5% Asian, and 0.9% Native American. The number of the students who qualify for free or reduced lunch and who are classified as low SES is 6,913 (35%).

Research Design

The research design of this study is a two-way repeated measures design. The repeated measures experimental design, often referred to as within-subjects design, allows the researcher the opportunity to study research effects while controlling for subjects. The primary benefit of a repeated measures design is statistical power relative to sample size, which is important in many real-world research situations. Repeated measures designs use the same subjects throughout different treatments and thus requires fewer subjects overall. Furthermore, because the subjects are constant, the variance due to subjects can be partitioned out of the error variance term, thereby making any statistical analysis more powerful (Stevens, 1996).

The subjects used in the study were selected from the total number of students who were enrolled in the sixth grade for the 2003-2004 school year that were also consecutively enrolled at the same elementary campus in both the fourth and fifth grades. 35 students that met the criteria were selected for each school in this study for a total sample size of 70 students. This sample size remained constant throughout the duration of the study. In this study, achievement data were gathered on students who had attended a Core Knowledge elementary school and a traditional school for at least three years.

The independent variable in this study was the implementation of the Core Knowledge curriculum in two elementary schools. The dependent variables were the reading achievement scores of sixth grade students, the reading achievement scores of sixth grade advantaged students, and the reading achievement scores of disadvantaged sixth grade students as measured by the TAKS test.

Research Questions

Four questions guided the research. The questions and relevant null hypotheses are related to the impact of the Core Knowledge curriculum on student achievement.

As measured by the TAKS test, how do the achievement test scores of 6th-grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Null hypothesis 1: There is no statistically significant difference in the reading achievement of sixth grade students when immersed in a Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to sixth grade students who were not taught the Core Knowledge curriculum in the same grades.

As measured by the TAKS test, how do the achievement test scores of advantaged sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Null hypothesis 2: There is no statistically significant difference in the reading achievement of advantaged sixth grade students when immersed in a Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to advantaged sixth grade students who were not taught the Core Knowledge curriculum in the same grades.

As measured by the TAKS test, how do the achievement test scores of disadvantaged 6th-grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Null hypothesis 3: There is no statistically significant difference in the reading achievement of disadvantaged sixth grade students when immersed in a Core

Knowledge curriculum in the fourth, fifth, and sixth grades when compared to disadvantaged sixth grade students who were not taught the Core Knowledge curriculum in the same grades.

As measured by the TAKS test, how does the achievement gap for advantaged and disadvantaged students taught the Core Knowledge curriculum differ from comparable advantaged and disadvantaged students who were not taught the Core Knowledge curriculum?

Null hypothesis 4: There is no statistically significant difference in the achievement gap for advantaged and disadvantaged students taught the Core Knowledge curriculum when compared to the advantaged and disadvantaged students who were not taught the Core Knowledge curriculum.

Sample

The sample for this study includes the individual sixth grade student who has taken the reading portion of the TAKS test in the spring of 2004, and previously in the spring of 2003 as a fifth grade student, and in the spring of 2002 as a fourth grade student. The experimental group was selected from one elementary school that began implementation of the Core Knowledge curriculum during the 2001-2002 school year, and the control group was chosen from one elementary school that taught a traditional curriculum. The traditional school and the Core Knowledge school were closely matched based on factors of enrollment, race, and socioeconomic levels. Levels of teacher experience were also taken into consideration. Both schools selected to participate in the study were similarly matched in total years of experience and were comparable to district averages as well (See Table 2).

In order to minimize the discrepancy related to instructional practices and curriculum between the two schools, the school district represented in this study implemented a district-wide staff development policy that required all district teachers within the same grade to attend specified curriculum and instruction training (G. Buinger, personal communication, January 8, 2004). As a result of the training, teachers were expected to deliver the specified curriculum through the use of instructional strategies and practices learned.

Additionally, as with all districts in the state of Texas, each school represented in this study was required to teach a state-mandated, grade-specific curriculum for all subjects (TEKS). In addition to teaching the TEKS curriculum, the experimental school in this study also taught the Core Knowledge Sequence developed by the Core Knowledge Foundation. To ensure that both curriculums were appropriately implemented at the experimental campus and that students at all grade levels were prepared to take state-mandated exams, the district developed an alignment document. This alignment document was designed to help Core Knowledge teachers maximize the amount of time spent teaching Core Knowledge content while, at the same time, ensuring that state curriculum expectations were met (G. Buinger, personal communication, January 8, 2004).

The sample groups were comprised of all sixth grade students who fit the specified criteria. For the purposes of this study, only those subjects who were enrolled in the two schools during the entire implementation of the Core Knowledge curriculum are included in this analysis. It is recognized that the results of this study may not be generalized to the total population of schools, but the compelling interest is to examine the effects of the Core Knowledge curriculum. A purposive sample of sixth grade students who have been enrolled at their respective campuses since the fall of 2001 constituted the target sample for this study. This eliminates the extraneous variable of student mobility.

The sample included matched pairs of students from the Core Knowledge school and the traditional school and examined mean differences in achievement scores following the baseline year. As noted by Borg and Gall (1989), this method is most useful in studies where large differences between the experimental and control groups on the dependent variable are not likely to occur. Sampling errors are reduced by the use of matching, and the differences that do occur are more likely to be detected (Borg & Gall, 1989). Furthermore, “the measure of standard error used in tests of statistical significance is reduced considerably by the matching technique” (p. 678). Students in the sample were matched according to their participation in the federal free and reduced-lunch program, ethnicity, and gender.

In order to maintain confidentiality for the students, students were listed numerically by the student ID number that was assigned to each student when he/she enrolled in the district. In order to provide anonymity for the schools, they were assigned numeric identification numbers as well.

Data Collection

The achievement measurements in reading were derived from the TAKS test administered to sixth grade students in the spring of 2004, and previously in the spring of 2003 as fifth grade students, and in the spring of 2002 as fourth grade students. Achievement scores obtained from the spring of 2002 were converted from the TAAS

TLI score to a percentile rank score for TAKS comparison. The TAKS standardized test was given to both the experimental and control groups in this study along with the entire population of all testing grades in the school district. Achievement scores were initially reported on a percentile scale during the time of the TAAS administration and then later reported as scale scores for the TAKS test.

The TAKS test was used to measure students' academic achievement. The TAKS test is a state-developed test given to all 3-12th grade students in Texas to measure student learning of statewide curriculum. Statistical equating was conducted by the Texas Education Agency to ensure that a standardized passing standard existed for each test administration. As a result, minor shifts may occur regarding the total number of items that need to be answered correctly in order to meet minimum expectations.

The TAKS test is a criterion-referenced assessment that all Texas public school students have been required to take since 2003. Prior to 2003, a similar test, the TAAS test, was administered to all students in the same manner. The TAKS test was developed by classroom teachers, curriculum specialists, specialists in the area of test development, and personnel from the Texas Education Agency. The TAKS test is an effort to test mastery of academic skills based on the TEKS curricular guidelines. Results of the TAKS test are reported annually at the student, campus, district, regional, and state levels. All TAKS tests are then released to the public at the end of each school year.

TAKS test reliability studies focus on ensuring that a test measures what it purports to assess. Internal consistency of the TAKS test data has been assessed using the Kuder-Richardson Formulas 20 and 21 (KR-20 and KR-21). Kuder-Richardson 20 is used yearly by the Texas Education Agency in relationship to all exams at all levels. A range of 0.86 to 0.91 was reported by the Texas Education Agency for the 2003 administration in the area of reading.

With approval from the district superintendent, the district's test results on the TAKS test for 2002, 2003, and 2004 were obtained from district records. Permission was received to record individual test results for the population of this study, which included additional data on the population's characteristics. An analysis was conducted to compare the reading achievement scores of the students in the samples to determine if there were any significant differences in the scores of the students who were taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to those who were taught a traditional curriculum in the same grades.

