

SCIENCE STANDARDIZED ACHIEVEMENT TESTS: THE RELATIONSHIP
BETWEEN PUBLISHERS, TEXTBOOK COMPLETION, ADMISSION STANDARDS
AND SCIENCE TEST SCORES OF SEVENTH THROUGH NINTH GRADE
STUDENTS IN FACCS SCHOOLS

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Sharon J. Nix

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Science Standardized Achievement Tests: The Relationship between Publishers,
Textbook Completion, Admission Standards, and Science Test Scores of Seventh through
Ninth Grade Students in FACCS Schools

by Sharon J. Nix

APPROVED:

COMMITTEE CHAIR

Constance Pearson, Ed.D.

COMMITTEE MEMBERS

Tracey Pritchard, Ed.D.

Wesley Scott, Ed.D, Ph.D.

CHAIR, GRADUATE STUDIES

Scott B. Watson, Ph.D.

Abstract

Sharon Nix. SCIENCE STANDARDIZED ACHIEVEMENT TESTS: THE RELATIONSHIP BETWEEN PUBLISHERS, TEXTBOOK COMPLETION, ADMISSION STANDARDS AND SCIENCE TEST SCORES OF SEVENTH THROUGH NINTH GRADE STUDENTS IN FACCS SCHOOLS (Under the direction of Dr. Constance Pearson) School of Education, April, 2009.

Scaled scores from the *Stanford Achievement Test Series, Tenth Edition* were examined in this causal-comparative study to determine if science publishers in Florida Association of Christian Colleges and Schools (FACCS), textbook completion rates, and admission standards affect standardized test scores. Administrators from 34 schools in FACCS participated in the study by returning an original eleven-question survey instrument to help ascertain what differences or relationships affect standardized test scores. Nine Mann-Whitney tests, one for each grade level in seventh through ninth, did not reveal a significant difference on hypotheses 1a-3c. Publishers (*BJ U Press, A.C.E., Glencoe, Prentice Hall*), standardized tests, entrance exams, GPA, and ability index factors were reviewed in the study. The results of this study might prompt administrators to consider factors other than publisher usage, textbook completion, and admission standards when attempting to close achievement gaps.

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CHAPTER ONE

Introduction to the Study

Reflecting on end of year standardized testing results often leads the administrator to consider why one school performs higher than another school. There are multitudes of factors that may affect test scores including teacher content knowledge, teaching strategies, student and teacher interactions, course sequence, curriculum supplementation and a standard school admissions process. Due to the difficulties in trying to prove one specific factor or a combination of factors that truly affect success, few venture into investigating the topic. However, by taking the effort to compile information supplied from administrators, researchers can begin to eliminate and confirm factors that affect achievement on standardized tests.

Background of the Study

In 1965, the Elementary and Secondary Education Act (ESEA) was established to provide funding to schools so that low-income students could academically achieve (Guilfoyle, 2006). In 1983, a report entitled “A Nation at Risk: the Imperative for Educational Reform” revealed that the educational system in the United States was in need of reform (Lentz, 2007). By 1998, school districts were required to evaluate schools based on test results and in 1994 the Improving America’s Schools Act made sure that schools that did not meet the adequate yearly progress (APY) were identified (Guilfoyle, 2006). Yet, a renewal of interest with the No Child Left Behind Act of 2001 (NCLB) reminds administrators that children need to be proficient in state standards, and with this

Act, the deadline for proficiency has been set for 2014 through the measurement of state standardized tests (Oswald, 2008; Moses & Nanna, 2007; Guilfoyle, 2006). By looking back at the progression of the timeline, one can see that accountability is not a new issue. (See Table 1.)

Table 1

Accountability Timeline		
1965	Elementary and Secondary Education Act	Guilfoyle, 2006
1983	A Nation At Risk	Lentz, 2007
1994	Improving America's Schools Act	Guilfoyle, 2006
1998	Evaluate schools based on test results	Guilfoyle, 2006
2001	No Child Left Behind Act of 2001	Oswald, 2008; Moses and Nanna, 2007; Guilfoyle, 2006
2014	Proficiency Deadline	Oswald, 2008; Moses and Nanna, 2007; Guilfoyle, 2006

To identify proficiency and readiness for the 2014 deadline, administrators analyze student scores from various types of standardized tests. In many schools, if a student does not perform satisfactorily, then graduation or promotion is at risk (Hurwitz, N. & Hurwitz, S., 2000). Because many states now require students to pass a specific exit exam to graduate, the term *high-stakes* testing has been associated with required tests (Johnson, Thurlow, Cosio, & Bremer, 2005). High-stakes testing takes place through state or national assessments rather than through standards-based testing in the classroom. This focus on a particular assessment gives clarity to all of the constituents.

The administration of the *Stanford Achievement Test Series, Tenth Edition* in FACCS schools on a yearly basis is comparable to the high-stakes test of the public school. For the FACCS Christian schools, parents view test results as an important indicator of achievement, and in return, parents make monetary decisions as to whether their child should remain in the same school. Since science is an area of concern, this study will analyze the science test scores from the *Stanford Achievement Test Series, Tenth Edition*, which is given to students in the FACCS schools. Both parents and administrators should ensure that students are adequately prepared in the field of science, especially after hearing statistics in the news concerning the ranking of students from the United States compared to students in other countries. Because of the reports on international assessments and accountability concerns, administrators have become highly interested in ensuring their students are successful on state assessments.

According to Luft (2008), two international assessments that focus on science education are the Trends in International Mathematics and Science Study (TIMSS) that is administered every four years and the Program for International Assessment (PISA) that is administered every three years. The Trends in International Mathematics and Science Study tests factual information versus the Program for International Assessment's problem solving type questions (Bybee & Stage, 2005). In the Organization for Economic Cooperation and Development (OECD), there are twenty-nine nations. Because compulsory schooling ends for students at the age of fifteen in many countries, the Program for International Assessment, which is not tied to a specific curriculum, is given to fifteen year olds. It tends to concentrate on problem solving abilities and overall general knowledge in reading, mathematics, and science (Bybee & Stage, 2005). It is in

this broad knowledge test of the 2003 testing session that the United States placed in the bottom portion only scoring in the same range as they scored in the year 2000 (Bybee & Stage, 2005).

Although the students scored in the same range as in 2000, the relative standing to the Organization for Economic Cooperation and Development nations fell. The United States ranked nineteen out of the twenty-nine nations in the science literacy scores and twenty-four in the problem solving area of the Program for International Assessment (Bybee, 2007). Gains were made over a four-year period in the Program for International Assessment, but the United States is still not at a level representing a country wanting to excel in math or science (Bybee & Stage, 2005).

The Trends in International Mathematics and Science Study revealed a slightly better picture showing fourth and eighth grade students in the United States were closing a gap in the 2003 testing session (Bybee & Stage, 2005). However, the 2007 Trends in International Mathematics and Science Study revealed that U.S. students made some gains in math and no gains in science (Dillon, 2008). Students in Asian countries are outperforming students in math and science, which can affect future economy and research if today's students are not ready for the workforce (Dillon, 2008). The Trends in International Mathematics and Science Study is linked to specific objectives in science and math that students are expected to learn based upon the consensus of curricula from participating countries. Due to media pressure, voiced parental concerns, and results from studies such as the Program for International Assessment and Trends in International Mathematics and Science Study, administrators find themselves wanting to perform at a higher standard, specifically in the science area.

Whether it is international assessment or state assessment, parents and administrators remain concerned about the performance standards of the children. Students must be prepared and have a knowledge base where they are able to compete both against their peers and against those from other nations for future careers. International trade and commerce expanded from 2.5 billion people to 6 billion people with the entrance of China, India, and the Soviet Empire in 2000 (Friedman, 2006). The United States' entire workforce is only 150 million; therefore, educators must ensure the level of education is rigorous enough so that students from the United States have the knowledge and ability to maneuver in the global economy (Friedman, 2006).

In 1957, the space race was a catalyst for a new generation of scientists and engineers; but statistics show that the scientist's and engineers in America are reaching the age of retirement, and by 2010 two-thirds of the teachers in the field of mathematic and science will retire (Friedman, 2006). Thirty years ago, America ranked third in the number of American students between the ages of eighteen and twenty-four who received science degrees and now America ranks number seventeen (Friedman, 2006). For the United States to rise to the top, the culture must promote an educational system, a governance system, and an infrastructure to connect and collaborate across the flat world (Friedman, 2006). There is a need for students to excel in the United States, and parents are aware of that need.

Problem Statement

Based on the data, students in the United States are performing at a lower rate than students in many other countries. With that news, parents are concerned that their children are not going to be able to compete in the global economy if they do not get a

solid education. Therefore, many parents take time to research schools and standardized test scores thinking that if they can find a school performing at a higher level than a similar school then their children will have a better chance at success.

When a parent has a choice between two Christian schools and areas such as distance, Christian influence, and qualified personnel appear equal, then the parent may lean toward the school with the higher standardized test scores. This can present a problem for a Christian school that is not performing at the higher end of the scoring scale on standardized tests. The effective school administrator will continually aim for academic success (Johnson & Uline, 2005). Administrators need to determine the factors that are affecting the science standardized test scores. For this reason, the following problem and hypotheses are presented: Why do students in some Christian schools perform at a higher standard in science on standardized tests compared to students in other Christian schools on standardized tests?

Null Hypotheses

Null Hypothesis 1a

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of seventh grade students in schools that use *A Beka Book* textbooks and those that use books from other publishers.

Null Hypothesis 1b

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of eighth grade students in schools that use *A Beka Book* textbooks and those that use books from other publishers.

Null hypothesis 1c

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of ninth grade students in schools that use *A Beka Book* textbooks and those that use books from other publishers.

Null hypothesis 2a

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of seventh grade students in schools whose approximate percent of science textbook completion is above 85% than those students in schools whose approximate percent of science textbook completion is at or below 85%.

Null hypothesis 2b

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of eighth grade students in schools whose approximate percent of science textbook completion is above 85% than those students in schools whose approximate percent of science textbook completion is at or below 85%.

Null hypothesis 2c

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of ninth grade students in schools whose approximate percent of science textbook completion is above 85% than those students in schools whose approximate percent of science textbook completion is at or below 85%.

Null hypothesis 3a

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of seventh grade students in schools that use a standard school admissions process and those that do not use a standard school admissions process.

Null hypothesis 3b

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of eighth grade students in schools that use a standard school admissions process and those that do not use a standard school admissions process.

Null hypothesis 3c

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of ninth grade students in schools that use a standard school admissions process and those that do not use a standard school admissions process.

Professional Significance

Since parents are concerned that their children are ready to compete in a global economy, parents often refer to test scores from standardized testing in Christian schools. Although some parents will rely upon the Biblical influence and godly foundation of the Christian school when determining where to place their children, most parents will still try to determine if their children will also be receiving a strong academic education.

Administrators know that test scores can be an influencing factor as to whether parents will enroll their child at the school; therefore, it is imperative to make the highest scores possible on the standardized testing. It is for this reason that the administrator must regularly analyze the test scores and try to determine what is affecting the test scores. The results of this study can help administrators consider whether publisher usage makes a difference when selecting textbooks and give administrators insight about whether completing a specific percentage of a textbook tends to make a difference. In addition, the study addresses whether standard school admissions processes such as GPA, test results, ability testing, and entrance exams have any relationship to test scores.

Methodology Overview

This causal-comparative study investigates the relationship between textbook publisher usage, the approximate percent of textbook completion, the standard school admissions process, and the achievement of seventh through ninth grade students on standardized science tests in FACCS secondary schools. Nine Mann-Whitney tests are used on the nine hypotheses through use of SPSS statistical software. For the purpose of this study, the dependent variable, total science test score, was referred to as standardized test score. The usage of textbook publisher, the approximate percent of textbook completion, and a standard school admissions process represented the independent variables. By exploring standardized test scores, an attempt was made to understand why some Christian schools are able to achieve higher standardized scores in science than other Christian schools. Group standardized test scores in the area of science from a representation of seventh through ninth grade students in FACCS schools were investigated. By determining if a possible relationship existed, further research can be completed.

Definitions of Key Terms

For the purpose of this study, the following definitions will help understand the terms in the context of the study:

Curriculum. the operational curriculum used by a school which includes the content, what the teacher teaches, and the learning outcomes (Posner, 1992)

Curriculum alignment. “listing the skills of the standardized tests and comparing them with the skills listed in curriculum objectives and curriculum materials” (Brent, Diobilda, 1993, p. 333)

FACCS. Florida Association of Christian Colleges and Schools (FACCS, 2008)

High-stakes testing. an exit exam that students must pass to graduate (Johnson, Thurlow, Cosio, Bremer, 2005), exams students must take to “move on to succeeding grades, graduate from high school” (Clarke, 2000, ¶2)

Learning outcomes. may be called standards, instructional objectives, learning objectives, target objectives, benchmarks (Walker, 2007)

Norm referenced. comparison of “a student’s performance with that of other students in a reference group” (Harcourt Assessment, Inc., 2003, p. 57)

Standardized tests. “has set rules for administration, such that everyone taking the test receives the same exact directions and has the same restrictions of time and resources” (Marchant, 2004, p. 2)

CHAPTER TWO

Review of the Literature

Articles, dissertations, and studies were accessed through EBSCO, Academic Search Complete, ProQuest, American Educational Research Association, ERIC and organizational websites. The researcher attempted to limit searches to the last ten years, although there were a few limited searches from earlier years that appeared relevant or provided a historical perspective. A broad search of the literature went into locating information on the theoretical framework, high-stakes testing, curricular differences, science textbooks in Christian schools, benefits of curriculum alignment, educational reform, textbook selection, a standard school admissions process, accountability testing, curriculum test overlap, Stanford achievement test, understanding standardized test scores, descriptive studies, ex post facto, curriculum studies, FACCS, and variations to these topics. Throughout the review of the literature, a closer look goes into the theoretical framework, high-stakes testing, Florida Association of Christian Colleges and Schools, *Stanford Achievement Test Series, Tenth Edition*, Christian school publishers (A Beka Book, BJU Press, *Accelerated Christian Education, Inc.*), curriculum publishers, textbooks, textbook completion, and admission processes.

Theoretical Framework

For the purpose of this study, the researcher will begin narrowing factors by analyzing which publishers are used in the seventh through ninth grade FACCS science classes, the approximate percent of textbook completion, and standard school admissions

processes in the Florida Association of Christian Colleges and Schools (FACCS). As Jones and Egle (2006) point out, instructional leaders want data from standardized tests to help with administrative curricular decisions. In the case of Christian school administrators, “Offering a quality spiritual and academic program is a moral obligation that Christian educators have to parents, pastors, to the constituencies of the school, and most of all, to God Himself” (Suiter, 2005, p. 6). The previous statement, presented at the American Association of Christian Schools Congress of 2005, follows in line with the educational principles of John Amos Comenius, the Father of Modern Education. Comenius, who believed in having an interest in the advancement of the child with clearly defined goals and objectives, was ahead of his time in the early 1600’s (Peterson, 2004). Pansaphia, a theory developed by Comenius, acknowledged that education consists of the intellectual, moral, and religious learning and that it was important that everyone had the opportunity to learn (Clemen, 2007).

Comenius, a Brethren Protestant, had three major interests in his lifetime: religion, education, and organizing knowledge into an encyclopedic form (cited in Parker, 1912). A thirty-year war between the Catholics and Protestants forced Comenius to leave Moravia, Austria, and during that time, Comenius was made bishop of the scattered Brethren. It was in the midst of the war, as he moved from country to country, that Comenius made great strides in his educational goals. He wrote a plan to place all knowledge in encyclopedic form and he argued that elementary education should be compulsory, which should include a basis of religion, and that man was created in the image of God (cited in Parker, 1912). He believed education went beyond the study of the Bible and that God should be the source of all things (cited in Parker, 1912).

