

FACTORS THAT CONTRIBUTE TO STUDENT ACHIEVEMENT:
A CASE STUDY OF ONE HIGH SCHOOL

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ABSTRACT

The purpose of this study was to determine if there were definable factors, which contributed to or impacted the ACT scores, end of course test scores or grade point averages of groups of high school students who possessed those factors. The hypothesis that this study adopted was that there were definable factors that created barriers to success for students. It was hypothesized that when these negative factors were identified and when students were grouped according to the factors that they possessed, differences in the success these groups achieved, with regard to ACT scores, end of course test scores, and grade point average, become readily apparent.

In the sample of 288 students, groups that possessed three potential negative factors were identified. The three negative factors were high absenteeism, lack of a two-parent family structure and low socio-economic status. Seven groups possessing one or more of these factors were compared with the group that possessed none of the factors. In this research study, some of the groups were predicted to be adversely affected by their characteristics, resulting in lower ACT scores and end of course exams. It was also hypothesized that groups, whose members lacked the negative characteristics, would have higher scores on these tests.

The academic performance of these groups was tested to see if there were statistical differences in the mean scores of each group. A series of one-way analysis of variance, ANOVA tests were used to determine if there were significant differences between the mean scores of

these disaggregated groups. The final variance measurement was then tested for statistical significance. When it was found that the groups were significantly different with regard to their test results then the study hypothesis was confirmed that the groups could be different due to the factors that they possessed. The supposition, at this point, was that educational leaders should focus on these factors and others that could impact academic success to target educational reforms. As additional factors are identified, reforms can be made to reduce these factors among the students or minimize their effects upon the students and the schools that they attend.

DEDICATION

This work is dedicated to the educational professionals and their families, who have struggled and are continuing to struggle to adapt to the ever-changing landscape of education in America.

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CHAPTER I

INTRODUCTION

Background to the Problem

The American Education system was failing (Melendez, 2010). According to many authors, including Melendez, something needed to be done. If one had been watching the evening news or had read the newspaper over the past ten years, one would often hear of this negative prognosis. Education policy makers, politicians and government leaders had heard these news stories and had been implementing change after change in order to address the problem. Attempts to improve the system resulted in one reform after another being proposed and/or implemented. The No Child Left Behind Act (NCLB), standardized testing, targeting of sub-groups, graduation rates, college readiness, teacher evaluation, curriculum alignment, Race to the Top and Common Core curriculum were among the many educational reforms implemented within the past ten years, or which were incorporated into the federal “Race To the Top” program (Ravitch, 2011).

From the news bureaus publications often came accusations that American education was not working (Youngman, 2012). During the 2012 Presidential campaigns, Presidential candidate Mitt Romney, accused President, Barack Obama of presiding over a failing U.S. education system (Youngman, 2012). He also asserted that the current U.S. educational system was in the grip of teacher union bosses who refused to accept or implement educational reforms

(Youngman, 2012). In a campaign speech delivered in front of a banner that read, “A Chance for Every Child,” Romney touted more money for education, more access to charter schools and teacher accountability. With this assertion he aligned his educational reform plans with those of former Republican president George W. Bush’s NCLB law. This law set in motion major reforms to the U.S. educational system and discounted the potential influences that external factors could have contributed to the decline in our educational statistics, test scores, graduation rates, etc. (Ravitch, 2011).

In September 2010, President, Barack Obama condemned the current educational system (Melendez, 2010). In a speech he stated that the U. S. education system was broken and only money and reform could fix it. In addition, he pointed out that the U.S. ranked 21st in Science and 25th in Math when compared with the other 41 industrialized countries. Reforms were an imperative, he claimed, and underperforming teachers should be replaced. Perhaps his strongest indictment was his comment that his daughters were currently enrolled in private schools and could not get the same quality of education if they attended any of Washington’s public schools. His diagnosis was that our public educational system was failing due to inadequacies in the system itself.

The statistics supporting the argument that our education system was failing were regularly reported. In 2009 approximately 25 out of every 100 students in America dropped out of school before graduating (Stillwell, Sable, & Plotts, 2011). According to its report issued in 2011, ACT found that less than 25 % of high school students who took the ACT test were college-ready in all subject areas (Act, 2011). In 2000, 28 % of all entering college freshmen were enrolled in one or more remedial reading, writing, or mathematics courses (Parsad, Lewis,

& Greene, 2003). In 2008, only 55.8 % of first-time, full-time bachelor's degree-seeking students earned a degree within six years (Snyder, 2010).

According to research there are problems with the current public educational system in America (Stillwell et al., 2011). The statistics attest to this. The question that this research study examined was, can there be factors that could be identified that could be responsible for the problems and poor results in our public educational system? More specifically, are there deleterious effects of three factors that, seemingly, are pervasive in today's educational systems? These three factors are low socio-economic family levels, lack of two parents in the home and excessive absences, although there are many more factors that could have been chosen.

When the impact of these three factors is studied, one could, perhaps, find problem areas within our educational system that could be targeted. It could then be possible to place less emphasis on the common reform targets, which seem to be offered every year. The determination of the problems facing our educational system needs to be found before the solutions should be proposed. This will require some thoughtful consideration and will certainly take some time. The search for quick results will only compound the problem. Some believe that this search for a quick fix is what we are experiencing now with the latest educational reforms that are currently in progress (Wolk, 2011). They function to improve education, but may be targeting areas that do not need reform. If the process could be altered to first identify the problems, the reforms could then be designed to offer the solutions to the problems. This study demonstrated that there were certain factors that could be shown to affect the success of students. These factors and others that are shown to impact student success should be the targets of educational reforms in the future.

Some individuals believe that the schools and teachers of America's public school system should be able to handle every single difficulty that American society throws at them and thus they expect them to solve these problems (Ravitch, 2011). This study attempted to determine whether the three factors, identified earlier and which are beyond the control of the faculties or schools, negatively impact academic measures of the groups of students who possess these factors. By determining factors that were certain to be negatively impacting our students, educational reform decisions could be made more productively (Ravitch, 2011).

Historically, public reaction to these questions has been that the schools needed to be fixed (Ravitch, 2011). The public rationale is that the school systems must, therefore, fix, change, or reform the way they operate. Such a decision is received well by the public as it directs attention to perceived source of causation, the schools. This decision to place the blame on our schools also fails to recognize that there may be some situations and problems that schools and teachers were just not able to deal with, let alone, fix (Ravitch, 2011). An alternative reaction is rarely considered (Wolk, 2011).

The public school systems have control over the public schools across the nation but have little or no control over the families and students who populate them. There are those who believe that groups of those students and families could be the source of the problems within our public schools. This research attempted to identify factors and groups of students that possess those factors, that impact academic success that could be addressed before system wide reforms are implemented.

In January 2002, President George W. Bush signed the "No Child Left Behind Act" (Abernathy, 2007). This law dramatically changed the way education was administered throughout the United States (Sunderman, 2006). This 700-page law placed the blame for the

achievement gap in American education squarely on the shoulders of our schools, and required that they transform themselves with school improvement programs until this achievement gap was closed (Casner-Lotto & Barrington, 2006). Unfortunately, this argument was based entirely on the premise that schools were the source of the problem in the first place (Wolk, 2011). This has not yet been adequately proved to the satisfaction of the United States citizenry (Wolk, 2011).

The “No Child Left Behind Act” required that states enact certain educational modifications in order to receive a portion of the Title I funding they were expecting to receive from the federal government (Mills, 2008). The Title I funds are composed of grants and funds from the federal government to local school districts to support the educational success of children from families with low income. Although the funding that this law provided to the states comprised only seven to nine percent of each state's overall educational funding, it was a significant amount of money and school districts have become dependent upon these funds to operate (Mills, 2008). States had to comply with the government mandates contained within the act or be prepared to live without the additional funding. For several years after its implementation in 2002, no state had refused to comply with the “No Child Left Behind Law” and thus, every state was still receiving the additional funding (Granger, 2008).

More recently, a new reform program, the four billion dollar Race to the Top Initiative, allowed states to be freed from some of the severe requirements of the law by committing to other reform programs, primarily targeting the evaluation procedures that states impose upon their teachers (Santos & Hu, 2012). These new evaluation requirements were already raising tensions among teachers, school administrators, and government officials (Santos & Hu, 2012). The main contention was that the new, high stakes evaluation procedures were implemented too

quickly, without the certainty that they were effective, accurate or fair (Santos & Hu, 2012). This debate is still unfolding.

Other laws establishing education reform have been established to promote the equality of educational opportunity. Among those historical decisions were the desegregation of schools and the Americans with Disabilities Act. Our latest reform programs, the “No Child Left Behind Act”, “Race to the Top”, and Common Core curriculum programs went a step further and not only guaranteed equality of opportunity for every child, but they also provided for equality of outcomes (McGuinn, 2011). This meant that the federal government was assuring every parent that their children were going to receive the best possible education, regardless of where they attended school (Wolk, 2011). Has the Federal government required the states to make an impossible promise to the general public (Wolk, 2011)? Many believe this to be the case (Ravitch, 2011).

In order to reach the goals set forth in the “No Child Left Behind Act” and the “Race to the Top” program, significant responsibilities were placed upon states, school systems, principals, and teachers. If these were not met, a series of transformations were required by the federal government, which must be implemented in each school that failed to meet annual yearly progress. This change for the sake of change failed to determine if the change was warranted in the first place. It failed to recognize that the annual yearly progress might not have been met because of factors other than those created by the schools. The one thing that the law assured was that change was required until the goals were achieved. As the changes unfolded many of the goals remained unachieved.

An example of a mandatory reform was unfolding within a county school district in Southeastern Tennessee, where this study was conducted. A failing school in this county had

sought approval from the state to change its start time in order to reduce the tardiness of its students (Gauthier, 2011). The belief was that a starting time of 9:00 A.M. would produce better attendance than a regular 7:15 A.M. start time. One of the district school board members suggested that this requirement constituted an inappropriate response to a problem over which the school district had no control (Gauthier, 2011). How could the county assure that all of its students showed up, “on time” to school every day? He suggested that if the state could do a better job of managing the school, that they should take over the operation of the school. Many tended to agree with this obviously frustrated school board member. This school board member called this requested change a prime example of how the failure of students and parents was interpreted as the failure of a school (Gauthier, 2011).

These frustrations within schools and school districts were becoming all too common (Ravitch, 2011). In order to achieve the goals set forth by the “No Child Left Behind Act” and the “Race to the Top” program, school districts were straining beyond their capacity. There was no margin for error (Hursh, 2007). Each school had to make annual yearly improvement. For example, a top-performing high school with a graduation rate of ninety-two percent was required to achieve a ninety-three percent rate the following year (Porter, McMaken, Hwang, & Yang, 2011). There was no level that was considered satisfactory, except a level that was higher than the previous year. By the year 2014 the level was expected to be 100%.

There were no allowances for a bad year (Copeland, 2013). There was no consideration for students who were ill prepared for school, with poor attendance records, disrespect for authority, lack of motivation for learning, attention disorders, addictions and abuses at home. There was no allowance for these and many more conditions that were affecting student success, over which the schools and teachers had no control. There was an expectation of constant annual

yearly improvement, or the threat of unpleasant and costly consequences. Copeland (2013), wondered if this was a realistic expectation. He wondered if the expectation of annual yearly improvement was driving the school to set the statistical mark as the goal, as opposed to the fundamental needs of the students (Copeland, 2013).

The “No Child Left Behind Act”, although very complex, had two primary goals (Mills, 2008). The first goal was to close the achievement gap between high and low performing children, especially the achievement gaps between minority and non-minority students, and between disadvantaged children and their more advantaged peers (Mills, 2008). The second goal of the law was to create and implement a rigid evaluation of the assessment results that posed significant consequences for those schools that failed to improve their scores annually (Sunderman, 2006). Many felt that the first goal of the “No Child Left Behind Act” was a bit ambiguous (Ravitch, 2011). At its origination there were several questions that were raised about the law (Wolk, 2011). Would the law lower the standards for the overachieving students? Did the law intend to raise the standards of the underperforming students? Was the intent of the law to have our standards meet somewhere in the middle, leading all of the students to average territory? Would the law change the way that assessments were designed? Would the assessments be designed to be able to pass more students? To accomplish this, would the assessments be made easier? Should the assessments be designed to make it more difficult to pass, and thus, exclude more students (Wolk, 2011)? The trends of ACT scores showed that no state has come upon the right answers to these questions (Act, 2013).

In addition to closing the achievement gap and requiring assessment, the federal government required several other benchmarks (Hoff, 2008). Graduation rates must increase. Dropout rates must decrease. Attendance levels must increase. There was a requirement that at

least 95% of all students must take three annual assessments. In fact, there were 36 possible ways for an individual school or district to fail to meet the requirements of the “No Child Left Behind Act”, in a given year (Hoff, 2008). The practice of monitoring these benchmarks required full-time staffing at each school (Hoff, 2008). Schools and school districts throughout the country became responsible for meeting the goals set forth by the “No Child Left Behind Act” and consequently, many states were worrying about the “Race to the Top” program. Tennessee, Rhode Island, Massachusetts, Maryland and others rushed to be the first states to become part of this federal education funding program, in part to relieve them from the strict requirements of the previous law (Ravitch, 2011).

The new “Race to the Top” program offered additional incentive funding to state educational departments that targeted the five following reform areas, rigorous assessments, attracting great teachers, implementing data systems, employing innovation, and the turn-around of struggling schools (McGuinn, 2011). The first area mandated the design and implementation of rigorous standards and high quality assessments, by encouraging states to work jointly toward a system of common academic standards that built toward college and career readiness, and that included improved assessments designed to measure critical knowledge and higher-order thinking skills.

The second area that the “Race to the Top” program targeted was to attract and retain great teachers and leaders in America’s classrooms (Crowe, 2011). This was to be accomplished by expanding effective support to teachers and principals by reforming and improving teacher preparation. The program targeted revising teacher evaluation, compensation, and retention policies to encourage and reward effectiveness; and working to ensure that the most talented teachers were placed in the schools and subjects where they were needed the most (Crowe,

2011). The third area targeted the supporting data systems that inform decisions and improve instruction by fully implementing a statewide longitudinal data system, assessing and using data to drive instruction, and making data more accessible to key stakeholders.

The fourth and fifth areas targeted involved the use of innovation and effective approaches to turn-around struggling schools (Viteritti, 2011). This was to be accomplished by prioritizing and transforming persistently low-performing schools. States were to demonstrate and sustain education reform, by promoting collaborations between business leaders, educators, and other stakeholders to raise student achievement and close achievement gaps. States were to expand support for high-performing public charter schools, reinvigorate math and science education, and promote other conditions favorable to innovation and reform. This seemed to be an extremely ambitious set of goals (Viteritti, 2011).