Data Analysis

An analysis was conducted to compare the reading achievement scores of the students in the samples to determine if there were any significant differences in the scores of the students who were taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to students taught a traditional curriculum in the same grades. The statistical analysis of this study was composed of two parts: descriptive and inferential. As a measure of central tendency, the means was used to represent the entire group of scores. The standard deviation was calculated to determine the variability of the experimental and control group test scores in the study. The measures of variability were used to attempt to quantify the spread of data values around the mean and included the range and standard deviation (Norusis, 1996).

Inferential statistics were calculated using a two-way repeated measures analysis of variance (ANOVA) design. In repeated measures ANOVA the individual variability of participants can be calculated as the same people take part in each condition, thus partitioning more of the error of variance. The variance caused by differences between individuals is not helpful when determining the degree of difference between testing sessions. Repeated measures ANOVA allows for a comparison of the variance caused by the independent variable to a more accurate error term which has had the variance caused by differences in individuals removed from it. This comparison increases the power of the analysis (Huck, 2000).

In using repeated measures ANOVA, individual participant variability and variability due to testing sessions were calculated. After calculating the variability and converting the variances into mean squares, an analysis was conducted and the degrees of freedom determined. The degrees of freedom were calculated by the number of individual participants or testing sessions minus 1. The results of the two-way repeated measures ANOVA were calculated by SPSS and displayed in an ANOVA summary table (Norusis, 1996). The summary table includes information relating to the degrees of freedom (df), mean square (MS), the main effect (F), and the significance value (p).

Summary

This chapter provided an overview of the purpose of the study, context, research design, hypotheses, subjects, instrumentation, and data analysis. The findings of the study will be presented in chapter 4. The chapter will be organized into several sections. The first section presents and describes the descriptive statistics that were used to compare the demographic and contextual characteristics of the schools and the students in the study. The second section presents the data and reviews the findings related to the research questions. A summary is provided in the final section.

CHAPTER 4

PRESENTATION AND ANALYSIS

OF THE DATA

Data presentation, analysis, and interpretation are provided in this chapter. It is divided into several sections. The first section presents the descriptive statistics that were used to compare demographic and contextual characteristics of the schools and the students in the study. The second section presents the data and reviews the findings related to the research questions. In the final section, a summary is provided.

Descriptive Statistics

Descriptive statistics were used to compare the demographic and contextual characteristics of the schools and the students in this study. The students in the study were chosen from two public elementary schools located in a north Texas suburban school district. The experimental school taught the Core Knowledge curriculum and the control school chose not to teach the Core Knowledge curriculum. Table 1 depicts the information regarding the total school population as reported by the school district office for the experimental and control school during the three-year implementation of the Core Knowledge curriculum.

Table 1 specifically presents information regarding the school enrollment, free and reduced-lunch participation, race, and mobility. This information was used to compare and match the two schools participating in this study.

Table 1

Student Population Data for the Participating Schools

	2001-2002	2002-2003	2003-2004
Experimental School			
Enrolled	561	598	598
% F/R Lunch	34.9	43.8	38.1
% Black	11.0	14.7	17.4
% White	63.5	55.0	52.8
% Hispanic	10.2	13.9	14.0
% Asian	14.4	15.6	14.2
% Native Am	0.50	0.80	1.50
% Mobility	27.0	24.1	24.1
Control School			
Enrolled	593	636	593
% F/R Lunch	30.4	39.8	44.8
% Black	9.8	13.4	13.5
% White	63.9	60.7	59.7
% Hispanic	15.7	15.9	18.1
% Asian	9.10	7.70	7.50
% Native Am	1.50	2.40	1.27
% Mobility	21.4	21.0	21.0

Note. F/R= Free and reduced.

The experimental school had an enrollment of 561 students in 2001-2002, 598 students in 2002-2003, and 598 students in 2003-2004. The control school had an enrollment of 593 students in 2001-2002, 636 students in 2002-2003, and 593 students in 2003-2004. The difference in total enrollment between the schools was only about 1% for the three academic years. The control school increased its enrollment by 7.25% during the 2001-2002 academic year; therefore, the control school had the largest one year increase in enrollment.

The free and reduced-lunch populations for the experimental school were 34.9% in 2001-2002, 43.8% in 2002-2003, and 38.1% in 2003-2004. The free and reduced-lunch populations for the control school were 30.4% in 2001-2002, 39.8% in 2002-2003, and 44.8% in 2003-2004 school years. Both the experimental and control schools reported a 9% increase in the free and reduced-lunch population during the 2001-2002 school year.

For the experimental school, African American students comprised 11.0% of the student population during the 2001-2002 school year, 14.7% during the 2002-2003 school year, and 17.4% during the 2003-2004 school year. The African American population of the control school was 9.8% during the 2001-2002 school year, 13.4% during the 2002-2003 school year, and 13.5% during the 2003-2004 school year.

The experimental school had an enrollment of 63.5% White students during the 2001-2002 school year, 55% during the 2002-2003 school year, and 52.8% during the 2003-2004 school year. The control school had a White enrollment of 63.9% during the 2001-2002 school year, 60.7% during the 2002-2003 school year, and 59.7% during the

2003-2004 school year. Both schools reported a similar decline in White enrollment during the 3-year period of the study.

During the 2001-2002 school year, the experimental school reported a Hispanic enrollment of 10.2%, 13.9% during the 2002-2003 school year, and 14.0% during the 2003-2004 school year. The control school had a Hispanic enrollment of 15.7% during the 2001-2002 school year, 15.9% during the 2002-2003 school year, and 18.1% during the 2003-2004 school year. Although the experimental school reported a 4% increase in Hispanic students over the 3-year period, the control school maintained a higher percentage of enrolled Hispanic students overall.

For the experimental school, Asian students comprised 14.4% of the student population during the 2001-2002 school year, 15.6% during the 2002-2003 school year, and 14.2% during the 2003-2004 school year. In the control school Asian students comprised 9.1% of the student population during the 2001-2002 school year, 7.7% during the 2002-2003 school year, and 7.5% during the 2003-2004 school year. The experimental school averaged 5% to 7% more Asian students over the three-year period compared to the control school.

During the 2001-2002 school year, the experimental school reported an enrollment of 0.5% Native American students, 0.8% during the 2002-2003 school year, and 1.5% during the 2003-2004 school year. The control school had a Native American enrollment of 1.5% during the 2001-2002 school year, 2.4% during the 2002-2003 school year, and 1.27% during the 2003-2004 school year. Both the experimental and control schools have reported less than a 1% increase each year in their Native American student population since the 2001-2002 school year.

The mobility rate for the experimental school was 27% during the 2001-2002 school year, 24.1% during the 2022-2003 school year, and 24.1% during the 2003-2004 school year. The control school mobility rate was 21.4% during the 2001-2002 school year, 21% during the 2002-2003 school year, and 21% for the 2003-2004 school year. Although the experimental school had a slightly higher mobility rate, the mobility rate at both schools remained relatively constant during the 2002-2004 school years.

Table 2 depicts the contextual data regarding the characteristics of teachers in this study, including the number of teachers assigned to each grade level during the three-year period, the average number of years of teaching experience for those teachers, and the percentage of teacher retention. This information was used to compare and match the two school participating in this study.

Both the experimental and control schools were assigned four teachers per grade level between 2001-2004, with the exception of the experimental school for the 2002-2003 school year, which assigned three teachers that year due to decreased enrollment at that grade level. The numbers of teachers assigned to the experimental and control schools were based on student enrollment and state-mandated requirements regarding teacher-to-pupil ratios.

Table 2

Teacher Contextual Data for the Participating Schools

	Grade 4 2001-2002	Grade 5 2002-2003	Grade 6 2003-2004
Experimental School			
Number of Teachers At Each Grade Level	4	3	4
Av. Years of Exp.	5.0	5.5	4.5
% Teacher Retention	75	66	100
Control School			
Number of Teachers At Each Grade Level	4	4	4
Av. Years of Exp.	12.7	7.5	8.5
% Teacher Retention	50	50	100

The average number of years of full-time teaching experience for the experimental school was 5 years during the 2001-2002 school year, 5.5 years during the 2002-2003 school year, and 4.5 years during the 2003-2004 school year. The control school reported an average of 12.7 years of experience during the 2001-2002 school year, 7.5 during the 2002-2003 school year, and 8.5 years during the 2003-2004 school year. Between 2001-2004, the average number of years of teaching experience at the control school was 9.6 years while the average number of years of teaching experience at the experimental school was 5 years.

