The Effects of Classical Education on Achievement in Lutheran Schools

A Research Project Presented to Concordia University, Nebraska

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ABSTRACT

The purpose of this study was to determine whether or not there was a significant difference in achievement between comparable Lutheran schools that utilized a classical education model and those that did not. The classical education model of education had been adopted by a growing number of Christian schools across the county in recent years. Despite this growth trend, however, a review of the literature showed a dearth of any quantitative research on the model. This study compared the norm-referenced achievement tests of classical Lutheran schools and comparable non-classical Lutheran schools. The results of the study provided quantitative data for those seeking to learn more about the academic results of classical model schools.

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CHAPTER 1: INTRODUCTION

The classical education movement had picked up momentum in the United States, growing from one school in 1980, to 56 in 1997, to 111 in 2000 (Veith, 2000), and to over 220 classical education model schools today (Association of Classical and Christian Schools, n.d.).   The classical education model was a special model of education whose curriculum was based on the trivium of grammar, logic, and rhetoric; Latin was also taught. The proliferation of the classical model was a movement that had also been making in-roads into the schools of the Lutheran Church-Missouri Synod. A group, the Consortium of Classical Lutheran Education had been formed to spread the word on this unique pedagogy. As more and more Lutheran schools had been considering adopting a classical Lutheran approach in their schools, parents, school boards, teachers, and administrators had numerous questions about not only what makes a school "classical" but they also wanted to know if this approach would produce results.

Recently, there had been primarily word-of-mouth and anecdotal evidence to vouch for the academic rigor and results touted by proponents of the classical education model. While there was a plethora of literature on the nature of the classical school, there was remarkable lack of research, either quantitative or qualitative, that assessed the quality of education being implemented by the classical school.   This study has analyzed the effects of classical education on achievement in Lutheran schools in an attempt to provide much needed data to discerning parties interested in classical Lutheran education.

Purpose Statement

The purpose of this study was to determine whether or not there was a significant difference in achievement between comparable Lutheran schools that utilized a classical education model and those that did not. To achieve this purpose a quasi-experimental design was used. The use of the classical education curriculum served as the independent variable and the use of the non-classical Lutheran schools' curriculum and standardized test scores served as the control. The dependent variable was be the standardized test scores of the classical Lutheran schools.

The design chosen was a quasi-experimental design because of the nature of the sampling (Cresswell, 2008). A true experiment would utilize random sampling but because of the limited availability of classical Lutheran schools, a convenience sampling was used. The study sought standardized test scores from all members of the Consortium for Classical Lutheran Education and, upon a member's agreement to participate, tried to obtain standardized test scores from a Lutheran school of similar composition that did not adhere to a classical curriculum.

The Consortium of Classical Lutheran Education recently had eleven members. With a non-classical Lutheran counterpart for each classical Lutheran school, this study would have no more than 22 participants.

Schools of the Lutheran Church-Missouri Synod (LCMS) were chosen as the study population because of the relative homogeneity of their student bodies as well as their solidarity to LCMS teachings and doctrine. Such solidarity of belief provided a common

background and philosophical base that further accentuated the effects of curricular variance.

Research Question

How do the standardized test scores of Lutheran classical schools compare to Lutheran schools not using the classical education model?

Hypothesis

This researcher hypothesized that mean test scores of classical model schools would be significantly higher than non-classical schools. While there was dearth of research on classical schools, there has been some study on the teaching of Latin. The teaching of Latin has been a key component of the classical school's curriculum which set it apart from the average non-classical curriculum. Studies (reviewed in detail in the literature review) indicated that the study of Latin could lead to higher standardized test scores. There was also a plethora of anecdotal evidence espousing the benefits of Latin instruction. While there was very little research to be found concerning classical model schools, logic would dictate that the inclusion of Latin in the curriculum should have lead to higher standardized test scores, especially in the language arts.

Definition of Terms

The following terms were used regularly throughout this study and may have needed further clarification for the average reader: *classical model of education*; *Lutheran education* and/or *Lutheran schools*; and *achievement*.

Classical model of education: this term referred to the educational approach used by a growing number of schools who have adopted this curriculum.   The Association of Classical and Christian Schools (ACCS) provided the following definition for classical education:

> "From its beginning, ACCS has advocated as its definition of "classical" the form of education that Miss Sayers described in her 1947 essay, *The Lost Tools of Learning*, and subsequently popularized in *Recovering the Lost Tools of Learning* by Douglas Wilson. Both of these authors advance the pedagogical methodology of the Trivium, which includes three aspects: grammar, dialectic, and rhetoric. Further, ACCS advocates, along with Miss Sayers and Mr. Wilson, that children tend to grow through developmental stages that generally coincide with the three areas of the Trivium. The Poll-parrot stage in which young children like to memorize and chant various bits of information coincides with the grammar stage of the Trivium. As children grow into their pre- and early teens, they become more argumentative and questioning; this is called the Pert stage, and coincides with the dialectic aspect of the Trivium. In their mid to late teens, children seem to be more vocal and expressive; this is called the Poetic stage, and conforms to the area of rhetoric. Children that are taught with these developmental stages in mind are receiving an education using classical methodology" (Association of Classical and Christian Schools, n.d., ¶19).

For the purposes of this study, any references to classical education and/or school were made in light of the ACCS definition.

Lutheran education and/or *Lutheran schools:* These terms referred to the association of some 1,300 preschools; 1,000 elementary schools; 100 high schools; 10 colleges; and 2 seminaries which, at the time of this research, were located across the United States and which adhered to the teachings of the Lutheran Church-Missouri Synod. In the Lutheran system of schools, schools had great autonomy and in most schools policies were set by the congregation's (or association's) school board (Cochran & Stueber, 1995). Members of the Lutheran Church-Missouri Synod were geographically

organized into districts and each district did have a District Executive for Education and Youth Ministries, which was a position similar to that of superintendent. This individual, however, only served in an advisory capacity and could only make recommendations, not directives, to the schools under his/her supervision. (Nebraska District - LCMS, n.d.) Lutheran schools were not totally autonomous in that they must still follow state laws that governed the operation of nonpublic schools; these regulations varied from state to state. Lutheran schools were used in this study because of this author's familiarity with them and the relative homogeneity of their school populations

　　　　Achievement: referred to the knowledge, skills, and competence that was attained by the student at a given point in time (Lyman, 1998). For the purposes of this study, achievement would be gauged by national percentile ranking of the norm-referenced standardized test that the student's school utilized. The terms *achievement test* and *standardized test* were used interchangeably.

Closing

　　　　The effects of a classical Lutheran education were worthy of study because the adoption of the classical curriculum by schools across the country was a phenomenon that was not backed by any quantitative research. It would be unfortunate for many schools to have jumped on a bandwagon that did not have the data to back its claims of academic superiority. The teaching of Latin, however, did provide some justification of classical school model success. In this study the standardized test scores of classical and non-classical schools were compared. This researcher hypothesized that classical

Lutheran schools would have test scores that were significantly higher than their non-classical counterparts.

The field of quantitative research on classical education was a desolate one. Much literature existed, but nothing that provided hard, empirical data. There did exist much literature that was theoretical, philosophical, and anecdotal concerning the virtues of classical education. There was very little substantiated criticism of the classical school. Studies of the effects of Latin teaching on learning could be connected to the classical school and should be considered in this research study.

CHAPTER 2: REVIEW OF LITERATURE

Introduction

Issue Being Studied

This research project studied the effect of a classical education curriculum on standardized test scores in Lutheran schools. It was important to note that while this literature review made note of research studies on the teaching of Latin in schools, Latin was not the central issue being studied in this project. The teaching of the classical language of Latin was worthy of mention because it was a key component of the classical education curriculum and was the only component that has been studied in some depth.

Purpose of Literature Review

This literature review validated the hypothesis that classical Lutheran schools would have higher mean standardized test scores than their non-classical counterparts. The literature review would also provide an account of the process used to try to locate primary and secondary source literature, a search which revealed a lack of published research on the benefits of classical education. The literature review then discussed non-researched based materials (anecdotal accounts, opinions, theoretical, and philosophical work) that were available. Finally, since there was a lack of research based work in the field of classical education, the literature review cited research in the teaching of the classical language, Latin, which had been a distinguishing characteristic of all true classical schools (Veith & Kern, 2001).

Organization of literature review

I.   The search for primary & secondary literature sources discussing research conducted on teaching practices and results of classical education.

II.   Literature on classical education that was not researched based but rather sources which had presented arguments for classical education or related the benefits (which would be anecdotal, opinion-based, theoretical, and philosophical – none of which were empirically based)

III.   Research on the teaching of Latin

Literature Findings

The Search for Quantitative Research on Classical Schools

An exhaustive search for research on the classical education model yielded virtually no results, even when that search was aided by a professional reference librarian. There was a true lack of quantitative or qualitative research in this growing, though still somewhat obscure education model. This researcher searched the largest and most respected academic libraries, databases, and search engines for anything relating to the classical education model. The following were searched: ERIC, JSTOR, EBSCOhost, ArticleFirst, WorldCat, and Omnifile.

Boolean searches were utilized but were fruitless. "Classical education" was not even listed as a subject area, showing how neglected this area is in academics. Since *classical education* was not listed as valid subject area, the following subjects and terms were searched: education; instruction; nontraditional education; educational philosophy;

liberalism; humanistic education; back-to-basics; classical; et cetera. These terms were all searched as both keywords and subjects with a publication or source type of research and/or study. Even without these narrowing identifiers, nothing could be found that was a true academic study.

Non-researched Based Literature on Classical Education

While research on the classical education was wanting, there was an abundance of literature that explained the history, philosophy, curriculum, and benefits of the classical education model. A thorough treatment was provided here to thoroughly ground the reader in the available background knowledge on the classical model of education.

Proponents of the classical model of education believed that it was a model of education that should be considered as a viable alternative to conventional schooling. There had been much controversy over the state and quality of modern education, both public and private, and out of this controversy there was a revival of schools that followed the traditional education models. One of these models of traditional education was the classical education model. The classical education model had a distinctive philosophical foundation and was characterized by the teaching of the trivium, quadrivium, and of Latin. The classical education model had its origins in ancient Greece and Rome and was the primary mode of education for centuries, even in the United States, until the turn of the twentieth century. The writings of Dorothy Sayers sparked a resurgence in the United States and in recent decades the number of classical schools had grown significantly and with success, despite obstacles (Vieth & Kern, 2001).

Today the philosophical base of classical education would be known as perennialism (Knight, 2008). Perennialists believed that truth was not subjective, and that man could know what was real and what was not. Applied to education, Robert Hutchins said "But the function of man as a man is the same in every age and every society, since it results from his nature as a man. The aim of an educational system can exist; it is to improve man as man" (Ediger, 1997, p. 3). This philosophy was especially attractive to Christian schools, which looked to God as the source of absolute truth. Perennialism was a grouping of traditional philosophic ideas, of which neo-scholasticism was one. Neo-scholasticism, especially as influenced by theologian/philosopher Thomas Aquinas, easily made allowance for the metaphysical concept of God. According to George Knight,

> "The basic approach developed by Aquinas was that a person should acquire as much knowledge as possible through the use of human reason and then rely on faith in that realm beyond the scope of human understanding" (Knight, 2008, p. 55-56).

Aquinas's teachings eventually were adopted by the Roman Catholic Church and were also known as ecclesiastical neo-scholasticism or ecclesiastical neo-Thomism. The educational philosophy of many Christian schools was probably originally grounded in such belief. This was a far cry from progressivist/pragmatic educational thought (based on the teachings of John Dewey) where the child and his experience/emotion was central to all, reducing education to socialization (Leithart, 2008).

The classical education model was considered traditional not only because of its perennialist/neo-scholastic foundation, but also because the pedagogy was ancient as well. It was based in the seven ancient liberal arts: grammar, logic, rhetoric (these three

established what was known as the trivium) and mathematics, music, astronomy, and geometry (these four established what was known as the quadrivium). These "arts" of the trivium were not academic "subjects" but were, according to Veith & Kern, "modes of learning" (Veith and Kern, 2001, p.12). In short, during the grammar stage the student trained his mind to absorb knowledge through recitation, memorization, and other forms of knowledge acquisition. In the logic stage (also known as the dialectic stage) the student began to understand what he had learned. In the rhetoric stage of development, the child (now young adult) learned to express ideas, digest and discern the arguments of others, and to use speaking skills to persuade others. The trivium taught a student how to think and appreciate the world around them. The quadrivium built on this and expanded the breadth of educational experience. The quadrivium had been updated in a natural fashion to reflect modern subjects (Littlejohn and Evans, 2006).

The teaching of the ancient language of Latin was another characteristic mark of a classical model school. Latin was taught because 1) many ancient works used the Latin language, 2) it helped improve English grammar, 3) it contributed to higher SAT scores, 4) it increased vocabulary, (Leithart, 2008) and 5) it was the linguistic base of most European languages (LeBovit, n.d.). LeBovit believed that with Latin "children could acquire higher communication skills by pushing through to the Latin roots basic to so many of the linguistic forms woven into the texture and fabric of our language." (LeBovit, n.d., p.1) Latin was also traditionally taught in schools prior to 1900, as was Greek (Denham, 2002). A few classical schools still did still teach Greek today (Leithart, 2008). In a liberal arts curriculum, Latin and Greek were simply expected, as was the Bible to

religion class – they were considered inseparable and today's classical schools were no

different.

Dr. Randall Hart outlined the long development of the liberal arts, most notably

the trivium, over the course of over 2000 years. The teachings of Socrates, Plato, and

especially Aristotle had a profound impact on Western education. For a time, the Greek's

works were lost, but were recovered by the Romans, only to be lost again for a time. They

were recovered around the year 1100 through Spanish traders. Around this time the first

universities sprang up and though details were fuzzy, it is known that circa 1159 A.D. the

importance of the trivium was already noted and so it would remain until the late 19th

century (Hart, 2006). "The liberal arts have a purpose which has been more than

achieved in the educations of Alexander, Archimedes, Dante, Aquinas, Rabelais, Luther,

Newton, Burke, and Jefferson" (Veith and Kern, 2001, p.15). Anne Lewis made special

reference also to the founding fathers of the United States and the classical education

that they benefited from and espoused, especially Thomas Jefferson and James Madison

(Lewis, 2008).