Comenius understood that the foundation of a child started at home and through the five senses, a child should learn. He believed in using things to learn, such as objects and pictures, which is commonly called manipulatives in today's society (cited in Peterson, 2004). He also thought with repetition, review, and curricula that are more complex, students could gain mastery (cited in Glimpses of Christian History, 2009). These concepts and other theories of Comenius were presented in the *Great Didactic* where he wrote that both the teacher and student should keep careful records so that progress can be monitored (cited in Peterson, 2004). In 1658, Comenius published *Orbis Pictus*, an illustrated Latin text where 150 pictures illustrated various topics. This book has been considered a model for later primers (cited in Parker, 1912). Comenius believed man should display the glory of God (cited in Peterson, 2004). His pansophism educational philosophy has the same spiritual basis as Christian schools do today.

Comenius understood that God was the source of all, including truth and knowledge. He encouraged growth in learning through his example of writings in the *Great Didactic*, the *Orbis Pictus*, and his encyclopedic endeavors. Over three hundred years later, administrators in Christian schools understand as children grow academically, they should also grow in Christ. Herbster (1988) believes that Christian schools should have a Christian philosophy, a goal of Christ-likeness; and in the case of academics, the student should be striving as Christ strived in Luke 2:52 to increase "in wisdom and stature, and in favour with God and man." Colossians 3:23 states, "And whatsoever ye do, do it heartily, as to the Lord, and not unto men" (Bible: King James). This is true of the student, teacher, and administrator in the Christian School.

To be like Christ, one must know Christ. Throughout the curriculum and lessons of the day, the students in Christian schools should learn of God's nature, creation, thoughts, and desires. A Christian based publisher, who has the same mindset of Christ-likeness, can provide a curriculum with a Christian philosophy. It is up to the Christian administrator to make the final decision concerning publisher choice and other factors that affects the student's academic progress. Some thoughts by Herbster (1988) sums up the term philosophy:

In searching for truth, each man develops a system of values and beliefs that guide his every action. This system is his philosophy of life...The Christian must develop his philosophy by studying God's truth, the Bible (John 17:17). A man who derives his system of values and beliefs from any source other than God's Word is susceptible to worldly influences and error (p. 8).

What does Comenius and Christian philosophy have to do with this research? Both agreed on the need to have God in the education process and both understand the need to strive for continual growth. The Christian philosophy includes teaching God's truths from his Word as the basis for all things. In the classroom, the influences of today's world can cause students to become confused and misunderstand concepts in science such as creation and power. By using Christian-based publishers of science textbooks that establish God as the source of all knowledge, students can view science through the lens of God's Word. Taking the enthusiasm and drive from Comenius and his ambition to see growth, administrators can continually strive to find those factors that affect the learning process. The Christian school administrator must take the Christian

philosophy of education into account as he weighs in his mind how the accountability issues of the public sector affect the local Christian school.

High-stakes Test

In the best-case scenario, if a standardized test or high-stakes test is going to be given, the test should align with the standards taught; but as so many administrators and teachers know, this is not the case. A standardized norm-referenced achievement test purposefully includes a wide gamut of questions to spread out test scores, not to align with a local district's curriculum (Popham, 1999). There has to be not only questions that the students will know, but also questions that students are expected to miss to make differentiations in scores (McGehee & Griffith, 2001; Edigar, 2000). In other words, achievement test scores will reveal a distribution of scores for grade levels (Marchant, 2004). It is the score-spread that helps the results from an achievement test reveal relative performance (Popham, 2001). Since the standardized test is revealing scores based on a comparison of students from different portions of the country, the administrator must recognize that the local district's textbook and the content of the standardized test may not closely correlate which can result in lower scores (Marchant, 2004).

If the content area or objectives of an achievement test are not taught in the classroom, then test scores cannot reach the highest levels (Ybarra & Hollingsworth, 2001). There will be questions that will not align with the school objectives (McGehee & Griffith, 2001). Therefore, when making textbook decisions, educators can try to come relatively close to matching assessment objectives, but there will always be some questions which allow for the high and low percentiles (McGehee & Griffith). Educators find themselves in the position of making time and content adjustments to make sure the

objectives of particular standardized or high-stakes tests are covered (Hurwitz & Hurwitz, 2000).

By trying to cover the objectives of the high-stakes test, some teachers find that they are concentrating more on the testing objectives than the curriculum objectives (Hess & Brigham, 2000). Statewide assessment content is considered more valuable just because it is on the statewide assessment and therefore, it gets the most focus. Even though there is a lack of focus on specific curriculum objectives, the concentrated focus on objectives from statewide assessment may be exactly what some schools need to stay on track (Hess & Brigham). Through the usage of standardized tests and the policy-maker's emphasis on test-driven change, schools can focus on academic achievement (Neill, 2003). Possible negative consequences from low test scores motivate educators to make improvements (Hess & Brigham). As NCLB requires accountability from schools, parents appear to associate low test scores with ineffectiveness (Popham, 1999).

The accountability issue has led the public to question whether children will be able to compete with other countries (Hurwitz & Hurwitz, 2000). It has become evident that standardized test scores carry a level of importance to parents and should be evaluated, even in the Christian school environment. If a Christian school can provide evidence that the students are in a strong learning environment, parents appear to be satisfied and pleased that their children can receive both a Christ-centered education and a strong academic background. Academic quality in the school is important to a parent and if the expectations are not met, parents have the option of choosing another school (Lubienski & Lubienski, 2006). It is the job of the administrator of the Christian school to

determine what is best for the students in the Christian school. In the case of this study, FACCS administrators must review the factors that affect standardized test scores.

Florida Association of Christian Colleges and Schools

Since the research for this dissertation is directly related to FACCS, it is important to understand the foundation of the association. In a recent documentation of the historical journey of FACCS, Scott (2008) relays the following information. Dr. Janney founded New Testament Baptist Church in 1954 and founded Dade Christian School in 1961 after the U.S. Supreme Court voted against Bible reading in public schools. After the school grew to over 2400 students and other Christian schools in Florida grew at the same rate, even more government regulation appeared to be advancing. Dr. Janney responded by establishing the Florida Association of Christian Schools in 1968 which later became the Florida Association of Christian Colleges and Schools. Dr. Al Janney, Dr. Dan Burrell, and Dr. Dino Pedrone have all served in leadership positions as President of FACCS over the last forty years. In 2007, FACCS established the International Association of Christian Colleges and Schools (IACCS), which now includes schools in Africa and the Bahamas. As Dr. Dino Pedrone leads IACCS and FACCS, Christian school educators are challenged to be rooted in a Biblical worldview.

The schools in FACCS strive to make God's Word a foundation as goals and objectives are used in daily teaching (FACCS, Accreditation/Co-accreditation, 2008). FACCS currently has a directory of 97 schools of which 81 schools include grades seven through nine. Schools within the association report on an annual basis their *Stanford Achievement Test Series, Tenth Edition (SAT 10)* results, which are then compiled into a yearly report revealing grade equivalent scores, percentile ranking, and stanines based on

national scores. Standardized tests provide feedback that allows a school to view how students are performing and in what particular area students are improving (Schmoker, 2000).

A summarized report revealing grade equivalent scores and percentile ranks is located on the FACCS website (FACCS, Student Assessment Program, 2008) and reveals that FACCS students score above the national average on the *Stanford Achievement Test Series, Tenth Edition*. This self-monitoring of standards has been in existence in FACCS long before the call for action by the No Child Left Behind Act of 2001 (NCLB). Even though Christian schools are not under public school mandates, FACCS retains high academic standards (FACCS, Accreditation/Co-accreditation, 2008).

Stanford Achievement Test Series, Tenth Edition

The *Stanford Achievement Test Series, Tenth Edition* used by FACCS schools is a norm-referenced test where reported scores compare student or group performance with the performance of similar students or groups of the same grade level during the same time frame (FACCS, *Student Assessment Program*, 2008). The *Stanford Achievement Test Series*, which concentrates on important concepts and content, started in 1923 and was the first achievement test (Harcourt Brace & Company, 1997). The current series, the *Stanford Achievement Test Series, Tenth Edition* was published in 2003 and offers thirteen battery levels with two parallel forms that reflect “national curriculum and educational trends” (Harcourt Assessment, Inc., 2003).

As listed in Harcourt Assessment, Inc. (2003) norm referenced scores “compare a student’s performance with that of other students in a reference group” (p.57). Norm-referenced scores can be reported as grade equivalent scores, individual percentile ranks,

and stanines. Grade equivalent scores can be very confusing to both parents and some school personnel because many parents see the grade equivalent score and if it is above their child's grade level believe that their child can do that level work. In actuality, it means that if a fifth grader had a grade equivalency of a 9.1 "he or she scored the same as an average entering ninth grader would if the ninth grader took the fifth-grade test" (Mertler, 2003, ¶6). Since confusion arises in this area, grade equivalent scores will not be used for this study.

Harcourt Assessment, Inc. (2003), now under the direction of Pearson, Inc., produced a brochure titled *Guide for Classroom Planning*. According to this publication, individual percentile ranks and stanines must be interpreted in relation to students in the same grade who took the test during the same time. Individual percentile ranks do not represent equal intervals and changes in raw scores can affect the extreme ends of the scale more than the middle portion of the scale. In addition, one must clearly understand that scoring a specific percentile rank does not mean that the student answered that percentage of questions correctly. Instead, the individual percentile ranks indicate, "the percentage of a reference group obtaining scores equal to or less than that score" (Harcourt Assessment, Inc., 2003). The use of stanines does provide for a closer equity in distribution of ability if norm-referenced scores are used for interpretation. In addition, school administrators must also be careful to note that group percentile ranks and stanines relate to group norms, not individualized scores (Harcourt Assessment, Inc.). It behooves administrators to be cautious when interpreting test results and to consider which scores to use for interpretation.

For statistical purposes in this study, the more accurate scaled score from the group report in total science for seventh, eighth, and ninth grade students will be used. As Holloway (2000) points out, a scaled score can help a school view the current status of a student's academic achievement. The scaled score "has been transformed mathematically and put on a scale to allow comparisons with different forms and levels of a test" (Mertler, 2003, ¶5).

The *Guide for Classroom Planning* (Harcourt Assessment, Inc., 2003) explains information concerning the interpretation of scaled scores:

The Stanford 10 scaled-score system links together all thirteen levels and all forms of the series. The scaled-score system forms a continuous scale of uniform intervals that makes it possible to compare scores within a given content area from level to level and form to form. Scaled scores are especially suitable for comparing results when different forms or levels of the test have been administered and for studying change in performance over time. Each subtest and total has its own system of scaled scores.

While scaled scores are useful for comparisons from form to form or level to level within a subtest or total, they should not be used to compare one subject area to another. (p. 57)

As confusing as the interpretation of scores can be, it is important that data be provided to constituents to prove that students are in a competitive learning environment. Although administrators may understand that standardized tests are not testing one local school's specific goals and objectives, parents see the test results as a strong sense of direction. If parents are not satisfied with grades alone based on criterion referenced

testing and assignments, then providing standardized testing can be an asset, if the scores are high enough.

Christian School Publishers

Christian schools in the studied association are interested in ensuring students view science through the lens of God's Word as evidenced in the accreditation standard 1.0 (FACCS, 2008, Accreditation/Co-accreditation, ¶6). According to Dr. Dino Pedrone (2004), the current president of FACCS, Christian educators should commit to excellence and lead children to the knowledge of God. Dr. Daniel Brokke (2007), emphasizes, "Godliness is the foundation of Christian school education" (p. 28). As is the case with most Christian schools, FACCS Christian schools must aim toward a Biblical foundation. A Christian philosophy would be difficult to integrate without a Godly foundation through text; therefore, it is assumed that Christian schools will use Christian textbooks in the field of science. Hypotheses 1a-1c was studied to help determine if Christian schools are using Christian-based publishers in the science classroom and if publisher choice affects standardized test scores.

There was a limited amount of research located that dealt with science publishers in Christian schools, although a 1986 dissertation was located that centered on kindergarten through sixth grade students. It was noted that out of overall curriculum choices, the three main Christian publishers were *A Beka Book*, *Accelerated Christian Education*, and *BJU Press*. However, two companies, *A Beka Book* and *Accelerated Christian Education, Inc.* were the primary choice of science textbooks for kindergarten through sixth grade in Christian schools in Missouri (George, 1986). George (1986) also pointed out that the smaller schools appeared to use the individualized materials of *A.C.E.*

while the larger schools appeared to use *A Beka Book*. At that time, *BJU Press* materials were used in one school out of twenty-one schools in the Missouri study with *A Beka Book* and *A.C.E.* splitting at ten schools each using their respective curriculum. This dissertation will add to the body of literature by expanding research to different grade levels and a different state after thirty years of usage.

A direct request was sent to *A Beka Book* and *BJU Press* to determine if they had participated in any research studies or knew of any research surrounding the respective publishing companies. *A Beka Book* responded that they did not know of any research. *BJU Press* responded with reference to a published study. The director of marketing from *BJU Press* provided a link concerning a blind study of 245 Christian schools, which revealed that schools using *BJU Press* in grades five and eleven performed higher than schools that did not use *BJU Press* (*BJU Press*, 2008, Test-scores, ¶2). In grades six through twelve, scores were “at or above those schools using different publishers” (*BJU Press*, 2008, Test-scores, ¶2). The *BJU Press* study reflects that publisher trends may be tracked.

Administrators can make decisions that are more informed when they are aware of the facts. Therefore, to help answer the first hypothesis, the survey instrument included a question dealing with publisher usage by FACCS schools in the area of seventh through ninth grade science. A brief synopsis of the popular Christian publishers of science textbooks, *A Beka Book*, *BJU Press*, and *A.C.E.*, will help the reader to understand the foundation for biblically based science textbooks.

A Beka Book materials have been used and tested for over fifty years at Pensacola Christian Academy in Pensacola, Fl. Throughout the last thirty years, *A Beka Book* has

sold their materials to Christian schools for all grade levels (*A Beka Book*, 2008, Our Foundation, ¶1). Dr. Arlin Horton established *A Beka Book* “to provide Christian schools with God-honoring, high-quality textbooks and teaching aids to help each school fulfill the goal of its ministry” (*A Beka Book*, 2008, Our Foundation, ¶1). With other biblically based science publishers available, the researcher tried to determine if *A Beka Book* continues to play a part in the academic success of Christian schools.

Dr. Bob Jones III saw the need for Christian textbooks for Christian schools and in 1974, *BJU Press* began publishing with a Biblical worldview in mind. By the mid-nineties, there were materials for all grade levels. Throughout all of the materials, the “underlying educational philosophy remains unchanged: to help train Christ-like students who excel in life, in work, and in witness” (*BJU Press*, 2008, Education-philosophy, ¶2). It is clear to see that the expected Christian school emphasis should be one of a Biblical worldview.

Accelerated Christian Education, Inc. (A.C.E.) published a historical document on their website, which showed the company began in 1970 when Mr. and Mrs. Donald Howard founded a learning center in Garland, Texas. By 1971, there were six new schools and the site states that by 2005 there were 686 schools using the curriculum that allows students to work independently and advance at their own speed of achievement (*Accelerated Christian Education*, 2009, About Us, ¶1). The goal of A.C.E. is “to prepare children for the world today and give them the academic and spiritual tools necessary to achieve their God-given potential” (*Accelerated Christian Education*, 2009, About Us, ¶1). Just like *A Beka Book*, and *BJU Press*, *Accelerated Christian Education, Inc.* has a clear focus on including the spiritual emphasis in its materials.