The percentage of teacher retention at the experimental school was 75% during the 2001-2002 school year, 66% during the 2002-2003 school year, and 100% during the 2003-2004 school year. The control school had 50% teacher retention during the 2001-2003 school year and 100% during the 2003-2004 school year. Overall, the experimental school reported a 72% teacher retention rate during the 3-year period, while the control school reported a slightly lower retention rate of 66% during the 2001-2004 school years.

Research Questions, Presentation, and Analysis of Data

The presentation and analysis of the data collected for this study are provided in this section. The research questions that were explored are presented in sequential order followed by the data analyses that were used to answer each research question.

Four questions were explored for this study.

Research question 1: As measured by the TAKS test, how do the achievement test scores of sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Research question 2: As measured by the TAKS test, how do the achievement test scores of advantaged sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Research question 3: As measured by the TAKS test, how do the achievement test scores of disadvantaged sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Research question 4: As measured by the TAKS test, how does the achievement gap for advantaged and disadvantaged students taught the Core Knowledge curriculum differ from comparable advantaged and disadvantaged students who were not taught the Core Knowledge curriculum?

Descriptive Statistics

Descriptive statistics were used to examine the means and standard deviations for the TLI score totals of the 2001-2002 TAAS achievement test and the scaled score totals of the 2002-2003 and 2003-2004 TAKS achievement tests. This information was obtained and compared for the reading subject area by school for the total targeted population in both the experimental and control schools.

Inferential Statistics

Both TAAS and TAKS reading achievement scores were converted to standard z scores so that all scores could be directly compared to the normal curve. Z scores express equivalent intervals on a distribution; therefore, each score is proportional in value to all other z scores. Thus the difference between z scores provides precise information about differences in learning and ability. Inferential statistics were also used to calculate repeated measures ANOVA tests to examine whether there were significant differences in achievement scores between subjects in the experimental and control schools.

Results

Table 3 represents the TAKS test means and standard deviations for the reading subtest for each cohort year in the study for the total sample population.

Overall, in examining the cohorts for the experimental and control schools, the experimental school revealed slightly higher mean scores throughout the study. The experimental school revealed a higher mean score in 2001-2002 (94 vs. 90), in 2002-2003 (2278 vs. 2200), and in 2003-2004 (2396 vs. 2394) when compared to the control school. In conclusion, although the experimental school showed higher mean scores when the total sample populations were compared, the control school revealed a greater gain (8.8% vs. 5.2%) from 2002-2003 to the 2003-2004 school year when compared to the experimental school.

Table 3

Texas Assessment of Knowledge and Skills (TAKS) Means and Standard Deviations for the Total Sample Population

	2001-2002	2002-2003	2003-2004
Experimental School			
Reading			
Mean	94	2278	2396
SD	6.08	206	198
n	35	35	35
Control School			
Reading			
Mean	90	2200	2394
SD	8.83	193	203
n	35	35	35

Note. *SD* = Standard Deviations; *n* = Number.

Table 4 represents the TAKS test means and standard deviations for the reading subtest for each cohort year in the study for the advantaged total sample population.

Table 4

Texas Assessment of Knowledge and Skills (TAKS) Means and Standard Deviations for the Advantaged Total Sample Population

	2001-2002	2002-2003	2003-2004
Experimental School			
Reading			
Mean	95	2344	2464
SD	3.87	200	185
n	23	23	23
Control School			
Reading			
Mean	93	2286	2438
SD	7.07	179	208
n	24	24	24

Note. SD = Standard Deviations; *n* = Number.

Overall, in examining the cohorts for the experimental and control schools, the experimental school revealed higher mean scores throughout the study. The experimental school had a higher mean score in 2001-2002 (95 vs. 93), in 2002-2003 (2344 vs. 2286), and in 2003-2004 (2464 vs. 2438) when compared to the control school. In conclusion, although the experimental school showed higher mean scores when the advantaged total sample populations were compared, the control school revealed a greater gain (6.7% vs. 5.1%) from 2002-2003 to the 2003-2004 school year when compared to the experimental school.

Table 5 represents the TAKS test means and standard deviations for the reading subtest for each cohort year in the study for the disadvantaged total sample population.

Table 5

Texas Assessment of Knowledge and Skills (TAKS) Means and Standard Deviations for the Disadvantaged Total Sample Population

	2001-2002	2002-2003	2003-2004
Experimental School			
Reading			
Mean	91	2153	2265
SD	8.6	160	156
n	12	12	12
Control School			
Reading			
Mean	84	2076	2289
SD	9.7	142	165
n	11	11	11

Note. SD = Standard Deviations; *n* = Number.

When examining the cohorts for the experimental and control schools, the experimental school revealed higher mean scores for the 2001-2002 and 2002-2003 school years when compared to the control school. In 2001-2002 the experimental school revealed a higher mean score (91 vs. 84), and in 2002-2003 the experimental school scored higher (2153 vs. 2076). In contrast, the control school revealed an average mean score (2289 vs. 2265) in 2003-2004 when compared to the experimental school.

In conclusion, although the experimental school showed higher mean scores during the first two years of the study when the total sample populations were compared, the control school showed a greater gain (10.3% vs. 5.2%) from 2002-2003 to the 2003-2004 school year when compared to the experimental school.

Table 6 depicts the TAKS test means and standard deviations for the reading subtest for each cohort year in the study for the achievement gap between the advantaged and disadvantaged total sample population (within schools).

Overall, in examining the mean scores for the advantaged and disadvantaged populations within the experimental school, advantaged students showed higher mean scores throughout the study. The experimental advantaged population had higher mean scores in 2001-2002 (95 vs. 91), in 2002-2003 (2344 vs. 2153), and in 2003-2004 (2464 vs. 2265) when compared to the experimental disadvantaged population. The differences in mean scores between the experimental advantaged and disadvantaged populations revealed a consistent achievement gap from 2002-2003 to the 2003-2004 school year.

Table 6

Texas Assessment of Knowledge and Skills (TAKS) Means and Standard Deviations for the Achievement Gap of the Advantaged and Disadvantaged Total Sample Population (Within Schools)

	2001-2002		2002-2003		2003-2004	
Experimental School						
	Adv.	Dis.	Adv.	Dis.	Adv.	Dis.
Reading						
Mean	95	91	2344	2153	2464	2265
SD	3.87	8.6	200	160	185	156
n	23	12	23	12	23	12
Control School						
	Adv.	Dis.	Adv.	Dis.	Adv.	Dis.
Reading						
Mean	93	84	2286	2076	2438	2289
SD	7.07	9.7	179	142	208	165
n	24	11	24	11	24	11

Note. Adv. = Advantaged; Dis. = Disadvantaged; *SD* = Standard Deviations; *n* = Number.

When examining the mean scores for the advantaged and disadvantaged populations within the control school, advantaged students had higher mean scores throughout the study. The control advantaged population had higher mean scores in 2001-2002 (93 vs. 84), in 2002-2003 (2286 vs. 2076), and in 2003-2004 (2438 vs. 2289) when compared to the control disadvantaged population. The differences in mean scores between the control advantaged and disadvantaged populations revealed a 4% decrease in the achievement gap from the 2002-2003 to the 2003-2004 school year.

Table 7 represents the TAKS test means and standard deviations for the reading subtest for each cohort year in the study for the achievement gap of the advantaged total sample population (between schools).

Overall, when comparing the mean scores for the advantaged populations of the experimental and control schools, experimental advantaged students had higher mean scores throughout the study. The experimental advantaged population had a higher mean score in 2002-2002 (95 vs. 93), in 2002-2003 (2344 vs. 2286), and in 2003-2004 (2464 vs. 2438) when compared to the control school.

In conclusion, although an achievement gap between advantaged students was revealed each year of the study when comparing the experimental and control schools, the achievement gap (mean score differences) decreased by 45% from 2002-2003 to the 2003-2004 school year.