In colonial America, the first colleges adhered to a strictly classical/liberal arts

curriculum. Harvard was the first, founded in 1636, and was essentially a Bible college. It

was followed by William and Mary, Yale, the University of Pennsylvania, Princeton,

Columbia, Brown, Rutgers, and Dartmouth – all prior to the American Revolution

(Denham, 2002). Denham went on to say

> "In the colonial curriculum, Latin and Greek served as tools for the teacher
> and student to explore Aristotle's three philosophies (natural, moral, and
> mental) and the liberal arts of the medieval curriculum Unlike today, they
> were living languages for learning in logic, rhetoric, ethics, metaphysics,

astronomy, physics, and mathematics. These subjects formed the basic
course of study at the colonial colleges." (Denham, 2002, p.5)

Though the product of a classical education, it was Thomas Jefferson who first began the

push to make education more practical for the public. While his ideas were resisted for

the most part, it did mark the beginning of the slide away from this traditional education.

Eventually the elective system, the system by which students choose which courses they

want to study, was introduced and existed alongside the classical system as a parallel

course of study. As the Civil War approached, the trend toward vocational and utilitarian

education continued, and by 1900, classical education was in major decline (Denham,

2002).

The liberal arts education was in serious trouble, but it was not completely out of

favor. The ideas of John Dewey, a noted educational philosopher, nearly finished off the

classical or liberal arts education. John Dewey lashed out against the cold, impersonal

institutions that he felt characterized the traditional school and called for a reform in

education that placed the child at the center of the educational process (Noll, 2010). His

teachings paved the way for various schools of educational thought that have changed the

face of education significantly. Today, the traditional emphasis on memorization is

downplayed, and the importance of knowledge has been replaced by an increased focus

on the feelings of the child (Leithart, 2008).

Today, traditional education saw a revival in a different form. Mortimer Adler's

defense of traditional ideas had found adherents of his Paideia Proposal. His Great Books

program was popular in schools that were not even true Paideia schools (Ediger, 1997).

But a true liberal arts education, utilizing the trivium, quadrivium, and teaching of Latin,

owed much of its resurgence to a writer named Dorothy L. Sayers. Sayers, in 1947, made a now-famous speech called "The Lost Tools of Learning" and in it she shared her disappointment and dissatisfaction with the current educational system and called for a return to classical education. The "lost tools of learning" that she was referring to were grammar, logic, and rhetoric.   These tools correspond with developmental stages that Sayers called the Poll-Parrot (grammar stage: age 9-11), the Pert (logic stage: age 12-14), and the Poetic (rhetoric stage: age 15+). Sayers believed that it was no accident that students were taught over the centuries in this progressive fashion, rather education evolved over the years due to the intentional improvements and contributions of master teachers (Sayers, 1970).

Robert Littlejohn and Charles Evans did take exception with Sayers here and did not believe the trivium to be pedagogical and preceding the quadrivium, but rather subjects in their own right (Littlejohn and Evans, 2006).

The resurgence of classical education can be traced to Dorothy Sayers, and the influence that her speech was to later have on Douglas Wilson, the founder of the Association of Classical and Christian Schools. Douglas Wilson opened the Logos School in Moscow, Idaho in 1980 because he wanted a better education for his daughter than what the public school could provide (Veith and Kern, 2001). The Association of Classical and Christian Schools (ACCS) formed in 1994 with 10 member schools, would grow to 111 schools by 2000, and as of 2007 boasted over 207 classical schools (Leithart, 2008). Because these schools were relatively new, how successful they were as a reform school is

unclear. The Logos School was by far the oldest and had shown impressive test results, as had the Regents School in Austin, Texas. According to Veith & Kern:

> "Another ACCS school, Regents School in Austin, Texas, created a stir when its class scored an average of 950 on the Scholastic Aptitude Test (SAT). The national average for high school seniors is 906. But the Regents students were not seniors. They were eighth graders" (Veith and Kern, 2001, p. 25).

The ACCS was an association of classical Christian schools, and represented but one portion of the growing movement. There also existed the Consortium for Classical Lutheran Education (CCLE). There were many other secular classical schools, such as democratic classicism which was Mortimer Adler's Paideia Group. There was also a significant number of homeschoolers that were utilizing the classical model in one form or another (Veith and Kern, 2001). Much of this resurgence was a reaction against popular education and the pervasive post-modernism in it.

Research on the Teaching of Latin

There existed a number of research studies that had analyzed the impact on achievement in students of Latin. The majority of published Latin studies were conducted in the 1970's and 1980's. This treatment reviewed four studies that studied the effects of Latin in the classroom.

The Philadelphia, Pennsylvania Elementary Latin Program

In 1971 Richard Offenberg and others conducted a major study, "Evaluation of the Elementary School (FLES) Latin Program 1970-1971" in Philadelphia (Offenberg, 1971).

The research problem centered on the effects of daily Latin instruction in fourth, fifth, and sixth grade classrooms. The program had three major objectives: 1) to introduce children to basic Lain structure and vocabulary; 2) to extend the English vocabulary of children through the study of Latin roots and affixes; 3) to acquaint children with classical culture and its influence on the present.

To evaluate such a program, two locally developed curriculum guides were created. Latin was taught daily for twenty minutes each day by itinerant Latin teachers. The study involved 4,000 students in 85 classrooms. Program effectiveness was assessed by surveys which gauged program perceptions by pupils, host teachers, host principals, and parents. Content mastery was assessed by a cultural information test, a Word-Power game, and an oral Latin test. Finally the vocabulary subtest of Iowa Tests of Basic Skills was used.

The program yielded the following results: 1) parents, principals, students, and teachers were overwhelmingly in favor the program; 2) 92% of all Latin students passed the oral test; and 3) students in the test sample had a mean grade-equivalency of 5.6 vs. a mean of 4.6 for those not in the test population (this was statistically significant at 5%). In his discussion, Offenberg noted that students preferred learning Latin to learning new English words and suggested that direct attempts to teach English vocabulary might not be as effective as embedding English vocabulary into the Latin program (Offenberg, 1971).

The Alexandria, Virginia Pilot Program

In 1973, after the report of the success of the Philadelphia program, the Alexandria City Schools of the state of Virginia initiated a Latin pilot study. Researcher Jean W. Payne reviewed the study *Latin Pilot Study. Final Report.* The research problem: how to increase the English reading skills of elementary school children. The researcher hypothesized that Latin instruction with a strong emphasis on relating English words to Latin roots and affixes would strengthen students' reading skills.

The study would use six fifth grade classrooms from two schools. Three classes from each school were randomly selected to receive Latin instruction. The students would receive 20 minutes of Latin instruction per day. Originally the study had 145 test subjects that were matched by test scores, race, age (in months), and sex. Students were given a pretest using the 1972 SRA Assessment Survey – Blue Level, Form C, as well as the Gates-MacGinitie tests.

A number of factors outside of the study's control would comprise the integrity and legitimacy of the study. The number of test subjects dropped from 145 to 60 because of a series of staff and administrative turnover that led to the majority of students being assigned to other schools. The study did try to follow the students into their new schools, but the author noted that many students had difficulty adjusting and would either show up late to the Latin class – if they showed up at. As a result, nearly all post-tests showed no statistically difference between the control and experimental groups. The author also questioned whether or not the reading tests used were the best tests to gauge learning for

this study. Still, participating principals, teachers, and students reported positive

attitudes and perceptions toward the Latin instruction (Payne, 1973).

The Indianapolis, Indiana Elementary Latin Program

Researcher Rita Sheridan conducted a Title III project for the Indianapolis Public

Schools of the state of Indiana from 1973-1976 called *Augmenting Reading Skills Through*

Language Learning Transfer. FLES Latin Programs Evaluation Reports 1973-1974, 1974-

1975, 1975-1976 (Sheridan, 1976). The research sought to assess whether or not the study

of Latin and classical civilizations would 1) expand the verbal functioning of sixth graders

in English, and 2) broaden their cultural horizons and stimulate interest in the

humanities. The research was based on the hypothesis that

> "...significant English language skills and the control of syntactic structures
> can be measurably improved through participation in a specially designed
> Latin FLES program which stresses the importance of Latin root words"
> (Sheridan, 1976, p.3)

The study would use 400 sixth grade students in six schools. Two additional

schools with one hundred sixth grade students each served as the control. A Latin

specialist would teach a 30 minute lesson daily. A pre and post test would be used to

compare the experimental and control groups.

In the first year the Latin group showed the following gains on the non-Latin

groups: 8 months on word knowledge; 1 year in reading; 1year, 1 month in language; 4

months in spelling; 7 months in math computation; 8 months in math concepts; 9

months in math problem solving; 5 months in science; and 7 months in social studies.

Year two of the study showed similar results.   Sheridan cited the following significant

results: 10% of the students in the scored 80% and on the posttest 80% scored 80% or better. The year three experimental group showed no significant difference to the control group on the pretest. The year three posttest displayed significant gains by the experimental group over the control group (Sheridan, 1976).

Computerized Latin and SAT Prep

C. Thomas Holmes and Ronald Keffer conducted the study "A Computerized Method to Teach Latin and Greek Root Words: Effect on Verbal SAT Scores," published in 2001. The study problem focused on how to increase scores on the verbal portion of the Scholastic Aptitude Test (SAT). The researchers hypothesized that using a computerized program to teach Latin and Greek root words over six weeks will increase student scores on the verbal portion of the SAT.

The study used a Solomon four-group design, configured by random assignment. Group one would take the pretest and participate in the computer program. Group two took both the pretest and the posttest. Group three participated in the computer program and took the posttest. Group four took only the posttest.   High school volunteers were solicited; 115 signed up.   The groups that received the computer treatment used an Apple HyperCard system for 45 minutes, twice a week for six weeks.

The pretest showed no significant difference between the experimental and control groups. The posttest showed that the experimental groups mean to be 40 points higher than the mean of the control groups. The authors suggested that it was difficult to

gauge the effect of student motivation on the study and did acknowledge that the volunteers were not representative of the school population (Holmes & Keffer, 2001).

Closing

The study of classical education in general, showed a significant lack of academic research, be it quantitative or qualitative. This lack of pure published research could be due to its relative infancy in the field of education, it could be viewed by some as an aberration in education and therefore not worthy of study, or any number of possibilities could explain the deficiency. Though there was a lack of research, there was no lack of non-research based literature. There were literally dozens of authors publishing books and articles on classical tradition and the classical education movement, as a simple search on a bookseller like Amazon.com would show. There was research available on the teaching of Latin, though much of it was antiquated. In general, studies on Latin showed that students who learned Latin scored higher on a variety of tests over those who had not studied Latin.

The very lack of research on classical schools, much less on classical Lutheran schools, provided a strong impetus in and of itself for the need of research in this area. If one were to add to it the growing number of classical schools (both Lutheran and non-Lutheran) there existed a strong case for this study. To this end, this researcher designed a study that used classical and non-classical Lutheran schools that provided quantitative data on the achievement of classical schools and shed some light on the legitimacy of the movement.

CHAPTER 3: METHODOLOGY

Introduction

Classical education was a growing movement in education, but it was one that had not been quantitatively researched. The movement was attractive to many Christian schools because of its academic rigor and because its core philosophy was very compatible with Christian teachings and beliefs. However, the classical model was not just for Christian schools, the curriculum could be implemented in any school. The proponents of classical education touted its academic rigor and superiority. As of this writing, there had been no published research conducted to validate such a belief. There had, however, been several studies on the teaching of Latin (which all classical schools taught) that showed empirically that students that had been taught Latin had fared far better on various academic tests than their counterparts that did not receive Latin instruction, especially in the language arts. Latin was but one component of the classical curriculum which this project studied.

The purpose of this project was to determine whether or not there was a significant difference in achievement between comparable Lutheran schools that utilized a classical education model and those that did not. This project analyzed standardized test scores in an attempt to gauge the academic prowess of the classical education model in Lutheran schools.

Design

A quasi-experimental design was selected for this project because assignment of groups would not be random, as would be the case in a true experiment. This project utilized a relatively small set of self-identified classical Lutheran schools and the researcher needed to further seek out and intentionally match each classical Lutheran school with a non-Lutheran counterpart. Cresswell's book *Educational Research* did validate this method when he said "This might happen because of the availability of the participants or because the setting prohibits forming artificial groups" (Cresswell, 2008 p.313).

The quasi-experimental design was aptly suited to this research project because it allowed for the use of the already intact classical Lutheran schools group to be used. Since there were only 11 such schools that identified themselves as classical, as many of these schools as possible would need to be used. Random assignment was not an option if a sufficient amount of data was to be acquired (Cresswell, 2008).

Subjects

This study utilized two subject test groups: a classical Lutheran schools group and a non-classical Lutheran counterpart group. The first group, the classical Lutheran schools was comprised of 11 schools that make up the Consortium for Classical and Lutheran Schools (CCLE). They were selected because of the similarity of their curriculums and the solidarity of their beliefs and teaching as evidenced by their membership in this consortium.

The selection of the second group, the non-classical Lutheran schools, was made upon the receipt of demographic data from the participating classical Lutheran schools. A concerted attempt was made to find Lutheran schools that had similar K-8 populations. Race, ethnicity, and gender were not factors of consideration in the selection of appropriate matches. School population was the primary factor in determining matches, though geographic characteristics were considered as well. For example, a classical Lutheran school with a student population of 60 students located in the Midwest would be matched with a non-classical counterpart with 60 students also located in the Midwest, and in a similar population setting.

Lutheran schools had been specifically chosen because of convenience, accessibility, availability, and willingness of participants, which fitted Cresswell's description of a convenience sample (Cresswell, 2008). Cresswell indicated that with a convenience sample it would become more difficult to assure that the sample was representative of the population. However, by using only Lutheran schools that were relatively geographically diverse (that is, schools were not confined to a predetermined district or state) the degree of representation should have remained quite high because of the relative homogeneity of Lutheran schools.

A copy of the Informed Consent Form that was given to each participating school was included in Appendix A.

Instrumentation

The purpose of this project was to determine whether or not there was a significant difference in achievement between comparable Lutheran schools that utilized a classical education model and those that did not. The use of the classical education curriculum served as the independent variable and the non-classical Lutheran schools served as the control. The dependent variable was the standardized test scores of the classical Lutheran schools.

The research question addressed in this study was "How does the standardized test scores of Lutheran classical schools compare to Lutheran schools not using the classical education model?"