The general public was in agreement that the educational system in America was broken (Wolk, 2011). A Gallup poll from 2009 reported that 79% of all parents participating in their study rated the public education system with a grade below “C” (Bushaw, 2010). This percentage was twenty points higher than the previous poll results, which were obtained in 1985 (Bushaw, 2010). The parents were also in agreement with just about any plan or program that was intended to cure this problem. The general consensus was that the “No Child Left Behind Act” and the “Race to the Top” program were excellent ideas (Crosson, 2013). Both initiatives were created to raise standards for the educational system. They were designed to provide for more qualified teachers in our classrooms. It was difficult to argue against any of the targets proposed by these educational reform programs. Therefore these mandates received majority support and approval (Crosson, 2013).

Another group of the general public believed that the “No Child Left Behind Act” targeted the wrong areas of the public education system (Wolk, 2011). They believed that the reforms should first target the attitudes and motivation of this country’s students and parents. They argued that the conditions, attitudes, motivation, and environment of students played a critical role in the educational process and that the denial of this fact placed any reforms that could be made to the educational system in jeopardy of failure (Wolk, 2011). They believed many more students could be successful in the educational system currently in place if more parents supported their children toward educational achievement, better attendance, more discipline, and more student responsibility (Fox, 2013).

This group that questioned the need for the act also maintained another argument that conflicted drastically with the principles of the “No Child Left Behind Act” (Fox, 2013). They believed that all children were not destined to be college students (Wolk, 2011). Teachers and school administrators often made the same diagnosis. They proposed that many of our students were not destined to be college students and, therefore, shouldn’t be subjected to a curriculum that was designed for this group of students exclusively. These students shouldn’t be subjected to the rigorous gateway testing procedures. They should be offered vocational opportunities (Wolk, 2011). Requiring schools and teachers to guarantee success for all students was an impossibility (Miller, 1995).

Some students, for one reason or another, will fail to succeed in their educational careers. There could be many reasons for these failures (Young, 2013). Some students do not operate well in a classroom setting. There were students who would not learn to read (Young, 2013). Some students would not do any homework. Others would skip school. Some students would sleep late, not worrying about the impact it would have on their education. Some students would

use drugs. Dropping out of school was a choice some will make. Some students would become pregnant. Some students would commit a crime and become incarcerated. This list went on and on (Young, 2013). To have the federal government require the states to guarantee that each child would succeed academically is a promise too big to fulfill (Fletcher, 2010).

According to one opponent of the act; it shouldn't be necessary to have the educational system conform to the needs of the few at the expense of the many students who have shown the propensity and willingness to achieve academically (Young, 2013). Even though the statistics showed that this group of under-performing students was growing each year (Stillwell et al., 2011), would the act eventually lead to educational improvement in the United States? Civic Enterprises asked if it made a great deal of sense to repeat this process over and over again among thousands of schools and hundreds of thousands of students when the end result was nothing more than a disappointment (Bridgeland, DiIulio Jr, & Morison, 2006).

Research on the results of the impact of "The No Child Left Behind Act" tended to repeat the theme of this disappointment (Hoff, 2008). In the 2007-2008 school year almost 30,000 schools in the United States failed to make adequate yearly progress under the NCLB law. This number of schools failing was a 28% increase over the previous year. Twenty-eight percent more schools did not make enough progress. Half of those schools missed their achievement goals for two or more years. This meant that one out of every five of our nation's public schools was in some stage of reform designed to improve student achievement. In the 2009-2010 school year, 3,559 schools in the United States were faced with three or more consecutive years of failure to attain achievement goals and were subjected to the harshest reforms under the NCLB act. That was a 100% increase in the number of schools on this particular list from the previous year.

These reforms and this reform process in place for the past ten or so years seemed not to be providing the intended results (Bridgeland et al., 2006).

An article that appeared in a national news organization publication illustrated an example of a factor that was identified to potentially affect academic success (Orzag, 2012). Barbara Heyns, a sociologist at New York University studied schoolchildren from Atlanta and concluded that “summer fade”, the loss of academic gains in summer, can be substantially correlated with income (Heyns, 1978). Later studies have replicated that finding. A group from Johns Hopkins University found that this effect could explain why the gap in skills between children on either side of the socioeconomic divide grew, as students progressed through elementary school (Gamoran, 1996). Their study showed that children from all backgrounds learned at similar rates during the school year, but each summer students from high socioeconomic status continued to learn while those of low socioeconomic status fell behind. The group also contended that this effect could be in place for years. They claimed that the learning differences that begin in grade school can “substantially account” for differences in high-school graduation rates and admission into four-year colleges (Gamoran, 1996).

Peter Orzag (2012) the White House’s director of the Office of Management and Budget, explained that the perfect fix would be to extend the school year (Orzag, 2012). Extending the school year would address the “summer fade” issue. It would also impact those students who did not experience the “summer fade” problem. Changing the way the school or the entire school system operated could have negative influences for the other students (Young, 2013). Another approach would be to target the reforms toward the students that have “summer fade”. This approach, to focus reforms on the affected area, is the basis for this study.

Factors that affect students' academic progress can be found anywhere. The key is finding ways to identify them. What impact do drugs and alcohol have upon students? A recent survey by the National Center on Addiction and Substance Abuse found that nearly one in five high school students drank, smoked or did drugs during the school day (Siemaszko, 2012). This was a shocking revelation. Did this mean that only eighty-three percent of students were sober enough to participate in class? Should cots have been installed in classrooms so that chemically affected students were able to bounce back more rapidly? Should teachers have been sent to a training program to learn how to integrate the intoxicated and chemically impaired students into the class? This is, of course, an exaggeration, but, no doubt, schools will be tasked with finding a solution to this problem. Schools did not create the problem of alcohol or drug use. Was it reasonable to expect that changing the way schools operate was necessary to stop the use of drugs and alcohol by children?

How does attendance play a role in the success of the student? This is a factor that can be readily studied. It has been shown to have been the number one problem of school administrators during the 1970's and the rate of absenteeism has continued to rise since then (Dufours, 1983). Students with the highest incidence of absenteeism had the lowest academic achievement rates and were much more likely to withdraw completely from school than students with low absentee rates (Mccray, 2006). A recent study in Pasco County, Florida revealed that most of their schools had in excess of fifty percent of their students with more than ten absences during 2010 (Solocheck, 2011). They were completely unaware of the magnitude of the attendance problem until the state of Florida required schools to identify the number of students with ten or more absences. They suggested that this trend is the new normal in American education.

In Great Britain, absenteeism was considered the most important negative factor associated with progress toward literacy (Tymms & Williams, 1996). When literacy was affected at an early age the academic performance of a school or school system can be heavily affected for years. Once established in elementary school, student's poor attendance or truancy habits carried over into the upper grades (Roby, 2004). Students with annual averages of ten or more absences per year during elementary school would often have at least ten; (and for most of the study participants); many more absences annually as a middle school or high school student. In one study of African-American males, seventy-five percent of students with truancy problems from elementary school to high school would not graduate (Robins & Ratcliff, 1978). For this demographic group, absenteeism meant the end of their academic career.

It was the hypothesis of this study that students who suffered from low rates of school attendance would be adversely affected, but what about the remainder of the students in their class? How were they impacted by the poor attendance of their classmates (Ravitch, 2011)? In this day of heightened school accountability, it is the expectation that all students should succeed or score highly on their end of course tests. If a student missed an important class that covered curriculum on a test topic, the teacher was required to re-teach this topic to the students who were absent (Roby, 2004). When this happened on a regular basis the regularly attending students were faced with no direct instruction while the absent students were taught (Roby, 2004). Over time, this undermining of classroom rigor would have an impact on the performance of all students in the classroom (Roby, 2004).

Can poverty be a factor in academic success? Researchers have identified four ways that poverty places children at risk for academic failure (Caldera & Hart, 2004). Children of poverty had increased emotional and societal challenges. Children of poverty had more exposure to acute

and chronic stress stimuli. The lag of cognitive development was expected among children of poverty (Caldera & Hart, 2004). The environment of poverty placed these children at risk for increased health and safety issues. To state it bluntly, there were absolute requirements that children needed that children of poverty often did not possess, which could affect their cognitive development (Ekman, 2007).

Children of poverty often lacked a strong, reliable caregiver who provided constant and unconditional love, guidance and support. A safe, stable and predictable environment is needed. There is a lack of consistent housing among children in a setting of poverty. Children need ten to twenty four hours per week of harmonious reciprocal interaction from someone capable of instilling gratitude, forgiveness and empathy. Families in poverty are rarely able to provide this interaction. Enrichment activities that were personalized and those that became increasingly more complex are needed to stimulate learning. Children from poverty were rarely exposed to these minimum requirements. The result of this lack of exposure to nurturing experiences can be seen in many ways, but the most common malady was the strong disposition for emotional dysfunction (Ekman, 2007).

In homes of children of poverty, the parent's educational history was mostly substandard (Evans, 2004). The interactions between child and parent were usually brief and free of warm emotions. These interactions provided few nurturing experiences. Parents tended to be overworked, overstressed and authoritarian toward the children. The harsh discipline their parents had subjected them to was also passed on to their children. Most of the parent-child relationships in the setting of poverty were unhealthy from a developmental standpoint. In addition, parents that provided positive educational influence with a child of poverty, were a rarity. Children of poverty were only half as likely to have a parent who knew the names of their

teacher or friends (Evans, 2004). Most children of poverty came home to a life of isolation where the only interaction they had was between themselves and television cartoons (Evans, 2004). This lack of emotional contact often would lead to long-term emotional dysfunction.

The research was also clear about the effects of poverty on cognitive development (Harris, 2006). A particularly interesting writing concerned the lack of emotional assets in children of poverty. It pointed out the correlation between emotional and cognitive assets. This combination had an impact on educational success (Harris, 2006). Much of the literature concerning poverty and its impact on academic success suggested that it was the responsibility of schools to compensate for this lack of emotional capability within the children of poverty. There were many educational leaders who believed this was too much to ask of our schools (Wolk, 2011).

Growing up in a family with only one parent can impact academic success. Research overwhelmingly affirmed this, but pointed out that children were becoming more resilient when exposed to this condition. This resilience notwithstanding, more than half of all children today live in a home with either one or no parent at all, and this number was growing. In these homes, the vast majority were reported to have no father (Holyfield, 2010). The lack of a male role model in the home was considered to be significant (DeBell, 2008).

Among children with no exposure to a father, boys seemed to have more trouble forming peer relationships than girls (Daniels, 1986). They also were shown to have problems being able to maintain long-term heterosexual relationships. Third graders with no father at home were shown to have a lower score in locus of control than students with a father at home (Chapman, 1977). Lack of long-term employment and drug use were also potential impacts of the lack of two parents in the home (Lamb, 2004).

The concept behind this proposed research was simple. Can factors found among students be connected with negative student success? This research was purposely started with a small, limited number of factors, but could be replicated and expanded by introducing larger numbers of factors. The factors that were a part of this study were poor attendance, low socio-economic status, and absence of a two-parent support system. The study attempted to determine if there is a connection between these factors, the groups of students that possess these factors, and academic achievement or underachievement of these groups when compared to groups of students who do not possess any of these factors.

Statement of the Problem

The goal of both sides of the educational debate is to improve student success in the United States (Ravitch, 2011). As supported by the literature, the actions that were currently being undertaken toward reforming our schools to adjust to the problems and deficiencies that our students bring to class seemed to not be providing the necessary improvement in student success that we have been expecting. This research study operated under the hypothesis that there are factors beyond the control of our schools, teachers and educational systems, which contribute to the lack of educational success. If those factors could be identified, the community could begin to address those factors and improve the rate of student success in our country.

The problem that this research studied concerned the identification of some of those factors that negatively impact student success, as measured by ACT scores, end of course tests and grade point averages. Groups of students who possess these proposed negative factors, such as low attendance rates, lack of a two parent home environment and low socio-economic standing, were disaggregated from the entire population sample and the group's ACT scores, end

of course test scores and grade point averages were compared to the group that did not possess any negative factors. These comparisons provided the statistical insight in determining if the negative factors are correlated with groups of students that have less academic success. This study attempted to find a connection between these factors, the groups of students that possess these factors and academic achievement or underachievement.

This research study proposed three factors believed to negatively impact student success. The first factor was poor attendance. Does poor attendance, students with ten or more absences per year, have an impact on academic success, as measured by ACT scores, end of course tests and grade point averages, than students with less than ten absences?

The second factor was low socio-economic status. Do students with low socio-economic status, as measured by their inclusion into the free and reduced meals program, have lower academic success, as measured by ACT scores, end of course tests and grade point averages, than students not included in the free and reduced meals program?

The third factor was the lack of a two parent family arrangement. Do students who have no parent or only one parent, listed on school records, have lower academic success, as measured by ACT scores, end of course tests and grade point averages, than students that have two parents listed on their school records?

Purpose of the Study

The purpose of this study was to determine if there are definable factors, which are not influenced by schools, school policies or curricula, which negatively contribute to or impact a group of students' ACT scores, end of course test scores and grade point averages. The hypothesis that this study adopted was that there are definable factors that create barriers to

success for students. It was hypothesized that when these negative factors are identified and when students are grouped according to the factors that they possess, differences in the success that these groups are able to attain, with regard to ACT scores end of course test scores and grade point average, would become readily apparent.

As these factors were identified, steps could be taken by the community to reduce these factors among the students or minimize their effects upon the students and the schools that they attend (Wolk, 2011). This study did not attempt to identify the steps that should be taken to eliminate the negative factors, as its purpose was only to verify that there were, in fact, factors that impact student achievement.

Rationale for the Study

The rationale for the study was to provide an initial argument for the study of the potential factors that could contribute to the decline in success of the students of our public schools. Once a potentially negative factor has been identified, school systems would be able to target programs to specifically address the factor. By addressing a specific factor, school systems could work toward programs that would eliminate these factors or minimize their impact on our students and the schools they attend. By focusing on the specific factor, unintended consequences to the entire school or school system could be minimized.

Significance of the Study

There is a tremendous need to improve the results of the public educational system in America. A great deal of time, effort and money are currently being spent toward the implementation of educational reforms due to the “No Child Left Behind Act” and others. This

study intended to determine if it could be shown that there were factors, outside of the control of our school systems and teachers, that impact the success of students. Once we are cognizant of the factors that impede success, then the resources that were being used to implement educational reforms could be redirected to more productive programs that would eliminate or minimize the factors handicapping student success in our country.

In addition, the laws and the educational reforms that have been set in motion focused on the notion that the success or failure of our students was entirely dependent upon the operation of our schools. It provides for very little responsibility to be placed upon the shoulders of parents or other segments of our society. This has created the false impression to the general public that our schools are at the root of our educational problems (Hughes, 2011). The educational leadership in the U.S. should decide whether this perception should be changed. If it could be shown that there were other factors at play, perhaps the opinions of the public will change.