Table 7

Texas Assessment of Knowledge and Skills (TAKS) Means and Standard Deviations for the Achievement Gap of the Advantaged Total Sample Population (Between Schools)

	2001-2002		2002-2003		2003-2004	
	Exp. Adv.	Control Adv.	Exp. Adv.	Control Adv.	Exp. Adv.	Control Adv.
Reading						
Mean	95	93	2344	2286	2464	2438
SD	3.87	7.07	200	179	185	208
n	23	24	23	24	23	24

Note. Exp. Adv. = Experimental Advantaged; Control Adv. = Control Advantaged; *SD* = Standard Deviations; *n* = Number.

Table 8 represents the TAKS test means and standard deviations for the reading subtest for each cohort year in the study for the achievement gap of the disadvantaged total sample population (between schools).

Table 8

Texas Assessment of Knowledge and Skills (TAKS) Means and Standard Deviations for the Achievement Gap of the Disadvantaged Total Sample Population (Between Schools)

	2001-2002		2002-2003		2003-2004	
Reading	Exp. Dis.	Control Dis.	Exp. Dis.	Control Dis.	Exp. Dis.	Control Dis.
Mean	91	84	2153	2076	2265	2289
SD	8.6	9.7	160	142	156	165
n	12	11	12	11	12	11

Note. Exp. Dis. = Experimental Disadvantaged; Control Dis. = Control. Disadvantaged; *SD*= Standard Deviations; *n*= Number

Overall, when comparing the mean scores for the disadvantaged populations of the experimental and control schools, experimental disadvantaged students had higher mean scores for the 2001-2002 and 2002-2003 school years when compared to the control school. The experimental disadvantaged population had higher mean scores in 2001-2002 (91 vs. 84) and in 2002-2003 (2153 vs. 2076). In contrast, the control school had a higher average mean score in 2003-2004 when compared to the experimental school (2289 vs. 2265).

In conclusion, although an achievement gap between advantaged students was revealed each year of the study when comparing the experimental and control schools, the achievement gap (mean score difference) decreased by 32% from 2002-2003 to the 2003-2004 school year.

Inferential Statistics

In this section, inferential statistical findings are presented for each research question. The repeated measures ANOVA test was used to determine if there were significant differences at the .05 level for the fourth, fifth, and sixth grade TAKS achievement tests in the experimental school versus the control school.

Research question 1: As measured by the TAKS test, how do the achievement test scores of sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Table 9 presents the findings of the repeated measures ANOVA test. The Levine's test for equality of variances indicates that variances are equal. The ANOVA test statistic for equal variances reveals that the means for the experimental group who were taught the Core Knowledge curriculum were not significantly different from the means of the control group who were not taught the Core Knowledge curriculum (test 1, $F = .443$, $p = .508$; test 2, $F = .022$, $p = .884$; test 3, $F = .011$, $p = .918$).

Table 9

Analysis of Variance for the Total Sample Population,

Equal Variances Assumed

Source		df	F	MS	p
Test 1	Between Groups	1	.443	.443	.508
2001-2002	Within Groups	68	.443	1.00	
Test 2	Between Groups	1	.022	.022	.884
2002-2003	Within Groups	68	.022	1.003	
Test 3	Between Groups	1	.011	.010	.918
2003-2004	Within Groups	68	.011	.921	
Test of Within-Subjects Effects (Greenhouse-Geisser)					
Interaction Effect		1.92	.244	.103	.775

Note. Equal Variances Assumed= No differences exist among the two independent group variances.

The repeated measures within subjects effects test (Greenhouse-Geisser test) that measures the interaction effect between the two groups reveals that the level of improvement of the experimental group who were taught the Core Knowledge curriculum was not statistically significant at the .05 level when compared to the level of improvement of the control group who were not taught the Core Knowledge curriculum

(F = .244, p = .775). Therefore, the level of improvement of the experimental group who were taught the Core Knowledge curriculum was not significantly greater than the control group who were not taught the Core Knowledge curriculum.

Research question 2: As measured by the TAKS test, how do the achievement test scores of advantaged sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Table 10 presents the findings of the repeated measures ANOVA test that compares the achievement test scores of the advantaged experimental group taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades versus the advantaged control group who were not taught the Core Knowledge curriculum. The Levine's test for equality of variances indicates that variances are equal. The ANOVA test statistic for equal variances reveals that the means for the advantaged experimental group who were taught the Core Knowledge curriculum were not significantly different from the means of the advantaged control group who were not taught the Core Knowledge curriculum (test 1, F = .473, p = .495; test 2, F = .344, p = .560; test 3, F = .391, p = .535).

Table 10

Analysis of Variance for the Advantaged Total Sample Population,

Equal Variances Assumed-

Source		df	F	MS	p
Test 1	Between Groups	1	.473	.386	.495
2001-2002	Within Groups	45	.473	.816	
Test 2	Between Groups	1	.344	.334	.560
2002-2003	Within Groups	45	.344	.970	
Test 3	Between Groups	1	.391	.375	.535
2003-2004	Within Groups	45	.391	.957	
Test of Within-Subjects Effects (Greenhouse-Geisser)					
Interaction Effect		1.93	.880	.508	.415

Note. Equal Variances Assumed = No differences exist among the two independent group variances.

The repeated measures within subjects effects test (Greenhouse-Geisser test) that measures the interaction effect between the two groups revealed that the level of improvement of the advantaged experimental group who were taught the Core Knowledge curriculum was not statistically significant at a .05 level when compared to the level of improvement of the advantaged control group who were not taught the Core Knowledge curriculum ($F = .880$, $p = .415$). Therefore, the level of improvement of the advantaged experimental group who were taught the Core Knowledge curriculum was not significantly greater than the advantaged control group who were not taught the Core Knowledge curriculum.

Research question 3: As measured by the TAKS test, how do the achievement test scores of disadvantaged sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Table 11 presents the findings of the repeated measures ANOVA test. The Levine's test for equality of variances indicates that variances are equal. The ANOVA test statistic for equal variances reveals that the means for the disadvantaged experimental group who were taught the Core Knowledge curriculum were not significantly different from the means of the disadvantaged control group who were not taught the Core Knowledge curriculum (test 1, $F = .014$, $p = .907$; test 2, $F = .290$, $p = .596$; test 3, $F = .028$, $p = .868$).

The repeated measures within subjects effects test (Greenhouse-Geisser test) that measures the interaction effect between the two groups reveals that the level of improvement of the disadvantaged experimental group who were taught the Core Knowledge curriculum was not statistically significant at the .05 level when compared to the level of improvement of the disadvantaged control group who were not taught the Core Knowledge curriculum ($F = .287$, $p = .735$). Therefore, the level of improvement of the disadvantaged experimental group who were taught the Core Knowledge curriculum was not significantly greater than the disadvantaged control group who were not taught the Core Knowledge curriculum.

Table 11

Analysis of Variance for the Disadvantaged Total Sample Population, Equal Variances Assumed

Source		df	F	MS	p
Test 1	Between Groups	1	.014	.014	.907
2001-2002	Within Groups	21	.014	.994	
Test 2	Between Groups	1	.290	.284	.596
2002-2003	Within Groups	21	.290	.980	
Test 3	Between Groups	1	.028	.028	.868
2003-2004	Within Groups	21	.028	.999	
Test of Within-Subjects Effects (Greenhouse-Geisser)					
Interaction Effect		1.853	.287	.115	.735

Note. Equal Variances Assumed = No differences exist among the two independent group variances.

Research question 4: As measured by the TAKS test, how does the achievement gap for advantaged and disadvantaged students taught the Core Knowledge curriculum differ from comparable advantaged and disadvantaged students who were not taught the Core Knowledge curriculum?