A Beka Book and *A.C.E.* were the major publishers used in the Missouri study, but *A.C.E.* appeared to be popular in the smaller Christian schools while *A Beka Book* was popular in the larger schools (George, 1986). Griffin (2003) wrote a dissertation evaluating kindergarten through second grade level *A Beka Book* curriculum that showed positive results in the alignment of curriculum to the *Stanford Achievement Test*. The *BJU Press* article stated that schools using their curriculum performed higher than schools using other curriculum. In McCann's (2003) descriptive section of his dissertation, he uncovered the usage of *A Beka Book* along with four other secular publishers in the area of math in a study of second through fourth grade students in Christian schools (2003). Although there were these few studies for lower grade levels, no studies that involved upper grade levels in the area of science publishers used in Christian schools were found by this researcher. Since very few dissertations concerning Christian publishing companies could be located, it is worth investigating publisher choice across upper grade levels to add to the body of information for the FACCS schools so that administrators can make informed decisions.

Curriculum, Publisher, Textbook

Many educators believe curriculum is all materials used to complete the academic need, not a single textbook. As White (2004) notes, "A curriculum is a complete teaching program. It includes textbooks, curriculum guides, supplemental materials, goals and objectives, scope and sequence, and a variety of other material" (p.14). Curriculum is not necessarily one textbook, but rather what a particular district specifies in content, instruction, and sequence over a specific amount of time (District Administrator, 2009). This researcher holds to the view that curriculum refers to the

collective group of material and textbooks to teach objectives and a textbook is one text by one particular publisher. For the purpose of this study, the term *publisher* will be used to identify the publisher of the primary textbook used for any given science class, not the overall curriculum. Some schools create their own curriculum or mix textbook publishers while some schools use one textbook as a primary source. Every publishing company offers a variety of textbooks, but if a trend toward the publisher that is used in FACCS schools can be studied along with achievement on standardized tests, a more detailed focus can go into other factors affecting student achievement. This study attempts to determine science book publishers used and whether there are any significant differences in test scores based upon that usage.

Phillips and Mehrens (1988) conducted a study with reading and math textbook series for grades 3 and 6 that represented over 1550 third-grade students and 1,700 sixth-grade students. Although Phillips and Mehrens were quick to conclude that results may change if different textbook series in other countries are studied, Phillips and Mehrens (1988) concluded from that study that actual textbook series used had little impact on scores and achievement of items in subtests. Was this because there was not a content match? Marchant (2004) describes a study where five achievement tests for grades four through six and four textbooks were compared. The result indicated that achievement tests and textbooks revealed less than a 50% match. According to Hess and Brigham (2000), E.D. Hirsch points out that “nonuniform curriculum is a problem in a highly mobile society. Students can move from the upper quartile to the lower quartile of their school simply by moving 20 miles down the road to a school that follows a different curriculum” (p. 27).

Researchers have supported the idea of curriculum content influencing test performance as they examined curriculum-test overlap with third and fourth grade students and two different individual achievement tests in the area of reading (cited in Bell, Lentz, & Francis, 1992). Three reading achievement tests were used in a similar study and the results showed curriculum bias in testing which reveals that curriculum choice made a difference on achievement testing (Bell, et al., 1992). In the descriptive statistics of a dissertation on grade inflation, five math publications were compared that revealed users of specific math textbooks showed a significant relationship between grades and Stanford 9 scores (McCann, 2003). In this study, *A Beka Book* math was included, but in comparison to four other textbooks for second through fourth grade students, *A Beka Book* proved to test statistically significant, along with all of the other curricula tested except for one. The results of McCann's (2003) research question revealed, "the magnitude of effect was higher for scores by textbook selection than any other category" (p. 74).

Morse, a reviewer of the *Stanford Achievement Test, Tenth Edition for Mental Measurements Yearbook* reminds the reader that all users should "determine the degree of fit to the local curriculum" (Harcourt Assessment, Inc., 2004, Commentary, ¶ 2). This statement given by the company that distributes the *Stanford Achievement Test, Tenth Series* suggests that the administrator must consider the skills measured on the test and the relationship to the actual curriculum. According to Bell et al. (1992), the administrator should choose a test because it fits the educational goals of the school system. The opinion on whether publisher choice makes a difference has not been settled, especially in the area of Christian curriculum.

Textbook Completion

The second hypothesis related to whether a specific percentage of textbook completion is important in student performance on standardized test. For clarification in this study, the approximate percent of science textbook is based on concepts taught from a given textbook. The percent of completion does not mean that every question from every page must have been completed, but rather that the concepts from each of the pages have been taught. It is understood throughout this study that teachers will often supplement the primary textbook, but what is not known is how much emphasis is placed on the usage of the textbook in the teaching of science at the secondary level.

Some teachers use the textbook as a resource and others use it as the primary textbook. According to the literature, there are many schools where the intended curriculum and textbook is altered to accommodate for more intense focus on tested material. Some teachers focus on specific high-stakes testing information rather than the scope of the intended curriculum (Marchant, 2004; Perrone, 1992). Amrein and Berliner (2003) point out that some teachers eliminate sub-areas of the curriculum if the teacher knows the material will not be on a test. In fact, the teaching of entire subjects may be eliminated or reduced if the material is not on a test (Neill, 2006). It has been documented that 79% of the teachers who taught in states that had accountability testing focused on the area of study that was being tested (King & Zucker, 2005). According to the National Research Council, Japan and Germany only cover six to eight content areas per year in science textbooks compared to schools in the United States where science textbooks cover sixty to eighty topics per year (cited in Bybee, 2007). The narrowing of content may be a factor as to why some of the other nations perform ahead of the United

States in the Trends in International Mathematics and Science Study and Program for International Assessment. Early studies of content coverage examined the idea of the number of textbook pages covered with mathematics achievement (Anderson & Lorin, 2002) to determine if pages covered affected scores. There is plenty of literature that shows teachers are limiting material, but how does the limitation of content affect test scores? Neill (2003) holds to the belief that if students have not been taught the full curriculum, it results in inflated scores and misleading results due to the repetitive review of the primary objectives on the test rather than the school objectives.

Some administrators are very concerned about how the lack of content coverage will affect the student. High test results are such a concern, that teachers in Alberta, Canada are concerned that the provincial achievement exams appear to be the curriculum more than the set curriculum (Wallace, 2000; Levinson, 2000). With the skipping of content material, students miss content standards, which carry consequences to their learning (Oswald, 2008). Some teachers spend additional time on reviewing for the tests, eliminating opportune class time for completing other curriculum material (Clarke, 2000; Oswald, 2008). There are schools that appear to be sacrificing practice on higher thinking skills and understanding to ensure standardized test content is efficiently covered (Perrone, 1992). As seen in the research, some schools are limiting content, but others believe that the full curriculum should be taught to have higher success. With this in mind, administrators continue to look for textbooks that closely align with the standardized test.

To help with this search, many researchers have completed content analysis research and reviews of textbooks to determine curriculum alignment. The U.S.

Department of Education, Institute of Education Science, has a website titled *What Works Clearinghouse*. Within the website, reviews and effectiveness ratings are given for reading and math textbooks. A funded study by a grant from the David and Lucille Packard Foundation reviewed middle school texts although it does not appear to include curriculum alignment. The American Association for the Advancement of Science (AAAS) website investigates curriculum and standards alignment through a curriculum-materials analysis procedure and is supported with funding from the Carnegie Corporation of New York (Kulm, 1999). Although the site for AAAS offers extensive information on evaluation of textbooks, Christian textbooks are not included in the site.

Decisions made by the administrator can be complex, especially when dealing with curriculum. The administrator may like to align with the test, but questions from standardized tests are not selected from one particular text. Therefore, when a textbook is selected, the administrator must decide if all of the content and objectives in the book need to be covered or if the textbook can be limited. Hypothesis two of this research hopes to provide trends of textbook completion in Christian schools for use in future decision making.

Standard School Admissions Process

A third factor to consider is whether the reason for higher test scores is because the school already has defined limiters in the admissions process that produces a higher test result. If a school includes a minimum grade point average as a prerequisite for admissions into the school, students with lower abilities will not be able to attend the school. By limiting admission due to grade point averages, some administrators assume the testing population would have higher scores on standardized tests that would affect a

school's overall group scores. When parents are examining various schools to determine the best fit, a look at achievement test score averages is frequently at the top of the list and high test results may be the determining factor concerning which school a parent chooses.

Reviewing grade point averages to determine if a student may gain entrance to the school is not a new concept. The state board of education of Idaho considered making it a requirement for middle school students to have a cumulative C average or higher in core subjects, which would include passing a pre-algebra class. The proposal to require a C average in middle school to move to ninth grade did not pass the state board of education of Idaho, but the board did approve the requirement to take additional rigorous high school math and science courses (Jacobson, 2005). Although grade point average can be a concern, to this point, a study of Christian schools has not been located that revealed whether schools actually include grade point averages as part of the admission policy.

If a school refers to an ability index when making a decision for school entrance, achievement scores can be higher (Rothstein, 2005). This falls in line with the same reasoning as mentioned in the area of grade point averages. A student with a higher ability may positively affect group test scores, which can result in parents choosing one school over another due to test scores. Many FACCS schools administer the Otis-Lennon School Ability Test (OLSAT), a measurement of school ability, during the same testing period as the administration of the *Stanford Achievement Test, Tenth Edition*.

The Otis-Lennon School Ability Test measures a student's abstract thinking and reasoning abilities. Students are tested in both verbal and nonverbal areas, and raw scores

are converted to school ability indexes. Based on the Kuder-Richardson 20, the Otis-Lennon School Ability Test holds an internal consistency co-efficient range of .88 to .95, which can be classified as internally consistent (Domino & Domino, 2006). The administrator may take information from the Otis-Lennon School Ability Test, along with other factors such as grades and entrance test scores, to determine if the child will have the ability to keep up with the pace of the curriculum.

Some schools may enroll students based upon their ability in a particular subject area such as in music, technology, art, or dance (West, Hind, & Pennell, 2004). Other schools may use an ability test to identify children who are academically gifted. If a school limits entrance according to ability index quotients, then schools may have higher test scores due to an admission process that controls student ability (Flinders, 2005).

The same is true if a school limits access to the school based upon entrance test scores. Some schools use entrance tests to determine if the student is prepared for the rigor of the classroom. The entrance test may be designed by an individual school or designed by a publishing company specifically to help determine academic achievement level. One specific test used by several specialized schools in New York City is the Specialized High Schools Admissions Test. The test includes verbal and math scores that are reported through scaled scores. Based upon the rank of the scores, students are assigned to their specialized high school until the seats are full (NYC Department of Education, 2009, Test Information). According to a representative from the New York City district, only 5,200 students out of 26,000 students were offered seats in specialized high schools. Yet, a director of a New York City bank and a former student at one of the specialty schools whose daughter had to go through the testing process suggested that

there are no studies that support the validity of the Specialized High Schools Admission Test. The district data that he reviewed did not appear to support the usage of the test (Samuels, 2008). In the case of the New York City specialized schools, seats were limited and the schools were able to select the top test takers as a predictor of those students who would have the best chance to complete the program. In this case, the school system used a specialized test to narrow the application field.

Some entrance tests at FACCS Christian schools are given, not to find the top student and eliminate average or low achievers from the student body, but to ensure the student has enough foundational knowledge to have success in the classroom. The entrance test given in this situation is administered to determine that there are no major knowledge gaps in a particular subject area that would prevent the student from achieving with the rest of the class. If a student wants to enter a school in sixth grade and the student's knowledge base is approximately two years behind, the parent and school administrator must decide if the gap is too wide to succeed in the classroom or if remediation while attending classes can take place. When entrance tests are administered to help determine a student's placement, the administrator must have confidence that the entrance test will accurately reflect the student's ability to maintain the academic pace at the school. The usage of entrance test scores requires the administrator to reflect on the school's philosophy concerning the standard school admissions process.

The Christian school must balance its admission decisions around the student body that it is able to physically support and still provide a quality education. If a child does not provide enough foundational evidence on the entrance exam to succeed in the regular classroom, or if the child has special needs, the administrator must then evaluate

the services that can be provided (Taylor, 2005). Sizes of schools that participated in this study ranged from approximately 40 students to over 1700 students. Larger Christian schools have more facilities and teachers, which could translate to more services for students with special needs. The larger schools may have enough personnel, teacher aides, and classroom space to allow all students entrance without having to go through any formal evaluations or admission procedures. The larger school may be able to offer alternative classroom settings if a student is behind in a particular subject matter because there is space and qualified teachers on staff able to support the student. However, some of the smaller schools may not have the space or extra personnel to help a student overcome deficiencies. The smaller Christian school may only have one classroom per grade level with one teacher. In this situation, the teacher is limited in the number of students with learning deficiencies that can be adequately served in any given day. The services that a school can provide, versus wants to provide, may play a part in the answer when reviewing the relationship between achievement test scores and the standard school admissions process. Taylor (2005) notes that there is very little literature that details the types of services provided by private schools as well as which schools provide services.

If a student passes the entrance exam, but there are learning difficulties that must be addressed, the offering of services through an alternative classroom may not be available. Instead, many small schools try to help students succeed by offering accommodations. The accommodations will be as varied as the types of learners. Some student's may need extra time on tests, dictation of tests, or the availability to write in a test booklet (Dillon, 2006). Other students may need preferential seating or half

assignments as an accommodation. The important concept to remember is that the accommodation must fit the needs of the individual child.

The usage of an entrance exam may affect the results on the standardized achievement test scores. McCann (2003) suggested that the selection process for student enrollment in Christian schools might be why students in private schools have higher scaled achievement test scores than public school students. The example given by McCann detailed that some schools may only allow students who score above the 50th percentile to be admitted. If a school does not have a standard school admissions process, students from all achievement levels will be taking the end of the year standardized tests. The school that includes a broader academic population may have lower yearly standardized test scores than a school that has a stricter acceptance policy by only accepting already higher achievers.

All of the standard school admissions processes discussed in this study translate into one decision. Will the Christian school be open to provide a biblically based education to all students or will the Christian school be serving primarily the college-bound student? If the desire of the school administration is to obtain the highest test scores, entrance examination for selection of the highest academic achievers may be the direction a school chooses. However, if the maintaining of average to above average standardized test scores is acceptable to a school, entrance examinations for foundational evidence may be the direction a school chooses. By opening up the doors to a wider academic base of students, more students will have the opportunity to learn about the Lord Jesus Christ as spiritual concepts are incorporated throughout all aspects of the learning process. If the desire of the school administration is to allow all students to have

availability to a Christian philosophy of education, then the school must have the facilities and personnel qualified to help all levels of students.

By completing research concerning the practices of FACCS schools, literature can be available concerning admission factors such as grade point averages, the use of an ability index, and scores on entrance tests. In this study, schools have been reminded about the accountability issue, and administrators must try to determine what factors are affecting test scores. High school grade point averages and standardized test scores have been factors studied that predicted academic success for college students (Adebayo, 2008). Ability indexes and entrance tests are two additional factors that could possibly affect standardized test scores, which should be investigated, as administrators keep the accountability issue in mind.

CHAPTER THREE

Methodology

Overview of the study

The purpose of this study was to help administrators determine why some students in Christian schools perform at a higher standard in science on standardized tests compared to other students in Christian schools on standardized tests. To complete this task, this chapter describes the design of the study, the participants, data gathering methods, instrumentation, sampling procedures, data analysis procedures, and limitations of the study. This causal-comparative study was drawn from FACCS to determine if possible relationships exist between the dependent and independent variables. Further research can be completed based upon the results of this study. The problem of this research study is why some students in Christian schools perform at a higher standard in science compared to other students in Christian schools on standardized test scores.

The researcher directed the study to science group scores, textbook publisher usage, approximate percent of textbook completion, and the standard school admissions process as possible factors affecting higher standardized test scores. By reviewing the aforementioned list of variables from all reported schools, administrators can gain a preliminary look into factors that may affect standardized test scores.

Design of the study

This causal-comparative study was designed to analyze data from the population of FACCS. To participate in the study, school administrators documented that they used

the *Stanford Achievement Test Series, Tenth Edition* in 2006-2007, and seventh through ninth grade students were part of the school population.