If these negative factors can be shown to have deleterious correlations with student academic success, then the collective voices of our teachers and the largely silent group that believes that students and parents should be held more accountable should warrant the attention of our legislators. With sound reasoning behind the educational reforms that need to be made our schools should be able to implement them with positive results. With positive results the teachers and schools would be held in higher esteem and should have more impact upon public opinion and the future direction of education in America (Bullough Jr, 2014).

Research Hypothesis

The research hypothesis was that groups of students who possess one or more of the following factors: (high absentee rate, member of a one or no-parent household, or membership

in an economically disadvantaged family), would have lower academic scores than the group of students who did not possess those factors. Those factors were ACT scores, end of course test scores and grade point averages. This study endeavored to determine the validity of this hypothesis by calculating the mean scores for these measures and by comparing the mean scores of groups that possess the above-referenced factors with the mean scores of groups that do not possess any of the factors.

Grouping of Students

To perform the statistical analysis using the one-way analysis of variance test, ANOVA, it was necessary to form eight separate groups. This was necessary because no student in the study could be a member of more than one group. The groups that were formed are as follows:

Table 1.1 Group Characteristics

Group	Description
G1	Students who possess no potentially negative factors
G2	Students who possess the potentially negative factor of: Having nine or more absences
G3	Students who possess the potentially negative factor of: Having less than two parents in the household
G4	Students who possess the potentially negative factor of receiving free or reduced price lunches
G5	Students who possess the potentially negative factors of: A. Having nine or more absences, and B. Less than two parents in the household
G6	Students who possess the potentially negative factors of: A. Having nine or more absences, and B. Receiving free or reduced price lunches
G7	Students who possess the potentially negative factors of: A. Receiving free or reduced price lunches, and B. Less than two parents in the household
G8	Students who possess all three potentially negative factors

Research Questions

In order to determine if any of the potential negative factors played a role in the academic performance of a student, the following research questions have been addressed in this study. See table 1.1 for the grouping categories.

Q1- Is there a significant difference between G1 versus G2, G5, G6 and G8 on the Biology Gateway examination?

Q2- Is there a significant difference between G1 versus G2, G5, G6 and G8 on the Algebra Gateway examination?

Q3- Is there a significant difference between G1 versus G2, G5, G6 and G8 on the English Gateway examination?

Q4- Is there a significant difference between G1 versus G2, G5, G6 and G8 on the ACT test?

Q5- Is there a significant difference between G1 versus G2, G5, G6 and G8 on GPA?

Q6- Is there a significant difference between G1 versus G3, G5, G7 and G8 on the Biology Gateway examination?

Q7- Is there a significant difference between G1 versus G3, G5, G7 and G8 on the Algebra Gateway examination?

Q8- Is there a significant difference between G1 versus G3, G5, G7 and G8 on the English Gateway examination?

Q9- Is there a significant difference between G1 versus G3, G5, G7 and G8 on the ACT test?

Q10- Is there a significant difference between G1 versus G3, G5, G7 and G8 on GPA?

Q11- Is there a significant difference between G1 versus G4, G6, G7 and G8 on the Biology Gateway examination?

Q12- Is there a significant difference between G1 versus G4, G6, G7 and G8 on the Algebra Gateway examination?

Q13- Is there a significant difference between G1 versus G4, G6, G7 and G8 on the English Gateway examination?

Q14- Is there a significant difference between G1 versus G4, G6, G7 and G8 on the ACT test?

Q15- Is there a significant difference between G1 versus G4, G6, G7 and G8 on GPA?

Q16- Is there a significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the Biology Gateway examination?

Q17- Is there a significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the Algebra Gateway examination?

Q18- Is there a significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the English Gateway examination?

Q19- Is there a significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the ACT test?

Q20- Is there a significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on GPA?

Null Hypotheses

The null hypotheses associated with these questions were:

H₀₁- There is no significant difference between G1 versus G2, G5, G6 and G8 on the Biology Gateway examination.

H₀₂- There is no significant difference between G1 versus G2, G5, G6 and G8 on the Algebra Gateway examination.

H₀₃- There is no significant difference between G1 versus G2, G5, G6 and G8 on the English Gateway examination.

H₀₄- There is no significant difference between G1 versus G2, G5, G6 and G8 on the ACT test.

H₀₅- There is no significant difference between G1 versus G2, G5, G6 and G8 on GPA.

H₀₆- There is no significant difference between G1 versus G3, G5, G7 and G8 on the Biology Gateway examination.

H₀₇- There is no significant difference between G1 versus G3, G5, G7 and G8 on the Algebra Gateway examination.

H₀₈- There is no significant difference between G1 versus G3, G5, G7 and G8 on the English Gateway examination.

H₀₉- There is no significant difference between G1 versus G3, G5, G7 and G8 on the ACT test.

H₀₁₀- There is no significant difference between G1 versus G3, G5, G7 and G8 on GPA.

H₀₁₁- There is no significant difference between G1 versus G4, G6, G7 and G8 on the Biology Gateway examination.

H₀₁₂- There is no significant difference between G1 versus G4, G6, G7 and G8 on the Algebra Gateway examination.

H₀₁₃- There is no significant difference between G1 versus G4, G6, G7 and G8 on the English Gateway examination.

H₀₁₄- There is no significant difference between G1 versus G4, G6, G7 and G8 on the ACT test.

H₀₁₅- There is no significant difference between G1 versus G4, G6, G7 and G8 on GPA.

H₀16- There is no significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the Biology Gateway examination.

H₀17- There is no significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the Algebra Gateway examination.

H₀18- There is no significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the English Gateway examination.

H₀19- There is no significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the ACT test.

H₀20- There is no significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on GPA.

Definition of Key Terms

1. *Accommodations*: Education Law requires that any state that imposes an exit exam must provide appropriate accommodations for students with identified disabilities. All states provide accommodations as outlined in the students' IEP, Individual Education Plan (Mills, 2008).

2. *Accountability*: Accountability refers to a system of checks and balances to guarantee appropriate outcomes. Educational accountability holds schools, teachers, and students accountable for their performance. School accountability refers to a state making the school responsible for students' performance. If adequate school performance does not occur, actions by the state could include ranking the school, assigning the school to a low-performing list, or removing administrative staff. Student accountability might include grade retention or withholding a high school diploma (Mills, 2008).

3. *Achievement Gap*: Achievement Gap is the variation in test scores tied to racial or ethnic differences (Mills, 2008).
4. *Adequate Yearly Progress (AYP)*: This is a measure designed to track annual progress as defined by *No Child Left Behind* (Mills, 2008).
5. *Alignment*: Alignment is assessment that measures state standards according to the test that is given (Mills, 2008).
6. *Average Daily Membership (ADM)* - The average daily number of students enrolled in a particular school is known as the Average Daily Attendance (Mills, 2008).
7. *Carnegie Unit*: A Carnegie unit was developed in 1906 as a measure of the amount of time a student has studied a subject: 120 hours in one subject – meeting 4 or 5 times per week for 40 to 60 minutes for 36 to 40 weeks each year – earns one “unit” of high school credit (Tompkins & Gaumnitz, 1954).
8. *Core Curriculum*: All Tennessee students are required to complete the core curriculum: four units of English, three units of math, three units of science, three units of social studies, and one unit of physical fitness (Porter et al., 2011).
9. *Disadvantaged Students*: Disadvantaged students are those who are eligible to participate in the free or reduced-price lunch program. Eligibility for free or reduced-price lunch is based on family income. Effective July 1, 2005, children in a family of four making less than \$25,155 are eligible for free meals, whereas those making less than \$35,798 qualify for reduced prices (Natriello, McDill, & Pallas, 1990).
10. *Education Improvement Act of 1992*: This *Education Improvement Act* was passed by the Tennessee General Assembly and signed by then-Governor Ned McWherter in 1992. The act

incorporated many education reforms that included: class size requirements, Basic Education Program funding, and the exit exams for graduation from high school (Sanders & Horn, 1998).

11. *Education Reform Act of 2001*: The *Education Reform Act* was passed by the Tennessee General Assembly and signed by then-Governor Don Sundquist in 2001. The act was not funded by the General Assembly. The main tenets of the act included a reading initiative, a pre-kindergarten initiative, and a “Catching Up” program aimed at 7th and 8th grade students who were likely to fail the Gateway exams (Mills, 2008).

12. *End-of-Course Exam*: The end of course exam is an assessment given to students upon completion of a particular subject, the purpose of which is to measure material taught in a course. End-of-course exams taken in 2005 in Tennessee were: Algebra I, Foundations II, Biology I, English I, and English II, three of which were Gateways (Mills, 2008).

13. *English Language Learner (ELL)*: Students whose first language is not English are known as English Language Learners (Mills, 2008).

14. *English as a Second Language (ESL)*: The program that assists English language learners is known as (ESL) (Mills, 2008).

15. *Gateway Exams*: Tests implemented in the fall of 2001 in English II, Algebra I, and Biology I, are known as Gateway Exams. Students must pass each Gateway test to receive a regular high school diploma. Students take the exams for the first time upon completion of the corresponding course. Students who fail one or more of the exams have several additional opportunities to retake and pass the exams before graduation (Mills, 2008).

16. *High-Stakes Testing*: High-stakes tests are tests that a student must pass to graduate. (Nichols & Berliner, 2007).

17. *IEP Diploma*: The Individualized Educational Program diploma is a high school diploma awarded to special education students who have successfully completed the program outlined in his or her IEP. Many states refer to this diploma as a certificate of attainment or certificate of attendance (Colley & Jamison, 1998).

18. *School Wide Improvement*: Each high school develops a shared mission and vision, school-wide goals, and a school improvement plan that is based on a needs assessment. In working for continuous improvement, the school collects and uses student assessment information, program evaluation information, and other appropriate data (Renzulli & Reis, 1997).

19. *Standard or Regular Diploma*: A regular or standard diploma is obtained by passing 28 Carnegie units of class work and passing three Gateway Tests in Algebra I, Biology I, and English II (Tompkins & Gaumnitz, 1954).

20. *TACIR*: The Tennessee Advisory Commission on Intergovernmental Relations (2002) was created to monitor federal, state, and local government relations and to make recommendations to the Legislature for improvement.

21. *Tennessee Value-Added Assessment System TVAAS*: The TVAAS system is a statistical analysis of student achievement that uses the Gateways to measure gains in student, school, and teacher achievement (Sanders & Horn, 1998).

Delimitations of the Study

This study was limited to 288 students who were enrolled in one public high school in the state of Tennessee. This sample offered readily accessible data. Time and limited resources kept the research from widening its scope.

The study was also delimited to three potential factors that could have negatively impacted student success. Those factors were: high absenteeism, low socio-economic status, and lack of a two-parent household. The amount of available data and the time to analyze the data were the most compelling reasons for these delimitations.

Limitations of the Study

The limitations of the study could be caused by the use of recorded school data versus student interviews. Although there is no reason to believe that the data were inaccurate, the researcher did not attempt to interpret the responses to questions that were entered on the student records used in this study. For example, a student's record might have indicated that there were no parents in the student's life when, in fact, there could be quite capable foster parents or grandparents offering ample support to the student. The data that were available were recorded without interpretation.

The accuracy of several categories of student characteristics; socio-economic status, number of parents listed on the students' registration documents, and custodial changes that are not recorded or updated on the registration documents could impact the accuracy of the data examined. Some students could have failed to turn in the necessary forms to qualify for disadvantaged status. Another limitation of this study is that the study results could not necessarily be extended to other schools, even those schools with similar demographics. The study would benefit from a larger sample size, utilizing more schools from other geographic and demographic settings from around the country. The study might benefit from inclusion of more potential factors that could impact student success. These limitations are not believed to have an impact upon the results of the study.

CHAPTER II

REVIEW OF LITERATURE

Data on the Current State of Education in America

In preparation for performing this research study several priorities were identified. The first priority of the review of literature focused on the statistics of education and the problems reflected by those statistics and included numerous sources. Only seventy-five percent of American students, on a nationwide basis, were expected to graduate from high school (Stetser & Stillwell, 2014). Only twenty-four percent of those students who graduate from high school were “college ready” when they graduate (Act, 2013). According to these statistics, only eighteen out of every hundred students in America would be ready for college, eleven years after they entered first grade.

America’s colleges have to re-tool the way they admit freshmen into their schools as almost a third of all new college freshmen required remedial coursework (Boatman, 2014). Most new college students must pass a remedial class in Math or English that was presented mostly by computer before being allowed to register for the required courses in those subject areas (Boatman, 2014). Only fifty-five percent of all college students earned a degree within six years (Snyder, 2010). As shown by the previous two statistics, only a very small percentage of students were expected to graduate from college before they reached the age of twenty-five. Only seventy- five percent of America’s students would graduate from high school. Not all of these

children would have gone on to college. From these facts one can project that less than forty-two percent of students were expected to graduate from college within a six-year college experience (Boatman, 2014).

The NCLB Act and Education Legislation in America

The general public has limited knowledge of the NCLB act (Goodman & Goodman, 2004). This research study sought to understand the ramifications of the law fully, as it applies to this study. The United States Department of Education website explained the (NCLB) act completely (Sunderman, 2006). The (NCLB) act, although very complex, had two primary goals. The first goal was to close the achievement gap between high and low performing children, especially the achievement gaps between minority and non-minority students, and between economically disadvantaged children and their more economically advantaged peers. The second goal of the law was to create and implement a rigid evaluation of the assessment results that posed significant consequences for those schools that fail to improve their scores annually (Sunderman, 2006).

The United States Department of Education highlighted the four pillars of the (NCLB) act (Mills, 2008). The federal law's interpretation, by each individual state, was an important factor to consider. The explanations from Shaul and Ganson were insightful and listed the reforms that were being made in every state due to the (NCLB) act (Shaul & Ganson, 2005). The (NCLB) act placed significant responsibilities upon states, school systems, principals, and teachers. If these responsibilities were not met a series of transformations would be required by the federal government, which must be implemented in each school that failed to meet annual yearly progress.

The State of Tennessee provided information about how the act was addressed in their state. An explanation of what happens when a school is considered to be failing and a step-by-step approach of the recourses that the state had if a school fell into remediation was outlined by the Tennessee Department of Education (DOE, 2001). The process included notification to the school, notification to the community, provisions for parents to move their children to a non-remediation school, installation of programs to improve the school and, ultimately, the takeover of the school by the state. To inform the community of schools' performance, a detailed report explained the current status of schools that had not met federal benchmarks (DOE, 2014). Tennessee's education report card, which highlighted the progress the schools have made in the state of Tennessee during the initial years of the act was reviewed by Tim Caboni (Caboni & Adisu, 2004). An annual statistical report showed data from state mandated Gateway tests in the state of Tennessee (Tennessee Department of Education, 2004). Another helpful site from the state of Tennessee provided Gateway and end of course proficiency levels, which must be met in order for schools to achieve a passing score with regard to federal benchmarks status (Webb, 2005).