Table 12 presents the findings of the repeated measures ANOVA test. The Levine's test for equality of variances indicates that variances are equal. The ANOVA test statistic for equal variances reveals that the means for the experimental group who were taught the Core Knowledge curriculum were not significantly different from the means of the control group who were not taught the Core Knowledge curriculum. The findings for the experimental group were: test 1, $F = .003$, $p = .957$; test 2, $F = .430$, $p = .516$; test 3, $F = .009$, $p = .927$. Findings for the control group were: test 1, $F = .232$, $p = .633$; test 2, $F = .201$, $p = .657$; test 3, $F = .156$, $p = .695$. In conclusion, the achievement gap between advantaged and disadvantaged students at the experimental school was not significantly less than the achievement gap between advantaged and disadvantaged students at the control school.

Table 12

Analysis of Variance for the Achievement Gap of the Advantaged and Disadvantaged Total Sample Population, Equal Variances Assumed

Source		df	F	MS	p
Experimental School					
Test 1	Between Groups	1	.003	.003	.957
2001-2002	Within Groups	33	.003	1.00	
Test 2	Between Groups	1	.430	.415	.516
2002-2003	Within Groups	33	.430	.965	
Test 3	Between Groups	1	.009	.008	.927
2003-2004	Within Groups	33	.009	.979	
Control School					
Test 1	Between Groups	1	.232	.173	.633
2001-2002	Within Groups	33	.232	.745	
Test 2	Between Groups	1	.201	.197	.657
2002-2003	Within Groups	33	.201	.982	
Test 3	Between Groups	1	.156	.150	.695
2003-2004	Within Groups	33	.156	.962	

Note. Equal Variances Assumed = No differences exist among the two independent group variances.

Table 13 presents the findings of the repeated measures within subjects effects test (Greenhouse-Geisser test) that measures the interaction effect between the two groups. The ANOVA test statistic for equal variances reveals that the achievement gap between the experimental group advantaged and disadvantaged students was not statistically significant at the .05 level when compared to the achievement gap of the control group advantaged and disadvantaged students. The findings for the experimental group were: $F = .258$, $p = .761$. The findings for the control group were: $F = .476$, $p = .612$. Therefore, the achievement gap of the advantaged and disadvantaged experimental group who were taught the Core Knowledge curriculum was not significantly less than the achievement gap of the advantaged and disadvantaged control group who were not taught the Core Knowledge curriculum.

Table 13

Test of Within-Subjects Effects (Greenhouse-Geisser) for the Achievement Gap of the Advantaged and Disadvantaged Total Sample Population, Equal Variances Assumed

Source	*df*	*F*	*MS*	*p*
Experimental School				
Interaction Effect	1.892	.258	.143	.761
Control School				
Interaction Effect	1.882	.476	.237	.612

Note. Equal Variances Assumed= No differences exist among the two independent group variances.

Summary

This chapter presented and analyzed data related to each of the research questions. Chapter 5 provides the summary, findings, conclusions, policy recommendations, and recommendations for future research.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents the summary, conclusions, and recommendations from this study. The first section is a brief description of the study. The second section outlines the findings and conclusions for each research question. The conclusions are discussed in section three. Implications for practice are discussed in section four. In the final section, policy recommendations and directions for future research are discussed.

Description of the Study

This study examined the impact of the Core Knowledge curriculum on the achievement of elementary students in two public elementary schools located in a north Texas suburban school district. An analysis was conducted to compare the reading achievement scores of the students in the samples to determine if there were any significant differences in the scores of the students who were taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to students taught a traditional curriculum in the same grades.

Four research questions were addressed in this study:

Research question 1: As measured by the TAKS test, how do the achievement test scores of sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Research question 2: As measured by the TAKS test, how do the achievement test scores of advantaged sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Research question 3: As measured by the TAKS test, how do the achievement test scores of disadvantaged sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Research question 4: As measured by the TAKS test, how does the achievement gap for advantaged and disadvantaged students taught the Core Knowledge curriculum differ from comparable advantaged and disadvantaged students who were not taught the Core Knowledge curriculum?

For this study a repeated measures design was employed. All sixth grade students enrolled in the two identified schools that remained enrolled for the entire three years of the study constituted the sample for this study. Both schools have similar demographic characteristics (see Table 1). For the purposes of this study, only those subjects who were enrolled in the schools for the entire period of implementation of the Core Knowledge curriculum were included in the analysis. It is recognized that the results of this study may not be generalized to the total population of schools, but compelling interest was in the examination of the effects of the Core Knowledge curriculum.

To determine the impact of the Core Knowledge curriculum on student achievement, statistical analyses were conducted to compare student achievement, as measured by the TAKS test, among students taught the Core Knowledge curriculum and a comparable group of students not taught the Core Knowledge curriculum.

Statistical analysis was also conducted to compare the advantaged and disadvantaged student populations and the achievement gap between the two schools.

Descriptive statistics were used to analyze the data regarding the characteristics of the schools, teachers in the study, and students in the study. Inferential statistics were used to determine the statistical significance of the findings regarding student achievement.

Descriptive Statistics

First, descriptive statistics were compiled, which include the means, standard deviations, and the range. The mean is the most commonly reported measure of central tendency and was used to determine the properties of the values of the variables. The measures of variability were used to attempt to quantify the spread of data values around the mean and included the range of standard deviation (Norusis, 1996). Descriptive statistics were also used to analyze the data regarding the characteristics of schools, teachers in the study, and students in the study.

Inferential Statistics

Second, the inferential statistics were calculated using repeated measures ANOVA tests to examine scores. The repeated measures ANOVA test is a statistical technique in which subjects are measured two or more times on the dependent variable. The repeated measure ANOVA evaluates whether the mean value of the test variable for one group differs significantly from the mean value of the test variable for the second group. For a repeated measure ANOVA test, the assumptions must be made that: (a) the test variable is normally distributed in each of the two populations, (b) the population variances for the test occasions are equal, and (c) the population correlation coefficients between pairs of test occasion scores are equal (Huck, 2000). The repeated measures ANOVA tests were used to determine if there were significant differences at the designated level of $p \leq .05$.

Findings

In this section, the statistical findings of the questions and the conclusions based on those findings are presented.

As measured by the TAKS test, how do the achievement test scores of sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Null hypothesis 1: There is no statistically significant difference in the reading achievement of sixth grade students when immersed in a Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to sixth grade students who were not taught the Core Knowledge curriculum in the same grades.

There were no significant differences between the 2001-2002, 2002-2003, and 2003-2004 reading achievement scores on the TAKS test for those students who were taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to those students who were not taught the Core Knowledge curriculum in the same grades. The null hypothesis was accepted.

Null hypothesis 1 focused on the relationships between the academic achievement of the total samples in the two participating schools. The repeated measures ANOVA test computed on the total sample population revealed that there were no significant differences in reading achievement between the two schools at the .05 level of significance.

As measured by the TAKS test, how do the achievement test scores of advantaged sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Null hypothesis 2: There is no statistically significant difference in the reading achievement of advantaged sixth grade students when immersed in a Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to advantaged sixth grade students who were not taught the Core Knowledge curriculum in the same grades.

There were no significant differences between the 2001-2002, 2002-2003, and 2003-2004 reading achievement scores on the TAKS test for those advantaged students who were taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to those advantaged students who were not taught the Core Knowledge curriculum in the same grades. The null hypothesis was accepted.

Null hypothesis 2 focused on the relationships between the academic achievement of advantaged students in the two participating schools. The repeated measures ANOVA test computed on the advantaged student sample population revealed that there were no significant differences in reading achievement between the two schools at the .05 level of significance.

As measured by the TAKS test, how do the achievement test scores of disadvantaged sixth grade students taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades differ from comparable sixth grade students who were not taught the Core Knowledge curriculum in the same grades?

Null hypothesis 3: There is no statistically significant difference in the reading achievement of disadvantaged sixth grade students when immersed in a Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to disadvantaged sixth grade students who were not taught the Core Knowledge curriculum in the same grades.

There were no significant differences between the 2001-2002, 2002-2003, and 2003-2004 reading achievement scores on the TAKS test for those disadvantaged students who were taught the Core Knowledge curriculum in the fourth, fifth, and sixth grades when compared to those disadvantaged students who were not taught the Core Knowledge curriculum in the same grades. The null hypothesis was accepted.