The data collection instrument for this research project analyzed the results of standardized tests that every school conducts annually. The data collection instrument for this project was the nationally-normed, standardized test (e.g. The Iowa Tests of Basic Skills, The California Achievement Tests, et cetera) given for the 2008-2009 school year. The standardized test could be either the Iowa Test of Basic Skills (ITBS) or some similar test, such as the California Achievement Test (CAT). As long as the test used by each school was a nationally normed test, then the national percentile rankings of each test would still be comparable.

In order to compare the achievement of each school the project focused on the national percentile rankings (NPR's) of each class per school in each subject. Paired classical and non-classical NPR's were compared. The NPR's of all subjects in classical Lutheran schools were averaged, as were the NPR's of all non-classical schools. A t-test

was run, assessing the significance of the differences in NPR scores. Significance was determined at a .01 level due to the small sample size.

The comparison of means and the use of the t-test to evaluate significance answered the research question: *How do the standardized test scores of Lutheran classical schools compare to Lutheran schools not using the classical education model?* National percentile rankings were used because they were comparable to the percentile rankings in other similar tests.   While stanines and grade equivalencies could also be compared, these scores were not as easily understood by the average reader as were national percentile rankings. In addition to the comparison of means, the mode, median, and range also provided added statistical analysis of the data. These tools looked for unexpected trends and/or add data to support the comparison of means and the use of the t-test.

Data Collection Procedures

The following steps were taken to access the participants in this study:

a.   A form letter was sent to all members of the Consortium of Classical and Lutheran Education. This letter explained the research project; asked for their participation of it; and provided informed consent information. Schools will first received an email alerting them to the coming letter and was followed up with a telephone call several weeks after they should have received the packet. A copy of the form letter could be found in Appendix B.

b.   Regardless of whether or not a school had formally agreed to participate, a packet was sent to each prospective school with instructions on data submission as well as

a survey of basic school information, including enrollment. A copy of the instructions could be found in Appendix C.

c.   Upon the receipt of participating school data, the process to find a corresponding or similar school that did not use a classical model of education began.

d.   Matching non-classical Lutheran schools was selected based on K-8 enrollment. Use of the Lutheran school portal will assist with this process. Good matches were to be contact by email, form letter, and telephone call. Time constraints did not allow for all three. Ultimately each prospective non-classical school match received a packet containing the introductory letter and all requisite forms and instructions.

e.   A letter of consent was be prepared and included in the participant packet. A copy of the letter of consent could be found in Appendix A.

f.   Number of participants: ideally 11 per group, which would have been eleven classical Lutheran schools and eleven non-classical Lutheran schools. Cresswell recommends at least 15 per group, but this research project was confined by the total available classical Lutheran schools. Since only six of the eleven classical schools had consented to participate, each of these six schools were matched with four or five prospective matches. This was done in the hopes of bolstering the sample size. In the end, the six classical schools were complemented by nine non-classical schools.

g.   Security: Upon receipt of school data, the school's identifiable data was blacked

out and coded. A record of codes was kept in a locked file. Any digital copies were

password protected.

Standardized testing data from each school was collected via the completion of the

participation packet that each participant school received. A copy of this participation

packet could be found in the appendix.

Timeline

The following was the proposed timeline for the timely completion of this research

project. Dates were tentative and were intended to serve as a guide to the researcher.

Exact adherence to the proposed dates was not required and should not have affected the

results of the project.

a. **August 2009**: Prepared proposal and participant packets (22) and ready for mailing.

b. **Early September 2009**: Emailed CCLE schools to alert them about the research

participation proposal that would be coming to them soon.

c. **Mid-September 2009**: Mailed project proposal information.

d. **Late September 2009**: Called each CCLE school for confirmation or declination of

invitation to participate in project.

e. **Early October 2009**: Mailed participation packets to schools that had agreed to

participate.

f. **Early October 2009**: Matched classical Lutheran schools with comparable non-classical schools. Emailed and mailed proposals, and follow-up with proposed non-classical matches.

g. **Late October**: Mailed out final participant packets to non-classical Lutheran schools.

h. **All participant data was due Late November**

i. **Early January:** All data was collected, coded, and analyzed

Closing

In order to answer the question "*How does the standardized test scores of Lutheran classical schools compare to Lutheran schools not using the classical education model?*" standardized test scores were obtained from as many as possible members of the Consortium of Classical Lutheran Education (CCLE). In order to make legitimate comparisons with non-classical Lutheran schools, each classical Lutheran school was matched with multiple non-classical counterparts based on student populations. Once matched, standardized test scores were to be compared using national percentile rankings (NPRs). A t-test was used to determine the statistical significance of the scores.

The use of this quasi-experimental design would hopefully reveal results that could either substantiate or repudiate the claims and arguments of classical education proponents. This data would also be useful for principals, teachers, and school boards of Lutheran schools that were seeking more information on classical education.

CHAPTER 4: RESULTS

The growing movement of schools that had adopted a classical education model and the lack of quantitative or qualitative research supporting it had provided the impetus for a closer look at the effects of classical education on achievement. Classical schools had grown in number from one school in 1980 to over 220 classical education model schools today (Association of Classical and Christian Schools, n.d.).   The formation of the Consortium of Classical Lutheran Education within the body of schools of the Lutheran Church-Missouri Synod further warranted investigation. By soliciting the norm referenced test scores of comparable classical and non-classical Lutheran schools, this research was designed to provide quantitative data to prove whether or not the classical model provided the superior academic achievement that it purported.

The purpose of this study was to determine whether or not there was a significant difference in achievement between comparable Lutheran schools that utilized a classical education model and those that did not. Members of the Consortium of Classical Lutheran Education were been solicited for school testing data as were comparable Lutheran schools that did not implement the classical education model.

Description of Sample

Using a quasi-experimental design did allow for smaller sample populations since conditions may have limited the pool of available test subjects (Cresswell, 2008).   In this research, the Consortium of Classical Lutheran Education (CCLE) was chosen as the test subject. The CCLE, at the time of this research, consisted of eleven member schools.

Each of these schools was solicited by letter, email, and phone call for participation in the study. In the end, six of the eleven schools participated and sent in their test scores. Table 1 showed each school (now codified) and the following information: location, setting, K-8 population, racial diversity, % of Lutherans, the type of test score submitted, the non-classical schools that were matched with them, as well as any other notable information. The initial research proposal made it clear that race, gender, and ethnicity were not a factor in the matching of the schools and they were not. The racial diversity information and percentage of Lutherans in attendance were provided to show how similar/different the participating groups were to each other.

Table 1: Classical Lutheran Schools Profiles					
School Code	CLSA	CLSB	CLSC	CLSD	CLSE	CLSF
State:	Texas	Wyoming	Nebraska	Texas	Texas	Wyoming
Setting:	Large Urban	Small Urban	Large Urban	Large Urban	Large Urban	Small Urban
K-8 pop	188	78	20	105	175	35
Racial diversity	72% white 13% black 13% Hispanic 2% other	Dominantly Caucasian, small mix of Asian, Hispanic, and African American	80% white 20% other	Very racially diverse	79% Caucasian, 7% black, 4% Asian, 4% Hispanic, 6% other	Predominantly Caucasian, mixed racially
% of Lutherans	33%	40%	98%	25%	51%	20%
Test Type	ITBS	ITBS	Terra Nova	Stanford	ITBS	ITBS
Nonclassical Matches	NCLSA	NCLSB NCLSC	No matches responded	NCLSD NCLSH NCLSI	NCLSE	NCLSF NCLSG
Special notes:	In 6th year of transition to classical education curriculum	None	Did not have students in all K-8 grades	None	None	Because of alternating testing schedule, scores are from the 2007/2008 year.

Note: The table header spans all six school-code columns.

As Table 1 illustrated, all schools were similar in that they were located entirely in the Midwest of the United States. Three southern schools of Texas were complemented by three northern schools of Wyoming and Nebraska. The K-8 populations varied significantly and ranged from a low of 20 students to a high of 188. These school sizes represented a decent microcosm of Lutheran schools throughout the United States. One also noted that the percentage of students having a Lutheran religious background also varied, but tended to be less than half of the school population. Finally, while there were matches for most of the classical schools, school CLSC did not have a solicited match respond.

As it became clear that lower than expected numbers of classical Lutheran education schools would be participating, the research design was adjusted slightly to bolster the number of participants in an attempt to prevent a too-low sample population from invalidating the research. To this end, each classical participant was matched with three to four potential matches in the hopes of strengthening the data with more participants. An emphasis would now be placed on the number of overall students in the pooled population of classical Lutheran schools and that of the non-classical Lutheran schools.

Twenty non-classical Lutheran schools were matched with the six participating classical Lutheran schools. Appropriate matches were made through use of the Lutheran School Portal and the LCMS webpage. Both resources contained online data bases that provided student populations. Schools were primarily submitted from Texas and Nebraska since they also were represented in the classical Lutheran school models. There

were no non-classical Lutheran schools in the state of Wyoming because all Lutheran

schools in Wyoming had adopted the classical education model. Table 2 provided

detailed information about each participating non-classical Lutheran school. These could

be compared with their matches in Table 1.

Table 2: Non-Classical Lutheran Schools Profiles				
School Code	NCLSA	NCLSB	NCLSC	NCLSD	NCLSE
State:	Nebraska	Nebraska	Nebraska	Nebraska	Texas
Setting:	Large Urban	Small Urban	Small Urban	Small Urban	Large Urban
K-8 pop	127 (K-6)	66	70	151	55 (K-5)
Racial diversity	95% Caucasian 5% Other	89% Caucasian 3% Asian 3% Black 4% Other	92% Caucasian 4% Hispanic 2% Asian 2% Black	90% Caucasian 4% Hispanic, 6% Sudanese	60% Caucasian 17% Black 17% Hispanic 4% Asian 3% Other
% of Lutherans	85%	50%	45%	90%	17%
Test Type	Terra Nova	ITBS	ITBS	ITBS	ITBS
Classical Matches	CLSA	CLSB	CLSB	CLSD	CLSE
Special notes:	none	None	Wide range of socioeconomic backgrounds	27% of students are on free-reduced lunch	Middle to Upper Socioeconomic background

School Code	NCLSF	NCLSG	NCLSH	NCLSI	
State:	Nebraska	Nebraska	Nebraska	Texas	
Setting:	Small Urban	Rural	Small Urban	Large Urban	
K-8 pop	41	72	123	57	
Racial diversity	96% white 4% other	95%White 5% Hispanic	95% White 3% Asian 2% Black 6% Hispanic	60% Caucasian, 30% Hispanic, 10% African-American	
% of Lutherans	70%	90%	76%	12-15%	
Test Type	Terra Nova	Terra Nova	Terra Nova	ITBS	
Classical Matches	CLSF	CLSF	CLSD	CLSD	
Special notes:	none	none	40% students free/reduced	none	

It was interesting to note that the non-classical schools had a higher percentage of Lutheran students as compared to the classical Lutheran schools. The range of student populations did not vary as much as the classical Lutheran schools, ranging from a low of 40 students (school NCLSF) to a high of 151 (school NCLSD). Table 3 showed the six classical schools had a total of 587 reported student scores for the test Core Totals in grades K-8 versus 462 reported for the nine non-classical schools. Discussion of the groupings of reading, language, mathematics, and core total were discussed in detail in the data analysis.

Table 3: Comparison of Number of Students Tested

	Reading		Language		Mathematics		Core Total	
	Classical	Non-Classical	Classical	Non-Classical	Classical	Non-Classical	Classical	Non-Classical
K	55	0	78	9	94	9	94	9
1st	69	20	69	20	69	20	69	20
2nd	65	41	65	41	65	41	65	41
3rd	66	71	66	70	66	71	66	70
4th	65	75	65	75	65	75	65	75
5th	51	58	51	58	51	58	51	58
6th	65	62	65	62	65	62	65	62
7th	77	58	77	58	77	58	77	58
8th	35	68	35	68	35	68	35	68
T:	548	453	571	462	587	463	587	462
Difference	95		109		124		125	

Data Analysis by Research Question

In chapter one, this author proposed to study the following research question:

How do the standardized test scores of Lutheran classical schools compare to Lutheran

schools not using the classical education model? This researcher further hypothesized

that mean test scores of classical model schools would be significantly higher than non-

classical schools.

The research was designed to compare mean National Percentiles (NPR) as

reported on submitted norm-referenced achievement tests for the 2008-2009 school year.

Submitted achievement tests include the following: The Iowa Tests of Basic Skills, Terra

Nova, and the Stanford Tests. There were slight variances in each test, but each test did

include a reading total, a language total, and a mathematics total. There were some

terminology differences, but each also had what this research will call the "core total"

which combines the three previous sections. It should be noted that because of test

differences, standard tests of science, social studies, sources of information, and others

were not compared in this research.

Furthermore, it should also be noted that not all schools reported scores for every

grade. Some schools did not have all K-8 grades and some schools only tested selected

grade levels. For this reason caution should be exercised in the interpretation of scores at

the kindergarten level, especially, as very few schools tested at this level.

Tables 4 and 5 included the submitted data for reading, language, math, and core

totals from the participating classical and non-classical Lutheran schools, respectively.

The data had been pooled and a mean, mode, median, range, and standard deviation had

been calculated for each group by test and grade. These were descriptive statistics that showed general tendencies and the spread of the scores (Cresswell, 2008). The alternating sequence of highlighted sections of tables four and five served no purpose other than to further organize the data and ease the reading of it. Further detailed information showing scores and student populations of each school respectively could be found in Appendices E and F.