A causal-comparative study, also commonly termed an *ex post facto* study, cannot manipulate the independent variables since the changes in the variable have already taken place (Ary, 2006). In a causal-comparative study, a comparing of two groups that have already been formed takes place so that it can be discovered if there is a reason for the effect, although certainty with this type of study cannot be established (Schenker & Rumrill, 2004). Based on time dimension, this study falls under cross-sectional research since data for the survey were collected across one brief period (Johnson, 2000).

This study includes questions pertaining to the dependent variable, total science scores on the *Stanford Achievement Test Series, Tenth Edition*, and the independent variables of textbook publisher usage, the approximate percent of textbook completion, and the standard school admissions process. Since the variables cannot be manipulated, the research fits Ary's (2006) explanation of a causal-comparative that this type of study "starts with groups that are already different and tries to determine the consequences of or the antecedents of these differences" (p. 357). Variables are not manipulated in this study, which lends itself to a causal-comparative study allowing administrators to view quantitative data. Although cause and effect cannot be determined in this study, the primary focus is to determine what possible factors allow for a higher performance on standardized testing for FACCS schools in the area of science.

Null Hypotheses

The following null hypotheses were investigated:

Null Hypothesis 1a

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of seventh grade students in schools that use *A Beka Book* textbooks and those that use books from other publishers.

Null Hypothesis 1b

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of eighth grade students in schools that use *A Beka Book* textbooks and those that use books from other publishers.

Null hypothesis 1c

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of ninth grade students in schools that use *A Beka Book* textbooks and those that use books from other publishers.

Null hypothesis 2a

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of seventh grade students in schools whose approximate percent of science textbook completion is above 85% than those students in schools whose approximate percent of science textbook completion is at or below 85%.

Null hypothesis 2b

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of eighth grade students in schools whose approximate percent of science textbook completion is above 85% than those students in schools whose approximate percent of science textbook completion is at or below 85%.

Null hypothesis 2c

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of ninth grade students in schools whose approximate percent of science textbook completion is above 85% than those students in schools whose approximate percent of science textbook completion is at or below 85%.

Null hypothesis 3a

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of seventh grade students in schools that use a standard school admissions process and those that do not use a standard school admissions process.

Null hypothesis 3b

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of eighth grade students in schools that use a standard school admissions process and those that do not use a standard school admissions process.

Null hypothesis 3c

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of ninth grade students in schools that use a standard school admissions process and those that do not use a standard school admissions process.

Participants

The FACCS accrediting agency was contacted to determine if *Stanford Achievement Test, Tenth Series* group reports from 2006-2007 could be secured for this study. However, it was stated that the researcher would need to contact the schools individually. Following approval of the survey, it was sent to the administrators of all FACCS schools listed on the FACCS website that had seventh through ninth grade

classes. *Stanford Achievement Test, Tenth Series* scores were requested along with other information to help determine factors affecting the research question.

The population consists of 81 FACCS schools that enroll seventh through ninth grade students. Total school enrollments range from five to 2459. Statistics taken from the FACCS website (2008) reveal a total of 28,997 students in schools that enroll seventh through ninth grade students. For the purpose of this study, only scores from seventh through ninth grade students in FACCS schools were included. The number of participants was based upon the number of schools volunteering to return the survey instrument out of a total possible participant level of 81. A total of 39 schools responded with 34 schools returning usable surveys. The returned group reports from the 34 schools represented 3373 students. A Beka Book Academy, which was on the FACCS list, was not included in the study since it represents 8,494 students undergoing DVD and parent programs for distance learning. Home school settings were also deleted from this study.

Data gathering methods

The 2007 *Stanford Achievement Test Series, Tenth Edition* scores were used to analyze scaled scores in total science for seventh, eighth, and ninth grade students from the 81 possible participants. The technical data report of 2004 reports that the *Stanford Achievement Test Series, Tenth Edition* has established content validity, is nationally normed, and holds a high degree of internal consistency and reliability (Harcourt Assessment, Inc., 2004). Based on the Kuder-Richardson 20, the *Stanford Achievement Test Series, Tenth Edition* holds an internal consistency co-efficient range of mid-.80's to .90's, which is satisfactory to serve its purpose (Cronbach, 2004). "The reliability of a standardized test is verified by statistical evidence gathered by the test publisher during

national studies in which representative groups of students take the test under standardized conditions. By aligning a standardized test with the instructional standards that it is intended to measure, a test publisher can ascertain one facet of the test's validity" (Zucker, 2003, p. 3).

The 2007 *Stanford Achievement Test Series, Tenth Edition* test scores were collected and documented on a Microsoft Excel spreadsheet that listed the school name, administrator name, type of accreditation, school enrollment, grade levels, and email address. A second Microsoft Excel spreadsheet was created to store statistical information with codes representing the school. The information from the second Microsoft Excel spreadsheet was transferred to SPSS 15.0 for analysis. A total of 34 administrators provided useable information for the study.

Names and email addresses of all FACCS schools were located on the FACCS website. Emails with an attached survey were sent to all schools whose information showed an enrollment that included seventh through ninth grade students. Due to the convenience of technology and the immediate access to administrators, surveys were sent using email addresses with the option of return through email, fax, or regular mail.

The survey (Appendix A) was preceded with an introductory letter (Appendix B) that explained the steps for completing the survey, including the need to locate the 2006-2007 *Stanford Achievement Test Series, Tenth Edition* group score sheet for seventh through ninth grade students. An attachment included a face sheet (Appendix C) and survey. The face sheet included a location for the school name and administrator name. The retaining of a face sheet provided the researcher with the ability to document who did or did not return a survey. Any school administrator who did not return a survey

within seven days was then sent a second email. School administrators who did not respond in the second email were later sent a third email and called to determine if the school would like to participate. The actual two-page survey followed the face sheet in the attachment. As administrators returned the surveys, the face sheet was separated from the survey and filed away so that a listing of schools who responded could be maintained. Administrators were reminded in the introductory cover letter that school statistics would not be linked at any time to school names.

Instrumentation

A thorough review of EBSCO, Proquest, Academic Search Complete, Academic Search Premier, Educational Resources Information Center (ERIC), Liberty's Digital Commons, and Education Research Complete was completed to determine if a survey existed that fit the needs of this study. The researcher searched for surveys that included the key variables identified in this research, but no instruments or studies were located that measured the same variables of this study. Since this researcher did not locate an instrument that included the categories desired, a survey was designed reflecting the exact needs of the study and then field-tested with three school administrators within the association. The survey was designed to obtain information from administrators relating to standardized test scores, publisher usage, textbook completion, and a standard school admissions process. Questions were chosen based upon the researcher's 26 years of experience as a FACCS educator of which 10 have been as an academic principal. The survey questions were developed to help the researcher determine if significant differences existed in the dependent and independent variables of the hypotheses. Quantitative data from the surveys were collected.

The field test by three experienced administrators determined clarity, conciseness, and the ability to gather information. All three validators were seasoned administrators whose schools take the *Stanford Achievement Test, Tenth Edition* and use primarily Christian publishers in their school systems. One administrator, an assistant director, has 37 years of experience working in the same Christian school, which includes 10 years of experience overseeing the usage of Christian-based curriculum, and school achievement testing. The second administrator has 48 years experience as an educator and 35 years of experience as an administrator, which includes reviewing all new textbooks and implementing additional resources into the science and social studies area. The third administrator, a headmaster, is from south Florida and holds a doctorate in educational leadership. This administrator holds 25 years of experience as an administrator who also taught Chemistry and Physics in the classroom, which gives him insight into the achievement level of the students. He has also completed curriculum and textbook review from grades one through twelve in multiple subjects. The validators from the three Christian school settings have student body populations ranging from approximately 200 to 750 students.

According to Ary (2006), a colleague's review of the survey content to seek whether the survey is valid for its intended purpose helps a survey establish face validity. The validators had extensive experience with admission policies for their schools over multiple years and knowledge of curriculum and achievement tests; therefore, once given the survey, they would immediately recognize any problem issues. The survey questions included ordinal and nominal questions, which provided a clear direction for respondents when filling out the survey. There were no apparent misunderstandings in the reading of

the questions or understanding of what was asked; therefore, no changes were made to the survey. The agreement and feedback from the test validators helped establish face validity (Appendix D). A return request date of seven days was extended.

Questions from the survey corresponded to hypotheses one through three.

Question 1 of the survey determined if the identifying *Stanford Achievement Test Series, Tenth Edition* was administered at the school. To be included in the study a *yes* answer had to be answered on question 1. Questions 2-5 were dichotomized questions specifically relating to hypotheses 3a-3c. This format of yes versus no questioning gave the researcher insight into usage of the standard school admissions process that can be explored in future studies. Questions 6-8 are additional questions that can be investigated in future studies.

Question 9 correlated with hypotheses 2a-2c in a nominal format. The administrator was advised in the survey that the approximate percent of the textbook used is in reference to objectives per unit covered, not every question or assignment of every page covered. By using nominal statistics, distinctions could be identified when compiling the results.

Questions 10 and 11 on the survey correlated with hypotheses 1a-1c allowing the researcher to identify all publishers used per grade level compared to total scalene science scores.

Comment sections were provided in the survey. One suggestion was given to change the wording in the introductory letter, which was completed. All three validators agreed that the directions were clear and the survey was easy to navigate. The survey took approximately 10 to 20 minutes to complete, depending upon the administrator ease of gaining access to the group report scores. One administrator had difficulty returning the

survey by email, which prompted the researcher to provide the additional return methods of mail and fax. One comment was made concerning text wrap, which was checked before surveys were sent to the schools. One administrator voiced that the study will be very useful and another administrator commented about other factors that may affect test scores such as demographics, ethnic groups, and science training. Additional comments pertained to individual school situations concerning. Since administrators wanted to clarify issues, it verified the need to keep a comment section. One administrator stated that the teacher focused on the objectives being taught and used the text as a resource. Due to this comment, an additional comment on the definition of approximate percent of textbook in relation to the survey was made on the survey instrument for question nine.

Following the approval of the survey questions by the committee, the researcher applied for Institutional Review Board approval. After approval was granted, a survey was sent by email to the administrator of the FACCS schools. This step involved sending an introductory cover letter (Appendix B) to the principal via email with a survey (Appendix C) attachment that included an explanatory comment concerning personnel completing the survey. Surveys were returned through email with other options of returning the survey by a fax number or by regular mail. The latter option was given for those schools whose administrators determined this was an easier or more convenient option. The introductory letter explained the reason for the dissertation, a brief synopsis of the research problem, assurance of confidentiality, information needed to complete the survey, and researcher contact information. The letter also stated that the principal may have another office or school personnel such as a curriculum specialist help with the compiling of the quantitative information. Participation was on a voluntary basis.

A second email occurred after the completion deadline of the initial mailing. The second email was given a five-day response time. A phone call was then placed to all schools who did not respond after the second attempt. If it was determined the school did wish to participate, a third email was sent with a five-day response time. The actual returned survey was placed in a separate file. Information from the survey instrument was placed in a second Microsoft Excel spreadsheet that stored codes representing statistical information from the survey. Schools were listed by codes to provide anonymity. The information from the second Microsoft Excel spreadsheet was transferred to SPSS 15.0 for analysis.

The *Stanford Achievement Test Series, Tenth Edition*, also referred to as the Stanford 10, is used by FACCS schools as a norm-referenced test where reported scores compare student or group performance with the performance of similar students or groups of the same grade level during the same time frame (FACCS, *Student Assessment Program*, 2008). The *Stanford Achievement Test Series, Tenth Edition* offers the school a variety of assessment formats. The school has the option of purchasing this edition in multiple-choice format, open-ended format, writing prompt format, or a combination format. There are full and abbreviated tests available, which can be adapted to include some of the local school's criterion references or norm referenced information. The current series, the *Stanford Achievement Test Series, Tenth Edition* was published in 2003 and offers thirteen battery levels with two parallel forms. The math portion of the *Stanford Achievement Test Series, Tenth Edition* emphasizes the principles and standards of the National Council of Teachers of Mathematics. Process skills are assessed in the Science and Social Science area while Language is assessed through sentences and

paragraphs with the option of assessing through student writing. (Harcourt Educational Measurement, 2003).

A national try-out program of over 170,000 students and over 10,000 teacher questionnaires provided data that helped with the finalization of the test items. The actual norms for the Stanford Achievement Test, Tenth Edition were based on 250,000 students for the spring standardization and 110,000 students for the fall standardization using the K-12 population of 2002 (Cronbach, 2004). Norm-referenced scores can be reported as individual percentile ranks, stanines, group percentile ranks and stanines, normal curve equivalents, and grade equivalents. Other types of scores available are raw scores, derived scores, scaled scores, and content-criterion referenced scores (Harcourt Assessment, Inc., 2003). The Kuder-Richardson 20 reveals a satisfactory internal consistency co-efficient range of mid-.80's to .90's (Cronbach, 2004).

The *Stanford Achievement Test, Tenth Edition* mixes the question items rather than inserting questions from easy to hard, and it is untimed in its administration. The tenth edition version uses color illustrations to help it appear more like used textbooks and help alleviate student anxiety (Cronbach, 2004). Reading, Mathematics, Language, Spelling, Listening, Science, and Social Science are the subtests for grades seven through nine, the grade levels represented in this study.

Sampling Procedures

Compiling a list of Florida Association of Christian College and Schools (FACCS) from the official FACCS website was the first step in this study. This was a necessary step early in the process to determine the amount of possible school participants for the study. In order to participate in the study, schools had to be a FACCS

school, administer the *Stanford Achievement Test Series, Tenth Edition* in 2007 to seventh through ninth grade students, and return a completed survey. Names of all schools with grade levels seven through nine were placed in a Microsoft Excel database with identification areas of a school code, total school population size, grades seven through nine population size, total grade levels at the school, email addresses, and principal name. The total number of identifiable FACCS schools with grade levels seven through nine was 81. Following approval from the dissertation committee, approval from the Institutional Review Board, and the validation of the survey form, surveys were sent to all 81 FACCS schools.

As surveys were returned, the face sheet was separated from the surveys to preserve anonymity and to have a listing of schools that participated so that thank you notes and results could be mailed at the end of the dissertation. Survey responses were placed in a separate coded Microsoft Excel document as they were returned. Information from the Microsoft Excel document was transferred to SPSS 15.0 for analysis.

Selection of Participants

One way of choosing an appropriate sample size for a study is to assess the sample size needed to achieve a particular level of statistical power (Ary, 2006). The a-priori power analysis was utilized to this end. The power analysis was conducted on the most conservative (i.e., analysis yielding the largest sample size) statistical approach. An a-priori power analysis was conducted to determine the number of participants required to detect a medium effect size ($d = .50$) with power = .80 for a two-tailed independent samples t-test at $\alpha = .05$. The power analysis suggested that 128 individuals will be

needed to achieve a power of .80 given these parameters. The power analysis was conducted with the statistical software G*Power 3.0.8.

Data Analysis Procedures

Following the return of survey information from schools interested in participating, the researcher compiled two separate Microsoft Excel spreadsheets. One Microsoft Excel spreadsheet was strictly for communication purposes and listed the school name, grade levels in the school, contact name, email address, city, and a column for the final researcher contact method. Although all schools were initially contacted through email, follow up contacts were made by phone and some schools requested that the survey be resent through a fax number. The second Microsoft Excel sheet included coded information. Schools were listed by number. Questions one through seven were coded with yes equivalent to one and no equivalent to two. Question eight was coded with numbers one through three. All numerical scaled scores and titles of courses and publishers were listed in separate columns for questions nine through eleven. For confidentiality purposes, names of actual schools were not released in the study and were not combined with the statistical Microsoft Excel worksheet or inserted into SPSS.