Null hypothesis 3 focused on the relationships between the academic achievement of disadvantaged students in the two participating schools. The repeated measures ANOVA test computed on the disadvantaged student sample population revealed that there were no significant differences in reading achievement between the two schools at the .05 level of significance.

As measured by the TAKS test, how does the achievement gap for advantaged and disadvantaged students taught the Core Knowledge curriculum differ from comparable advantaged and disadvantaged students who were not taught the Core Knowledge curriculum?

Null hypothesis 4: There is no statistically significant difference in the achievement gap for advantaged and disadvantaged students taught the Core

Knowledge curriculum when compared to the advantaged and disadvantaged students who were not taught the Core Knowledge curriculum.

As measured by the TAKS test, there were no significant differences in the achievement gap of the advantaged and disadvantaged students' reading achievement scores within the experimental school where the Core Knowledge curriculum was taught when compared to the achievement gap of those advantaged and disadvantaged students who were not taught the Core Knowledge curriculum.

As measured by the TAKS test, there were also no significant differences in the achievement gap of the advantaged and disadvantaged students when comparing the reading achievement scores of the experimental school students who were taught the Core Knowledge curriculum and the control school students who were not taught the Core Knowledge curriculum. The null hypothesis was accepted.

Null hypothesis 4 focused on the relationships between the achievement gap of the advantaged and disadvantaged reading achievement of the total samples in the two participating schools. The repeated measures ANOVA test computed on the total sample population revealed that there were no significant differences in reading achievement between the two schools at the .05 level of significance.

Additional Considerations

By utilizing a nontheoretical stance when evaluating the results of the study, mixed patterns emerge from scores on the TAKS test. Given the limitations of this study, however, a more informative, theory-based interpretation arises. According to Hirsch (1987), examining the "value added" characteristics of the schools, especially with regards to the most important issue of reading, is critical. Reading is more than a skill; it requires large amounts of specific information. Cognitive psychologists have shown that when two people have similar levels of intelligence, the person who has more general knowledge will learn faster and function more competently than the person who has less general knowledge. The more general knowledge one has, the easier it is to think critically.

Furthermore, general knowledge works in conjunction with vocabulary building, and vocabulary is thought of as the best predictor of academic achievement (Hirsch, 1987). The lack of general knowledge is what prohibits poor readers from becoming good readers. A broad vocabulary means broad knowledge because to know a lot of words one must know a lot of things. Thus, broad general knowledge is an essential requisite to superior reading skills and is indirectly related to the skills that accompany it (Hirsch, 1987).

Research about the effects of general knowledge on recall during testing suggests that the words on a page are only symbols and do not, in and of themselves, carry meaning; rather, it is the student's prior knowledge that enables him/her to comprehend the information presented. New ideas and information are learned and retained most effectively when relevant and related ideas are readily available within the student's knowledge base. Hirsch (1987) refers to this type of learning as the "velcro theory of learning". Students develop hooks of vocabulary and knowledge which later attach themselves to new learning. Important implications arise from this theory regarding expectations that teachers set for their students. This would lead one to conclude that more attention should be given to adding to the general knowledge of students rather than matching content to individual students according to their perceived abilities (Hirsch, 1987).

Core Knowledge is designed to provide students with a broad base of general knowledge. The development of this knowledge is a cumulative process that takes several years to accomplish. While this three year study provided information that we can learn from, a more long-term study would garner additional information as it relates to the cumulative effects of curriculum on reading achievement.

Conclusions

The purpose of this study was to determine the impact of using the Core Knowledge curriculum, a curriculum that is sequenced and specific for grades pre-kindergarten through 8. Based on the outcomes of this study, the inferential statistics do not support the idea that Core Knowledge curriculum increases reading achievement. Although the outcomes of this study did not reveal increased reading achievement as reported in previous quantitative studies (i.e. Kosmoski et al., 1990; Schubnell, 1996; Stringfield et al., 1999), qualitative factors may provide reason to continue the program.

In a 1996 study, Stringfield et al. reported that although schools had varying reasons for implementing the Core Knowledge Sequence, the educators that implemented Core Knowledge articulated clear benefits that were common to all schools in the study. The academic benefits of Core Knowledge showed an increase in student self-confidence and interest in learning. Anecdotal teacher records suggested that the implementation of Core Knowledge had a positive effect on students' reading abilities and served to inspire lower-achieving students. At a number of schools, educators cited the fact that students were more interested in reading nonfiction as a primary benefit of Core Knowledge. Another reported benefit of Core Knowledge was that the curriculum met the needs of all students. Schools found that Core Knowledge works well with students who are below grade level and not able to read on the same level as their peers; they are able to grasp Core Knowledge material that is presented through hands-on projects and activities. A number of schools reported that a greater interest in student learning of Core Knowledge also resulted in fewer classroom discipline problems (Stringfield et al., 1996).

Other benefits that related to teacher satisfaction were also reported. Teachers in the study reported that Core Knowledge increased the interaction among teachers as well as accountability for the curriculum. Data collected at many of the schools indicated that teachers felt that Core Knowledge made their work lives more interesting and exciting as a result of Core Knowledge planning and preparation. Data in this area also suggested that teacher support and enthusiasm for Core Knowledge appears to increase over time as teachers attain mastery of the curriculum. Schools in the study also reported an increased level of parent satisfaction as a benefit of Core Knowledge (Stringfield et al., 1996).

From the data collected, researchers also found a number of factors that greatly facilitated successful implementation of the Core Knowledge curriculum: (a) extra funding for start-up costs, (b) common planning time, (c) parent and community support, (d) site-based management, (e) district support, (f) a staff interested in teaching the Core Knowledge curriculum, (g) team teaching, (h) sharing lessons and experiences with teachers at other Core Knowledge schools, (i) assistance in locating and securing

Core Knowledge materials, and (j) local adaptations to better serve diverse populations (Stringfield et al., 1996).

It might also be inferred that while no statistically significant differences between student achievement scores were revealed, the Core Knowledge school maintained or increased mean test scores throughout the study, thus suggesting that districts do not have to solely rely on state curriculum. Supplemental curriculums such as Core Knowledge may actually provide additional support in meeting state requirements. Supplemental curriculums may also offer students access to a broader range of curriculum not found in the TEKS curriculum alone, thus enhancing the curriculum quality.

The “value-added” aspect of the Core Knowledge curriculum in achieving excellence and fairness for all students regardless of socioeconomic status is also important as it relates to the findings of this study. According to Hammond (1998), curricular quality contributes more to educational outcomes than the economic backgrounds of students. Curriculum quality is most important to disadvantaged students who sometimes receive lower-quality teaching and less demanding material. Curriculum quality is also a central assumption of Hirsch’s Core Knowledge theory in that a highly rich, sequential, and content-specific curriculum bridges the achievement gap between advantaged and disadvantaged students or, at least, prevents disadvantaged students from falling further behind (Hirsch, 1999).

While examining the achievement gap within schools for the advantaged and disadvantaged populations of this study, Hirsch’s theory was proven in part. Although the mean scores of disadvantaged students in the Core Knowledge school consistently increased throughout the study, the mean scores of advantaged students improved as well, thus revealing a consistent achievement gap between the experimental advantaged and disadvantaged populations from the 2002-2003 to the 2003-2004 school year.

In contrast, the achievement gap within the control school revealed a lower achievement gap (mean scores) between advantaged and disadvantaged students when compared to the achievement gap within the Core Knowledge school. Over the course of the study, the achievement gap between advantaged and disadvantaged students in the control school decreased by 4%. In conclusion, the findings reveal that the Core Knowledge school did not decrease the achievement gap between advantaged and disadvantaged students, but rather the disadvantaged students did not appear to fall further behind.

According to the Core Knowledge Foundation literature, it is important to begin foundations of knowledge in the early grades because that is when children are most receptive, and because academic deficiencies in the first six grades can permanently impair the quality of later schooling. The previous analysis of mean scores of both schools revealed that the widening of the achievement gap can be halted or decreased if schools make a systematic effort to provide a coherent curriculum that students, especially disadvantaged students, need (Hirsch, 1996).