	Reading Total	Language Total	Math Total	Core Total
Table 4: Classical Lutheran Schools National Percentile Rankings (NPR)				
K	Total # of students: 55 Mean NPR: 86.2 Mode: 90 Median: 90 Range: 13 Standard Deviation: 5.96	Total # of students: 78 Mean NPR: 87.6 Mode: 94 Median: 94 Range: 23 Standard Deviation: 9.0	Total # of students: 94 Mean NPR: 75.7 Mode: 84 Median: 74 Range: 34 Standard Deviation: 11.48	Total # of students: 94 Mean NPR: 76.4 Mode: 85 Median: 72 Range: 30 Standard Deviation: 10.63
1st	Total # of students: 69 Mean NPR: 64.5 Mode: 69 Median: 69 Range: 57 Standard Deviation: 20.28	Total # of students: 69 Mean NPR: 56.6 Mode: 55 Median: 55 Range: 50 Standard Deviation: 18.72	Total # of students: 69 Mean NPR: 56.9 Mode: 55 Median: 55 Range: 45 Standard Deviation: 15.89	Total # of students: 69 Mean NPR: 59.8 Mode: 60 Median: 60 Range: 41 Standard Deviation: 14.48
2nd	Total # of students: 65 Mean NPR: 73.4 Mode: 75 Median: 75 Range: 39 Standard Deviation: 13.74	Total # of students: 65 Mean NPR: 66.1 Mode: 70 Median: 70 Range: 24 Standard Deviation: 9.17	Total # of students: 65 Mean NPR: 71.5 Mode: 70 Median: 74 Range: 37 Standard Deviation: 12.75	Total # of students: 65 Mean NPR: 71.3 Mode: 72 Median: 72 Range: 30 Standard Deviation: 11.1
3rd	Total # of students: 66 Mean NPR: 67.5 Mode: 70 Median: 70 Range: 52 Standard Deviation: 17.96	Total # of students: 66 Mean NPR: 62.4 Mode: 58 Median: 58 Range: 57 Standard Deviation: 20.3	Total # of students: 66 Mean NPR: 62.3 Mode: 54 Median: 54 Range: 46 Standard Deviation: 17.53	Total # of students: 66 Mean NPR: 65.7 Mode: 61 Median: 61 Range: 54 Standard Deviation: 19.53
4th	Total # of students: 65 Mean NPR: 69.1 Mode: 85 Median: 66 Range: 27 Standard Deviation: 13.2	Total # of students: 65 Mean NPR: 75.2 Mode: 91 Median: 68 Range: 47 Standard Deviation: 12.0	Total # of students: 65 Mean NPR: 77.6 Mode: 89 Median: 81 Range: 52 Standard Deviation: 12.44	Total # of students: 65 Mean NPR: 74.1 Mode: 91 Median: 71 Range: 54 Standard Deviation: 13.81

5th	Total # of students: 51 Mean NPR: 78.3 Mode: 87 Median: 87 Range: 34 Standard Deviation: 11.09	Total # of students: 51 Mean NPR: 78.6 Mode: 92 Median: 91 Range: 43 Standard Deviation: 14.82	Total # of students: 51 Mean NPR: 78.8 Mode: 88 Median: 88 Range: 38 Standard Deviation: 14.21	Total # of students: 51 Mean NPR: 80.2 Mode: 91 Median: 91 Range: 30 Standard Deviation: 13.01
6th	Total # of students: 65 Mean NPR: 71 Mode: 88 Median: 72 Range: 41 Standard Deviation: 16.12	Total # of students: 65 Mean NPR: 73.1 Mode: 92 Median: 64 Range: 46 Standard Deviation: 15.85	Total # of students: 65 Mean NPR: 72.4 Mode: 79 Median: 69 Range: 35 Standard Deviation: 7.39	Total # of students: 65 Mean NPR: 72.2 Mode: 89 Median: 64 Range: 39 Standard Deviation: 14.43
7th	Total # of students: 77 Mean NPR: 79.4 Mode: 75 Median: 75 Range: 12 Standard Deviation: 8.96	Total # of students: 77 Mean NPR: 77 Mode: 75 Median: 75 Range: 39 Standard Deviation: 13.19	Total # of students: 77 Mean NPR: 83.5 Mode: 81 Median: 81 Range: 26 Standard Deviation: 8.93	Total # of students: 77 Mean NPR: 80.5 Mode: 78 Median: 78 Range: 32 Standard Deviation: 11.33
8th	Total # of students: 35 Mean NPR: 73.6 Mode: 70 Median: 73 Range: 15 Standard Deviation: 4.76	Total # of students: 35 Mean NPR: 82.9 Mode: 78 Median: 81 Range: 14 Standard Deviation: 5.8	Total # of students: 35 Mean NPR: 82 Mode: 79 Median: 79 Range: 10 Standard Deviation: 4.55	Total # of students: 35 Mean NPR: 80.9 Mode: 78 Median: 79 Range: 12 Standard Deviation: 4.09

Table 5: Non-Classical Lutheran Schools National Percentile Rankings

	Reading Total	Language Total	Math Total	Composite
K	Total # of students: X Mean NPR: X Mode: X Median: X Range: X Standard Deviation: X	Total # of students: 9 Mean NPR: 96 Mode: 96 Median: 96 Range: 0 Standard Deviation: 0	Total # of students: 9 Mean NPR: 98 Mode: 98 Median: 98 Range: 0 Standard Deviation: 0	Total # of students: 9 Mean NPR: 98 Mode: 98 Median: 98 Range: 0 Standard Deviation: 0
1st	Total # of students: 20 Mean NPR: 80.4 Mode: 80 Median: 80 Range: 1 Standard Deviation: 0.5	Total # of students: 20 Mean NPR: 87.4 Mode: 87 Median: 87 Range: 1 Standard Deviation: 0.5	Total # of students: 20 Mean NPR: 71 Mode: 65 Median: 65 Range: 15 Standard Deviation: 7.54	Total # of students: 20 Mean NPR: 76.4 Mode: 74 Median: 74 Range: 6 Standard Deviation: 3.02
2nd	Total # of students: 41 Mean NPR: 80.7 Mode: 89 Median: 79 Range: 25 Standard Deviation: 9.21	Total # of students: 41 Mean NPR: 78.7 Mode: 82 Median: 82 Range: 17 Standard Deviation: 6.4	Total # of students: 41 Mean NPR: 76.3 Mode: 82 Median: 73 Range: 12 Standard Deviation: 5.47	Total # of students: 41 Mean NPR: 80 Mode: 87 Median: 79 Range: 16 Standard Deviation: 7.13
3rd	Total # of students: 71 Mean NPR: 71.9 Mode: 83 Median: 73 Range: 28	Total # of students: 70 Mean NPR: 70.5 Mode: 75 Median: 75 Range: 27	Total # of students: 71 Mean NPR: 69.8 Mode: 86 Median: 69 Range: 40	Total # of students: 70 Mean NPR: 72.3 Mode: 85 Median: 71 Range: 32

	Standard Deviation: 10.55	Standard Deviation: 8.95	Standard Deviation: 14.48	Standard Deviation: 11.86
4th	Total # of students: 75 Mean NPR: 73.5 Mode: 82 Median: 72 Range: 29 Standard Deviation: 10.28	Total # of students: 74 Mean NPR: 73.2 Mode: 86 Median: 77 Range: 43 Standard Deviation: 16.08	Total # of students: 75 Mean NPR: 69.1 Mode: 85 Median: 67 Range: 39 Standard Deviation: 15.26	Total # of students: 74 Mean NPR: 68.8 Mode: 87 Median: 57 Range: 39 Standard Deviation: 16.64
5th	Total # of students: 62 Mean NPR: 70.8 Mode: 83 Median: 72 Range: 22 Standard Deviation: 9.13	Total # of students: 62 Mean NPR: 63.3 Mode: 64 Median: 64 Range: 20 Standard Deviation: 7.77	Total # of students: 62 Mean NPR: 65 Mode: 70 Median: 69 Range: 35 Standard Deviation: 8.7	Total # of students: 62 Mean NPR: 66.5 Mode: 61 Median: 68 Range: 20 Standard Deviation: 8.04
6th	Total # of students: 62 Mean NPR: 70.4 Mode: 87 Median: 81 Range: 50 Standard Deviation: 22.42	Total # of students: 62 Mean NPR: 66.9 Mode: 78 Median: 78 Range: 62 Standard Deviation: 21.89	Total # of students: 62 Mean NPR: 70.5 Mode: 82 Median: 76 Range: 44 Standard Deviation: 14.84	Total # of students: 62 Mean NPR: 68.6 Mode: 81 Median: 81 Range: 61 Standard Deviation: 20.82
7th	Total # of students: 58 Mean NPR: 67.2 Mode: 67 Median: 67 Range: 10 Standard Deviation: 3.58	Total # of students: 58 Mean NPR: 64.1 Mode: 62 Median: 62 Range: 27 Standard Deviation: 8.7	Total # of students: 58 Mean NPR: 69.7 Mode: 82 Median: 68 Range: 23 Standard Deviation: 8.68	Total # of students: 58 Mean NPR: 68.3 Mode: 79 Median: 66 Range: 22 Standard Deviation: 8.65
8th	Total # of students: 68 Mean NPR: 64.7 Mode: 71 Median: 68 Range: 14 Standard Deviation: 6.21	Total # of students: 68 Mean NPR: 63.6 Mode: 65 Median: 64 Range: 27 Standard Deviation: 6.8	Total # of students: 68 Mean NPR: 63.8 Mode: 66 Median: 66 Range: 30 Standard Deviation: 9.51	Total # of students: 68 Mean NPR: 64.9 Mode: 68 Median: 68 Range: 21 Standard Deviation: 7.09

From the above data, the mean NPR of each data subset (grade and test type) for the classical school data pool was compared to the mean NPR of the non-classical Lutheran school data pool. The mean NPR was calculated by multiplying the number of students for each school by their submitted NPR. These results were compiled for each grade and test and divided by the total number of students in each subgroup to determine the mean national percentile ranking. This was done to ensure proper weighting of scores.

An unpaired t-test was run on each of the 36 subsets. The results of each t-test were included in Table 6 below the compared means. John Cresswell, author of *Educational Research,* did cite t-tests as an appropriate type of inferential statistic for determining statistical significance between two means (Cress, 2008). P values, degrees of freedom (df), and standard error of difference were also included in Table 6. Confidence intervals for the unpaired t-test could be found in Appendix G.

Table 6: Comparison of Mean NPRs							
	Reading		Language		Mathematics		Core Total	
	Classical Means	Non-Classical Means	Classical Means	Non-Classical Means	Classical Means	Non-Classical Means	Classical Means	Non-Classical Means
K	86.2	**	87.2	96.0	75.7	98.0	76.1	98.8
T-test	N/A		P = 0.0066 t = 2.7855 df = 85 standard error of difference = 3.016		P < 0.0001 t = 5.8016 df = 101 standard error of difference = 3.844		P = < 0.0001 t = 6.0688 df = 101 standard error of difference = 3.559	
1st	64.5	80.4	56.6	87.4	56.9	71.0	59.8	76.4
T-test	P = 0.0008 t = 3.4917 df = 87 standard error of difference = 4.554		p < 0.0001 t = 7.3274 df = 87 standard error of difference = 4.203		P = 0.0002 t = 3.8335 df = 87 standard error of difference = 3.678		P < 0.0001 t = 5.0753 df = 87 standard error of difference = 3.271	
2nd	73.4	80.7	66.1	78.7	71.5	76.3	65.1	80.0
T-test	P = 0.0034 t = 3.0006 df = 104 standard error of difference = 2.433		P < 0.0001 t = 7.6897 df = 104 standard error of difference = 1.639		P = 0.0247 t = 2.2788 df = 104 standard error of difference = 2.106		P < 0.0001 t = 4.4668 df = 104 standard error of difference = 1.948	
3rd	67.5	71.9	62.4	64.8	62.3	69.8	65.7	72.3

T-test	P = 0.0065 t = 2.7682 df = 124 standard error of difference = 1.589		P = 0.0028 t = 3.0402 df = 134 standard error of difference = 2.664		P = 0.0070 t = 2.7378 df = 135 standard error of difference = 2.739		P = 0.0179 t = 2.3975 df = 134 standard error of difference = 2.753	
4th	69.1	73.5	75.2	73.2	77.6	69.1	74.1	68.8
T-test	P = 0.0284 t = 2.2144 df = 138 standard error of difference = 1.987		P = .4127 t = 0.8216 df = 137 standard error of difference = 2.434		P = 0.0005 t = 3.5769 df = 138 standard error of difference = 2.376		P = 0.0446 t = 2.0268 df = 137 standard error of difference = 2.615	
5th	78.2	75.7	78.6	63.3	78.8	69.5	80.2	71.0
T-test	P = 0.0001 t = 3.9436 df = 111 standard error of difference = 1.902		p < 0.0001 t = 7.0415 df = 111 standard error of difference = 2.173		p < 0.0001 t = 6.3406 df = 111 standard error of difference = 2.176		p < 0.0001 t = 6.8550 df = 111 standard error of difference = 1.999	
6th	71	70.4	73.1	66.9	72.4	70.5	72.2	68.6
T-test	p = 0.8623 t = 0.1738 df = 125 standard error of difference = 3.453		P = 0.0690 t = 1.8345 df = 125 standard error of difference = 3.380		P = .3595 t = 0.9197 df = 125 standard error of difference = 2.066		P = 0.2577 t = 1.1369 df = 125 standard error of difference = 3.166	
7th	79.4	67.2	77.0	64.1	83.5	69.7	80.5	68.3
T-test	p < 0.0001 t = 9.7905 df = 133 standard error of difference = 1.246		p < 0.0001 t = 6.4615 df = 133 standard error of difference = 1.996		p < 0.0001 t = 8.9954 df = 133 standard error of difference = 1.534		p < 0.0001 t = 6.8342 df = 133 standard error of difference = 1.785	
8th	73.6	64.7	82.9	63.6	82.0	63.8	80.9	64.9
T-test	p < 0.0001 t = 4.6712 df = 101 standard error of difference = 1.199		p < 0.0001 t = 14.3156 df = 101 standard error of difference = 1.348		p < 0.0001 t = 8.2239 df = 101 standard error of difference = 1.702		p < 0.0001 t = 12.3192 df = 101 standard error of difference = 1.299	

An analysis of Table 6 showed that of the 36 subsets of data, only five of those

subsets were statistically insignificant (these are highlighted in yellow). When one

graphs the data by test type one could see that at an early level (kindergarten thru third grade) non-classical Lutheran schools outperformed classical Lutheran schools, but the reverse happened for grades 4-8. From the fourth grade thru the eighth grade, classical Lutheran schools outperformed the non-classical schools in achievement as assessed through standardized testing. In general, non-classical NPRs declined steadily from kindergarten through eighth grade while classical Lutheran schools' NPRs increased steadily from kindergarten through eighth grade.

Figures 1 thru 4 illustrated the trends as they occurred for each test type: reading total, language total, mathematics total, and core totals. Figure 5 compiled all four tests' results and used trend lines to more fully accentuate the results of the data.