The statistical data was entered into SPSS 15.0. The data analyses were entered in two stages. First, descriptive statistics were calculated on all research variables. Frequencies and percents were provided for nominal or ordinal-scaled variables. The second stage of the analyses presented inferential statistics used to test the research hypotheses. All statistical tests were conducted at $\alpha = .05$. The following statistical analyses were used to test each research hypothesis.

An independent samples t-test was planned to test each research question (9 total). The independent samples t-test is appropriate when comparing two groups of an independent variable on a ratio scaled dependent variable. Once surveys were returned and evaluation was to take place, it became evident that the sample sizes were not closely matched; therefore, a distribution free test was needed (Larson & Farber, 2003). After permission was secured from the committee, the tests were changed to Mann-Whitney (9 total). The Mann-Whitney can be used in sample sizes as low as three in one group and one in another group and can replace the parametric t test without showing much loss in power (Popham & Sirotnik, 1992).

Hypotheses 1a-1c have one nominal independent variable, textbook publisher with *A Beka Book* versus others (categorical nominal scale). Once it was estimated that there were only 81 possible schools in the association that could possibly participate in the study, it became evident that publishers would not be able to be evaluated independently. Instead, to retain a large enough sample size, the schools would have to be split in two groups. Since *A Beka Book* was the most used school in the Missouri study, *A Beka Book* was anticipated as the larger group (George, 1986).

For hypotheses 2a-2c, categories of measurement for textbook completion rate were divided into three categories to provide the administrator with a quick decision instrument. From there, the first two groups were combined to represent the group completing less than a majority of the textbook. This combined group was compared to the group representing completion of a majority of the textbook. Administrators were instructed that they could choose the approximate category in reference to objectives per unit covered, not every question or assignment of every page covered. The term

approximate and the categories of division were used to help guide the administrator into a quick decision. A quick decision instrument choice was made to ensure administrators would complete the category rather than ignore the question. If too many categories were included, this would result in the need for the volunteer respondents to count actual pages and determine percentage rates. The researcher felt as though this would limit response rates.

Hypotheses 3a–3c have one independent variable, standard school admissions process, using a categorical nominal scale of yes or no. A school was considered to have a standard school admissions process if the school answered yes to question 2-5.

Summary

This study is relevant to secondary schools in the Florida Association of Christian College and Schools, but the information gleaned from this study can transfer to other state organizations. This study will allow the researcher to consider why some Christian school students tend to perform higher in standardized test scores as compared to other Christian school students. A study such as this allows the educator to view statistical information to view patterns that can result in future research.

No studies were found that investigated Christian schools and a combination of textbook publisher choice, the approximate percent of textbook completion, the standard school admissions process, and standardized test scores. This researcher has personally been in meetings where administrators discussed textbook publisher usage and expressed an interest in knowing what other schools used. If administrators can review statistical information on the dependent and independent variables studied, administrators can make more informed administrative decisions. With the completion of this study,

administrators may draw individual conclusions about what impacts standardized test scores and future experimental studies may be conducted.

CHAPTER FOUR

Results

Thirty-four schools participated in the study. The descriptive statistics for the schools' responses regarding their standard school admissions process and teaching experience are listed in Tables 2 and 3, respectively. All 34 schools reported administering the *Stanford Achievement Test Series, Tenth Edition* as an end of year standardized test, which allowed the researcher to include the results in the study. Table 2 indicates that the schools used several admission procedures, as marked by the asterisks. The use of varying instructional pace and semester exams for science projects was commonly reported, 97.1% and 85.3% respectively. The use of minimum GPA, standardized tests, entrance exams and the Student Ability Index/IQ were reported with less frequency.

Table 3 reveals that approximately half of the seventh, eighth, and ninth grade science teachers had 1–5 years teaching experience at their current school. Table 4 reveals through descriptive statistics that a school using *A Beka Book* had the highest maximum score for seventh grade with 697.00, a school using *BJU Press* had the highest score for eighth grade with 693.90, and a school using *Prentice Hall* had the highest score for ninth grade with 714.10. One can see that high maximum and mean scores are being produced from varied publishers. Point spreads are relatively close with only five to ten point spreads throughout much of the chart. It is also important to remember that sample sizes play a part in the mean averages, and the sample sizes vary from one to

eighteen schools. It is for this reason that the study collapsed the publishers into two groups, *A Beka Book* versus others.

Glencoe, which was represented by one school for seventh and eighth grade, carried the highest mean averages at 674.30 and 679.70, respectively. The schools using *Prentice Hall* had a very small sample size, but carried the highest mean average for 9th grade with 696.67. It would be interesting to note if the high mean remains in a larger sample size. Schools using *BJU Press* carried high means for both seventh (668.11) and eighth grade (678.16) with 18 schools represented in the sample size. Of the three Christian publishers, *BJU Press* scored a higher mean average across the board, but *A Beka Book* carried the highest maximum score for seventh and ninth.

Table 2

Descriptive Statistics for the Schools' Procedures

	Yes		No	
	N	%	N	%
Admission Requirement/Procedure				
Administer <i>Stanford Achievement Test Series, Tenth Edition</i>	34	100	0	0.0
*Require Minimum GPA	12	35.3	22	64.7
*Require Minimum Standardized Test Score	12	35.3	22	64.7
*Minimum Score on Entrance Exam	23	67.6	11	32.4
*Use Student Ability Index or IQ	7	20.6	27	79.4
Vary Instructional Pace for Student Mastery	33	97.1	1	2.9
Take Semester Exams for Science Projects	29	85.3	5	14.7

Table 3

Descriptive Statistics for Teachers' Experience

	1 – 5 Years		6 – 10 Years		10+ Years	
Variable	N	%	N	%	N	%
7 th Grade Science Teachers	15	46.9	10	31.3	7	21.9
8 th Grade Science Teachers	17	53.1	11	34.4	4	12.5
9 th Grade Science Teachers	14	45.2	9	29.0	8	25.8

Table 4

Descriptive Statistics for Science Test Scores by Textbook Publisher & Grade Level

Textbook Publisher	Grade Level	N	Min.	Max.	M	SD
<i>A Beka Book</i>	7 th Grade	9	612.00	697.00	658.51	27.98
	8 th Grade	10	600.00	691.00	660.48	26.75
	9 th Grade	10	662.00	704.00	682.92	12.83
<i>A.C.E.</i>	7 th Grade	2	640.00	654.00	647.00	9.90
	8 th Grade	2	638.00	671.00	645.50	23.33
	9 th Grade	2	662.00	676.00	669.00	9.90
<i>BJU Press</i>	7 th Grade	18	648.00	687.40	668.11	11.92
	8 th Grade	18	663.00	693.90	678.16	7.48
	9 th Grade	14	670.00	702.00	687.91	8.99
<i>Glencoe</i>	7 th Grade	1	674.30	674.30	674.30	0.0
	8 th Grade	1	679.70	679.70	679.70	0.0
	9 th Grade	4	677.20	706.00	690.68	12.71
<i>Prentice Hall</i>	7 th Grade	2	651.00	667.00	659.00	11.31
	8 th Grade	2	657.00	682.00	669.50	17.68
	9 th Grade	3	688.00	714.10	696.67	15.07

Research Hypotheses 1a – 1c

Several Mann-Whitney tests (one for each grade level) were conducted to determine if there was a statistically significant difference between schools that use the publisher *A Beka Book* and schools that use other publishers on their students'

standardized science tests scores. The Mann-Whitney test procedures that follow were conducted separately for the seventh, eighth, and ninth grade students.

The Mann-Whitney test is the non-parametric equivalent of the independent samples t-test. The test is useful when the dependent variable is ordinal scaled and when the assumptions of the parametric test cannot be met. The Mann-Whitney test was used in place of the independent samples t-test; in this case, because the sample size in the *A Beka Book* group was relatively small. The small sample size in the *A Beka Book* group ruled out the use of the central limit theorem to assume normality.

The descriptive statistics for each group and the Mann-Whitney statistics are listed in Tables 5 and 6, respectively. The first test failed to reveal a significant difference between schools that use the publisher *A Beka Book* and schools that use other publishers on seventh grade students standardized science test scores, $U = 66.50, p > .05$. The second test was not as clear. Technically, the test did not reveal a significant difference between the two publisher groups on eighth grade standardized science scores, $U = 65.00, p = .05$. The exact criterion for significance is a p-value less than .05. However, the p-value was equal to .05, which suggests a strong trend effect. Lastly, the tests failed to reveal a significant difference between the two groups on ninth grade standardized science test scores, $U = 93.50, p > .05$.

Table 5

Mean and Sum of Ranks for Research Hypotheses 1

Dependent Variable	Publisher	N	Mean Rank	Sum of Ranks
7 th Grade Science Scores	<i>A Beka Book</i>	9	12.39	111.50
	Other	23	18.11	416.50
8 th Grade Science Scores	<i>A Beka Book</i>	10	12.00	120.00
	Other	23	19.17	441.00
9 th Grade Science Scores	<i>A Beka Book</i>	10	14.85	148.50
	Other	23	17.93	412.50

Table 6

Mann-Whitney Tests for Research Hypotheses 1

Dependent Variable	Mann-Whitney U	Sig.
7 th Grade Science Score	66.50	.121
8 th Grade Science Score	65.00	.050
9 th Grade Science Score	93.50	.400

Research Hypotheses 2a – 2c

Several Mann-Whitney tests (one for each grade level) were conducted to determine if there was a statistically significant difference between schools that complete 86% or more of their science textbook and schools that complete less than 86% of their science textbook on their students' standardized science tests scores. The Mann-Whitney test procedures that follow were conducted separately for the seventh through ninth grade

students. The Mann-Whitney was used because of sample size concerns in the “less than 86%” group.

The descriptive statistics for each group and the Mann-Whitney tests are listed in Tables 7 and 8, respectively. The first Mann-Whitney test failed to reveal a significant difference between schools that complete 86% or more of their science textbook and schools that complete less than 86% of their science textbook on seventh grade students standardized science test scores, $U = 68.00, p > .05$. The second test indicated that the two textbook completion groups did not significantly differ on eighth grade science scores, $U = 96.50, p > .05$. Lastly, the tests failed to reveal a significant difference between the two groups on ninth grade standardized science test scores, $U = 75.00, p > .05$. Overall, the amount of textbook completion did not have an effect on the standardized science scores for the seventh through ninth grade students.

Table 7

Mean and Sum of Ranks for Research Hypotheses 2

Dependent Variable	Textbook Completion	N	Mean Rank	Sum of Ranks
7 th Grade Science Scores	Less than 86%	7	19.29	135.00
	86% or More	25	15.72	393.00
8 th Grade Science Scores	Less than 86%	9	17.28	155.50
	86% or More	23	16.20	372.50
9 th Grade Science Scores	Less than 86%	6	16.00	96.00
	86% or More	25	16.00	400.00

Table 8

Mann-Whitney Tests for Research Hypotheses 2

Dependent Variable	Mann-Whitney U	Sig.
7 th Grade Science Score	68.00	.374
8 th Grade Science Score	96.50	.769
9 th Grade Science Score	75.00	1.00

Research Hypotheses 3a – 3c

Several Mann-Whitney tests (one for each grade level) were conducted to determine if there was a statistically significant difference between schools that have a standard school admissions process and schools that do not have a standard school admissions process on their students' standardized science tests scores. The Mann-Whitney test procedures that follow were conducted separately for the seventh, eighth and ninth grade students. The Mann-Whitney was used because of sample size concerns in the no admission standard group.

The descriptive statistics for each group and the Mann-Whitney tests are listed in Tables 9 and 10, respectively. The first Mann-Whitney test failed to reveal a significant difference between schools that have a standard school admissions process and schools that do not have a standard school admissions process on seventh grade students standardized science test scores, $U = 44.50, p > .05$. The second test indicated that the two admission groups did not significantly differ on eighth grade science scores, $U = 43.00, p > .05$. Lastly, the tests failed to reveal a significant difference between the two groups on ninth grade standardized science test scores, $U = 45.50, p > .05$. Overall, the

presence of a standard school admissions process had no significant impact on the students' scores.

Table 9

Mean and Sum of Ranks for Research Hypotheses 3

Dependent Variable	Admission Process	N	Mean Rank	Sum of Ranks
7 th Grade Science Scores	Yes	28	17.91	501.50
	No	5	11.90	59.50
8 th Grade Science Scores	Yes	28	17.96	503.00
	No	5	11.60	58.00
9 th Grade Science Scores	Yes	28	17.88	500.50
	No	5	12.10	60.50

Table 10

Mann-Whitney Tests for Research Hypotheses 3

Dependent Variable	Mann-Whitney U	Sig.
7 th Grade Science Score	44.50	.200
8 th Grade Science Score	43.00	.175
9 th Grade Science Score	45.50	.218

CHAPTER FIVE

Summary and Discussion

This study focused on the relationship between textbook publishers, textbook completion rate, standard school admissions process, and standardized test scores. Primarily, group reports of student science scores on the *Stanford Achievement Test Series, Tenth Edition* were reviewed to examine any possible relationships. The group reports were drawn from FACCS schools who administered the standardized *Stanford Achievement Test Series, Tenth Edition* to seventh through ninth grade students in the year 2007. A review and results of the study are examined throughout chapter five in the following order: Statement of the Problem, Review of Methodology, Summary of Results, Discussion of Results, Implications of the Study, Relationship of the Study to Prior Research, Limitations of the Study, and Recommendations for Future Research.

Statement of the Problem

With the increased interest in accountability, Christian schools often find themselves in the position of having to review the standardized test scores to make sure the students are receiving high enough scores to participate in a competitive environment. This interest has risen due to increased media attention concerning standing of American students in relation to students from other countries in the areas of science and math. Parents have become concerned as to whether their children are receiving a proper education where their children will be able to compete when they graduate from high school. Many parents no longer want just a biblically sound Christian school; they want both a biblically sound Christian school and a school that will help their children excel

academically. One piece of evidence for academic success is the annual standardized test scores. If parents perceive a lack of academic rigor and success, the parents may consider moving to another Christian school where their child can have both a biblically sound education and a quality academic education. Just as parents tell their children to give God their best, school administrators must strive to make sure students in the school can perform at the highest possible level.

The purpose of this causal-comparative study is to help administrators determine why some students in Christian schools perform at a higher standard in science on standardized tests compared to other students in Christian schools on standardized tests. To pursue this study, a survey was sent to FACCS administrators that requested general admission policies, information from their 2006-2007 *Stanford Achievement Test Series, Tenth Edition* results, and information relating to publishers used for seventh through ninth grade science classes. The *Stanford Achievement Test Series, Tenth Edition* is administered to students in FACCS on an annual basis. Nine hypotheses were examined to help determine answers to the following research question: Why do students in some Christian schools perform at a higher standard in science on standardized tests compared to students in other Christian schools on standardized tests?

Review of Methodology

With the usage of archived data and surveys, the researcher conducted a causal-comparative study to compare textbook publishers, textbook completion rate, standard school admissions process, and standardized test scores. Group science scores of seventh through ninth grade students on the *Stanford Achievement Test Series, Tenth Edition* were collected from the administrators in FACCS schools whose students took the science

portion of the test and placed in a document, which was later transferred to SPSS 15.0. Comparisons were made of science scores on *Stanford Achievement Test Series, Tenth Edition* for seventh through ninth grade students to textbook publishers, textbook completion, and admission policies to determine if possible relationships existed.