Another “value-added” assumption of the Core Knowledge curriculum is that it provides equal educational opportunity to advantaged and disadvantaged students by allowing students to experience a broad range of curriculum that may not be present in state mandated curriculums. In order to examine this theoretical assumption an evaluation of the achievement scores of the advantaged and disadvantaged student populations is required. Although the experimental school advantaged student population had higher mean scores in 2001-2002 (95 vs. 93), 2002-2003 (2344 vs. 2286), and 2003-2004 (2464 vs. 2438) when compared to the control school, no statistically significant difference was revealed (test 1, $F = .473$, $p = .495$; test 2, $F = .344$, $p = .560$; test 3, $F = .391$, $p = .535$).

When comparing the mean scores for the disadvantaged populations of the experimental and control schools, experimental disadvantaged students revealed higher mean scores for the 2001-2002 and 2002-2003 school years when compared to the control school. The experimental disadvantaged population revealed higher mean scores in 2001-2002 (91 vs. 84) and in 2002-2003 (2153 vs. 2076). In contrast, the average mean score for the control school in 2003-2004 was slightly higher than the experimental school (2289 vs. 2265). The control school also revealed greater mean score gains than the experimental school from the 2002-2003 to 2003-2004 school year. In conclusion, a statistically significant difference was not revealed between disadvantaged students at the experimental school when compared to the disadvantaged students at the control school (test 1, $F = .014$, $p = .907$; test 2, $F = .290$, $p = .596$; test 3, $F = .028$, $p = .868$).

Although the TAKS test is standardized, it was not highly informative for this study. This can be attributed to the fact that both schools have curricula that are aimed at passing the objectives of the state-mandated TAKS test in order to meet the requirements of Senate Bill 103. The TAKS test is designed to measure how well a student is able to apply the concepts and skills expected at each grade level. The TAKS test is also directly linked to the TEKS state curriculum (Texas Education Agency, 2003).

Evaluating the effects of the Core Knowledge curriculum on student achievement may be better realized through the use of a nationally norm-referenced test such as the Stanford 9 TA. Norm-referenced tests are not curriculum-based, but based upon broad samplings. These tests are domain–specific. It might be inferred that increased relative performance on norm-referenced achievement tests could be explained in part by the cumulative effect of content-focused curriculum on general academic skills. Since the TAKS test is not specifically tied to a particular curricular sequence, the cumulative effects of carefully sequenced content would be more likely to exhibit themselves in later grades.

The theory of Core Knowledge is that several domains are being built upon gradually, systematically, and cumulatively, and as these domains multiply, the chances of overlap with the domains being tested becomes greater. Stringfield et al. (1999) did find consistent evidence of positive impact on norm-referenced tests when students were followed for successive years. This inference seems to be consistent with Hirsch's (1987, 1996) theory that knowledge builds coherently over time.

This study did not specifically examine the perceptions of teachers. Given the anxiety level caused by the standards movement, it is assumed that both schools are teaching the TAKS test objectives. In theory, students could benefit from a carefully sequenced curriculum that allows them to build on knowledge gained in previous years. If they do, the full benefits of the Core Knowledge curriculum may take several years to materialize. This might be the case if teachers need time to adjust their teaching methods and the effects of aligning and tightening curricular sequencing on student achievement across the years.

In determining reform success, policy makers typically use several criteria: (a) effectiveness as determined by improved student outcomes (results on standardized tests), (b) fidelity of implementation, and (c) popularity (Cuban, 1998). The effectiveness standard is usually the determiner of the “thumbs-up or thumbs- down verdict on a reform” (Cuban, 1998, p. 471). Cuban advocates expanding the notion of reform success, which reflects the standards of the policy elite rather than favor practitioner expertise anchored in schools. He argues that, when evaluating reforms, researchers should point to “improvements in practice”. Expanding notions of reform success, Cuban also argues for assessing the longevity of reforms and their standard for adaptiveness. An adaptable reform allows for inventiveness and active problem solving among teachers as they use the reform to improve practice and change values, attitudes, and behavior of students on both academic and nonacademic tasks.

For Core Knowledge, fidelity and popularity are closely connected. In fact, the school board of the district represented in this study voted to begin the process of implementing the Core Knowledge program at all campuses starting in the fall of 2004. Additionally, the growth of the Core Knowledge curriculum to over 1,000 schools nationwide may be attributed to the fact that the Core Knowledge program is an ongoing, collaborative process and not based on buying materials or following a method (Core Knowledge Foundation, 2002).

Policy Recommendations

This section presents policy recommendations that emerged from this study. These recommendations represent this particular study and are presented to provide further understanding.

1. Develop a comprehensive document that aligns state standards with the Core Knowledge curriculum at each grade level.
2. Design an inclusive accountability and assessment system for schools that are implementing reform models that better reflect the impact of the model.
3. Designate a third-party research center within the district or state so schools can have access to research information about comprehensive school reform models.
4. Provide schools and districts with the necessary funding that is needed to fully implement and sustain comprehensive school reform models over several years.

Implications for Future Research

The following implications for future research have been formulated based on the literature review, results, and conclusions of this study.

1. To assess student achievement, conduct a longitudinal study of the effects of the Core Knowledge curriculum on students who have been taught the Core Knowledge objectives since kindergarten.
2. Conduct future research to determine the effectiveness of the Core Knowledge curriculum in increasing the achievement of students who were taught the Core Knowledge curriculum first in elementary school and then in middle school.

3. Conduct future research to determine the effectiveness of the Core Knowledge curriculum in increasing the achievement of students by race.
4. Conduct future research to determine the effectiveness of the Core Knowledge curriculum in increasing the achievement of gifted versus non-gifted students.
5. Conduct future research to determine the effectiveness of the Core Knowledge curriculum in increasing the achievement of special education students.
6. Conduct future research to determine the effectiveness of the Core Knowledge curriculum in increasing the achievement of economically disadvantaged students who receive free lunches versus economically disadvantaged students who received reduced-price lunches.

Summary

This chapter has presented the summary, conclusions, and recommendations from this study. The first section outlined a brief description of the study. The second section outlined the findings and conclusions for each research question. Implications for practice were also discussed. In the final section, policy recommendations and directions for future research were outlined.

APPENDIX A

RESEARCH STUDY CONSENT FORM

May 10, 2004

Dear Parent,

For the past three years the Hurst-Euless-Bedford Independent School District has implemented the Core Knowledge curriculum on several campuses. I am conducting a research study to determine if this curriculum has been effective in increasing the reading achievement of the students. In order to conduct this study I need your permission to use your child's reading achievement scores from his/her TAKS test from the spring 2002, 2003, and 2004. I will then compare the scores of the students who receive Core Knowledge curriculum with students who receive traditional curriculum.

There should be no risk involved for your child in this process. Your child's identity will not be used in the study. Students will be given a code number by the campus before any information is provided to me. The data provided by the campus will be kept confidential and used only for research purposes.

This study will provide useful information to the Hurst-Euless-Bedford Independent School District. The results will help us determine if the Core Knowledge curriculum is effective in increasing the reading achievement of students.

This study has been reviewed and approved by the University of North Texas Committee for the protection of Human Subjects and by the Hurst-Euless-Bedford Independent School District. If you have any questions or concerns regarding this study you may contact Dr. Jane B. Huffman in the Educational Administration department at the University of North Texas at (940) 565-2832. You may also contact me at (817) 354-3529 or your campus principal with any questions regarding this study.

Thank you for your assistance in this study.

Sincerely,

Aungelique Brading
Assistant Principal
Hurst- Euless- Bedford ISD

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You are making a decision about whether or not to have your child's data used in this study. Your signature indicates that you have decided to allow this information to be used and that you have read or have had read to you the information provided in the Consent Letter and that you have received a copy of the Consent Letter.