Figure 1. Comparison of Mean NPRs: Classical vs. Non-classical Total Reading

	K	1st	2nd	3rd	4th	5th	6th	7th	8th
Classical		64.5	73.4	67.5	69.1	78.2	71	79.4	73.6
Nonclassical		80.4	80.7	71.9	73.5	75.7	70.4	67.2	64.7
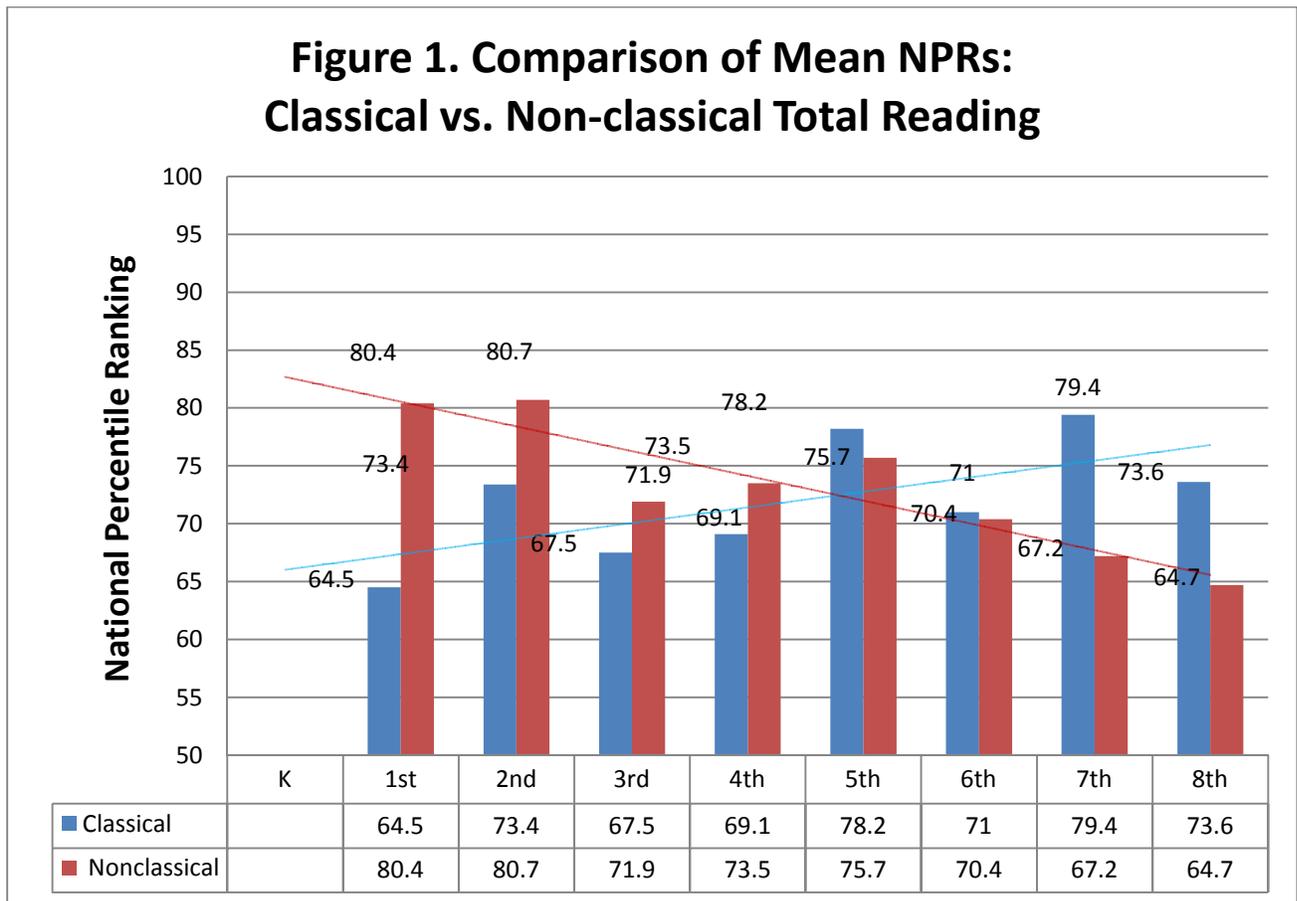
Figure 2. Comparison of Mean NPRs: Classical vs. Non-classical Total Language

	K	1st	2nd	3rd	4th	5th	6th	7th	8th
Classical	87.2	56.6	66.1	62.4	75.2	78.6	73.1	77	82.9
Nonclassical	96	87.4	78.7	64.8	73.2	63.3	66.9	64.1	63.6
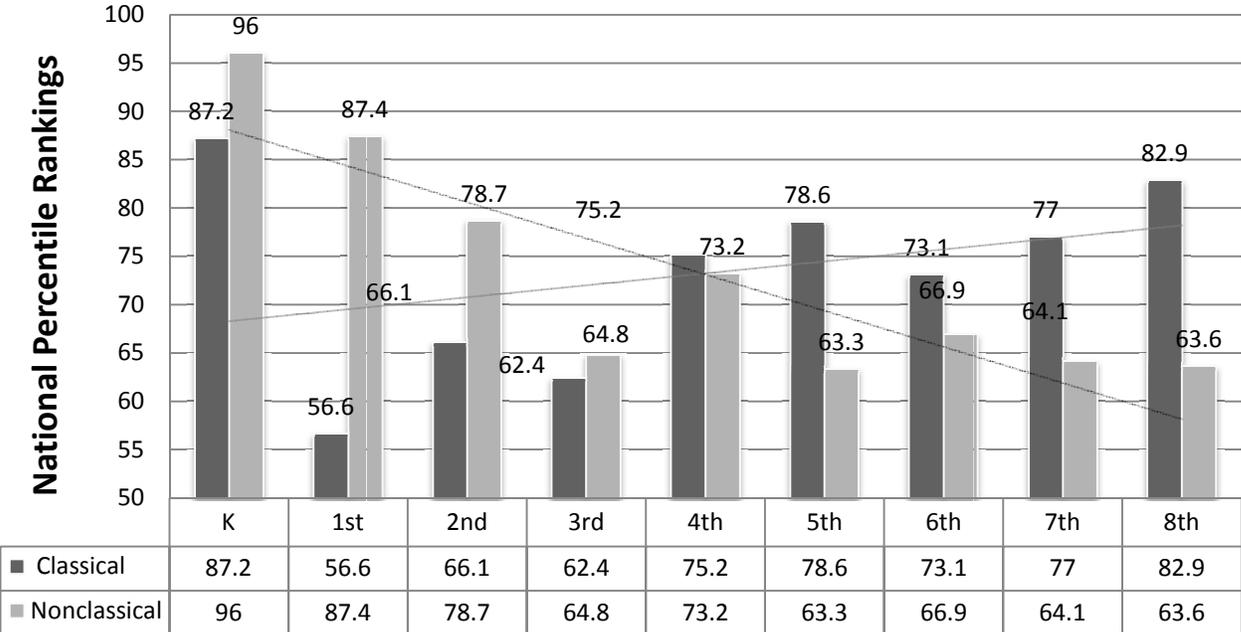
Figure 3. Comparison of Mean NPRs: Classical vs. Non-classical Total Math

	K	1st	2nd	3rd	4th	5th	6th	7th	8th
Classical	75.7	56.9	71.5	62.3	77.6	78.8	72.4	83.5	82
Nonclassical	98	71	76.3	69.8	69.1	69.5	70.5	69.7	63.8
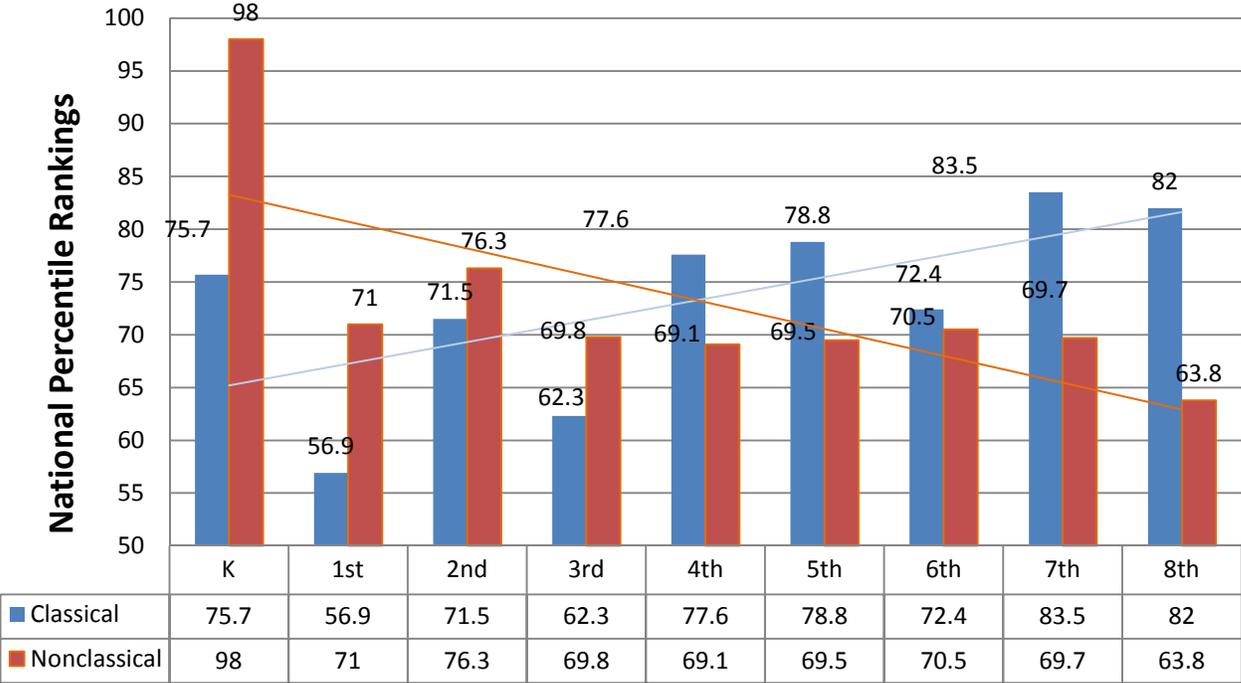
Figure 4. Comparison of Mean NPRs: Classical vs. Non-Classical Core Totals

	K	1st	2nd	3rd	4th	5th	6th	7th	8th
Classical	76.1	59.8	65.1	65.7	74.1	80.2	72.2	80.5	80.9
Nonclassical	98.8	76.4	80	72.3	68.8	71	68.6	68.5	64.9
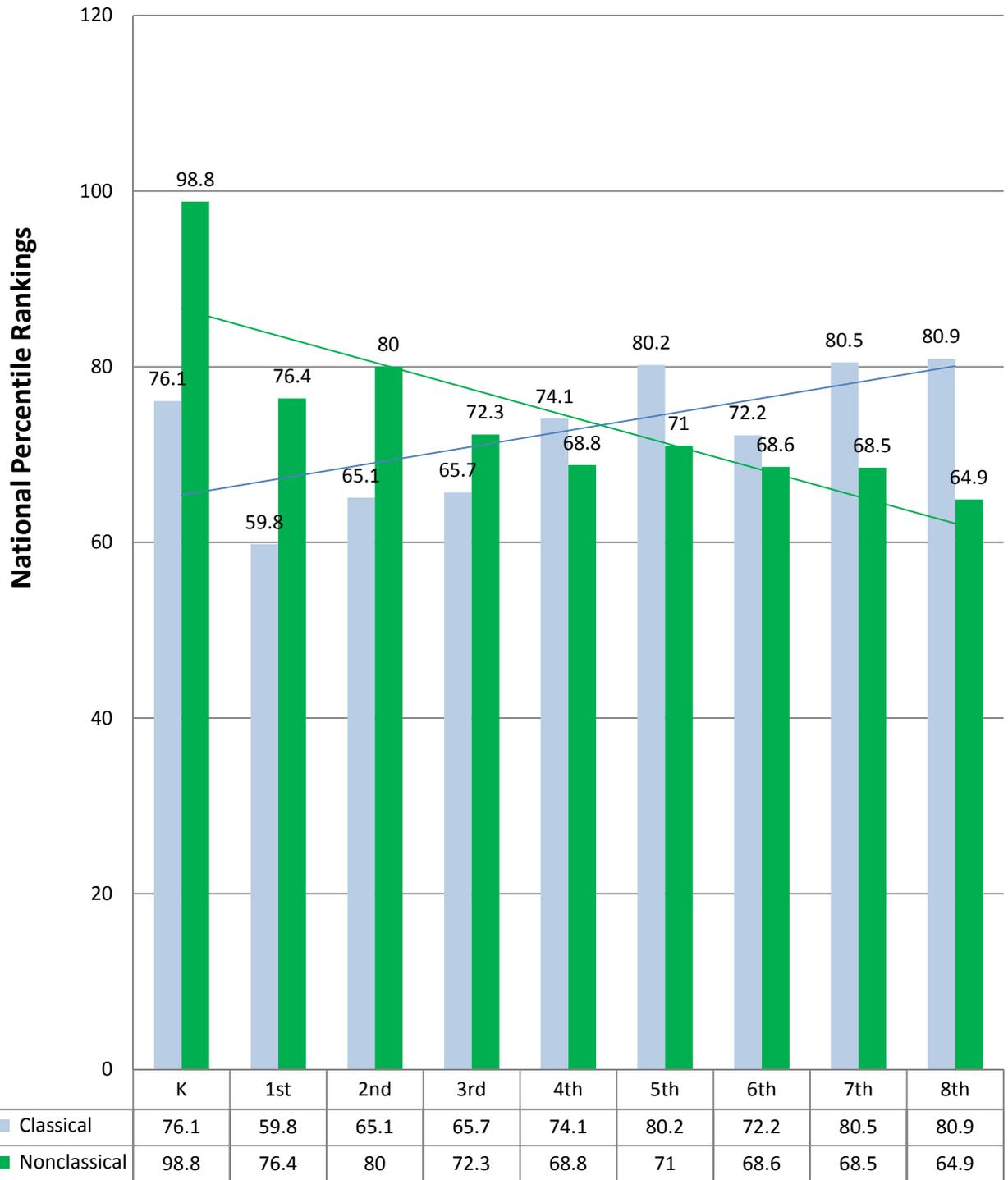
Figure 5. Comparison of Mean NPRs: All Tests
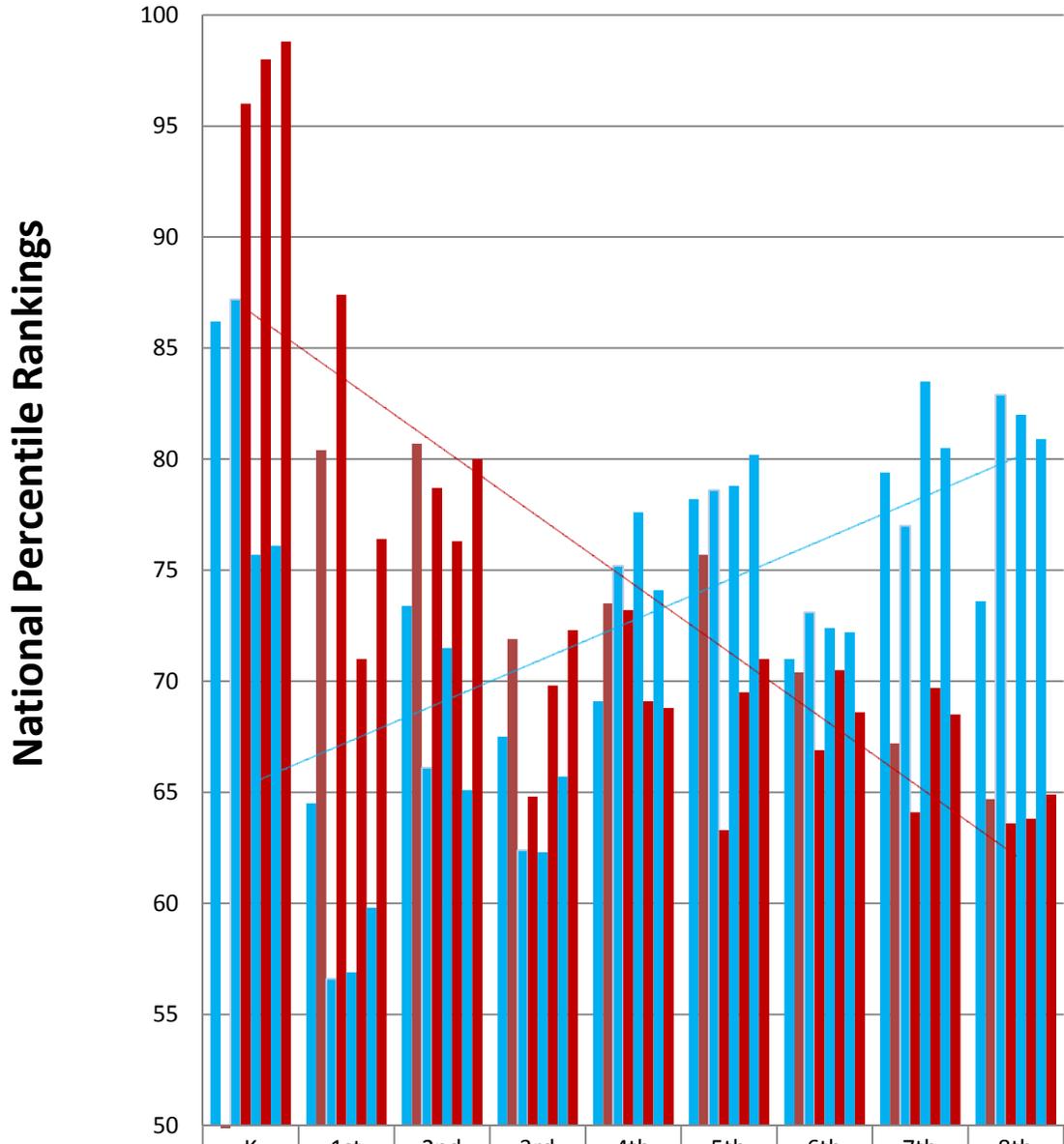
	K	1st	2nd	3rd	4th	5th	6th	7th	8th
Reading:Classical	86.2	64.5	73.4	67.5	69.1	78.2	71	79.4	73.6
Reading: Nonclassical	0	80.4	80.7	71.9	73.5	75.7	70.4	67.2	64.7
Language: Classical	87.2	56.6	66.1	62.4	75.2	78.6	73.1	77	82.9
Language: Non-classical	96	87.4	78.7	64.8	73.2	63.3	66.9	64.1	63.6
Math: Classical	75.7	56.9	71.5	62.3	77.6	78.8	72.4	83.5	82
Math: Non-classical	98	71	76.3	69.8	69.1	69.5	70.5	69.7	63.8
Core Total: Classical	76.1	59.8	65.1	65.7	74.1	80.2	72.2	80.5	80.9
Core Total: Non-classical	98.8	76.4	80	72.3	68.8	71	68.6	68.5	64.9