The population consisted of schools in FACCS, which represented 28,997 students. Surveys were sent to 81 Christian schools in FACCS. Out of the 81 schools, 34 schools returned useable surveys. The eleven-question survey instrument contained questions related to test scores, publisher information, standard school admissions process, teacher experience, and number of students per grade level. The survey yielded scaled scores for seventh through ninth grade science on the 2007 *Stanford Achievement Test Series, Tenth Edition* with additional answers to questions related to publishers, textbook completion, standard school admissions process, and general data. From this group, five out of thirty-nine administrators who responded stated that they would not be able to participate. Thirty-four administrators returned useable surveys, which gave a useable response rate of 42% and represented 3373 students in the group score reports. Results from the eleven-question survey were inserted into a Microsoft Excel document and later transferred to SPSS 15.0 to evaluate the reported information. Mann-Whitney tests were conducted for all hypotheses with significance levels set at .05. In the behavioral sciences, .05 is commonly used as a level of significance, which was chosen to help the researcher take precautions against a Type I error (Ary, 2006).

Summary of Results

This study reviewed the dependent variable, total science scores on the *Stanford Achievement Test Series, Tenth Edition*, and the three independent variable of textbook

publisher usage, the approximate percent of textbook completion, and standard school admissions process. Out of the nine analyzed tests, data analysis showed no statistically significant results. The researcher failed to reject the hypotheses on all nine null hypotheses. This finding suggests that the independent factors investigated may not be the factors that are affecting science test scores.

The Mann-Whitney test revealed there was not a significant difference on hypotheses 1 a- 2 c, although the mean ranks did reveal a higher score across all grade levels for the group labeled other. Other was represented by publishers *BJU Press*, *Prentice Hall*, *A.C.E.*, and *Glencoe*. Hypotheses 2 a- 2 c did not reveal a significant rate at any grade level. The mean rank did show that those who completed less than 86% of the textbook in seventh through ninth grade scored slightly higher than those who completed more than 86%. Admission processes of schools were reviewed in hypothesis three and the results showed no significant difference on impacting scores. The mean rank for hypotheses 3 a-c was higher for those schools that did have an admission process.

Null Hypothesis 1a

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of seventh grade students in schools that use *A Beka Book* textbooks and those that use books from other publishers. ($U=66.50$, $p > .05$). (Failed to reject the hypothesis)

Null Hypothesis 1b

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of eighth grade students in schools that use *A Beka Book* textbooks

and those that use books from other publishers. ($U=65.00$, $p = .05$). (Failed to reject the hypothesis)

Null hypothesis 1c

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of ninth grade students in schools that use *A Beka Book* textbooks and those that use books from other publishers. ($U=93.50$, $p > .05$). (Failed to reject the hypothesis)

Null hypothesis 2a

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of seventh grade students in schools whose approximate percent of science textbook completion is above 85% than those students in schools whose approximate percent of science textbook completion is at or below 85%. ($U=68.00$, $p > .05$). (Failed to reject the hypothesis)

Null hypothesis 2b

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of eighth grade students in schools whose approximate percent of science textbook completion is above 85% than those students in schools whose approximate percent of science textbook completion is at or below 85%. ($U=96.50$, $p > .05$). (Failed to reject the hypothesis)

Null hypothesis 2c

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of ninth grade students in schools whose approximate percent of science textbook completion is above 85% than those students in schools whose

approximate percent of science textbook completion is at or below 85%. ($U=75.00$, $p>.05$). (Failed to reject the hypothesis)

Null hypothesis 3a

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of seventh grade students in schools that use a standard school admissions process and those that do not use a standard school admissions process. ($U=44.50$, $p>.05$). (Failed to reject the hypothesis)

Null hypothesis 3b

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of eighth grade students in schools that use a standard school admissions process and those that do not use a standard school admissions process. ($U=43.00$, $p>.05$). (Failed to reject the hypothesis)

Null hypothesis 3c

There will be no significant difference between *Stanford Achievement Test Series, Tenth Edition* scores of ninth grade students in schools that use a standard school admissions process and those that do not use a standard school admissions process. ($U=45.50$, $p>.05$). (Failed to reject the hypothesis)

Discussion of Results

There have been many times when this researcher has conferred with other administrators and discussed curriculum choices. There may be multiple choices for math and reading, but the selection of science textbooks has been few due to the limited number of Christian based publishers. One area that has never been a question in this researcher's mind is the importance of making sure students have a firm foundation in

scripture when it comes to the scientific world. If a school wants to select a textbook with scripture integrated throughout, the choices are limited to primarily three publishers: *A Beka Book*, *BJU Press*, and *A.C.E.*

By reviewing the descriptive results of this causal-comparative study, it became apparent that the majority of the Christian schools in FACCS are using Christian publisher textbooks, primarily *A Beka Book* and *BJU Press*. This confirms that Christian schools are interested in using textbooks that are Christian based. *BJU Press* is the most used science publisher across all seventh through eighth grade levels; and in grades seven and eight *BJU Press* is used more than all of the other publishers combined. The results of this study showed *BJU Press* as the most used publisher, which is a change from the results of the 1986 Missouri study where *A Beka Book* and *A.C.E.* were the most used publishers (George, 1986). At that time, *BJU Press* was the least established publisher. *A.C.E.* has dropped in usage, which is more than likely due to being geared to individual pace for smaller schools rather than group instruction in larger schools. Two additional publishers, Prentice Hall and Glencoe, are currently being used by a few of the Christian schools. This may be due to the thought that curriculum content may be stronger, more expansive, or more aligned with testing objectives. Additional comments will be addressed in the theoretical implications concerning this issue.

Table 11

Descriptive Statistics for Used Textbook Publishers

Variable	N	%
7 th Grade Book Publisher		
<i>BJU Press</i>	18	54.5
<i>A Beka Book</i>	10	30.3
<i>Prentice Hall</i>	2	6.1
<i>A.C.E.</i>	2	6.0
<i>Glencoe</i>	1	3.0
8 th Grade Book Publisher		
<i>BJU Press</i>	18	52.9
<i>A Beka Book</i>	10	29.4
<i>A.C.E.</i>	3	8.8
<i>Prentice Hall</i>	2	5.9
<i>Glencoe</i>	1	2.9
9 th Grade Book Publisher		
<i>BJU Press</i>	14	41.2
<i>A Beka Book</i>	10	29.4
<i>Glencoe</i>	3	8.8
<i>Prentice Hall</i>	3	8.8
<i>A.C.E.</i>	3	8.8
<i>Glencoe/BJU Press</i>	1	2.9

The first hypothesis dealt with publisher usage in seventh through eighth grade classrooms of FACCS schools. Based on the statistical results from hypotheses one, the Mann-Whitney test failed to reveal a significant difference between the schools that use *A Beka Book* and schools that use other publishers. This reveals that the publisher does not make a significant difference. The degree of fit is important and it appears as though the reason why Christian schools already experience scores that are higher than the national average is because of the degree of fit to the local curriculum of FACCS schools (Harcourt Assessment, Inc., 2004). This is good news for the FACCS schools because the Christian school can be comfortable in knowing the choice of publisher is not

affecting the scores. Therefore, the administrator can now have a choice in which publisher to use, which one is more cost effective, which one gears more toward critical thinking, and which one allows time for interactive activities. The lack of significance actually allows more freedom for the administrator.

Another result that appeared when completing the Mann-Whitney tests was the unusual significance level of the eighth grade. To be significant, the p value should be less than .05; but in this case, the significance level came out to exactly .05. It cannot be technically classified as significant, but it is worth reviewing. Why would this happen for the eighth grade and not for the other grade levels if it did not have importance? None of the other factors varied. Since this level is as strong as one can get without moving into significance, FACCS administrators should consider whether the choice of publisher could be a factor.

If the choice of publisher for eighth grade is a factor, then administrators can consider analyzing their curriculum to determine if the textbook choice is meeting their school and testing objectives. If a teacher is not aware of the objectives that must be taught to meet the testing goals and the teacher is given freedom to adjust curriculum, scores can be affected. They must know which objectives must be taught and which ones can be altered. It is for this reason that the second hypotheses were also examined.

The second hypothesis addressed textbook completion. The results in this study revealed that textbook completion did not significantly impact student scores. The literature has suggested that schools are altering content and the results of this study confirm those thoughts of Anderson and Lorin (2002) and Bybee (2007).

Although this author anticipated textbook completion would impact scores, the results allowed the researcher to contemplate why there would not be a difference in scores if one school finished most of the textbook and another school did not finish the textbook. Apparently, this researcher was not alone in this thought as 23 to 25 schools out of 32 schools completed 86% or more of their textbook. Yet, the six to nine schools that did not finish 86% or more of the text actually scored a higher mean rank than the schools that did finish 86% or more. The numbers show that a higher textbook completion rate does not equate with higher scores.

The answer to why this could occur can go back to the earlier hypotheses remark. If one has a text that apparently fits with the test objectives, then as long as the testing objectives are taught properly, high test scores can be reflected. It appears as though the FACCS schools have all the right tools. The schools that are teaching less than 86% of the textbook appear to know which objectives are necessary to cover within the school year and which can be eliminated. Since publisher may not be the factor and textbook completion may not be the factor affecting test scores, then the fine tuning of who is reaping the higher test scores can come down to other factors. Some of those factors may include having an experienced teacher who connects with the students or having more hands on and interactive opportunities due to the limitation of textbook completion.

As listed in the review of the literature, curriculum alignment and quantity of textbook covered have been issues studied for many years. Some believe that if content is not covered, then objectives are not covered which would result in lower scores. Others have determined through alignment studies that textbooks do not have a high percentage of alignment with standardized tests; therefore, only some test objectives are being taught

and other objectives that are taught will not show up as test questions on standardized tests. This study shows that the majority of the schools complete the textbooks, but that does not make a significant difference on test scores. The results of this study appear to confirm studies such as Phillips and Mehrens (1988) that studied third and sixth grade reading and math textbooks and determined that textbook series had little impact on scores.

The third hypothesis, standard school admissions process, showed there was no significant relationship between science test scores and a standard school admissions process for grades seven through nine. As one reflects on this outcome, the standard school admissions process may not be a determining factor for science test results due to the rather varied and new content knowledge taught for each type of science class. Unless the teacher knows to supplement for a specific objective, a concept may not be taught for two or three years at a time. For this very reason, hypothesis three may not be significant because concepts for that particular year are not based upon whether the child had a high GPA or whether the child has a higher ability index.

The results of this study reveal that the standard school admissions process does not affect test scores. McCann (2003) thought the selection process might be why achievement test scores are higher in some schools; however, the results of this study produced a different result. McCann's study was in relation to math scores, which involves a more intense building of subject matter. This study dealt with science scores, which involves a broader scope of subject matter. Future studies could investigate if a standard school admissions process affect various subject matter scores in as different

way. To help confirm the results, further investigation with a larger sample size would be beneficial.

Implications of the Study

Administrators in Christian schools use the *Stanford Achievement Test Series, Tenth Edition* on an annual basis to determine the academic standing and progress of their students. With the usage of standardized test scores, schools have focused on the standards and improved test scores (Schmoker, 2000). Administrators should be active in helping every student excel to the best of his ability. This means the administrator should monitor test results and determine if any changes need to take place in the classroom. Due to the .05 equivalence on hypothesis 1b of eighth grade science scores to schools that use *A Beka Book* for publisher usage, administrators should review curriculum alignment to determine if the tested objectives are identified in the textbook produced by the current publisher.

Dr. Dino Pedrone, president of FACCS, explained in one of his lectures that the roots of the Christian educator should be biblically based (cited in Scott, 2008). With the knowledge that publisher choice did not show a significant difference on science test scores, administrators can choose a Christian-based publisher knowing their students are academically prepared. A foundation in God can remain and the Christian educator can continue to aim for improvement, just as Comenius believed back in the 1600's. That improvement may come through supplementation of the current curriculum or addition of more interactive studies. As Christian schools determine to strive for excellence, administrators should make sure teachers are teaching to all of the required objectives.

When looking at the scores reported by the individual schools, it was clear to see that a variety of publishers were used in schools with the highest scores. Out of the four highest scoring schools for each grade level, the group sizes ranged from 12 to 122. Both small school settings and large school settings represented the higher scores. The implication of these numbers reminds administrators that the size of a school does not matter when it comes to performance. Out of the top four science scores for each grade level, two schools had top scores for every grade level. One of the schools with high scaled science scores across all grade levels (7th-687.4, 8th-693.9, 9th-714) used *BJU Press* for seventh and eighth grade and *Prentice Hall* for ninth grade. Another high scoring school (7th-686, 8th-689, 9th-702) used *BJU Press* across all grade levels. A third school using *A Beka Book* scored the highest on the *Stanford Achievement Test Series, Tenth Edition* science test for seventh and second highest for eighth with 697 and 691, respectively. Other top scores came from various schools (7th-*BJU Press*-687, 8th-*BJU Press*-687, 9th-*A Beka Book* -704, and *Glencoe*-706). This variety of publisher usage in the top four science scaled scores for each grade level coupled with the statistical information showing that no significance was found for publisher usage prompts administrators to consider factors other than publisher usage when trying to raise standardized test scores.

In the area of textbook completion, the results of this study show that textbook completion rate is not a significant factor for any of the tested grade levels. This would suggest that teachers who normally push to finish the core curriculum could alter the completion goals and consider slowing the pace, open up the studies to more hands on activities, or select specific objectives for study. An important concept to remember is

that not all of the questions on the standardized test are based on the textbook from the current year. Some knowledge is acquired from objectives and content learned from prior years. A study of a larger population in textbook completion rate would be beneficial to help confirm or reject the hypothesis. As for the administrator, one needs to weigh carefully the options before making a publisher change. Consideration can go into supplementation rather than change if scores are not at the desired level.

Admission processes vary from school to school; yet, the null hypotheses were maintained. There were four questions on the survey that related to a standard school admissions process. The four areas in question were requiring a minimum GPA, standardized test score, an entrance test, and an ability index. Only twelve schools out of the thirty-four reporting schools required a minimum GPA; twelve require a specific minimum score on standardized tests; twenty-three schools require a minimum score on an entrance test; and seven use an ability index score for admittance. There were six schools that had no listed admittance requirements. The Mann-Whitney revealed that there was no significant difference. One of the four highest scoring schools answered yes to requiring all four admission processes and one of the highest scoring schools answered no to all four admission processes. Although these schools approach admissions in a different manner, both were ranked as having the top scores of all 34 schools. The statistics support that overall test scores are not affected by a standard school admissions process.

This gives the administrator information to reflect upon, especially if the school has been turning down students who could have otherwise been attending if they had fulfilled a particular admission standard. What does a Christian school do about standard

admission processes? A school may only have one section of every grade, but still wants to promote the school as a college preparatory school. In this case, it would be easy to filter for students who already excel by raising the admission requirements; but with the raising of standards, the door may close to some students who want to have the opportunity to learn in a Christian environment with Christian principles. Based on the results of this study, the door could widen and allow a more diverse group of students into the Christian school system and still maintain excellence.

Most Christian schools, as evidenced by the survey, have tried to find a balance by having some requirements. Administrators should evaluate what admission processes are necessary to keep enough rigor in the classroom for the college bound student and still provide an opportunity for a Christian education for struggling students. Schools that have no standard school admissions process have freely admitted students without affecting their standardized test scores. With this knowledge in hand, schools can open their doors so that more students can experience a Biblical foundation in a Christian school. If test scores have been an issue affecting admission, schools should reconsider the matter.

The researcher expected to see a variety of science course options for the larger schools, but only three schools appeared to offer alternatives to physical science for ninth grade. Seven schools schedule biology in ninth grade rather than physical science, but most of those schools take earth science in seventh grade and physical science in eighth grade. Out of the four top scoring schools in ninth grade, three scheduled physical science and one scheduled biology honors. Although students who took biology did not outperform students who took physical science in ninth grade, it is not possible to know if

the early introduction will make a difference in upper high school standardized testing. The sequencing of courses is worth investigating in future studies to determine if course selection impacts test scores. Administrators should attempt to offer alternative classes and have teachers help analyze curriculum weaknesses.