Author Barry Gold, gave a detailed explanation of the (NCLB) act and its effects on urban schools (Gold, 2007). He mentioned that urban schools were in a constant state of failure or improvement, which in turn fostered an atmosphere of disorganization within the school. New administration, new faculty, new change or school improvement personnel were continually rotating throughout these schools. Scott Franklin Abernathy wrote in *No Child Left Behind and the Public Schools* that the law was more of a hindrance to the American educational system than it was a positive tool (Abernathy, 2007). He outlined the myriad processes that a school system

and school must endure before the first child is benefitted. Abernathy also explained, in great detail, the (NCLB) act.

There was a historical precursor to the NCLB act, President Lyndon Johnson's "war on poverty" (Brauer, 1982). As part of this program, the Elementary and Secondary Education Act was established (Brauer, 1982). This act emphasized equal access to education and established high standards of educational accountability. It also authorized federally funded education programs that were to be administered by the states. These programs have evolved in many different directions, but, most importantly, they initiated the increasing responsibility of the federal government toward the funding and oversight of education in America. Another precursor to this evolving administration of education concerned civil rights issues and the law that stemmed from the Brown versus Board of Education trial (Klarman, 2007). This desegregation issue was enhanced by the NCLB law, which afforded more focus to groups of disadvantaged children.

Several resources were useful in examining the effects of the NCLB act. The National Center for Education Statistics highlighted in its 2009 Report, the lack of progress in graduation rates (Snyder, 2010). The graduation rate fell to 73.4 percent in the 2005-2006 school year, extending the decline in this rate to four years in a row. The National Center for Education Statistics also published a report which highlighted a number of other areas in American public education that were on the decline, even several years after the NCLB law was set in place to improve those same areas (Stillwell et al., 2011). Average reading scores for fourth graders have been on a steady decline since 1994, reaching their lowest levels in 2007 and rising insignificantly since (Thorson, 2014). Average mathematics scores have been on a decline since

1992 for fourth and eighth grade students, and have reached their lowest levels since 1990. There has been no improvement in reading scores since 1971 (Thorson, 2014).

The American College Testing organization (Allen, 2013), now called the ACT organization, provided much information about the trends of student achievement. Underscoring the decline in college readiness and freshman retention rates, this study showed there remains much work to do to prepare high school students for college (Act, 2013). The percentage of first year college students who returned for a second year was 74.7 percent in 1989 and had fallen to 72.9 percent in 2010. The lowest year was in 2008 when only 72.3 percent of our college students returned for a second year. ACT also provided a comprehensive report on the issue of college readiness (Act, 2011). The figures for Tennessee were especially startling. As measured by ACT score benchmarks in English, Reading Mathematics and Science, only 16 percent of graduating high school students in 2011 were ready for college. In Tennessee, and the rest of America, the average scores that our high school graduates earned on these tests were falling and had done so for several years (Act, 2011).

Pointing out the wastefulness of establishing educational reforms, before the potential results could be measured, was a trend that seemed to be repeated (Abernathy, 2007). Tracking the cost of educational spending in America, an article published by the Heritage organization highlighted the wastefulness of our education policies (Lips, Watkins, & Fleming, 2008). From their point of view, there was no correlation between extra spending and improved student achievement. From 1985 through 2008, there had been an increase of 136 percent in federal spending on education. During this period, from 1985 to 2008, there had been no corresponding

growth in reading scores, ACT scores or graduation rates. The authors pointed out that the allocation of funds was not selected thoughtfully (Lips et al., 2008).

Abernathy (2007) exposed some meaningful information about the NCLB act. He pointed out that little empirical evidence indicated that the NCLB act was working (Abernathy, 2007). Graduation rates were not increasing. Test scores were not increasing. The sub-groups that the law was targeting for focused improvement were showing little, if any, improvement. To illustrate his frustration with the basic assumption of the law that aimed for complete competency in certain academic areas, the author further pointed out that, “100% competency on just about anything, is just plain impossible (Abernathy, 2007, p. 34). The NCLB act, he postulated, “was destined to fail to live up to its liberal promises” (Abernathy, 2007).

Gold (2007) mentioned many unanticipated outcomes stemming from the implementation of the NCLB act (Gold, 2007). It pushed low performing students from schools. It deterred talented teachers from entering the teaching profession. It hampered the creativity of teachers by forcing them to focus solely upon teaching to the test. It undermined the public perception of public education. Gold further asserted that the law had actually widened the gap between middle-class white students and minority students. Some members of the teaching profession today share these perceptions of the author.

One of Gold’s case studies, Newark, New Jersey, was a prime example of what the NCLB act could do (Gold, 2007). In Gold's book, *Still Separate and Unequal*, about education, poverty and segregation, he highlighted the schools in the downtown Newark, New Jersey area (Gold, 2007). They were located in an extremely low-income area and were largely populated with underperforming students. After numerous attempts to jumpstart progress at these Newark

schools, the state government finally took over. After three years of operating these schools, the state government decided they had done all that they could. They eventually turned control back over to the city of Newark. With all of the money spent, time invested and lives affected, no improvement in these schools was made according to the measurements that were used. Attendance rates did not increase. Graduation rates did not increase. Test scores did not increase (Gold, 2007).

In their book about urban schools a group of education professionals wrote about the challenges that they face (Kincheloe, Hayes, Rose, & Anderson, 2006). The Kincheloe et al. book talked about how experts believed that the NCLB act would fail, but they still considered it a positive step because it brought more money into urban schools (Kincheloe et al., 2006). The "so-called" educational experts described many urban middle and high schools as militarized zones with security, police, drugs and gangs (Kincheloe et al., 2006). They even suggested that schools were using military tactics to govern their schools. They used hall sweeps, scheduled raids, checkpoints, stun guns and metal detectors to manage unruly students Kincheloe et al. (2006) further suggested that in order to solve our educational problems, broader societal issues must be addressed first. The focus was the need to transform the student by the methods of the teachers. All students do not learn in the same way. A teacher needs to be able to vary the instruction to fit the student. A federal law was unable to account for all of the variables necessary to accomplish this. One of his statements was closely aligned with the hypothesis of this study. "Today we continue to try to educate young men and young women of color who have an overwhelming appetite for immediate wealth, no reasonable way of gratifying it and no understanding of how to counteract it" (Kincheloe et al., 2006, p. 45). "This is a barrier to any

hope of success, especially in education”, he wrote (Kincheloe et al., 2006, p. 46). This problem was societal, not educational in its causation.

The NCLB act required high stakes testing as a means for determining the quality of education. Kincheloe et al (2006) believed that high stakes testing just widened the gap between social classes and races. If this statement was true, the programming that the law required contributed to the detriment of the stated goals of the law and to its targeted sub-groups. (Herman & Haertel, 2005) stated that high stakes testing has brought about invalid results, from score inflation to test coaching and even fraud. Placing the success or failure of the educational system on the results of these high stakes tests was problematic at best.

Bracey (2002) discussed high stakes testing and NCLB as he identified the issues about the war against America’s public schools. He asked, "Does anyone believe that spending more money will cause test scores to rise?" “Spending money will not cure the problems in education” (Bracey, 2002, p. 76). His position was that high stakes testing would only make matters worse for our educational system. He pointed to the Regents Examinations introduced in New York in 1999. Since they were introduced, overall passing rates had declined, IEP diplomas increased by 21.6 percent, the dropout rate increased by 2 percent and the English-language learner dropout rate increased 12 percent in 2001. These measures were not the results of a program that was benefitting education.

The United States government’s involvement in education is a historically recent event. Kosar (2005) provided clear reasoning about why the government should become involved and why it should not. He was most critical of the NCLB law. He quoted Ross Perot saying, "The United States schools had been the best in the world in 1960, but once the federal government

got involved in them they became the worst" (Kosar, 2005, p. 291). Scott Abernathy probably put it best when he said "The NCLB law was an easy problem to fix" (Abernathy, 2007, p. 47). First, we needed to be able to measure the value added to each student by each school and each teacher. (Abernathy, 2007). He suggested that in order to determine if the value of education added was accurate a current level of intelligence for each student was also needed. This would be hard to attain. He felt that it was also appropriate to determine how each student's prior teachers impacted their educational improvement to determine if teachers were able to reach this child before. All of these points have merit. Abernathy wanted to point out how much latitude the results were given to determine the value of the schools and teachers. He also pointed out that the law didn't take into account the socio-economic background of the child, which would have bearing on their results. The test results wouldn't necessarily tell you how proficient the student was in English before they took the test. There was no way to measure the health, hunger or motivation to learn and compare that with the results that the NCLB would be using to effect educational change in America. Abernathy (2007) points out that the filtering out all of these factors would not be an easy task. It would certainly be a very expensive and, therefore, not likely to be considered. He postulated that the decisions would just be made with the data that was available(Abernathy, 2007). When these decisions were made from Washington, they became impossible to calculate. Abernathy was making the point that the teachers needed the authority and support to educate our children. The federal government should get out of the way (Abernathy, 2007).

The NCLB law created an opportunity for fraud, cheating and ethical problems (Callet, 2008). The Federal oversight was minimal, at best. The state's educational budgets strained to

keep up with the requirements of the law. The opportunity for misdeed was readily available ("NCLB Scams," 2007). Some of the bolder misdeeds studied had to do with poor, or inappropriate, record keeping within the state of Kentucky ("NCLB Scams," 2007). In one case involving the school system in Louisville, a \$450,000 grant was awarded to an organization that performed no work in connection with the grant. A school board member in Louisville was actually the director of the organization that was awarded the grant.

There have been accusations made that cheating was also a result of the NCLB law (Titone & Duggan, 2011). High stakes cheating was a new market, according to one educational investigator (High Stakes Cheating, 2007). The state of Florida misrepresented its population numbers and thus escaped a federal benchmark trap (Haney, 2006). Tutoring companies were raking in millions of dollars when, in fact, they were just babysitting (Springer, 2008). During the summer of 2011, a group of teachers from Atlanta, Georgia was accused of altering their students' test scorecards to allow for higher scores on end of course tests. The outcome of this event has continued to unfold (Copeland, 2013). Events that take advantage of the lack of oversight, that this law created, continued to appear.

Race to the Top Initiative

The Race to the Top initiative, created in 2009, was President Obama's program for raising student achievement (McGuinn, 2014). The program offers cash incentives to states willing to adopt changes to improve teaching and learning in America's schools. The money was awarded on a competitive bidding basis. The bids from the states were to include programs that reform three areas. Those areas were assessments, data systems to record student progress and

teacher and administrative support and rigorous interventions in schools that are the lowest performing (Hallgren, James-Burdumy, & Perez-Johnson, 2014).

Forty-six states submitted bids for the program and nineteen were accepted. Tennessee became one of the first states to be awarded a slot in the program. The state was awarded five hundred million dollars to implement its reform plans. The first items that Tennessee implemented were a new teacher evaluation program, new end of course tests and teacher training to implement common core curriculum standards (Gottlieb & Gottlieb, 2013).

The Race to the Top initiative is not popular with everyone. Critics point to the new teacher evaluations and claim that they are not fair or valid (Corcoran, 2010). Some point out that the “value added” student scores are not always reflective of the true value of the teacher. In some cases it has been pointed out that some teachers value added scores were from some students that the teachers had never had in their classroom. Others point out the statistical correlation between student test scores and the impact their teachers had on those scores.

There are a great number of people opposed to the common core, curriculum standards that are intertwined with the Race to the Top Initiative. The standards in one part of America are not always aligned with other parts. The debate has been fierce among teachers who will have to incorporate math, reading, and science to all other course curriculums to satisfy the common core, curriculum standards requirements (Tanner, 2013). The debate is continuing to unfold.

The Race to the Top Initiative and the No Child Left Behind act are both in effect at the current time. They were both created to improve student success that was shown to be below satisfactory levels. Both programs address reforms or changes that are required to be made to school systems, schools and teachers. There are huge sums of money at stake. There are huge

ramifications to systems, schools and teachers (Mercier & Doolittle, 2013). These reforms seem to indicate that our schools have been doing things wrong and students and parents will immediately start to perform up to expectations as soon as the schools get things right (Weiss, 2013). There are those that believe that parent and student responsibility should also become part of the reform (Mehta, 2013).

Potential Negative Factors That Could Affect Academic Success

Negative factors that impact the academic success of the students are an important part of this research (Berliner, 2009). The three negative factors this study examined were poor attendance, low socio-economic status and lack of a two-parent household. These factors are believed to negatively impact student achievement and were examined in this study.

Attendance

One of the biggest problems facing education is the declining attendance of our students (Dufours, 1983). This was pointed out in Richard Defours' book that outlined the case for compulsory attendance laws as a means to improve student achievement, as well as to protect children from child labor abuses. The book asserted that attendance was the biggest problem facing educators in the seventies. Although there are other problems drawing the focus of school reform organizers, attendance is still a major factor in the poor performance of many students. Attendance has steadily declined since the seventies and yet, it no longer appears on the list of the most pressing problems facing education. Diane Ravitch proposes the reason. Campus and classroom violence have become a more important focus of education professionals (Ravitch, 2011). Adding more technology, improving the results of sub-groups, standardized testing,

aligning curriculum and creating specialized schools to accommodate the special needs of students are more important than finding a solution to low attendance rates (Ravitch, 2011).

There are connections between poor attendance and poor academic performance. The Department of Justice report on delinquency prevention detailed a connection (Baker, Sigmon, & Nugent, 2001). The report showed that not only do students with low attendance rates have lower grades, lower standardized test scores and lower graduation rates, but, they were also more prone to withdrawal from school. A New York Times educational supplement pointed out the main connection between school attendance and academic success (Tymms & Williams, 1996). Poor attendance was the most prominent barrier to literacy. A student will not be successful in school if he or she cannot read. A study of Ohio schools, published by the Educational Research Quarterly noted that low attendance was addictive (Roby, 2004). Once a student commenced the trend of absenteeism, it most often persisted for their entire educational career and even, in most cases, increased. This only made things worse for a student who needed every advantage due to deficient reading skills (Roby, 2004). When an African-American male started this pattern of absenteeism, the results were, almost always, negative, usually resulting in dropping out of high school (Robins & Ratcliff, 1978).