After having analyzed the data, it was clear that this researcher must reject his hypothesis that classical Lutheran schools would have higher standardized test scores than their non-classical counterparts. The hypothesis was partly correct as classical Lutheran schools did score higher than non-classical Lutheran schools in grades 5-8.   It was important to recognize that the results of the statistical t-tests did indicate that the differences between the schools models were significant in every grade except for the 6th grade.

Though the hypothesis was rejected since classical schools did not significantly achieve higher test scores than non-classical schools in all tests, this researcher believed that he was on to something with this research. In a comparison of six classical schools and nine non-classical schools that jointly represented 1,049 students, the data revealed some surprising trends. Classical Lutheran schools showed a steady increase in achievement over their norm group, while non-classical Lutheran schools showed a steady decline. How could this be? Could the results be for real? Was the experiment sample large enough to be legitimate? All of these questions and more were discussed – next!

CHAPTER 5: DISCUSSION & CONCLUSIONS

As Chapter 1 pointed out in detail, there were a growing number of schools in the United States that were adopting a classical model of education. Many of these schools were Christian in nature. The classical model was marketed heavily on its academic success as well as its Christian-friendly philosophical foundation. A review of the literature (Chapter 2) showed that despite this growth trend, there was no quantitative data backing the claims of the classical education movement. This researcher designed a quasi-experimental research design (Chapter 3) that attempted to determine the effects of classical education on achievement in Lutheran schools. This research was able to solicit the participation of six classical Lutheran schools and nine non-classical Lutheran schools. All schools were located in the geographic Midwest and came from schools in Nebraska, Texas, and Wyoming. Each school granted their consent and submitted their achievement results from the 2008-2009 school year. From these schools over 1,000 students were represented from grades kindergarten thru eighth grade.

The purpose of this study was to determine whether or not there was a significant difference in achievement between comparable Lutheran schools that utilized a classical education model and those that did not. The results of the data showed that there is indeed a significant difference between classical and non-classical Lutheran schools, but the nature of the results were completely unexpected and surprising for this researcher.

Discussion of Results

The results of the data were statistically significant for every grade but the sixth grade. The data showed a steady increase in test scores from kindergarten through grade eight for the classical Lutheran schools and a steady decline in scores for the non-classical Lutheran schools. The scores were of such an unexpected nature that while the research question was answered, it became clear that this researcher's hypothesis was really not an appropriate one.

Research Question

Research question: How do the standardized test scores of Lutheran classical schools compare to Lutheran schools not using the classical education model? This researcher hypothesized that mean test scores of classical model schools would be significantly higher than non-classical schools. The research indicates that the hypothesis is an incorrect one – at least in part. The classical model schools did score higher than their non-classical counterparts in grades four thru eight (the data was significant in all but the sixth grade). However, the hypothesis was incorrect in respect to the data for the lower grades, where the non-classical Lutheran schools did perform significantly better than the classical schools.

Despite the partially incorrect hypothesis, the research was successful in answering the research question and in achieving the purpose of the research. There was most definitely a significant difference in achievement between comparable Lutheran schools that utilized a classical education model and those that did not. The question now

becomes: why did the scores of the classical models begin so poorly in comparison to their later scores and why did non-classical scores have such a decline from their kindergarten scores to their eighth grade scores? These questions did warrant further investigation.

It should further be noted that most classical schools did not begin the teaching of Latin until the third grade, which possibly explained why the scores continued their steady increase and overtook the non-classical schools in the fourth grade. In addition, most non-classical schools did not begin standardized testing until the third grade. From the third grade on there were similar populations being compared, but at the kindergarten level there were 94 classical students being compared to only nine non-classical students. The non-classical score was extremely high (98th percentile) and was probably not representative of the entire non-classical population.

Other Notable Findings

Classical Lutheran schools showed achievement gains in each of the four areas reported, even mathematics. This researcher hypothesized that at the very least, classical Lutheran schools would show gains in reading and language because previous research indicated that the teaching of Latin would have this effect. So it is some surprise that the classical school would still outperform the non-classical Lutheran school in the upper grades in mathematics. This data would give credence to the thought that it is the whole curriculum, not just the teaching of Latin, which helped to account for the difference in scores and the upward trend of the classical scores.

Conclusion

The results of the research indicated that there is indeed a significant difference between in achievement between comparable classical and non-classical Lutheran schools. The classical Lutheran schools showed a steady improvement in achievement over time, while the non-classical Lutheran schools showed the opposite. While the study of Latin may have been a key factor in accounting for the significant gains after third grade in reading and language, the gains in mathematics could not be discounted. This research would indicate that the whole classical curriculum was more effective over time in educating children in Lutheran schools.

Relevance of the Study to Past Research

As there had been no prior quantitative research on either classical model schools or classical Lutheran schools, this research stood alone. Various prior research on the effect of Latin on reading and language scores was supported by this research. Assuming that the classical schools all began the teaching of Latin at the third grade, these schools made a collective gain from a mean language NPR of 62.4 in the third grade to a mean NPR of 82.9 in the 8th grade – a very convincing 20.5 point increase over their peers nationwide! While it should still be noted that classical schools also made a nearly 20 point increase in their mean math NPR, this research still did not discount or diminish the effect of Latin instruction. This research showed a significant increase in achievement for the classical students over their national and non-classical Lutheran peers that was also seen in research done by Richard Offenberg, Rita Sheridan, and C.

Thomas Holmes & Ronald Keffer.

Application of Results

Upon the analysis of this research, this researcher would not discourage parents, administrators, teachers, and school boards from pursuing the adoption of a classical education model. The literature available did suggest that at its philosophical foundation, the classical model was one that was a good fit for Christian schools, and it was even harder to argue with the impressive test scores that this research presents.

At the very least, this researcher would encourage non-classical Lutheran schools (or any non-classical school, Lutheran or not) to investigate the benefits of Latin instruction and to adopt Latin as the foreign language. The research on Latin shows that it could positively affect English language learning as well as foreign language learning. As the linguistic base for over 60% of the English language, it made foreign language instruction in just Spanish or French seem narrow-sighted. Just because there was a growing immigrant population that spoke Spanish, did not mean that students would have no use for French, Italian, Portuguese, etc. The teaching of Latin, however, would make later adoption of any and/or all of those other Latin-based languages far easier.

Limitations

Though this research did utilize the scores of nearly 1,000 students combined between the classical and non-classical model Lutheran schools, this researcher remained cautious in purporting the data to be representative of all classical and non-classical

Lutheran schools. This research utilized convenience sampling as the chosen method for gaining participants. Noted researcher and author, John Cresswell, stated that "in convenience sampling the researcher selects participants because they are willing and available to be studied. In this case, the researcher cannot say with confidence that the individuals are representative of the population" (Cresswell, 2008, p.155). The problematic nature of convenience sampling is further compounded by the small number of participants willing to be studied for this research. Cresswell states that 15 would be a rough number needed to conduct research (Cresswell, 2008, p.156). By participants, it must be understood to be that this research was referring to a school and not each student. However, since each school represented a collective number of students, this researcher did believe that though the number of schools was lower than would be preferred, the larger pool of students did compensate for this deficiency somewhat. Still, certain data sets of this research, such as the comparison of kindergarten scores, should not be considered as representative of the population.

Another limitation of the research lied in the comparison compatibility of the norm-referenced test that each school utilized. Three different tests: the Iowa Tests of Basic Skills, TerraNova, and the Stanford Achievement Test, were used by the participating schools. While each test did test for achievement in the same subject areas, it was a major assumption that the scores were comparable. It must be conceded that differences in each publisher's test design, sampling methods, test content, and the like could undermine the validity of any comparisons that this research made.

Recommendations for Future Research

While this research did provide some noteworthy results, future research is encouraged to address the flaws and limitations of this research. In a future study, the number of classical participants could be shifted from the Lutheran setting to a larger potential participant group, such as the members of the Association of Classical and Christian Schools (ACCS) which numbered over 200. Then similar non-classical Christian schools could be studied. If the researcher wished to maintain a high degree of homogeneity and study only Lutheran schools, it would be important to gain the participation of all classical Lutheran schools. Furthermore, this researcher would solicit all non-classical Lutheran schools for participation, not just ones identified as potential matches. These measures would effectively ensure that sample size is not an issue for future research.

Another recommendation for future research would be to administer the same standardized test to all participants. By making sure that all participants took the same test, the issue of whether or not the comparisons are appropriate, compatible, or valid would be eliminated. Another possibility would be for the researcher to design a test specifically for the purposes of this research and have it administered to all students.

Finally, this researcher would encourage that a future study be conducted to determine what it is exactly that facilitates the high achievement of classical schools. Was it the teaching of Latin or a strict trivium-based pedagogy that was the key to high achievement? Or was it the clientele of the schools? This research made the assumption that Lutheran schools would have fairly similar student demographics be they classical or

non-classical. Perhaps this assumption should be investigated further as well.

As one could see, this research was but the beginning of a very intriguing avenue of educational research. This research no doubt had its flaws, but at the very least, it showed some surprising results that warranted further study. If done again and after having compensated for its weaknesses, the findings still showed similar results, then it was the opinion of this researcher that such data must be published! Such news should be communicated and shared within not only the classical community (as a validation of what they were already doing), but also with other Lutheran and Christian schools who had expressed interest in the classical model but just didn't have the empirical data to justify the change. The classical education movement may be considered obscure and underground in nature to mainstream American education, but for those educators who were looking for reform that works, the classical model of education should not be discounted or dismissed. It has shown that it is indeed worthy of study and further research.

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Appendix A: Informed Consent Form

Title: The Effects of Classical Education on Achievement in Lutheran Schools

The following information is provided to help you decide whether you wish to participate in this important study. You are by no means obligated to participate in this study and you are free to withdraw at any time without affecting your relationship with this researcher Anthony Splittgerber, the education department of Concordia University, Nebraska, and the supervisor, Dr. Bernard Tonjes.

The purpose of this study is to determine whether or not there is a significant difference in achievement between comparable Lutheran schools that utilize a classical education model and those that do not.