Relationship of study to prior research

The researcher did not locate a study that included Christian schools and all three independent variables of publisher usage, textbook completion, and a standard school admissions process. Yet, all of the factors involved in this research were based on thoughts from the studies mentioned below. Since there was not one particular study that focused on all of the variables, the researcher focused on individual variables.

As noted earlier, Christian schools focus on a philosophy of Christian education. Within that education, God does require students and administrators in Christian schools to strive for excellence. Just as Christ increased in wisdom (Bible: King James, Luke 2:52), the student in the classroom should always strive to learn more and the administrator must want improvement to take place. Comenius believed that knowledge should be built upon knowledge. He stated that through instruction schools “can produce true men, true Christians, and true scholars, throughout graduating the instruction to the age of the pupil and the knowledge he already possesses” (Parker, 1912, p. 142). Comenius was a theorist who believed in progression and continual learning. Suiter (2005) told the educators at the American Association of Christian School education conference that “school improvement must be a part of the action plan of every Christian school administrator” (p.6). It is up to the administrator to make sure students are fully prepared and ready to enter their next phase of life. In today’s society, that means the

students need to be academically prepared for the global economy and all of the challenges it presents. The administrator can help students by ensuring they have been given a solid education. In the secular world, accountability is a term frequently heard. The NCLB requires that students reach specific goals. In FACCS, students take the *Standardized Achievement Test Series, Tenth Edition* on a yearly basis. The scores from these tests are a guideline for administrators and for parents to know if the school is providing the needed academic background. However, once the scores are reported, it is up to the administrator to determine if additional action must be taken to close any gaps. This can only be known if the administrator analyzes the scores, isolates factors, and studies current research. Yet, research is limited in the field.

When the researcher began looking for studies or dissertations directly related to science in the Christian school, only one study could be found. Unfortunately, this study was not for the same grade level and was over twenty years old. This lack of information confirmed to this researcher that Christian researchers need to close this gap. It is imperative that Christian educators stay alert to occurrences throughout its community.

A Christian philosophy of education is based on the truth of God's Word. It is evident, based upon the results of this study, that most of the Christian schools use a biblically based publisher. This allows even the first year teacher or newly born-again teacher to see how the Word of God so easily weaves into the science curriculum. To know and learn of God's truth in the science classroom would prepare one to have a God-centered worldview that could stand against the worldly view. Schultz, who uses the term kingdom education, states that it is the "goal of kingdom education to equip believers now, enabling them to serve Christ in His kingdom work" (Schultz, 1998, p. 28). The

results of this study suggest that most Christian schools have selected a Christian based publisher for the science classroom, which can help equip the student in the classroom, not only academically, but also spiritually. This is what makes a study related to Christian schools so important. The Christian educator views all of education through the lens of eternity. If the Christian school builds and equips a child for Christ in the classroom, then learning and achievement should take place.

In 2005, the Association of Christian Schools International and a private Christian school became embattled in a lawsuit with the University of California over the usage of some of the science textbooks written by Christian publishers, *A Beka Book* and *BJU Press*. The original complaint stemmed from viewpoint discrimination against Christian schools. This was due to the refusal of the University of California to accept specific courses from a Christian viewpoint (ACSI, 2005). Specifically, the biology texts were considered inappropriate because the student was taught to reject the scientific method if a concept disagreed with the Bible. The University of California contends that they are not discriminating against the religious content; rather they are concerned that the lack of content, teaching skills, and critical thinking skills are not sufficient for a college preparatory course. In August of 2008, a ruling determined in favor of University of California stating that the defendants had a basis for the rejecting of the courses (University of California, 2009). As issues such as these arise in the nation, Christian schools will have to review their school mission and philosophical stands. In the meantime, Christian educators need to continue in the pursuit of educational research and be armed with the statistical answers concerning the preparation of the students in Christian schools. The results of this study reveal all of the Christian schools are above

the national norm in all levels of science standardized tests, which allows the Christian school administrator to have confidence in the publisher selection. It is up to the individual school and teacher to incorporate the critical thinking and research needed to ensure all aspects of the course codes are covered.

Hypothesis one centers on publisher usage and standardized test score performance. George (1986) focused on curricula of Christian elementary schools in Missouri, and compiled a list from twenty- two schools, which showed *A Beka Book* as the top used publisher in larger schools with *BJU Press* as the lowest chosen publisher of science curricula. McCann (2003) examined usage of *A Beka Book* among other secular publications in Christian Schools across various states. Griffin (2003) studied curriculum alignment with *A Beka Book* curricula in lower elementary. Although these studies did not center on the same grade level or subject area as this study, the concept of determining what curriculum is used the most solidified the researcher's desire to include publisher usage in the current research.

BJU Press completed a blind study of 245 Christian schools, which found schools that used *BJU Press* in two grade levels, five and eleven, performed higher than schools that used other curriculum. It also found that schools using *BJU Press* in sixth through twelfth scored at or above schools that used other curriculum (*BJU Press*, 2008, Test-scores). McCann (2003) researched grade inflation and standardized test results, and compiled statistics for five math publications in Christian schools, one of which was *A Beka Book*. In the descriptive statistics of McCann's research, it was concluded that all of the publications studies, except for one, showed a statistically significant relationship between report card grades and *Stanford Achievement Test Series, Ninth Edition* scores. A

Beka Book was one that showed a statistically significant relationship for three years. No other Christian curriculum was in the textbook publication list of curriculum in McCann's study.

Phillips and Mehrens (1988) used the term textbook series instead of publisher as they reported that the textbook series did not affect scores. Bell et. al. (1992) determined after studying three reading achievement tests that curriculum choice did not make a difference on testing. Beyond determining which publishers were used in Christian schools, it became evident that controversy exists as to whether publisher textbook choice was significant to test scores. Since no other research could be located that focused on science publisher usage in Christian schools, this body of research adds to the body of literature concerning the impact of publisher choice in Christian schools.

The second hypothesis was evaluated to determine if there was a significant difference in scores of students based upon textbook completion rates of content. Content coverage completion was studied by Good, Grouws, and Beckerman in the area of math achievement to textbook pages covered; and Anderson & Lorin, Evertson, and Brophy studied the area of basal readers in first grade and reading achievement scores (cited in Anderson & Lorin, 2002). Bybee (2007) remarked that Japan and Germany only cover a minimum of content areas per year, six to eight, compared to the United States who typically cover sixty to eighty topics. The textbook content coverage discussed in these studies aligns with hypothesis two and with the following studies on curriculum alignment. Researchers of the Second International Mathematics and Science Study (2001) found gaps in math and science instruction and suggested there are benefits to curriculum alignment (as cited in The District Administrator, 2009). Griffin (2003)

researched *A Beka Book* kindergarten through second grade curriculum and found positive results in the alignment of curriculum to the Stanford Achievement Test. The alignment processes discussed in these studies are closely related to the concepts in hypothesis two. A study by Freeman showed that when four textbooks were compared to achievements tests, there was less than a 50% match (as cited in Marchant, 2004). If this is the case and curriculum shows so little alignment, then this supports the concept that less textbook completion also will not affect achievement scores. However, there are varying views on whether textbook completion makes a difference and there are no studies on either alignment or textbook completion in Christian curriculum for science in seventh through ninth grade. Once again, the investigation into this concept will add to the body of literature so that future studies can work toward verifying any patterns.

McCann (2003) pointed out that private schools score higher on achievement tests, but one reason for this may be that Christian schools may be more selective in their admission process. Specifically, McCann (2003) mentions that the students may only be accepted in a private school if they, as an example, make a specific score on tests such as a fifty percent or above. Rothstein (2005) discussed the concept that higher ability level groups tend to produce higher test scores. Flinders (2005) suggested that ability index quotients might play a factor on higher test scores. Therefore, since there were many suggestions, but no specific studies, hypothesis three was established to help identify if there were any significant relationships.

Limitations of the Study

In the best-case scenario, there would be a clear picture revealing one textbook used by schools that make the highest science scores on standardized tests along with a

definite picture of textbook completion and a standard school admissions process.

However, there are limitations in a study such as this. Listed below are possible limitations that should be considered.

In this study, the sample size was limited due to the voluntary return basis of an already limited number of FACCS schools. Although there were more FACCS schools, not all schools had a seventh through eighth grade. Therefore, participants in this study were limited to 81 FACCS schools of which 34 FACCS schools returned useable surveys. A larger sample size would help strengthen the test.

By the time the 34 schools were divided by publishers, sample size for each publisher was too small to use independently. Therefore, publisher groups were collapsed into two groups so that the numbers could be statistically manipulated. A larger study would give the researcher the opportunity to compare specific publishers.

Approximate answers were requested for textbook completion on the survey because the researcher felt as though administrators would not take time physically to count pages to determine percentage rates. Examination into additional ways to determine exact textbook completion rate and still have survey participants fill out the form would be beneficial. However, no administrators appeared to have any problem with selecting a category as it was listed.

The study was also limited to seventh through ninth grade science scores. The investigation of a larger sample size across multiple grade levels would help solidify whether publishers, textbook completion, and a standard school admissions process are factors that affect test scores. It will be beneficial for future studies to complete personal interviews to identify if other factors skewed any results.

Additional factors that could not be considered within this study are OLSAT scores, motivation of students, teacher influence, and teacher effectiveness (Ybarra & Hollingsworth, 2001). It is also possible that circumstances could have affected the reported scores due to student illness, anxiety, sleep or a variety of other factors on the particular testing day (Newkirk, 1975). It is important to note, “The smaller the school, the less reliable a single test is as a measure of achievement because a few extreme scores can more easily distort an average” (Rothstein, 2005). For this reason, a nonparametric test had to be used for examination. A similar study with a larger sample size would help confirm results.

Recommendations for future research

This researcher exhausted multiple sources in an effort to locate studies related to Christian schools, publisher usage, textbook completion, and a standard school admissions process. It is evident that more research needs to occur across Christian school populations to ensure that administrators are aware of the trends and facts surrounding the academic programs. Additional research should cross into larger sample sizes from various state organizations. The Christian school organizations should be just as aware of their standing in relation to other Christian schools as public schools are of their counterparts. This awareness will open up lines of communication between schools and help Christian schools to unite in providing not only a Christ honoring education, but also a solid academic foundation.

Recommendations are as follows:

1. Conduct a study on course sequences and the effect on science achievement from middle school through high school.

2. Conduct a curriculum to Stanford Standardized Test series alignment study of Christian science textbook publishers.
3. Replicate this study in another state organization using a larger population covering sixth through twelfth and an instrument that can more accurately measure completion rate.
4. Complete a qualitative study of schools that produce high scores on standardized tests.

Summary

Accountability may not be mandated in Christian schools, but Christian schools should certainly strive to provide students with the best possible education. In the Christian school, parents view test scores as a confirming factor when making a choice of where to enroll their child (McCann, 2003). In this competitive environment, it is important for the Christian school administrator to provide data concerning academic success to those parents who have fallen into the accountability lure. Suiter (2005), who serves on the board of directors of the American Association of Christian Schools, stated “those of us involved in Christian education have probably been somewhat negligent in designing and conducting research, in reviewing the literature and designing our own conceptualizations about the nature of school improvement programs” (p. 7). Part of this study dealt with curriculum research. Mauritz Johnson (1976) summed up his thoughts about curriculum research.

The field of curriculum research that remains is wide open. Practically nothing has been done in it. We know very little for sure about causes and effects pertaining to the content, structure, source, functions, and development of

curriculum...At the current rate at which we are pursuing genuine curriculum research, our great-grandchildren will know little more about these matters in our tricentennial year. (p. 506)

Now is the time to collaborate as Christian educators to identify ways to growth and academic success.

References

- A Beka Book*. (2008). Our foundation. Retrieved October 11, 2008, from www.abeka.com.
- A.C.E. (2009). About us. Retrieved January 6, 2009, from www.schooloftomorrow.com/aboutus.
- ACSI. (2005). Should some students be denied entrance because they used these textbooks? *Legal/Legislative Update*, 16(1), 1-4. Retrieved April 18, 2009, from <http://www.cccsmurrieta.com/elementary/pdfs/lawsuitoverview.pdf>.
- Adebayo, B. (2008). Cognitive and non-cognitive factors. *Journal of College Admissions*, 200, 15-21.
- Amrein, A. & Berliner, D.C. (2003). The effects of high-stakes testing on student motivation and learning. *Educational Leadership*, 60(5), 32-38.
- Anderson, L.W. & Lorin, W. (2002). Curricular alignment: A re-examination. *Theory into Practice*, 41(4). Retrieved April 21, 2008, from Academic Search Premier.
- Ary, D., Jacobs, L.C., Razavieh, A., & Sorensen, C. (2006). *Introduction to research in education* (7th ed.). Belmont, CA: Thomson Higher Education.
- Bell, P.F., Lentz, F. & Francis, E. (1992). Effects of curriculum-test overlap on standardized achievement test scores: Identifying systematic confounds in educational decision making. *School Psychology Review*, 21(4). Retrieved April 22, 2008, from Academic Search Premier.
- BJU Press. (2008). Education-philosophy. Retrieved November 30, 2008, from <http://www.hightestscores.com/education-philosophy.htm>

- BJU Press. (2008). Test-scores. Retrieved November 30, 2008, from <http://www.hightestscores.com/test-scores/scorecard.htm>.
- Brent, G. & Diobilda, N. (1993). Effects of curriculum alignment. *Journal of Educational Research*, 86(6), 333-338.
- Brokke, D. (2007). Breaking down the stumbling blocks. *Journal for Christian Educators*, 13(3), 26-29.
- Bybee, R. W. (2007). Science teaching and international assessments. *Science Teacher*, 74(8), 41-48.
- Bybee, R. W. & Stage, E. (2005). No country left behind. *Issues in Science & Technology*, 21(2), 69-75.
- Campbell, J. (1994). Interpreting scores from standardized tests. *Clearing House*, 67(6), Retrieved April 22, 2008, from Academic Search Premier.
- Clarke, K. (2000). Why students are feeling so testy. *U.S. Catholic*, 65(7), Retrieved April 22, 2008, from Academic Search Premier.
- Clemen, J. (2007). Philosophy of education of John Amos Comenius. *KINAADMAN, An interdisciplinary research journal*, 18(2), Retrieved from <http://www.hnu.edu.ph/main/publication/kinaadman/2181007/218100719.pdf>.
- Dillon, N. (2006). Multiple choice. *American School Board Journal*, 193(1), 22-25.
- Dillon, S. (2008, December 10). Math gains reported for U.S. Students. *The New York Times*, Retrieved December 11, 2008, from www.nytimes.com.
- District Administrator. (2009). The benefits of curriculum alignment. Retrieved March 26, 2009, from <http://www.districtadministration.com/ViewArticle.aspx?articleid=600>.

- Domino, G. & Domino, M. (2006). *Psychological testing: An introduction* (2nd ed.). New York: Cambridge University Press.
- Edigar, M. (2000). Purposes in learner assessment. *Journal of Instructional Psychology*, 27(4), Retrieved April 22, 2008, from EBSCOhost.
- FACCS. (2008). FACCS accreditation/co-accreditation. Retrieved October 12, 2008, from <http://www.faccs.org/accreditation>.
- FACCS. (2008). Student assessment program. Retrieved October 11, 2008, from <http://www.faccs.org/student-assessment-program>.
- Flinders, D. (2005). The costs of accountability. *Journal of Curriculum Studies*, 37, 621-629.
- Friedman, T.L. (2006). *The world is flat: A brief history of the twenty-first century-updated and expanded*. New York: Farrar Straus and Giroux.
- George, P. (1986). *Curricula of elementary Christian fundamental schools in Missouri*. Unpublished doctoral dissertation, University of Missouri-Columbia.
- Glimpses of Christian History*, March 28, 1592 (2009). Comenius: Born to Learn, Born to Teach. Christianity Today International. Retrieved March 14, 2009, from www.chinstitute.org.
- Griffin, D. (2003). *An evaluation of the advantages of the A Beka Book Curriculum used in conjunction with supplemental materials in math and reading in grades K-2 within two urban Christian schools* (Doctoral dissertation, Wilmington College, 2003). Dissertation Abstracts International, 63/11, 3838.
- Guilfoyle, C. (2006). NCLB: Is there life beyond testing? *Educational Leadership*, 64(3), 8-13.