The public school systems in America have a problem with student absenteeism. A recent newspaper article in the Tampa Bay Times shocked the Tampa Bay area by revealing that the majority of students were absent more than ten days per year (Solochek, 2011). Florida has established a law that requires schools to report excessive absences to the government (Solochek, 2011). This requirement exposed the problem even though previously reported attendance rates were acceptable by state standards. The schools had been under-reporting absences due to a variety of reasons. Some schools did not report excused absences. Some schools did not report

absences at the beginning of the school year because they could not be certain whether the student attended another school elsewhere. Many now called the under-reporting a scam that allows a school to maintain its non-failing status according to NCLB guidelines (Solochek, 2011). It seems that getting accurate attendance data from schools can be a real problem. At this point in the history of American education, it would probably be extremely difficult to determine the actual rate of attendance of our students (Riddle, 2012).

When a classroom had a student absence it affected all other students (Roby, 2004). Several absences magnified the impact on the other students. All students were now expected to succeed or score highly on end of course tests. The outcome of these tests could determine the fate of the school and the teachers. If a student missed an important class that covered curriculum on a test topic, the teacher would be required to re-teach this topic to the students who were absent. When this happened on a regular basis, regularly attending students were faced with no direct instruction while the absent students were taught (Roby, 2004). The overall result was that the total classroom instruction was constantly trending toward the minimum as the number of absences increased. The schools were truly achieving the goal of providing instruction to the absent student at the expense of those attending students who truly deserved better. This was the determination of Douglas Roby in his study of Ohio schools in 2003 (Roby, 2004).

Students are restricting their opportunity to learn when they don't attend school. One focus of this study was how poor school attendance impacts academic success. The literature not only showed that there was a significant impact, but also that this impact was increasing (Riddle, 2012). A local failing school in Chattanooga, Tennessee, experienced the problem of low attendance and high tardy rates. An explanation of the problem appeared in an article in the Chattanooga Times Free Press. To remedy this problem, the school improvement plan called for

the school to delay the school start time by two hours. This proposal caused a great deal of controversy. School board members wondered why the students from other schools should be expected to arrive at school on time and the students of the failing school shouldn't be expected to adhere to these same standards (Gauthier, 2011). The school quietly transitioned its start time to nine am.

The combined effect of poverty and low attendance has created a phenomenon, in some school districts, which is characterized by forgetting the material previously learned during the school year during the months off during the summer. This phenomenon has been called "summer fade". It was outlined in a special article in Bloomberg News (Orzag, 2012). Researchers seemed to believe that this fade was more pronounced in students within poor environments because of the lack of meaningful learning experiences while away from school. A lack of appropriate reading material, non-availability of a capable adult to converse with, and a lack of structured activities contributed to this effect. The proposed solution to this "summer fade" was to increase the number of days in the school year. This would seem to be a perfect solution to the problem, except for the cost, of course. This solution would also eliminate some activities and experiences of summer for the majority of students. Finding a solution that addresses the problem while not creating additional problems would be another response to consider.

No matter how much money is spent on improving our schools, the final results of school improvement will not be positive if children do not attend class (Robins & Ratcliff, 1978). This hypothesis is tested in this research study. Do students with high attendance rates, (fewer than ten absences per year) perform better in school than do students with low attendance rates, ten or

more absences per year)? This is a problem that could be addressed in many different ways (Kim & Streeter, 2008). Motivating students to attend should be the primary method, but there are others who suggest that a punitive action against the parents is an appropriate response to get the attention of the students and their families (Kim & Streeter, 2008).

Poverty

Another major problem facing schools is the impact of poverty. In an extremely detailed study, several noted psychologists reported four ways that poverty placed children at risk for academic failure (Caldera & Hart, 2004). Children of poverty had increased emotional and societal challenges. They were more exposed to acute and chronic stress stimuli. Among children of poverty it was expected that cognitive development would be significantly delayed. The environment of poverty placed these children at risk for increased health and safety issues.

Writing about the development of emotions, Ekman (2007) clearly stated that there were absolute requirements that children needed, that children of poverty often did not have access to, but which affected their cognitive development. A reliable caregiver, who was there to offer ongoing and unconditional love, guidance, and support, should be available to young children aged three to eight. Children needed a safe, stable and predictable environment. Ten to twenty four hours per week of harmonious reciprocal interaction, from someone capable of instilling gratitude, forgiveness and empathy are needed by children. Children needed enrichment activities that were personalized and increasingly more complex, however, children from poverty were rarely exposed to these minimum requirements. The result of this lack of exposure to nurturing experiences can be seen in many ways, but the most common malady was the strong disposition for emotional dysfunction (Ekman, 2007).

In discussing the environments of poor children, Gary Evans pointed out that, in homes of children of poverty, the parents' educational history was mostly substandard (Evans, 2004). Interactions between child and parent were usually brief, cold and devoid of nurturing content. The parents in homes of poverty tended to be overworked, overstressed and authoritarian in their position toward the children. Much like they had been reared, the parents in homes of poverty were very authoritarian. Most of the parent/child relationships, in the setting of poverty, were unhealthy from a developmental standpoint. In addition, having a parent at all, with whom to have any type of developmental relationship was a rarity. Children of poverty were only half as likely to have a parent know the name of their teacher or friends. Most children of poverty came home to a life of isolation where the only interaction that they might have was between themselves and a television cartoon. This lack of emotional contact, as pointed out by Evans, often could lead to long-term emotional dysfunction (Evans, 2004).

Writing about the traits, emotions and values children possess that are innate versus those that were learned, based upon the environment in which they live, Judith Harris may have described with absolute clarity why educational problems persist in America (Harris, 2006). Her book, *No Two Alike*, detailed six emotions that were hardwired in the brains of all children at birth. Those emotions were sadness, joy, disgust, anger, surprise and fear. Appropriate cognitive development would have added an additional bank of ten emotions that would be used to temper the standard six emotions. They developed these ten additional emotions through relationships with their family and friends. The children of poverty routinely lacked exposure to these ten emotional assets and therefore would, subsequently, generally not develop some of them. These additional ten emotions, that seemed to be lacking in children from homes of poverty were humility, forgiveness, empathy, optimism, compassion, sympathy, patience, shame, cooperation

and gratitude. Harris could not imagine a child being able to perform in a school setting without these basic emotional assets. She suggested that this is an illustration of the impact that poverty has had upon schools, communities and the entire world (Harris, 2006).

The problem of drugs and alcohol is one that society needs to face (Robers, Kemp, & Truman, 2013). It not only occurs in environments of poverty, but in affluent segments of society, as well. America seems to want to shy away from focusing on the problems associated with drugs and alcohol use by our young people (Robers et al., 2013). Although this problem has a significant impact on the education of our young people, the NCLB law failed to address its impact and offered no programming to address its influence on schools. Although this study would not examine the impact, there is certainly cause for educators and the public, in general, to be alarmed. This study sought to identify factors such as this to determine if they impose a barrier to academic success. It may be possible to seek out ways to transform our approach to educational reform to solve problems, such as this, before overhauling our schools to accommodate for the problem (Ravitch, 2011).

This study did not attempt to verify that this problem is affecting the success of our students, but it is another example of one of the factors that potentially impact students that has not been caused by schools, educators and administrators. It is another of the many problems that has affected the effectiveness of our educational system. Although the solution may involve input from the educational community, the complete change of our educational system will not make this problem go away nor cure the impact that it will have on our children (Ravitch, 2011).

An article in The New York Daily News sent shockwaves throughout the educational community (Siemaszko, 2012). Almost twenty percent of high school students drank, smoked or

used drugs during the school day. This, to many, was an alarming figure. Certainly this much illegal substance use, at school, had a negative impact on student performance. What educational changes could have been effective in reaching these students who chose to exhibit this type of behavior and the parents who allowed this to occur?

Parental Involvement

The third potential negative factor that could negatively impact academic success was the lack of exposure to two parents in the home. Research indicated that children who have a mother and father present in their homes performed better in school than those children with one parent or none at all (DeBell, 2008). Although children were becoming more resistant to this effect, the research pointed out that children were better off when two parents were at home. In his study about fatherless homes, Matthew DeBell in 2008 found that in single parent situations, the overwhelming percentage of these homes were fatherless (DeBell, 2008). More than half of all children were growing up with only one parent at home and most of those homes were at, or near, the poverty line. He pointed out another alarming statistic. The percentage of one-parent homes was growing every year. DeBell's most important finding was that, in fatherless homes, psychologists found a significant correlation between this factor and the diagnosis of an emotionally dysfunctional child.

In the *Journal of Applied Psychology* (Daniels, 1986), Stacey Daniels noted that among children with no exposure to a father, boys seemed to have a more difficult time in forming peer relationships (Daniels, 1986). Boys were also shown to have problems in being able to maintain long-term heterosexual relationships when they had little exposure to a father figure. Michael Chapman noted in his study of third grade students that students with no father at home were

shown to have a lower score on locus of control than students with a father at home (Chapman, 1977). This lack of personal control severely impacted the student's ability to function in a classroom setting. He also pointed out that the lack of long-term employment and drug use were additional factors frequently present at the homes that lack two parents.

The expectations of parents are an important factor in determining the outcome of academic success in children. In her study of families with single parents and working mothers, Ann Milne showed that these expectations create a reason for the action of children (Milne, Myers, Rosenthal, & Ginsburg, 1986). When there were two parents there were more expectations to uphold. When only one parent was in the home, these parental expectations could be reduced by a half and in most cases were reduced far more than that. Her study pointed out that parental guidance was vitally important. The more quality guidance that was provided to a child, the better off that child would be. The most important influence upon a child was that of the parent. When those influences were bad, the child suffered. When those influences were missing altogether, the impact upon the child could have been devastating. The impact of positive influences, contributing to the guidance of the child could not be overstated (Milne et al., 1986).

The State of Affairs in America's Schools, From the Standpoint of Teachers and Administrators

This study could not have been undertaken without taking into account the experiences, beliefs and opinions of school administrators, principals and teachers (Morris, 2013). Seeing the operation of schools from the inside provided a whole new dimension on the problems that our

educational system was facing. As the general public saw the bad news concerning education on the evening news, and in the newspapers, they rarely heard from the educational leaders fighting the battles in the trenches of our schools on a daily basis. They rarely heard of the fears of school faculties that the changes being made were not in the best interest of our schools' future. These views were important (Ravitch, 2011).

The first driving influences stemmed from the opinions of teachers and their witnessing the lack of motivation, acceptable behavior and care by the high school students that seem to be in abundance in American classrooms (Skiba & Peterson, 2000). Are these characteristics caused by or are they the responsibility of America's schools and teachers? Many of America's teachers and administrators believed that they were being asked to take on responsibilities that should have been fulfilled at home before the student arrived at school (Ravitch, 2011). A number of individuals in the community concurred with this assessment, but these beliefs were rarely heard in the mainstream news. This small, quiet group of people kept following the prevailing mindset about education and rarely challenged the current political opinion. Why did teachers and school administrators quietly go along with programs and policies when they believed those programs would not be able to solve the problems that we face (Kumashiro, 2009)?

This study sought to review the current state of thinking about the state of affairs in public schools today and the increasing responsibilities of school administration and the teachers (Ravitch, 2011). From the training they had received toward the pursuit of their professional credentials, what were teachers' understandings of their responsibilities? Were they taught that they were responsible for each and every problem that could possibly arise in their school and classroom? The literature verified that this has often been the case (Kumashiro, 2009).

Educational colleges promoted the idea that teachers were in control of the outcomes. This has been one of the reasons teachers often did not complain as they were asked to do more and more. They seemed to believe that they were responsible for the current state of affairs in American education (Morris, 2013). This understanding had been developing over time but took a dramatic turn with the onset of the NCLB guidelines (Ravitch, 2011).

The ability to connect current school culture with past school culture is a goal of effective school management. Could this connection still be made after the "No Child Left Behind Law" programs were fully implemented? School culture is the term describing how the school operated according to a set of values, goals, principles, procedures, and practices that helped define what it constituted (Gorton, Alston, & Snowden, 2007). Culture was usually defined as the social or normative glue that holds an organization together (Gorton et al., 2007). It expressed the values, social ideas and beliefs that organization members come to share. The literature pointed out that our view of education has turned away from the utopian setting of the school that we remembered from the 1960's. Today schools are viewed as being too focused on that final examination and disciplinary problems (Ravitch, 2011).

Establishing the values and ideas of the faculty and the students is an important factor in determining the school culture. In order for a school administrator to analyze the school's organizational culture he should have begun with developing a good understanding of the values and ideals that the school represented (Gorton et al., 2007). In order to determine the values and ideals of a school, the principal determined what kinds of behavior were valued in the school and what the school aspired to become. The range of inappropriate behaviors today has grown, stressing the limits of many school administrators. These stressors were considered to be a major

problem by teachers and administrators, and were believed to be a major factor responsible for the lack of attainment of educational goals. Discipline problems today have grown to such an extent that administrators were forced with accepting many of them in order to avoid the impact that suspensions and dismissals would have upon the final data that the government was measuring, such as graduation rates (Ravitch, 2011).

There are times when determining the values and ideas of the school can be difficult. When this occurs values usually can be reflected in the norms of the school. Norms include the unwritten rules stating what people should and should not do (Gorton et al., 2007). They serve the purpose of regulating and controlling the behavior of an organization and its constituents. Four core values define school culture (Gorton et al., 2007). The first was cooperative, community and parent relationships. The second was cooperative teacher relationships. The third was student needs. The fourth was the principal's role as a cultural transmitter. Of real importance amongst a principal's duties was the creation and management of culture (Gorton et al., 2007). These were ideological issues, which were an important component of our schools. Teachers and administrators had little time to be able to conceive such ideological issues, when classroom management issues, graduation rates, school improvement plans, evaluation scores and test scores were a constant worry (Ravitch, 2011).

In years past, the school principal had the ultimate responsibility for school culture. If he liked the school culture as it was, he just needed to perpetuate it. Once an administrator had attained a good understanding of the organizational culture of the school, the administrator would have then been in a position to try to enhance that culture if changes were needed (Gorton et al., 2007). Today's principal did not have the same power or ability to affect the problems that

students bring into the building previous principals may have had (Wolk, 2011). A school's greatest impact occurred not in the formal lessons taught, but in creating a climate in which virtues were learned by example. This example originated with the principal (Parkay & Hall, 1992). The principals of successful schools were not merely supervisors, they inspired teachers and they took action to ensure that appropriate values were embodied in teacher's actions. The teachers' actions were important. Their effects could be more profound with better-prepared students. This focus on culture is not an expectation in the typical public school today (Ravitch, 2011).

One of the attributes of a school with strong cultural linkages is that it showed a commitment to improve quality educational service (Parkay & Hall, 1992). In order to improve the instructional program of the school, the principal should have allowed and supported risk-taking and experimentation by its faculty (Parkay & Hall, 1992). One of the focuses of the "No Child Left Behind Law" was the school principal. Principals were ultimately responsible for the success or failure of the school. From the literature reviewed, they were under increasing scrutiny. Clearly, the direct instructional leadership role of a principal made a difference (Sergiovanni, 2006). Over the longer term, however, it may have been that indirect leadership was more important to student learning. Although the principal needed to set an example every day, the parents also needed to provide more leadership. This one reference to parental involvement, in a sea of reference to teacher responsibility, had been at the forefront of school management over thirty years ago, but it is not being mentioned today (Ravitch, 2011).