____________________________________ ______________
Signature of Parent or Guardian Date

____________________________________ ______________
Signature of Witness Date

____________________________________ ______________
Signature of Principal Investigator Date

APPENDIX B

RESEARCH STUDY CONSENT FORM (SPANISH)

Puedo 10, 2004

Estimado Padre,

Para los últimos tres años el districto independiente de la escuela de Hurst-Euless-Bedford ha puesto el plan de estudios del conocimiento en ejecucio'n de la base en varios campus. Estoy conduciendo un estudio de la investigación para determinarme si este plan de estudios ha sido eficaz en el aumento del logro de la lectura de los estudiantes. Para conducir este estudio necesito su permiso de utilizar las cuentas del logro de la lectura de su niño de su prueba de TAKS a partir del resorte 2002, 2003, y 2004. Entonces compararé las cuentas de los estudiantes que reciben plan de estudios del conocimiento de la base con los estudiantes que reciben plan de estudios tradicional.

No debe haber riesgo implicado para su niño en este proceso. La identidad de su niño no será utilizada en el estudio. El campus darán los estudiantes un número de código antes de que cualquier información se proporcione yo. Los datos proporcionados por el campus serán mantenidos confidenciales y utilizados solamente para los propósitos de la investigación.

Este estudio proporcionará la información útil al districto independiente de la escuela de Hurst-Euless-Bedford. Los resultados nos ayudarán a determinarnos si el plan de estudios del conocimiento de la base es eficaz en el aumento del logro de la lectura de estudiantes.

Este estudio ha sido repasado y aprobado por la universidad del comité del norte de Tejas para la protección de temas humanos y por el districto independiente de la escuela de Hurst-Euless-Bedford. Si usted tiene algunas preguntas o preocupaciones con respecto a este estudio usted puede entrar en contacto con a Dr. Jane B. Huffman en el departamento educativo de la administración en la universidad de Tejas del norte en (940) 565-2832. Usted puede también entrarme en contacto con en (817) 354-3529 o sus principales del campus con cualquier pregunta con respecto a esto estudio.

Gracias por su ayuda en este estudio. Sinceramente,
Aungelique Brading
Principal Auxiliar
Hurst-Euless- Bedford ISD

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Usted está tomando una decisión alrededor si o no tener datos de su niño usados en este estudio. Su firma indica que usted ha decidido permitir que esta información sea utilizada y que usted ha leído o haber tenido leído a usted la información proporcionada en la letra del consentimiento y que usted ha recibido una copia de la.

______________________________________ ____________________

La Firma de la Fecha de Padre o Guardian Date

______________________________________ ____________________

Firma de la Fecha Principal de Investigador Date

APPENDIX C

SAMPLE OF TEKS AND CORE KNOWLEDGE ALIGNMENT DOCUMENT

Sixth Grade Language Arts
Core Knowledge/TEKS by Six Weeks

Six Weeks	Core Knowledge	TEKS
1st Six Weeks	Writing, Grammar, and Usage **Writing and Research** • Learn strategies and conventions for writing a persuasive essay, with attention to defining a thesis, supporting the thesis with evidence, examples, and reasoning distinguishing evidence from opinion anticipating and answering counter arguments maintaining a reasonable tone. • Write a research essay, with attention to asking open-ended questions; gathering relevant data through research; summarizing, paraphrasing, and quoting; organizing with an outline; integrating quotations from sources; and acknowledging sources. • Write a standard business letter. **Speaking and Listening** • Participate in group discussions • Give a short speech to the class that is well-organized and supported. • Demonstrate an ability to use standard pronunciation when speaking to formal groups. **Grammar and Usage** • Understand what a complete sentence is • Identify different sentence types, and write for a variety of reasons by using simple, compound, complex, and compound-complex sentences. • Correctly use punctuation introduced in earlier grades, learn how to use a semi-colon to separate sentences that form a compound sentence. • Recognize verbs in active voice and passive voice, and avoid unnecessary use of passive voice. • Recognize the following troublesome verbs and how to use them correctly: sit/ set; rise/ raise; and lie/ lay; **Spelling** • Review spelling rules for use of ie and ei for adding prefixes and suffixes. • Continue work with spelling, with special attention to commonly misspelled words.	**(6.1) Listening/speaking/purposes. The student listens actively and purposefully in a variety of settings.** The student is expected to: (a) determine the purposes for listening such as to gain information, to solve problems, or to enjoy and appreciate (4-8); (b) eliminate barriers to effective listening (4-8); (c) understand the major ideas and supporting evidence in spoken messages; and (d) listen to learn by taking notes, organizing, and summarizing spoken ideas. **(6.2) Listening/speaking/critical listening. The student listens critically to analyze and evaluate the speaker's message.** The student is expected to: (a) interpret speakers' messages, purposes, and perspectives; (b) identify and analyze a speaker's persuasive techniques such as selling, convincing, and using propaganda; (c) distinguish between the speaker's opinion and verifiable fact; (d) monitor his/her own understanding of the spoken message and seek clarification as needed; (e) compare his/her own perception with the perception of others; (f) evaluate a spoken message in terms of its content, credibility, and delivery. **(6.3) Listening/speaking/appreciation. The student listens to enjoy and appreciate spoken language.** The student is expected to: (a) listen to proficient, fluent models of oral reading, including selections from classical and contemporary works; (b) analyze the use of aesthetic language for its effects.

Sixth Grade Language Arts
Core Knowledge/TEKS by Six Weeks

Six Weeks	Core Knowledge	TEKS
1st Six Weeks	Writing, Grammar, and Usage **Spelling Continued** • Correctly use the following: Sit/set Rise/raise Lie/lay Good/well Between/among Bring/take Accept/except Fewer/less Like/as Affect/effect Who/whom Imply/infer Principle/principal Their/there/they're • Continue work with spelling, with special attention to commonly misspelled words, including: Acquaintance Separate Occurrence Exaggerate Answer Substitute Philosopher Gymnasium Characteristic Tragedy Receipt Interrupt cooperate Criticize Dependent Develop Amateur Similar Parallel Exercise Athlete Success Hypocrite Committee Woman Recommendation License Marriage Minimum Naturally Embarrassed **Fiction and Drama** Julius Caesar (William Shakespeare)	**(6.4) Listening/speaking/culture. The student listens and speaks to gain and share knowledge of his/her own culture, the culture of others, and the common elements of the cultures.** The student is expected to: (a) connect his/her own experiences, information, insights, and ideas with experiences of others; (b) compare oral traditions across regions and cultures; and (c) identify how language use such as labels and sayings reflects regions and cultures. **(6.5) Listening/speaking/audiences. The student speaks clearly and appropriately to different audiences for different purposes and occasions.** The student is expected to: (a) adapt spoken language such as word choice, diction, and usage to the audience, purpose, and occasion; (b) demonstrate effective communication skills that reflect demands as interviewing, reporting, requesting, and providing information; (c) present dramatic interpretations of experiences, stories, poems, or plays to communicate; (d) generate criteria to evaluate his/her own oral presentations and the presentations of others; (e) use effective rate, volume, pitch, and tone for the audience and setting; and (f) clarify and support spoken ideas with evidence, elaboration, and examples.

Sixth Grade Language Arts
Core Knowledge/TEKS by Six Weeks

Six Weeks	Core Knowledge	TEKS
1st Six Weeks		**(6.6) Reading/word identification. The student uses a variety of word recognition strategies.** The student is expected to: (a) apply knowledge of letter-sound correspondences, language structure, and context to recognize words; (b) use structural analysis to identify root words with prefixes such as dis-, non-, in-, and suffixes such as –ness, -tion, and –able; and (c) locate meanings, pronunciations, and derivations of unfamiliar words using dictionaries, glossaries, and other sources. **(6.7) Reading/fluency. The student reads with fluency and understanding in texts at appropriate difficulty levels.** The student is expected to: (a) read regularly in independent level materials (texts in which no more than approximately 1 in 20 words is difficult for the reader); (b) read regularly in independent level materials (texts in which no more than approximately 1 in 10 words is difficult for the reader); (c) demonstrate characteristics of fluent and effective readers; (d) adjust reading rate based on purposes for reading; (e) read aloud in selected texts in ways that both reflect understanding of the text and engage listeners; and (f) read silently with increasing ease for longer periods.

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