Data will be collected through the submission of nationally-normed standardized test scores (such as the Iowa Tests of Basic Skills, the California Achievement Tests, et cetera) from each participating school.

Do not hesitate to ask questions about the study before participating or during the study. I would be happy to share the findings with you after the research is completed in the spring of 2010. Neither your name nor your schools name will be associated with specific research findings in any way and only the researcher and his supervisor will have access to your school's data.

There are no known risks to you or your school for your participation. This study will not be making a judgment on the quality of education that your school is providing; rather the data you submit will be compared with another similar school and then will be used as part of an aggregate.

Conversely, there are many benefits to be had from your participation. Your participation help shed light on an under-researched area of education and will add to the greater public a heightened awareness of the legitimacy and quality of Lutheran education (classical or not). If this study is later submitted for publication, a by-line will indicate the participation of your school (though it will not be connected to any specific data).

Please sign this consent form. You are signing it with full knowledge of the nature and purpose of the procedure. A copy of this form will be given to you to keep for your records.

_____   _____

Signature   Date

Anthony Splittgerber

Graduate Student
Concordia University of Nebraska

Appendix B: Introductory Letter

Date: _____

Dear _____,

Greetings in Christ! I hope this letter finds you well! My name is Anthony Splittgerber and I am a fellow Lutheran administrator at Zion Lutheran School of Kearney, Nebraska. I am very interested in classical Lutheran schools and have made classical education the focus of my master's research. There is a real lack of research in the area of classical education, which is a shame because I know of many Lutheran schools who are intrigued by the concept but just don't know enough about classical education. I want to change that!

I am writing you because I need your help! As a member of the Consortium of Classical Lutheran Schools (CCLE), you are a member of a very select group of schools, and it is this special group that I would like to study.

My research will be comparing the standardized test scores of classical Lutheran schools to similar/comparable Lutheran schools that are non-classical. I am looking for statistically significant differences between the scores of classical and non-classical Lutheran schools. There is absolutely no risk for you, your school, or your congregation. Your data will be part of an aggregate, and your information will be kept completely confidential. If the data does not show a difference, you have lost nothing but gained some food for thought. Should the classical scores prove significantly higher than your non-classical counterparts, then you have further gained some factual marketing statistics and other interest by other Lutheran schools may be stimulated!

Are you willing to contribute to important educational research? I hope so! Your assistance will go a long way to setting some of the first empirical data on classical Lutheran schools. I will be calling you in within in the next two weeks to speak with you personally. Your involvement will be significant but will require very little of your time. Your primary role will be to provide me with a copy of your school's norm-referenced achievement tests (e.g. Iowa Test of Basic Skills, California Achievement Tests, etc) for the 2008-2009 school year. Think about it, and I'll be in touch soon!

God bless,

Anthony Splittgerber

Graduate Student
Concordia University of Nebraska

Appendix C: Participant Instructions

Date: _____

Dear _____,

Thank you for agreeing to participate in this valuable research study! I have made every effort to make this process as painless as possible for you. Please follow these instructions to ensure that I get all of information that I need. If you have any questions at any point, please call or email me! I have attached my business card.

Your instructions:

1. You will need to find the test results of the nationally-normed achievement test that your school took for the 2008-2009 academic school year.

2. Please make copies of all class, grade, and school reports for your school. I will not be needing any individual student scores.

3. You may black out sensitive information on any of the documents as long as the test data and grade level of the scores are clearly identifiable. For example, if you wish, you may black out the names of the individual classroom teachers.

4. Staple and enclose the document copies in the manila envelope provided.

5. Please complete the school data sheet that I have attached to this sheet. This data will help me match your school with a non-classical school of similar composition.

6. Enclose completed data sheet in provided manila envelope with the test scores that you will be submitting.

7. Seal the manila envelope and mail back to me!

8. You're done! Thanks! At the completion of my research, I will share my findings with you. God bless!

Anthony Splittgerber

Graduate Student
Concordia University of Nebraska

Appendix D: Participant Information Form

Please complete the following information and send with test scores:

School name:_____

Your name:_____ position/title:_____

Enrollment breakdown: Please write the number of students in the appropriate blank.

Preschool/prekindergarten: _____ Kindergarten: _____ 1st grade: _____

2nd grade: _____ 3rd grade: _____ 4th grade: _____ 5th grade: _____ 6th grade: _____

7th grade: _____ 8th grade: _____

Geographic & Demographic Information: please provide any data that you feel should be considered as the researcher will need to find a comparable match for your school.

Please circle the descriptor that best describes your school setting:

        Rural   Small urban   Large urban

How would you describe the racial composition of your student body?

_____

_____

_____

How would you describe the socio-economic background of your school families?

_____

_____

_____

What percentage of your students is Lutheran? _____

Any other information that the researcher should consider when matching your school's data to a comparable non-classical Lutheran school:

_____

_____

_____

Appendix E: Detailed Classical Lutheran School Test Data

	Classical Lutheran Schools National Percentile Rankings (NPR)							
	Reading Total		Language Total		Math Total		Core Total	
K	CLSA: 90 Students: 26	CLSD: 77 Students: 16	CLSA: 94 Students: 30	CLSD: X Students: X	CLSA: 84 Students:30	CLSD: 74 Students: 16	CLSA: 85 Students: 30	CLSD: 72 Students: 16
	CLSB: X Students: X	CLSE: X Students: X	CLSB: 86 Students: 16	CLSE: 73 Students: 19	CLSB: 59 Students: 16	CLSE: 66 Students: 19	CLSB: 69 Students: 16	CLSE: 62 Students: 19
	CLSC: X Students: X	CLSF: 90 Students: 13	CLSC: X Students: X	CLSF: 96 Students: 13	CLSC: X Students: X	CLSF: 93 Students: 13	CLSC: X Students: X	CLSF: 92 Students: 13
1st	CLSA: 69 Students: 22	CLSD: 30 Students: 15	CLSA: 55 Students: 22	CLSD: 34 Students: 15	CLSA: 55 Students: 22	CLSD: 32 Students: 15	CLSA: 60 Students: 22	CLSD: 38 Students: 15
	CLSB: 65 Students: 9	CLSE: 87 Students: 19	CLSB: 43 Students: 9	CLSE: 84 Students: 19	CLSB: 60 Students: 9	CLSE: 77 Students: 19	CLSB: 57 Students:9	CLSE: 79 Students: 19
	CLSC: X Students: X	CLSF: 61 Students: 4	CLSC: X Students: X	CLSF: 50 Students:4	CLSC: X Students: X	CLSF: 59 Students: 4	CLSC: X Students: X	CLSF: 56 Students: 4
2nd	CLSA: 75 Students: 19	CLSD: 49 Students: 11	CLSA: 70 Students: 19	CLSD: 54 Students: 11	CLSA: 70 Students: 19	CLSD: 46 Students: 11	CLSA: 72 Students: 19	CLSD: 52 Students: 11
	CLSB: 61 Students: 8	CLSE: 85 Students: 19	CLSB: 52 Students: 8	CLSE: 76 Students: 19	CLSB: 74 Students: 8	CLSE: 82 Students: 19	CLSB: 61 Students: 8	CLSE: 82 Students: 19
	CLSC: X Students: X	CLSF: 88 Students: 8	CLSC: X Students: X	CLSF: 64 Students: 8	CLSC: X Students: X	CLSF: 83 Students: 8	CLSC: X Students: X	CLSF: 81 Students: 8
3rd	CLSA: 70 Students: 21	CLSD: 39 Students: 11	CLSA: 58 Students: 21	CLSD: 36 Students: 11	CLSA: 54 Students: 21	CLSD: 42 Students: 11	CLSA: 61 Students: 21	CLSD: 41 Students: 11
	CLSB: 55 Students: 11	CLSE: 91 Students: 18	CLSB: 51 Students: 11	CLSE: 93 Students: 18	CLSB: 51 Students: 11	CLSE: 88 Students: 18	CLSB: 52 Students: 11	CLSE: 95 Students: 18
	CLSC: 71 Students: 1	CLSF: 60 Students: 4	CLSC: 61 Students: 1	CLSF: 52 Students: 4	CLSC: 70 Students: 1	CLSF: 75 Students: 4	CLSC: 73 Students: 1	CLSF: 62 Students: 4
4th	CLSA: 66 Students: 19	CLSD: 58 Students: 15	CLSA: 68 Students: 19	CLSD: 67 Students: 15	CLSA: 81 Students: 19	CLSD: 62 Students: 15	CLSA: 71 Students: 19	CLSD: 60 Students: 15
	CLSB: 69 Students: 7	CLSE: 85 Students: 21	CLSB: 75 Students: 7	CLSE: 91 Students: 21	CLSB: 79 Students: 7	CLSE: 89 Students: 21	CLSB: 75 Students: 7	CLSE: 91 Students: 21
	CLSC: 39 Students: 1	CLSF: 31 Students: 2	CLSC: 70 Students: 1	CLSF: 44 Students: 2	CLSC: 79 Students: 1	CLSF: 37 Students: 2	CLSC: 57 Students: 1	CLSF: 37 Students: 2
5th	CLSA: 75 Students: 10	CLSD: 62 Students: 12	CLSA: 70 Students: 10	CLSD: 59 Students: 12	CLSA: 80 Students: 10	CLSD: 57 Students: 12	CLSA: 75 Students: 10	CLSD: 61 Students: 12
	CLSB: 90 Students: 5	CLSE: 87 Students: 22	CLSB: 91 Students: 5	CLSE: 92 Students: 22	CLSB: 95 Students: 5	CLSE: 88 Students: 22	CLSB: 94 Students: 5	CLSE: 91 Students: 22
	CLSC: 56 Students: 1	CLSF: 79 Students: 1	CLSC: 73 Students: 1	CLSF: 49 Students: 1	CLSC: 44 Students: 1	CLSF: 79 Students: 1	CLSC: 70 Students: 1	CLSF: 68 Students: 1
6th	CLSA: 54 Students: 21	CLSD: 72 Students: 10	CLSA: 62 Students: 21	CLSD: 64 Students: 10	CLSA: 69 Students: 21	CLSD: 66 Students: 10	CLSA: 61 Students: 21	CLSD: 64 Students: 10
	CLSB: 47 Students: 5	CLSE: 88 Students: 25	CLSB: 46 Students: 5	CLSE: 92 Students: 25	CLSB: 61 Students: 5	CLSE: 79 Students: 25	CLSB: 50 Students: 5	CLSE: 89 Students: 25

	CLSC: 76 Students: 1	CLSF: 83 Students: 3	CLSC: 73 Students: 1	CLSF: 69 Students: 3	CLSC: 53 Students: 1	CLSF: 88 Students: 3	CLSC: 56 Students: 1	CLSF: 81 Students: 3
7th	CLSA: 75 Students: 30	CLSD: 70 Students: 8	CLSA: 75 Students: 30	CLSD: 74 Students: 8	CLSA: 81 Students: 30	CLSD: 87 Students: 8	CLSA: 78 Students: 30	CLSD: 73 Students: 8
	CLSB: 71 Students: 13	CLSE: 92 Students: 24	CLSB: 54 Students: 13	CLSE: 93 Students: 24	CLSB: 68 Students: 13	CLSE: 94 Students: 24	CLSB: 63 Students: 13	CLSE: 95 Students: 24
	CLSC: 86 Students: 2	CLSF: X Students: X	CLSC: 75 Students: 2	CLSF: X Students: X	CLSC: 82 Students: 2	CLSF: X Students: X	CLSC: 87 Students: 2	CLSF: X Students: X
8th	CLSA: 70 Students: 16	CLSD: 76 Students: 7	CLSA: 78 Students: 16	CLSD: 81 Students: 7	CLSA: 79 Students: 16	CLSD: 89 Students: 7	CLSA: 78 Students: 16	CLSD: 79 Students: 7
	CLSB: 85 Students: 4	CLSE: 73 Students: 8	CLSB: 92 Students: 4	CLSE: 90 Students: 8	CLSB: 88 Students: 4	CLSE: 79 Students: 8	CLSB: 90 Students: 4	CLSE: 84 Students: 8
	CLSC: X Students: X	CLSF: X Students: X	CLSC: X Students: X	CLSF: X Students: X	CLSC: X Students: X	CLSF: X Students: X	CLSC: X Students: X	CLSF: X Students: X