(Sergiovanni, 2006) reported that principals were required to know and engage in matters of instruction to a much greater extent and with greater depth than in previous history. Principals

who were instructional leaders needed to practice a number of duties (Sergiovanni, 2006). They needed to lead the faculty in analyzing classroom test data and in analyzing the data by socioeconomic status, race, ethnicity, and language group. The principals needed to be able to lead a group of teachers in analyzing examples of student work from their classes with reference to benchmark standards that met state or district standards. All principals needed be able to lead the faculty committee appointed to align textbooks or other teaching materials to standards. Principals needed to visit classrooms daily to observe teaching and to develop along with teachers the best practices of effective teaching. The principals also needed to build professional development plans with individual teachers, based on classroom observations, student data, and characteristics of the adopted instructional program (Sergiovanni, 2006). The qualifications for this job were becoming difficult to fulfill and as a result were overlooked, in many cases (Sergiovanni, 2006).

The principal was required to be the initiator of faculty professional growth. The purpose of professional development was to align the teacher's sense of purpose, to align the teacher's perception of students, to intensify the teacher's knowledge of subject matter and sharpen the teacher's mastery of technique (Sergiovanni, 2006). Ambiguous and unstructured professional development along with unclear expectations of what the professional development was to accomplish could have been a source of frustration and dissatisfaction for teachers (Sergiovanni, 2006). It was the principal's responsibility to provide clarification of goals to the faculty. The federal education laws have placed more strenuous evaluation procedures on teachers as well as administrators (Santos & Hu, 2012). Many education professionals felt that too much was expected from teachers and administrators.

Effective school management could come from unlikely actions. Kimbrough stated that good relations with teachers could be accomplished by having the principal wander around the building in an informal manner (Kimbrough & Burkett, 1990). Helpful wandering around resulted in big dividends for the principal when he asked for assistance. The principal received the support from the teachers, and his visibility promoted an atmosphere of caring and sharing that could permeate the entire school. But, with all of the responsibilities that this person had now, was there, possibly, time for wandering?

Some of the most important advice about school management concerns the faculty. More specifically it addresses the selection and training of the faculty. Principals needed to select capable teachers committed to excellence (Kimbrough & Burkett, 1990). Principals were required to be actively involved with the faculty and the instructional program of the school. The principal should be a strong leader (Kimbrough & Burkett, 1990). The principal was responsible for placing a strong emphasis on planning for the school (Kimbrough & Burkett, 1990). A successful in-service education program should be provided and directed by the principal. High expectations of students and teachers should be insisted upon by the principal (Kimbrough & Burkett, 1990). The faculty and principal should collectively provide an organizational climate conducive to instruction. The principal and faculty needed to believe that the discipline plan was imperative to maintain an orderly student behavior. The involvement of parents was a necessity and the principal and teachers need to foster more parental interest. One of the most important leadership roles of the principal was to assist teachers in providing time on task for instruction. The evaluation process needed to be ongoing for the administration for the faculty and for its students (Kimbrough & Burkett, 1990). The ability of the school

administrators and faculties to uphold these imperatives has declined substantially in recent years (Ravitch, 2011).

There was also a great deal of information about the negative aspects of being a principal. The NCLB requirements contributed to this perception (Combs, Edmonson, Jackson, & Greenville, 2009). Some of the sources pointed out that the work of an administrator was characterized by brevity, variety, and fragmentation, and that the majority of administrative activities lasted only for a brief duration, often taking only minutes (Sergiovanni, 2006). Activities of principals were not only varied but also were disjointed, disconnected, and interspersed with trivia. The result of this was that the administrator often shifted moods and intellectual frames (Sergiovanni, 2006). These findings suggested a high level of superficiality in the work of administration. Because of the open-ended nature of administrative work, this individual was compelled to perform a great number of tasks at an unrelenting pace. This contributed further to superficiality. Free time was only rarely available, and job responsibilities seemed inescapable (Sergiovanni, 2006). Sometimes the stress that accompanied the job was unbearable (Parkay & Hall, 1992).

The principal was ultimately responsible for almost everything that happened inside and outside the school (Sergiovanni, 2006). The principal was responsible for all aspects of managing and maintaining school plant facilities (Kimbrough & Burkett, 1990). These responsibilities were sometimes quite diverse. Among these responsibilities were: assuring the physical appearance of the school to be appealing, maintaining the safety of the school, maintaining an optimum thermal environment for the educational process, supervising the operation of the physical plant and grounds, and assuring appropriate custodial services

(Kimbrough & Burkett, 1990). With the continually rising expenses accruing toward the implementation of new programs, school systems were forced to do more with less funding. This meant more responsibility for our teachers and administrators, which added more stress (Combs et al., 2009).

One factor often addressed concerned the principal's role as a community leader. Being involved in the community was also mandatory for a principal (Gorton et al., 2007). Studies since the early 1950s have shown that schools did not exist in a political vacuum. The prevailing opinion was that educational leaders should be adept at political leadership. Moreover, this opinion dictated that the school leader should have seen that an effective home/school partnership in the education process was developed (Kimbrough & Burkett, 1990). The principal, or the persons so designated by the principal, must have mounted strategies to establish good school community relations, traditionally labeled as public relations (Kimbrough & Burkett, 1990). Perhaps one of the most important ways to impact community relations was for the principal to just be visible (Parkay & Hall, 1992). This has become harder for principals to accomplish.

To understand the political landscape in the community, Kimbrough and Burkett reported as an imperative that the principal ask three important questions (Kimbrough & Burkett, 1990). Those were: "Who are the persons and groups that have the power to influence policy concerning my school?" "How do these persons and groups behave in the decision-making process?" and, "What type of policies, beliefs or ideology do the leaders favor?" The school principal needed to gauge the motivation of leaders in the political process (Kimbrough & Burkett, 1990). In order to maintain a safe political harbor for their school, principals sometimes,

had to keep the facts, concerning the school, from politicians. It can be difficult to receive positive publicity at a school that has recently experienced a number of gang fights and weapons confiscations (Wolk, 2011). Keeping the true picture away from the public was becoming more common (Ravitch, 2011).

The school principal was expected to keep abreast of political change in the community and within the attendance area of the school (Kimbrough & Burkett, 1990). The principal's initial task was to elicit the support and cooperative participation of members of the faculty and staff in the development of a school community relations program (Kimbrough & Burkett, 1990). The support of students was also a key to success. If students believed that their school was bad, and treated them shabbily, the most technically proficient public relations techniques would not change that image of the school among parents. The principal was required to attempt to make every relationship personal (Kimbrough & Burkett, 1990). Community support was becoming harder and harder to gain (Kimbrough & Burkett, 1990).

Communities were defined as collections of people who came together because they shared common commitments, ideas, and values (Sergiovanni, 2006). Schools should have been the center of and an extension of these communities. Schools should have embraced the view of being a learning community, a collaborative community, a caring community, and inclusive community, an inquiring community, a responsible community and the community of practice (Sergiovanni, 2006). The concept of schools being the center of communities was trending in the opposite direction. With the exception of athletic events, schools were vacated shortly after the final classroom bell sounded. Many schools were ordering their students to leave the building and property in order for the doors and gates to be locked. The schools could not be an extension

of communities when the grounds were closed to the members they serve. If the communities were the problem, improvement was needed for them first in order for them to be safely extended into our schools (Sergiovanni, 2006).

It was generally acknowledged that the quality of relationships was an important ingredient in the makeup of a good school (Sergiovanni, 2006). The quality of relationships determined the quality of the school. In leading a successful school, connections were found in everything. If students were not connected to the school and its goals, very little learning took place (Sergiovanni, 2006). If the community was not connected, the school received very little support. In order to connect the community, communication from the school had to be clear, consistent and ongoing (Gorton et al., 2007). The statement, “very little learning will take place” is exactly why the focus of this study investigated external factors impeding student achievement. It involves community. It involves family. It involves parents. Without reforms to the community, family and parents, the reforms made in schools could not be expected to cure the problems that were being faced. It was time to focus on the problem and stop believing that our schools could cure every single problem (Ravitch, 2011).

Theoretical Framework

The Institutional Change Theory, developed by John Meyer and colleagues in the 1970's, was referenced in this research project (Huerta & Zuckerman, 2009). This theory maintained that schools had a direct relationship with their cultural environment. The school had the possibility of shaping the norms of the culture as well as becoming shaped by the norms of the culture. What was once an institutionalizing of the education process in America, by the establishment of a rigorous curriculum and set of rules and procedures, our schools now tend to be more

influenced by the cultural trends where conformity has altered the traditional school model. The United States is restructuring the way all of our children are educated in order to accommodate the special needs of an ever-growing population of potentially dysfunctional students.

The second theory referenced in this research is the Free Market Theory (Marion & Gonzales, 2013). This theory proposed that educational change occurred when schools compete for excellence. Schools that achieved greater success drew more students from under-performing schools. School districts, therefore, had to direct their efforts on the remediation of the under performing schools. This theory failed to recognize what actually happens within a school district when schools failed (Ravitch, 2011). With the support of local, state and federal funding, many schools just do not improve. Federal regulations made it impossible to create free markets. Increased spending in failing schools, tended to lure failing students into staying at the same school. The students who chose to move to a more successful school were usually the best students that the failing school had. These factors tended to create failing schools, with ever increasing densities of failing students.

These two theories, when used concurrently, provided a powerful context for educational change in America. Why were schools not working? The institutional change theory was producing change. It was just producing it in the wrong direction. Schools and leaders had adopted the idea that the institution should adapt to the culture. No longer was it expected that the culture adapt to the institution. Somehow, it was surmised, our methods have become outdated. They need to be changed to conform to the new cultural norms that exist now. Change had been the key word for the past twenty, or so, years. If one change didn't work, just make another (Ravitch, 2011).

The Free Market Theory was, perhaps, the main idea behind the NCLB law, by utilizing the free market to improve the educational delivery system. Allow all students the access to successful schools. Improve the failing schools. Spare no expense on the failing schools. Install layer after layer of regulation in order to increase the speed of our improvement. Measure the results at every opportunity. If positive change was not made, change everything and start over. Only one outcome was allowed. If this outcome did not materialize, changes must be made. Repeat this process until something good happens (Wolk, 2011).

Summary of Literature

The review of literature offered the idea that public education had not been up to the task of providing the expected results for many years (Stillwell et al., 2011). Among the failing categories were graduation rates, dropout rates, college readiness and academic comparisons with other countries (Act, 2011). In response to these academic shortcomings the federal government took over more control of the public educational system by initiating laws that impacted the amount of federal dollars that states received for education. If the states did not adhere to the proposed reforms set forth by the federal government, the states did not receive the added funding (Abernathy, 2007). States had, thus far, gone along with federal education programs in order to continue receiving federal education funding. These programs required changing the way that schools operated, indicating a belief by the general public that the schools were responsible for the previous performance failures (Kumashiro, 2009).

The programs that were initiated had not produced the intended results. In fact, in many cases the problems intensified. In response to the continuing poor academic performance by

students in public schools the federal government proposed new federal education programs that targeted the ways that schools and teachers operated with the belief that the responsibility of failure rested upon our public schools and their teachers (Kumashiro, 2009).

Teachers and administrators have been instructed, through their professional training to accept the responsibilities that come with their positions. As new reforms were imposed, new responsibilities were added to already over-stressed teachers and administrators. They took on these new responsibilities, but, as the results have shown, they were not able to transform students into the academic success stories that our government has demanded.

The literature pointed out that there were factors, well beyond the control of our educational system, that have the potential to impact the academic performance of our public education students (Caboni & Adisu, 2004). Among those were the factors that this study focused upon, poor attendance, low socio-economic status and lack of a two parent family unit.

CHAPTER III

RESEARCH METHODOLOGY

Introduction

This study focused on the performance of students on a series of tests, namely, the ACT, the Algebra gateway exam, the English gateway exam, and the Biology gateway exam. In addition, the student's grade point average (GPA) was examined. The students in the sample population were then disaggregated into dichotomous groups according to low socio-economic status, students with less than two parents at home with the child, students with more than nine absences in a school year and combinations of these factors. Also students who did not possess any of the three potential negative factors mentioned above were used as comparisons. The purpose of the study was to identify whether there were statistically significant differences in the results for each group, as measured by their mean scores of test scores and GPA measures. It was proposed that there were statistically significant differences between the mean scores of these academic measurements between these disaggregated groups and specifically, the group with no negative factors.

Methodological Assumptions

The methodological assumptions of this research study have been carefully considered. The sample that was selected provided a typical cross section of all of the types of students found throughout the public school system in the county studied. There were students from families

whose incomes exceeded the limit for qualifying for free or reduced price lunches and students from families with incomes that allowed them to qualify for free or reduced price meals. The sample consisted of low-performing students, average performing student and high performing students. If the needed data for a student were missing, that student was removed from the study. No students in the sample population were excluded from the study unless access to all of the needed data could not be obtained.

The negative factors were carefully considered and chosen because of frequency of appearance in the reviewed literature. Additional factors were not studied because of limited access to available data and time and resource constraints. The negative factors were high absenteeism, low socio-economic status and single or no-parent family. The delimitations and limitations of the study were not believed to have an impact on the results. Both have been discussed, in detail, earlier in the study.

The instrumentation was believed to capture accurate data and the transfer of the data was performed with care. A detailed list of the instrumentation is detailed below. Further discussion of the research methodology is also provided.

Institutional Review Board Approval

In order to address the protection of the human subjects who were a part of this research, a number of steps were taken. Before the collection and use of data that were examined in this study, the Institutional Review Board of The University of Tennessee at Chattanooga and the Hamilton County Department of Education conducted a review of the research proposal. Once these reviews were completed and approval had been obtained from both institutions, the data collection and analysis commenced.

The principal of the high school where the data originated granted permission for this researcher in this study to have access to school records. The Superintendent of the Hamilton County Department of Education also granted permission for the access to school records.

The identification of individual students was not a part of this study. The data from each student were assigned to a non-identifiable number, which represented the student in the data file. As the data were examined, only mean values from sub-groups were analyzed.

Description of the Research Design

To perform this study, the information from six instruments was transferred into an Excel spreadsheet. The six instruments are explained, in detail, in the section of this study entitled Instrumentation. From these instruments the following information fields for each student were recorded; gender of the student, ethnicity of the student, the student's family's socio-economic status, the number of parents registered with the school for each individual student, and the student's total number of unexcused absences. These fields represented the potential factors that could impact the student success performance indicators. Three of these fields were considered potential negative factors. They were socio-economic status, number of parents in the student's household and unexcused absences. The other two fields, gender and ethnicity were considered neutral factors.