- Harcourt Assessment, Inc. (2003). *Guide for Classroom Planning*. [Brochure].
- Harcourt Assessments, Inc. (2004). Stanford achievement test, tenth edition [Review of the Stanford achievement test, tenth edition]. *Mental Measurements Yearbook*, 16, Retrieved January 6, 2009, from Mental Measurements Yearbook database on EBSCOhost.
- Harcourt Brace & Company. (1997). *Stanford Achievement Test Series, Ninth Edition: Multiple-choice assessment*. [Brochure].
- Harcourt Educational Measurement. (2003). *Directions for Administering*. [Brochure].
- Herbster, C.D. (1988). *Productive teaching in the Christian school*. Greenville, SC: Bob Jones University Press.
- Hess, F. & Brigham, F. (2000). None of the above, the promise and peril of high-stakes testing. *American School Board Journal*, 187(1), 26-29.
- Holloway, J. H. (2000). A value-added view of pupil performance. *Educational Leadership*, 57(5), 84-85.
- Hurwitz, N. & Hurwitz, S. (2000). Do high-stakes assessments really improve learning? *American School Board Journal*, 187(1), 20-25.
- Jacobson, L. (2005). Idaho board softens career focus following criticism. *Education Week*, 25(13), 8.
- Johnson, B. (2000). *It's (beyond) time to drop the terms causal-comparative and correlational research in educational research methods*. (Paper presented at the annual meeting of the American Educational Research Association) New Orleans, LA.
- Johnson, D., Thurlow, M., Cosio, A., & Bremer, C. (2005). High school graduation

- requirements and students with disabilities. *National Center on Secondary Education and Transition Information Brief*, 4(2). Retrieved March 18, 2009, from www.ncset.org/publications/viewdesc.asp?id=1994.
- Johnson, J. & Uline, C. (2005). Preparing educational leaders to close achievement gaps. *Theory Into Practice*, 44(1), 45-52.
- Johnson, M. (1976). Needed research: Emphasis on the future. *Educational Leadership*, 33(7), 505-508.
- Jones, B. & Egley, R. (2006). Looking through different lenses: Teachers' and administrators' views of accountability. *Phi Delta Kappan*, 87(10), 767-771.
- King, K. & Zucker, S. (2005). Curriculum narrowing. *Pearson Policy Report*. Retrieved March 12, 2008 from www.pearsonassess.com.
- Kulm, G., Roseman, J., & Treistmas, M. (1999). A benchmarks-based approach to textbook evaluation. *Science Books & Films*, 35(4). Retrieved March 12, 2008, from www.project2061.org.
- Larson, R. & Farber, B. (2003). *Elementary statistics*. Saddle River, NJ: Prentice Hall.
- Lentz, C.A. (2007). *Science course sequence: the alignment of written, enacted, and tested curricula and their impact on grade 11 HSPA science scores*. Unpublished doctoral dissertation, Wilmington University.
- Levinson, C. Y. (2000). Student assessment in eight countries. *Educational Leadership*, 57(5), 58-61.
- Lubienski, C. & Lubienski, S., (January, 2006). *Charter, private, public schools and academic achievement: New evidence from NAEP mathematics data*. Retrieved

March 14, 2009, from <http://epicpolicy.org/publication/charter-private-public-schools-and-academic-achievement>.

Luft, J. (2008). International research and our classrooms. *National Science Teachers Association Reports*, 20(1), 1-2.

Marchant, G. (2004). What is at stake with high stakes testing? A discussion of issues and research. *Ohio Journal of Science*, 104(2), 2-7.

McCann, M. (2003). *Grade inflation: The relationship between math report card grades and standardized test results at the elementary level*. Unpublished doctoral dissertation, University of Central Florida.

McGehee, J. & Griffith, L. (2001). Large-scaled assessments combined with curriculum alignment. *Theory into Practice*, 40(2), 137-144.

Retrieved November 22, 2008, from EBSCOhost.

Mertler, C.A. (2003). Using standardized test data to guide instruction and intervention. Retrieved November 23, 2008 from <http://www.ericdigests.org/2003-4/standardized-test.html>.

Moses, M. & Nanna, M. (2007). The testing culture and the persistence of high stakes testing reforms. *Education and Culture*, 23(1), 55-72.

Neill, M. (2003). The dangers of testing. *Educational Leadership*, 60(5), 43-46.

Neill, M. (2006). The case against high-stakes testing. *Principal*, 85(4), 28-32.

Newkirk, T. (1975). The limitations of the standardized reading test. *The English Journal*, 64(3), 50-52.

NYC Department of Education. (2009). Test information. Retrieved April 18, 2009, from

<http://schools.nyc.gov/Accountability/YearlyTesting/TestInformation/Specialized+High+School+Admissions.htm>.

- Oswald, J. (2008). The future of testing. *District Administration*, 44(9), 58-59.
- Parker, S. (1912). *A textbook in the history of modern elementary education*. Boston, MA: Ginn and Company. Retrieved March 13, 2009 from books.google.com.
- Pedrone, D. (2004). The challenge of excellence in Biblical education. *Journal for Christian Educators*, 10(2), 22-24.
- Perrone, V. (1992). Stop standardized testing in early grades. *Education Digest*, 57(5), Retrieved April 21, 2008, from <http://web.ebscohost.com>.
- Peterson, D.L. (2004). Applying the educational principles of Comenius. *Journal for Christian Educators*, 10(3), 24-27.
- Phillips, S. & Mehrens, W. (1988). Effects of curricular differences on achievement test data at item and objective levels. *Applied Measurement in Education*, 1(1), 33-51.
- Popham, W.J. (1999). Why standardized tests don't measure educational quality. *Educational Leadership*, 56(6), 8-15.
- Popham, W.J. (2001). Standardized achievement tests: Misnamed and misleading. *Education Week*, 21(3). Retrieved April 22, 2008, from EBSCO.
- Popham, W. J. & Sirotnik, K. A. (1992). *Understanding statistics in education*. Itasca, IL: F.E. Peacock Publishers, Inc.
- Posner, G. (1992). *Analyzing the curriculum*. New York, NY: McGraw-Hill, Inc.
- Rothstein, R. (2005). The limits of testing. *American School Board Journal*, 192(2), 34-37.

- Samuels, C. (2008). N.Y.C. entrance exam questioned. *Education Week*, 28(10), 5.
- Schenker, J. & Rumrill, P.D. (2004). Causal-comparative research designs. *Journal of Vocational Rehabilitation*, 21(3), 117-121.
- Schmoker, M. (2000). The results we want. *Educational Leadership*, 57(5), 62-65.
- Scott, W. (2008). Old paths... new destinations! *Life at School*, 7(1), 3-8. Retrieved November 29, 2008, from <http://www.faccs.org>.
- Suiter, P. (2005). Improving your school through research-based initiatives. *Journal for Christian Educators*, 11(3), 6-9.
- Taylor, S. (2005). Special education and private schools: Principals' points of view. *Remedial & Special Education*, 26(5), 281-296.
- University of California. (2008). ACSI v Stearns-coursework subject matter and textbooks. Retrieved April 18, 2009, from <http://www.universityofcalifornia.edu/news/acsi-stearns>.
- Walker, C. (2007). The role of objectives and assessment to instruction. *Journal for Christian Educators*, 13(3), 10-14.
- Wallace, D. (2000). Results, results, results? *Educational Leadership*, 57(5), p.66-68.
- West, A., Hind, A., & Pennell, H. (2004). School admissions and 'selection' in comprehensive schools: policy and practice. *Oxford Review of Education*, 30(3), 347-369.
- White, B. (2004). The challenge of selecting an effective curriculum. *Journal for Christian Educators*, 10(3), 14-17.
- Ybarra, S. & Hollingsworth, J. (2001). Increasing classroom productivity. *Leadership*, 31(1), 34-35.

Zucker, S. (2003). Fundamentals of standardized testing. *Pearson Assessment Report*. Retrieved January 11, 2009, from www.pearsonassess.com.

Appendix A

Standardized Test Survey
 Return to sjinx@liberty.edu

Current school enrollment #_____ Current 7-9 enrollment#_____

Please place an x before your preferred response for questions 1-9.

1. ☐ Yes ☐ No Do you administer the *Stanford Ten* series as an end of year standardized test?
2. ☐ Yes ☐ No Do you require a minimum GPA for school entrance?
3. ☐ Yes ☐ No Do you require a minimum standardized test score for entrance?
4. ☐ Yes ☐ No Do you require a minimum score on an entrance test for admission into the school?
5. ☐ Yes ☐ No Do you use a student ability index or intelligent quotient score to determine if a child may be admitted?
6. ☐ Yes ☐ No Do you allow the teachers to vary instructional pace if the majority of the students need more time for mastery?
7. ☐ Yes ☐ No Do your students take semester exams for science subjects?

Comments on questions 1-7.

8. What is the *approximate* average number of years your secondary **science** teachers have taught on your staff for each grade level? (This should be an approximate average of all science teachers per grade level.)

7th ☐ 1-5 yrs ☐ 6-10 yrs ☐ 10+ years

8th ☐ 1-5 yrs ☐ 6-10 yrs ☐ 10+ years

9th ☐ 1-5 yrs ☐ 6-10 yrs ☐ 10+ years

Comments on question 8.

9. What *approximate* percent of **science** textbooks are used and completed for each grade level? (The approximate percent of textbook used is in reference to objectives per unit covered, not every question or assignment of every page covered.)

7th ☐ 0-65% ☐ 66-85% ☐ 86%-100%

8th ☐ 0-65% ☐ 66-85% ☐ 86%-100%

9th ☐ 0-65% ☐ 66-85% ☐ 86%-100%

Comments on question 9.

10. 2007 Stanford Achievement Test Scores (from the 2006-2007 school year)

	# of students listed on report	total science scalene score
7 th	_____	_____
8 th	_____	_____
9 th	_____	_____

11. Name of science course or courses offered

(Ex: Life Science, Physical Science)

List as many classes as you offer.

Textbook publishers/companies used

(Ex.: *A Beka Book*, Bob Jones, McGraw-Hill)

Please only enter publishers, not textbook titles.

7 th	_____	_____
	_____	_____
	_____	_____
8 th	_____	_____
	_____	_____
	_____	_____
9 th	_____	_____
	_____	_____
	_____	_____

Email: sjnix@liberty.edu

Fax: 407-831-6840

Mail: Miss Sharon Nix, Altamonte Christian School, 601 Palm Springs Drive, Altamonte Springs, Florida 32701

Questions: 407-831-0950

Appendix B

Survey Cover Letter

Dear Administrator,

I am the Academic Principal at Altamonte Christian School in Altamonte Springs, Florida. I am currently working on a dissertation to determine why some FACCS schools score higher on the Stanford Achievement Tests than other schools. Specifically, I am compiling a list of textbook publishing companies used for specific grade levels in the area of science, and reviewing information from a short survey that will ask questions relating to your specific textbook publisher, school admission standard process, the approximate percent of textbook completed each year, and a few other questions. Since I am also an administrator in the FACCS association, I realize how valuable your time is to you. Therefore, I have made the survey a minimal length of eleven questions and you may have one of your administrative team members help with the completing of the form.

Once information is compiled, I will share the information with the schools responding to this survey. Let me assure you that all school names will be coded when information is shared and reported in the dissertation. If you are like me, I have always been curious as to what textbook publishers other schools were using and what the top schools were doing to reach the higher percentiles in science. I would like to ask if you would be willing to help me complete this task, and in return, I believe you will find the results informative.

There are only two steps. Fill out the survey form attached and send it back through email, fax, or mail. I am only asking for the total science scaled score from 2007 for grades seven through nine. Since my study is based on group scores, you will only need to retrieve the three 2007 group reports for grades seven through nine. I am asking for the group mean scaled score under science for grades seven, eight and nine on the group report. The mean scaled score is in the fourth column. There are no individual student reports used in this study; just three scores. I will report any findings to all of the schools who participated from the beginning of this project.

If you have any questions, my number is 407-831-0950 (Altamonte Christian). If you would prefer to fax the information back, please fax to 407-831-6840. If you would like to return the form by email, please save the form as *returning standardized survey*, fill it out, and attach it to either the original document or a new document. It is my hope that this dissertation will allow administrators to have a little more insight to the patterns of success from the schools who are excelling. I appreciate your willingness to participate as I complete my doctoral studies at Liberty University.

Sincerely,

Appendix C

Face Sheet

Dear Administrator,

The information on the following survey will be separated from this face sheet so that your scores will not be able to be identified with a school name. The return of this face sheet gives me the opportunity to return results to you once the dissertation is complete. No school names will go in a database with statistical information.

The survey should take a minimal amount of time to complete. Please have a copy of the 2006-2007 group report for seventh through ninth grade. You will need three scaled science scores from that report.

Please return the face sheet and survey by one of the following methods.

Email: sjnix@liberty.edu

Fax: 407-831-6840

Mail: Miss Sharon Nix, Altamonte Christian School, 601 Palm Springs Drive, Altamonte Springs, Florida 32701

Questions: 407-831-0950

Name of School, City

Printed Name of Administrator Completing Report

Thank you for participating in this survey!

Appendix D

Survey Validators

Administrator response 1

When you have completed and returned the survey, I would appreciate it if you could give me some feedback by answering the questions listed below.

Were the directions on the letter, face sheet, and survey clear? YES If not, what was confusing? WE DID DISCUSS DROPPING THE REFERENCE TO FACCS ANNUAL FORM

Was the survey easy to navigate? YES If not, what part was difficult to use?

Were there any doubts about what was being asked? NO If so, what was confusing?

How long did it take you to complete the survey? 10-15 MIN - just long enough to get the test results from your office and then respond

Did you have any problems returning the survey? I did the first time, but I think it was due to my lack of computer knowledge. I don't think I saved it properly.

Do you have any comments or suggestions? When I added a comment regarding #1-7, the type does not wrap automatically. When it came to the end of the line it adjusted to a smaller font to keep the response on one line. When I realized it, I moved the cursor to the second line, but it would not let me adjust the first line - I tried to hit the return thinking the font would then return to the larger size, but it wouldn't let me do a return.

Administrator response 2

When you have completed and returned the survey, I would appreciate it if you could give me some feedback by answering the questions listed below.

1. Were the directions on the letter, face sheet, and survey clear? If not, what was confusing? *The directions were easy to follow*
2. Was the survey easy to navigate? *Yes* If not, what part was difficult to use?
3. Were there any doubts about what was being asked? *Not for me* If so, what was confusing?
4. How long did it take you to complete the survey? *Maybe 10 minutes—getting the SAT files caused some delay*
5. Did you have any problems returning the survey? *No*
6. Do you have any comments or suggestions? *Demographics plays a role on students achievement. Generally the differences between ethnic groups will have an affect the results i.e. Dade county will never achieve the averages of levels compared to for example Santa Rosa county in Florida. Teachers with science training will also influence results. Textbooks are only part of the answer.*

Administrator response 3

When you have completed and returned the survey, I would appreciate it if you could give me some feedback by answering the questions listed below.

1. Were the directions on the letter, face sheet, and survey clear? Yes , very clear If not, what was confusing?
2. Was the survey easy to navigate? Yes If not, what part was difficult to use?
3. Were there any doubts about what was being asked? No If so, what was confusing?
4. How long did it take you to complete the survey? Approximately 15-20 minutes
5. Did you have any problems returning the survey? No
6. Do you have any comments or suggestions? This information will be most helpful.