Appendix F: Detailed Non-Classical Lutheran School Test Data

	Reading Total		Language Total		Math Total		Composite	
K	NCLSA: X Students: X	NCLSF: X Students:	NCLSA: X Students: X	NCLSF: X Students: X	NCLSA: X Students: X	NCLSF: X Students: X	NCLSA: X Students: X	NCLSF: X Students: X
	NCLSB: X Students: X	NCLSG: X Students: X	NCLSB: X Students: X	NCLSG: X Students: X	NCLSB: X Students: X	NCLSG: X Students: X	NCLSB: X Students: X	NCLSG: X Students: X
	NCLSC: X Students: X	NCLSH: X Students: X	NCLSC: X Students: X	NCLSH: X Students: X	NCLSC: X Students: X	NCLSH: X Students: X	NCLSC: X Students: X	NCLSH: X Students: X
	NCLSD: X Students: X	NCLSI: X Students: X	NCLSD: X Students: X	NCLSI: 96 Students: 9	NCLSD: X Students: X	NCLSI: 98 Students: 9	NCLSD: X Students: X	NCLSI: 98 Students: 9
	NCLSE: X Students: X		NCLSE: X Students: X		NCLSE: X Students: X		NCLSE: X Students: X	
1st	NCLSA: X Students: X	NCLSF: X Students: X	NCLSA: X Students: X	NCLSF: X Students: X	NCLSA: X Students: X	NCLSF: X Students: X	NCLSA: X Students: X	NCLSF: X Students: X
	NCLSB: X Students: X	NCLSG: X Students: X	NCLSB: X Students: X	NCLSG: X Students: X	NCLSB: X Students: X	NCLSG: X Students: X	NCLSB: X Students: X	NCLSG: X Students: X
	NCLSC: X Students: X	NCLSH: X Students: X	NCLSC: X Students: X	NCLSH: X Students: X	NCLSC: X Students: X	NCLSH: X Students: X	NCLSC: X Students: X	NCLSH: X Students: X
	NCLSD: X Students: X	NCLSI: 81 Students: 8	NCLSD: X Students: X	NCLSI: 88 Students: 8	NCLSD: X Students: X	NCLSI: 80 Students: 8	NCLSD: X Students: X	NCLSI: 80 Students: 8
	NCLSE: 80 Students: 12		NCLSE: 87 Students: 12		NCLSE: 65 Students: 12		NCLSE: 74 Students: 12	
2nd	NCLSA: X Students: X	NCLSF: X Students: X	NCLSA: X Students: X	NCLSF: X Students: X	NCLSA: X Students: X	NCLSF: X Students: X	NCLSA: X Students: X	NCLSF: X Students: X
	NCLSB: X Students: X	NCLSG: X Students: X	NCLSB: X Students: X	NCLSG: X Students: X	NCLSB: X Students: X	NCLSG: X Students: X	NCLSB: X Students: X	NCLSG: X Students: X
	NCLSC: 79 Students: 7	NCLSH: X Students: X	NCLSC: 83 Students: 7	NCLSH: X Students: X	NCLSC: 70 Students: 7	NCLSH: X Students: X	NCLSC: 79 Students: 7	NCLSH: X Students: X
	NCLSD: 89 Students: 19	NCLSI: 64 Students: 7	NCLSD: 82 Students: 19	NCLSI: 80 Students: 7	NCLSD: 82 Students: 19	NCLSI: 73 Students: 7	NCLSD: 87 Students: 19	NCLSI: 72 Students: 7
	NCLSE: 77 Students: 8		NCLSE: 66 Students: 8		NCLSE: 71 Students: 8		NCLSE: 71 Students: 8	
3rd	NCLSA: 83 Students: 21	NCLSF: 68 Students: 4	NCLSA: 75 Students: 21	NCLSF: 74 Students: 4	NCLSA: 86 Students: 21	NCLSF: 69 Students: 4	NCLSA: 85 Students: 21	NCLSF: 67 Students: 4
	NCLSB: 57 Students: 11	NCLSG: X Students: X	NCLSB: 55 Students: 10	NCLSG: X Students: X	NCLSB: 51 Students: 11	NCLSG: X Students: X	NCLSB: 56 Students: 10	NCLSG: X Students: X
	NCLSC: 55 Students: 7	NCLSH: X Students: X	NCLSC: 57 Students: 7	NCLSH: X Students: X	NCLSC: 46 Students: 7	NCLSH: X Students: X	NCLSC: 53 Students: 7	NCLSH: X Students: X
	NCLSD: 73 Students: 13	NCLSI: 68 Students: 6	NCLSD: 71 Students: 13	NCLSI: 76 Students: 6	NCLSD: 69 Students: 13	NCLSI: 62 Students: 6	NCLSD: 71 Students: 13	NCLSI: 69 Students: 6
	NCLSE: 80 Students: 9		NCLSE: 82 Students: 9		NCLSE: 80 Students: 9		NCLSE: 82 Students: 9	
4th	NCLSA: 72 Students: 17	NCLSF: 66 Students: 10	NCLSA: 77 Students: 17	NCLSF: 59 Students: 10	NCLSA: 67 Students: 17	NCLSF: 49 Students: 10	NCLSA: 57 Students: 17	NCLSF: 53 Students: 10
	NCLSB: 90 Students: 4	NCLSG: X Students: X	NCLSB: 81 Students: 4	NCLSG: X Students: X	NCLSB: 88 Students: 4	NCLSG: X Students: X	NCLSB: 88 Students: 4	NCLSG: X Students: X
	NCLSC: 87 Students: 8	NCLSH: X Students: X	NCLSC: 87 Students: 8	NCLSH: X Students: X	NCLSC: 83 Students: 8	NCLSH: X Students: X	NCLSC: 88 Students: 8	NCLSH: X Students: X

Non-Classical Lutheran Schools National Percentile Rankings

Grade								
	NCLSD: 82 Students: 19	NCLSI: 59 Students: 12	NCLSD: 86 Students: 18	NCLSI: 43 Students: 12	NCLSD: 85 Students: 19	NCLSI: 48 Students: 12	NCLSD: 87 Students: 18	NCLSI: 49 Students: 12
	NCLSE: 61 Students: 5		NCLSE: 87 Students: 5		NCLSE: 69 Students: 5		NCLSE: 76 Students: 5	
5th	NCLSA: 72 Students: 12	NCLSF: 71 Students: 5	NCLSA: 64 Students: 12	NCLSF: 58 Students: 5	NCLSA: 58 Students: 12	NCLSF: 61 Students: 5	NCLSA: 68 Students: 12	NCLSF: 61 Students: 5
	NCLSB: 74 Students: 5	NCLSG: X Students: X	NCLSB: 64 Students: 5	NCLSG: X Students: X	NCLSB: 84 Students: 5	NCLSG: X Students: X	NCLSB: 74 Students: 5	NCLSG: X Students: X
	NCLSC: 52 Students: 5	NCLSH: 67 Students: 14	NCLSC: 55 Students: 5	NCLSH: 56 Students: 14	NCLSC: 55 Students: 5	NCLSH: 69 Students: 14	NCLSC: 54 Students: 5	NCLSH: 61 Students: 14
	NCLSD: 83 Students: 15	NCLSI: 58 Students: 4	NCLSD: 75 Students: 15	NCLSI: 55 Students: 4	NCLSD: 70 Students: 15	NCLSI: 49 Students: 4	NCLSD: 77 Students: 15	NCLSI: 54 Students: 4
	NCLSE: 62 Students: 2		NCLSE: 71 Students: 2		NCLSE: 62 Students: 2		NCLSE: 67 Students: 2	
6th	NCLSA: 87 Students: 22	NCLSF: 86 Students: 3	NCLSA: 78 Students: 22	NCLSF: 91 Students: 3	NCLSA: 82 Students:22	NCLSF: 86 Students: 3	NCLSA: 81 Students:22	NCLSF: 89 Students: 3
	NCLSB: 43 Students: 4	NCLSG: X Students: X	NCLSB: 54 Students: 4	NCLSG: X Students: X	NCLSB: 53 Students: 4	NCLSG: X Students: X	NCLSB: 49 Students: 4	NCLSG: X Students: X
	NCLSC: 24 Students: 3	NCLSH: X Students: X	NCLSC: 28 Students: 3	NCLSH: X Students: X	NCLSC: 42 Students: 3	NCLSH: X Students: X	NCLSC: 28 Students: 3	NCLSH: X Students: X
	NCLSD: 81 Students: 19	NCLSI: 37 Students: 11	NCLSD: 81 Students: 19	NCLSI: 29 Students: 11	NCLSD: 76 Students: 19	NCLSI: 48 Students: 11	NCLSD: 81 Students: 19	NCLSI: 35 Students: 11
	NCLSE: X Students: X		NCLSE: X Students: X		NCLSE: X Students: X		NCLSE: X Students: X	
7th	NCLSA: X Students: X	NCLSF: 66 Students: 5	NCLSA: X Students: X	NCLSF: 65 Students: 5	NCLSA: X Students: X	NCLSF: 67 Students: 5	NCLSA: X Students: X	NCLSF: 60 Students: 5
	NCLSB: 68 Students: 2	NCLSG: X Students: X	NCLSB: 50 Students: 2	NCLSG: X Students: X	NCLSB: 68 Students: 2	NCLSG: X Students: X	NCLSB: 61 Students: 2	NCLSG: X Students: X
	NCLSC: 67 Students: 10	NCLSH: 72 Students: 16	NCLSC: 69 Students: 10	NCLSH: 62 Students: 16	NCLSC: 64 Students: 10	NCLSH: 82 Students: 16	NCLSC: 66 Students: 10	NCLSH: 79 Students: 16
	NCLSD: 67 Students: 12	NCLSI: 62 Students: 13	NCLSD: 77 Students: 12	NCLSI: 53 Students: 13	NCLSD: 71 Students: 12	NCLSI: 59 Students: 13	NCLSD: 73 Students: 12	NCLSI: 57 Students: 13
	NCLSE: X Students: X		NCLSE: X Students: X		NCLSE: X Students: X		NCLSE: X Students: X	
8th	NCLSA: X Students: X	NCLSF: 68 Students: 4	NCLSA: X Students: X	NCLSF: 84 Students: 4	NCLSA: X Students: X	NCLSF: 80 Students: 4	NCLSA: X Students: X	NCLSF: 76 Students: 4
	NCLSB: 61 Students: 8	NCLSG: X Students: X	NCLSB: 57 Students: 8	NCLSG: X Students: X	NCLSB: 68 Students: 8	NCLSG: X Students: X	NCLSB: 62 Students: 8	NCLSG: X Students: X
	NCLSC: 59 Students: 5	NCLSH: 70 Students: 11	NCLSC: 73 Students: 5	NCLSH: 64 Students: 11	NCLSC: 65 Students: 5	NCLSH: 74 Students: 11	NCLSC: 67 Students: 5	NCLSH: 73 Students: 11
	NCLSD: 71 Students: 21	NCLSI: 57 Students: 19	NCLSD: 65 Students: 21	NCLSI: 58 Students: 19	NCLSD: 66 Students: 21	NCLSI: 50 Students: 19	NCLSD: 68 Students: 21	NCLSI: 55 Students: 19
	NCLSE: X Students: X		NCLSE: X Students: X		NCLSE: X Students: X		NCLSE: X Students: X	

Appendix G: T-Test Confidence Intervals

Confidence Intervals For T-Tests								
	Reading		**Language**		**Mathematics**		**Core Total**	
	Classical Means	Non-Classical Means	Classical Means	Non-Classical Means	Classical Means	Non-Classical Means	Classical Means	Non-Classical Means
K	86.2	**	87.2	96.0	75.7	98.0	76.1	98.8
Confidence Interval	N/A.		The mean of Group One minus Group Two equals -8.400 95% confidence interval of this difference: From -14.396 to -2.404		The mean of Group One minus Group Two equals -22.3000 95% confidence interval of this difference: From -29.9250 to -14.6750		The mean of Group One minus Group Two equals -21.6000 95% confidence interval of this difference: From -28.6604 to -14.5396	
1st	64.5	80.4	56.6	87.4	56.9	71.0	59.8	76.4
Confidence Interval	The mean of Group One minus Group Two equals -15.9000 95% confidence interval of this difference: From -24.9508 to -6.8492		The mean of Group One minus Group Two equals -30.8000 95% confidence interval of this difference: From -39.1547 to -22.4453		The mean of Group One minus Group Two equals -14.1000 95% confidence interval of this difference: From -21.4106 to -6.7894		The mean of Group One minus Group Two equals -16.6000 95% confidence interval of this difference: From -23.1009 to -10.0991	
2nd	73.4	80.7	66.1	78.7	71.5	76.3	65.1	80.0
Confidence Interval	The mean of Group One minus Group Two equals -7.3000 95% confidence interval of this difference: From -12.1244 to -2.4756		The mean of Group One minus Group Two equals -12.6000 95% confidence interval of this difference: From -15.8493 to -9.3507		The mean of Group One minus Group Two equals -4.8000 95% confidence interval of this difference: From -8.9770 to -0.6230		The mean of Group One minus Group Two equals -8.7000 95% confidence interval of this difference: From -12.5623 to -4.8377	
3rd	67.5	71.9	62.4	64.8	62.3	69.8	65.7	72.3
Confidence Interval	The mean of Group One minus Group Two equals -4.4000 95% confidence interval of this difference: From -7.5461 to -1.2539		The mean of Group One minus Group Two equals -8.1000 95% confidence interval of this difference: From -13.3695 to -2.8305		The mean of Group One minus Group Two equals -7.5000 95% confidence interval of this difference: From -12.9177 to -2.0823		The mean of Group One minus Group Two equals -6.6000 95% confidence interval of this difference: From -12.0448 to -1.1552	

4th	69.1	73.5	75.2	73.2	77.6	69.1	74.1	68.8
Confidence Interval	The mean of Group One minus Group Two equals -4.4000 95% confidence interval of this difference: From -8.3288 to -0.4712		The mean of Group One minus Group Two equals 2.0000 95% confidence interval of this difference: From -2.8135 to 6.8135		The mean of Group One minus Group Two equals 8.5000 95% confidence interval of this difference: From 3.8012 to 13.1988		The mean of Group One minus Group Two equals 5.3000 95% confidence interval of this difference: From 0.1290 to 10.4710	
5th	78.2	75.7	78.6	63.3	78.8	69.5	80.2	71.0
Confidence Interval	The mean of Group One minus Group Two equals 7.5000 95% confidence interval of this difference: From 3.7314 to 11.2686		The mean of Group One minus Group Two equals 15.3000 95% confidence interval of this difference: From 10.9944 to 19.6056		The mean of Group One minus Group Two equals 13.8000 95% confidence interval of this difference: From 9.4872 to 18.1128		The mean of Group One minus Group Two equals 13.7000 95% confidence interval of this difference: From 9.7397 to 17.6603	
6th	71	70.4	73.1	66.9	72.4	70.5	72.2	68.6
Confidence Interval	The mean of Group One minus Group Two equals 0.6000 95% confidence interval of this difference: From -6.2338 to 7.4338		The mean of Group One minus Group Two equals 6.2000 95% confidence interval of this difference: From -0.4889 to 12.8889		The mean of Group One minus Group Two equals 1.9000 95% confidence interval of this difference: From -2.1887 to 5.9887		The mean of Group One minus Group Two equals 3.6000 95% confidence interval of this difference: From -2.6666 to 9.8666	
7th	79.4	67.2	77.0	64.1	83.5	69.7	80.5	68.3
Confidence Interval	The mean of Group One minus Group Two equals 12.2000 95% confidence interval of this difference: From 9.7353 to 14.6647		The mean of Group One minus Group Two equals 12.9000 95% confidence interval of this difference: From 8.9511 to 16.8489		The mean of Group One minus Group Two equals 13.8000 95% confidence interval of this difference: From 10.7656 to 16.8344		The mean of Group One minus Group Two equals 12.2000 95% confidence interval of this difference: From 8.6691 to 15.7309	
8th	73.6	64.7	82.9	63.6	82.0	63.8	80.9	64.9
Confidence Interval	The mean of Group One minus Group Two equals 5.6000 95% confidence interval of this difference: From 3.2218 to 7.9782		The mean of Group One minus Group Two equals 19.300 95% confidence interval of this difference: From 16.626 to 21.974		The mean of Group One minus Group Two equals 14.0000 95% confidence interval of this difference: From 10.6230 to 17.3770		The mean of Group One minus Group Two equals 16.0000 95% confidence interval of this difference: From 13.4236 to 18.5764	