Five additional fields were added to represent the data for the student success performance indicators: scores from the overall ACT composite score, the Algebra gateway exam, the English gateway exam, the Biology gateway exam and the student's grade point average. Once the data had been entered, the students were grouped according to the following schedule:

Table 3.1 Group Characteristics

Group	Description
G1	Students who possess no potentially negative factors
G2	Students who possess the potentially negative factor of: Having nine or more absences
G3	Students who possess the potentially negative factor of: Having less than two parents in the household
G4	Students who possess the potentially negative factor of receiving free or reduced price lunches
G5	Students who possess the potentially negative factors of: A. Having nine or more absences, and B. Less than two parents in the household
G6	Students who possess the potentially negative factors of: A. Having nine or more absences, and B. Receiving free or reduced price lunches
G7	Students who possess the potentially negative factors of: A. Receiving free or reduced price lunches and B. Less than two parents in the household
G8	Students who possess all three potentially negative factors

Once the groups had been established, a mean grade point average was calculated for each group. These data were entered into SPSS software where one-way analysis of variance (ANOVA) tests were performed to compare the mean score of group 1 with the mean score of all other groups containing the independent variable to be tested. In all, four ANOVA tests were performed on each of the five independent variables. These tests also determined the significance of the difference between the mean scores of Group 1 and the means of other seven groups.

This process was repeated, using the mean scores for ACT test, Algebra, English and Biology end of course tests. In each of the four ANOVA sets the groups were compared on all five academic measurements. An analysis of these comparisons of mean scores determined if there was, in fact, a statistically significant difference between the academic performances of the groups and in particular, the group with no negative factors.

Description of Population and Sample

The population was approximately 13,250 high school students, the number of high school students in the Hamilton County Public School system. The Hamilton County school system had a makeup that was fifty-nine percent (59.0%) white, thirty-one point four percent (31.4%) African-American, seven percent (7.0%) Hispanic, and two point two percent (2.2%) Asian. Forty-eight point eight percent (48.8%) of the students were female and fifty-one point two percent (51.2%) were male. The percentage of students from economically disadvantaged families was fifty-six percent (56.0%).

The sample that was studied was the students who comprised the 2012 graduating class of Ooltewah High School located in Chattanooga, Tennessee. This sample consisted of 288 students. They were a diverse group of students who encompassed diversity in ethnicity, socio-

economic status and student success. Ooltewah High School had a makeup that was sixty-five point three percent (65.3%) white, twenty-two point two percent (22.2%) African-American, eight point four percent (8.4%) Hispanic, and three point eight percent (3.8%) Asian. Forty-seven point two percent (47.2%) of the students were female and fifty-two point eight percent (52.8%) were male. The percentage of students from economically disadvantaged families was fifty-two point eight percent (52.8%). This public high school, located in Chattanooga, Tennessee was considered to be one of the top performing public high schools in the Chattanooga area (Tennessee Report Card, 2011).

Data Collection

Data were collected from the school records of all 288 students. The data that were collected consisted of student I.D. number, student gender, student ethnicity, student family socio-economic status, student grade point average, student ACT score, student Algebra gateway score, student English gateway score, student Biology gateway score, student's number of registered parents, and student's absences.

Students were grouped according to the factors they possessed. For example, students who had 0 to 8 absences were grouped together in a single group. Students with nine, or more absences were grouped together in a single group. Then groups with two or more negative factors were formed. Finally the group with all three negative factors was formed. Once the groupings were made, the groups' mean ACT score end of course scores and grade point average were calculated. The impact of the group factor and addition of multiple factors on academic success were expected to be evident when the one-way analysis of variance (ANOVA) tests were

run on the twenty pairs of groups. The hypotheses that were used were that the groups with negative factors would have statistically significant reduced mean scores.

Instrumentation

The instrumentation used in this study came from six different instruments. They were gathered using resources from the guidance department at the school. The guidance department assisted in the identification of the appropriate records after approval had been received from the school principal and superintendent. The records that were used were as follows:

A. School record for each student. This instrument provided gender of the student, ethnicity of the student, the student's family's socio-economic status, student's number of parents registered with the school each particular student, student's grade point average, student's appropriate school zone.

B. School attendance record. Absences for each student were recorded on these records and labeled as an excused or unexcused absence. Only unexcused absences were used in this research study as the basis for a negative factor.

C. ACT score report. This report was created by the ACT organization reflecting the overall composite ACT score of each student.

D. Algebra gateway student score report. This report was created by The Department of Education of the State of Tennessee.

E. English gateway student score report. This report was created by The Department of Education of the State of Tennessee.

F. Biology gateway student score report. This report was created by The Department of Education of the State of Tennessee.

Data Analysis

Three independent variables and combinations were used in this study. Each independent variable represented a group previously identified, which possessed a potential factor that could impact student success. The independent variables that were used in the study were groups that possessed the factor of: high student absences, low family socio-economic status, and less than two parents registered with the school. All combinations of these independent variables were used.

There were five dependent variables. The dependent variables that were used in the study were; student overall composite ACT scores, student grade point average, student Algebra gateway exam score, student English gateway exam score, student Biology gateway exam score.

The levels for socio-economic status were yes, if the student qualified for free or reduced price school meals, and no, if the student did not qualify. The levels for number of parents were 0 for no registered natural parents, 1 for one registered parent or 2 for two registered parents. The datum for absences was the number of total unexcused absences. The data for all of the five student success performance indicator fields were the numerical scores or numerical grade point averages.

Use of Statistics in This Study

The students in this study were organized into groups. Membership in a particular group required that the member have a particular characteristic or lack any of the potential negative characteristics. Once the groups were constructed, it was possible to determine which groups, and thus, which characteristics, resulted in lower scores on these tests. To perform the statistical analysis using the one-way analysis of variance (ANOVA) test, it was necessary to form eight

separate groups. This was important because no student in the study could be a member of more than one group.

The academic performance of these groups was tested to see if there were statistically significant differences in the mean scores of each group. A series of one-way analysis of variance (ANOVA) tests were used to determine if there were, in fact, significant differences between the mean scores of these disaggregated groups. This was accomplished by analyzing the variance of the mean score values, removing the components of the variance due to random error. The final variance measurement was then tested for statistical significance. If the variance was statistically significant, then there was cause to believe that the variance between the mean scores of the groups was meaningful and thus the null hypothesis, which stated that the scores of all groups were the same except for statistically insignificant differences, would have been rejected. The alternative hypothesis was then accepted which stated that the mean scores of the population were different from each other.

To validate the findings of the ANOVA a post-hoc Tukey HSD test was performed to extend the findings of the ANOVA and to determine which groups were statistically different, with regard to each academic mean. A HSD test was performed for each academic measure.

When the groups were shown to be different due to their test results then it followed that they were probably different due to the factors that they possessed. Our theory, at this point, was to have our educational leaders focus on the removal of the characteristics that appear to be associated with the groups that have the lower scores.

This study attempted to show that it is possible to identify factors that impacted academic success. Groups were formed that possessed these identified negative factors. In the case of this research study, some of the groups were predicted to be adversely affected by their

characteristics, resulting in lower scores on ACT scores and end of course exams as compared to scores for all students. It was also hypothesized that groups whose members lacked the characteristic, predicted to adversely affect the group, would have higher scores on these tests.

This research study constructed groups. Membership in a particular group required that the member have a particular characteristic. Once the groups were constructed it was possible to determine which groups, and thus, which characteristics, would result in lower scores on these tests.

Research Questions

In order to determine if any of the potential negative factors play a role in the academic performance of a student, the following research questions have been addressed in this study.

Q1- Is there a significant difference between G1 versus G2, G5, G6 and G8 on the Biology Gateway examination?

Q2- Is there a significant difference between G1 versus G2, G5, G6 and G8 on the Algebra Gateway examination?

Q3- Is there a significant difference between G1 versus G2, G5, G6 and G8 on the English Gateway examination?

Q4- Is there a significant difference between G1 versus G2, G5, G6 and G8 on the ACT test?

Q5- Is there a significant difference between G1 versus G2, G5, G6 and G8 on GPA?

Q6- Is there a significant difference between G1 versus G3, G5, G7 and G8 on the Biology Gateway examination?

Q7- Is there a significant difference between G1 versus G3, G5, G7 and G8 on the Algebra Gateway examination?

Q8- Is there a significant difference between G1 versus G3, G5, G7 and G8 on the English Gateway examination?

Q9- Is there a significant difference between G1 versus G3, G5, G7 and G8 on the ACT test?

Q10- Is there a significant difference between G1 versus G3, G5, G7 and G8 on GPA?

Q11- Is there a significant difference between G1 versus G4, G6, G7 and G8 on the Biology Gateway examination?

Q12- Is there a significant difference between G1 versus G4, G6, G7 and G8 on the Algebra Gateway examination?

Q13- Is there a significant difference between G1 versus G4, G6, G7 and G8 on the English Gateway examination?

Q14- Is there a significant difference between G1 versus G4, G6, G7 and G8 on the ACT test?

Q15- Is there a significant difference between G1 versus G4, G6, G7 and G8 on GPA?

Q16- Is there a significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the Biology Gateway examination?

Q17- Is there a significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the Algebra Gateway examination?

Q18- Is there a significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the English Gateway examination?

Q19- Is there a significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the ACT test?

Q20- Is there a significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on GPA?

Null Hypotheses

The null hypotheses associated with these questions were:

H₀₁- There is no significant difference between G1 versus G2, G5, G6 and G8 on the Biology Gateway examination.

H₀₂- There is no significant difference between G1 versus G2, G5, G6 and G8 on the Algebra Gateway examination.

H₀₃- There is no significant difference between G1 versus G2, G5, G6 and G8 on the English Gateway examination.

H₀₄- There is no significant difference between G1 versus G2, G5, G6 and G8 on the ACT test.

H₀₅- There is no significant difference between G1 versus G2, G5, G6 and G8 on GPA.

H₀₆- There is no significant difference between G1 versus G3, G5, G7 and G8 on the Biology Gateway examination.

H₀₇- There is no significant difference between G1 versus G3, G5, G7 and G8 on the Algebra Gateway examination.

H₀₈- There is no significant difference between G1 versus G3, G5, G7 and G8 on the English Gateway examination.

H₀₉- There is no significant difference between G1 versus G3, G5, G7 and G8 on the ACT test.

H₀₁₀- There is no significant difference between G1 versus G3, G5, G7 and G8 on GPA.

H₀11- There is no significant difference between G1 versus G4, G6, G7 and G8 on the Biology Gateway examination.

H₀12- There is no significant difference between G1 versus G4, G6, G7 and G8 on the Algebra Gateway examination.

H₀13- There is no significant difference between G1 versus G4, G6, G7 and G8 on the English Gateway examination.

H₀14- There is no significant difference between G1 versus G4, G6, G7 and G8 on the ACT test.

H₀15- There is no significant difference between G1 versus G4, G6, G7 and G8 on GPA.

H₀16- There is no significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the Biology Gateway examination.

H₀17- There is no significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the Algebra Gateway examination.

H₀18- There is no significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the English Gateway examination.

H₀19- There is no significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on the ACT test.

H₀20- There is no significant difference between G1 versus groups G2, G3, G4, G5, G6, G7 and G8 on GPA.

CHAPTER IV

ANALYSIS OF DATA

Design of the Study

This study was designed to isolate groups of students, from the sample of 288 students, into distinct and mutually exclusive groups in order to measure each group's performance on five academic measures. In order to fulfill the requirements of the one-way analysis of variance (ANOVA) test, there were a total of eight groups to be studied. Seven of these groups consisted of students that possessed a certain factor or factors, believed to be associated with decreased student achievement and academic performance. The eighth group consisted of students that possessed none of the factors believed to be associated with decreased student achievement or academic performance. This group represented the ideal, or gold standard, for this study.

It was hypothesized that students who possessed a negative factor would perform at a lower level on academic achievement tests and other academic measures, such as Grade Point Averages, than those students from the gold standard. The academic achievement tests that were studied included the Biology Gateway examination, the Algebra Gateway examination, the English Gateway examination and ACT scores. The fifth academic measure, which was used in the study, was the student's high school grade point average.

Identification of Groups and Group Member Characteristics

The sample was divided into the eight groups outlined in Table 1 consisting of group populations as shown in Table 2. The mean scores of each group were recorded for each of the four achievement tests and the academic measure of grade point average. Each of these mean scores then was examined to determine if the groups had statistical differences when the scores of groups that possessed negative factors were compared to the group that possessed no negative factors.

These groups were formed by filtering the entire sample population of 288 students with each of the above referenced negative factors. After the filtering process the groups were composed of the following students:

Out of the 288-student sample, 94 students had no negative factors and were placed in Group 1, (G1). This represented a group population of 32.6% of the total student sample.

Forty-two students had greater than nine absences over the previous school year and possessed no other negative factor and were placed in Group 2, (G2). This represented a group population of 14.6% of the total student sample.

Twenty-four students had less than two parents in their household and possessed no other negative factor and were placed in Group 3, (G3). This represented a group population of 8.3% of the total student sample.

Eleven students received free or reduced price lunches and possessed no other negative factor and were placed in Group 4, (G4). This represented a group population of 3.8% of the total student sample. This group is so small that the group results could, possibly, be meaningless.

Thirty-five students had greater than nine absences over the previous school year and had less than two parents in their household and were placed in Group 5, (G5). This represented a group population of 12.2% of the total student sample.

Fifteen students had greater than nine absences over the previous school year and received free or reduced price lunches and were placed in Group 6, (G6). This represented a group population of 5.2% of the total student sample.

Ten students were receiving free or reduced price lunches had had less than two parents in their household and were placed in Group 7, (G7). This represented a group population of 3.5% of the total student sample.

Fifty-two students possessed all three of the negative factors and were placed in Group 8, (G8). This represented a group population of 18.1% of the total student sample.

Five students had missing data or test scores. These students were not placed in any group. These students represented 1.7% of the total student sample.

Table 4.1 Group Populations

		Frequency	Percent	Valid Percent	Cumulative Percent
	No Neg Group 1	94	32.6	33.2	33.2
	FRLOnlyNeg Group 4	11	3.8	3.9	37.1
	ParOnlyNeg Group 3	24	8.3	8.5	45.6
	AbsOnlyNeg Group 2	42	14.6	14.8	60.4
Valid	FRL & Par Neg Group 7	10	3.5	3.5	64.0
	FRL & Abs Neg Group 6	15	5.2	5.3	69.3
	Pars & Abs Neg Group 5	35	12.2	12.4	81.6
	All 3 Neg Group 8	52	18.1	18.4	100.0
	Total	283	98.3	100.0	
Missing	Can't Classify	5	1.7		
		288	100.0		
Total					

Statistical Analysis of Group Measures

(G1) students achieved the mean score of 39.84 on the Biology Gateway examination, a mean score of 45.26 on the Algebra Gateway examination, a mean score of 43.19 on the English Gateway examination, a mean score of 23.77 on the ACT test, and a mean score of 3.51 as their grade point average over their four-year career as high school students.

(G2) students achieved the mean score of 30.60 on the Biology Gateway examination, a mean score of 37.05 on the Algebra Gateway examination, a mean score of 35.26 on the English Gateway examination, a mean score of 15.50 on the ACT test, and a mean score of 2.82 as their grade point average over their four-year career as high school students.

(G3) students achieved the mean score of 42.79 on the Biology Gateway examination, a mean score of 46.50 on the Algebra Gateway examination, a mean score of 43.29 on the English Gateway examination, a mean score of 24.04 on the ACT test, and a mean score of 3.61 as their grade point average over their four-year career as high school students.

(G4) students achieved the mean score of 36.82 on the Biology Gateway examination, a mean score of 45.18 on the Algebra Gateway examination, a mean score of 42.64 on the English Gateway examination, a mean score of 21.82 on the ACT test, and a mean score of 3.19 as their grade point average over their four-year career as high school students.

(G5) students achieved the mean score of 32.46 on the Biology Gateway examination, a mean score of 40.60 on the Algebra Gateway examination, a mean score of 36.34 on the English Gateway examination, a mean score of 17.29 on the ACT test, and a mean score of 2.82 as their grade point average over their four-year career as high school students.

(G6) students achieved the mean score of 28.21 on the Biology Gateway examination, a mean score of 39.79 on the Algebra Gateway examination, a mean score of 32.71 on the English

Gateway examination, a mean score of 16.27 on the ACT test, and a mean score of 2.40 as their grade point average over their four-year career as high school students.

(G7) students achieved the mean score of 39.22 on the Biology Gateway examination, a mean score of 46.22 on the Algebra Gateway examination, a mean score of 41.00 on the English Gateway examination, a mean score of 22.78 on the ACT test, and a mean score of 3.22 as their grade point average over their four-year career as high school students.

(G8) students achieved the mean score of 30.12 on the Biology Gateway examination, a mean score of 38.14 on the Algebra Gateway examination, a mean score of 34.18 on the English Gateway examination, a mean score of 15.40 on the ACT test, and a mean score of 2.30 as their grade point average over their four-year career as high school students.

Table 4.2 Mean Group Scores on Each Academic Measure

Groups	Mean Scores on Gateway Achievement Tests, ACT and GPA				
	Biology	Algebra	English	ACT	GPA
1 n = 94	39.84	45.26	43.19	23.77	3.51
2 n = 42	30.60	37.05	35.26	15.50	2.82
3 n = 24	42.79	46.50	43.29	24.04	3.61
4 n = 11	36.82	45.18	42.64	21.82	3.19
5 n = 35	32.46	40.60	36.34	17.29	2.82
6 n = 15	28.21	39.79	32.71	16.27	2.40
7 n = 10	39.22	46.22	41.00	22.78	3.22
8 n = 52	30.12	38.14	34.18	15.40	2.30

Comparative Statistical Analysis Evaluation of Statistics

The statistical analysis that was used to determine if there was a significant difference between the scores of the groups was the one-way analysis of variance (ANOVA). This test determined the differences between the mean scores of the groups compared and the statistical significance of the differences between groups. Four ANOVAs were run to determine the statistical differences in the mean scores of the groups. The four ANOVAs were as follows.

ANOVA 1 analyzed the mean scores of five groups on the five academic measurements:

1. Biology Gateway Examination
2. Algebra Gateway Examination
3. English Gateway Examination
4. ACT Composite Test Scores
5. Grade Point Averages (GPA)

The ANOVA compares those scores among the five separate groups. The mean of the scores of the group with no negative factors G1 was compared to the means of the scores of all of the groups containing the negative factor of having nine, or more, absences. Those groups were the group of students with nine, or more absences and no other negative factor G2, the group of students with nine, or more absences plus less than two parents in the household and no other negative factor G5, the group of students with nine, or more absences plus receiving free or reduced price lunches and no other negative factor G6, and the group of students that have all three negative factors G8. Symbolically, G1 was compared to G2, G5, G6 and G8.

After the four ANOVA tests were performed, a significant result was indicated if, at least, one group differed from the other groups. To interpret the significance and determine the

pattern of difference between the means, a post-hoc comparison test was performed. This study used the HSD test developed by Tukey (Abdi & Williams, 2010). The HSD test computed the “honestly significant difference” (HSD) between two means using a statistical distribution called the “q” distribution. This distribution provided an exact sampling distribution for the largest difference of means in the study population. All of the mean scores from each group were compared to this sample distribution to determine and confirm which groups were significantly different from each other. The post-hoc HSD test is considered to be quite conservative (Abdi & Williams, 2010).

Presentation of Statistical Data (Results)

To obtain the results of the comparative analysis of the differences between the groups, four separate ANOVA sets were performed. The first ANOVA set (A1) compared the mean scores for five groups: The means of all five dependent variables of the group with no negative factors were compared to the means of all groups containing nine or more absences. The results of this ANOVA set (A1) addressed research questions Q1 through Q5.

ANOVA (A1)

The first ANOVA set and post-hoc HSD tests provided the responses to the first five research questions. Those questions were:

Q1- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having more than nine absences during the school year (G2, G5, G6 or G8), on the Biology Gateway examination?

Q2- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having more than nine absences during the school year (G2, G5, G6 or G8), on the Algebra Gateway examination?

Q3- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having more than nine absences during the school year (G2, G5, G6 or G8), on the English Gateway examination?

Q4- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having more than nine absences during the school year (G2, G5, G6 or G8), on the ACT test?

Q5- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having more than nine absences during the school year (G2, G5, G6 or G8), on GPA?

The one way analysis of variance was performed on the following five groups: Group of students with no negative factor, the group of students with nine, or more absences and no other negative factor, the group of students with nine, or more absences plus less than two parents in the household and no other negative factor, the group of students with nine, or more absences plus receiving free or reduced price lunches and no other negative factor, and the group of students that have all three negative factors.

For these analyses, all group mean score comparisons were shown to have significant differences for $\alpha=.001$. That means that there were significant differences in the mean scores for these groups on, at least, some measure. The null hypotheses to be tested were:

H₀1- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having more than nine absences during the school year (G2, G5, G6 or G8), on the Biology Gateway examination.

H₀2- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having more than nine absences during the school year (G2, G5, G6 or G8), on the Algebra Gateway examination.

H₀3- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having more than nine absences during the school year (G2, G5, G6 or G8), on the English Gateway examination.

H₀4- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having more than nine absences during the school year (G2, G5, G6 or G8), on the ACT test.

H₀5- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having more than nine absences during the school year (G2, G5, G6 or G8), on GPA.

Based on the results of the AVOVA, all null hypotheses were rejected; indicating that there were some differences within the groups tested. These differences were considered to be statistically significant. Table 4 shows the ANOVA tables for each of these tests, indicating that the differences were significant at a high level, $p < .001$.

Table 4.3 ANOVA (A1)

		ANOVA				
		Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
GPA	Between Groups	57.432	4	14.358	53.812	.000
	Within Groups	62.168	233	.267		
	Total	119.600	237			
ACT	Between Groups	3077.520	4	769.380	72.874	.000
	Within Groups	2459.946	233	10.558		
	Total	5537.466	237			
English	Between Groups	4072.207	4	1018.052	26.510	.000
	Within Groups	8870.827	231	38.402		
	Total	12943.034	235			
Algebra	Between Groups	2788.660	4	697.165	24.607	.000
	Within Groups	6544.573	231	28.331		
	Total	9333.233	235			
Biology	Between Groups	4991.357	4	1247.839	26.786	.000
	Within Groups	10761.062	231	46.585		
	Total	15752.419	235			

Post-Hoc Tests for ANOVA (A1)

To interpret the findings of ANOVA (A1) a post-hoc Tukey HSD test was performed to statistically determine which groups had means that differed, with regard to each academic measure.

Biology

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on The Biology Gateway Exam interpreted the results of the ANOVA (A1) and showed that there were two distinct subsets in which to place the five groups. The group of students who possessed no negative factors was shown to be in a separate subset from the other groups that were a part of Test Group A. The results of the Tukey HSD are displayed in Table 4.4.

Table 4.4 Post-Hoc Tukey HSD test for ANOVA (A1) Biology

Biology

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05	
		1	2
FRL & Abs Neg Group 6	14	28.21	
All 3 Neg Group 8	51	30.12	
AbsOnlyNeg Group 2	42	30.60	
Pars & Abs Neg Group 5	35	32.46	
No Neg Group 1	94		39.84
Sig.		.093	1.000

The mean of for Biology (39.84) of G1 students with no negative factors was significantly different, statistically, from the means of each of the other groups, ranging from 28.21 to 32.46, at the .05 level of significance.

Algebra

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on The Algebra Gateway Exam interpreted the results of the ANOVA (A1) and showed that there were two distinct subsets in which to place the five groups. The group of students who possessed no negative factors was shown to be in a separate subset from the other groups that were a part of this ANOVA Test. The results of the Tukey HSD are displayed in Table 4.5.

Table 4.5 Post-Hoc Tukey HSD test for ANOVA (A1) Algebra

Algebra

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05	
		1	2
AbsOnlyNeg Group 2	42	37.05	
All 3 Neg Group 8	51	38.14	
FRL & Abs Neg Group 6	14	39.79	
Pars & Abs Neg Group 5	35	40.60	
No Neg Group 1	94		45.26
Sig.		.059	1.000

The mean for Algebra (45.26) of G1 students with no negative factors was significantly different, statistically, from the means of each of the other groups, ranging from 37.05 to 40.60, at the .05 level of significance.

English

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on The English Gateway Exam interpreted the results of the ANOVA (A1) and showed that there were two distinct subsets in which to place the five groups. The group of students who possessed no negative factors was shown to be in a separate subset from the other groups that were a part of this ANOVA Test. The results of the Tukey HSD are displayed in Table 4.6.

Table 4.6 Post-Hoc Tukey HSD test for ANOVA (A1) English

English

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05	
		1	2
FRL & Abs Neg Group 6	14	32.71	
All 3 Neg Group 8	51	34.18	
AbsOnlyNeg Group 2	42	35.26	
Pars & Abs Neg Group 5	35	36.34	
No Neg Group 1	94		43.19
Sig.		.131	1.000

The mean for English (43.18) of G1 students with no negative factors was significantly different, statistically, from the means of each of the other groups, ranging from 32.71 to 36.34, at the .05 level of significance.

ACT

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on the ACT test interpreted the results of the ANOVA (A1) and showed that there were two distinct subsets in which to place the five groups. The group of students who possessed no negative factors was shown to be in a separate subset from the other groups that were a part of this ANOVA Test. The results of the Tukey HSD are displayed in Table 4.7.

Table 4.7 Post-Hoc Tukey HSD test for ANOVA (A1) ACT

ACT

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05	
		1	2
All 3 Neg Group 8	52	15.40	
FRL & Abs Neg Group 6	15	16.27	
Pars & Abs Neg Group 5	35	17.29	
AbsOnlyNeg Group 2	42	17.50	
No Neg Group 1	94		23.77
Sig.		.066	1.000

The mean of ACT (23.77) of G1 students with no negative factors was significantly different, statistically, from the means of each of the other groups, ranging from 15.40 to 17.50, at the .05 level of significance.

GPA

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on GPA interpreted the results of the ANOVA (A1) and showed that there were three distinct subsets in which to place the five groups. The group of students who possessed no negative factors was shown to be in a separate subset from the group that had nine, or more absences and no other negative factor and the group that had nine, or more absences and less than two parents in the household. The third subset, containing the lowest performing groups, consisted of the group who possessed all three negative factors and the group that had nine or more absences and received free or reduced priced lunches. The results of the Tukey HSD are displayed in Table 4.8.

Table 4.8 Post-Hoc Tukey HSD test for ANOVA (A1) GPA

GPA

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05		
		1	2	3
All 3 Neg Group 8	52	2.3005		
FRL & Abs Neg Group 6	15	2.4041		
Pars & Abs Neg Group 5	35		2.8183	
AbsOnlyNeg Group 2	42		2.8190	
No Neg Group 1	94			3.5121
Sig.		.924	1.000	1.000

The mean of GPA (3.51) of G1 students with no negative factors was significantly different, statistically, from the set containing the mean of G2 students (2.82) and the mean of G5 students (2.82); which were significantly different, statistically, from the set containing the mean of group 6 students (2.40) and the mean of G8 students (2.30) at the .05 level of significance. G8 and G6 also differed statistically on the means from G5 and G2.

Summary of ANOVA (A1)

Based upon the results of the ANOVA (A1) with groupings on the Absence variable and the five Post-Hoc Tukey HSD tests, the null hypotheses one through five were rejected. With the rejection of these five null hypotheses, the alternative stands that the mean scores of all groups that had members with nine or more absences, with this being the lone negative factor, or combined with one or more negative factor, were statistically different from the group that possessed no negative factors on these five academic measures. Most importantly, G1, with no potential negative factors, differed from the other groups by having significantly higher scores, statistically, than all other groups compared.

ANOVA (A2)

The second ANOVA (A2) compared the mean scores among the following five separate groups. The mean of the scores of the group with no negative factors (G1) was compared to the means of the scores of all of the groups containing the negative factor of having less than two parents in the household. Those groups were the group of students with less than two parents in the household and no other negative factor (G3), the group of students with less than two parents in the household, with nine, or more absences and no other negative factor (G5), the group of

students with less than two parents in the household, receiving free or reduced price lunches and no other negative factor (G7), and the group of students that have all three negative factors (G8). Symbolically, G1 was compared to G3, G5, G7 and G8. The results of this ANOVA (A2) addressed research questions Q6 through Q10.

The second ANOVA and post-hoc HSD tests provided the responses to the research questions six through ten. Those questions were:

Q6- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having less than two parents in the household (G3, G5, G7 or G8), on the Biology Gateway examination?

Q7- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having less than two parents in the household (G3, G5, G7 or G8), on the Algebra Gateway examination?

Q8- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having less than two parents in the household (G3, G5, G7 or G8), on the English Gateway examination?

Q9- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having less than two parents in the household (G3, G5, G7 or G8), on the ACT test?

Q10- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having less than two parents in the household (G3, G5, G7 or G8), on GPA?

For these analyses, all group mean score comparisons were shown to be significantly different for $\alpha=.001$. That means that there were significant differences in the mean scores for these groups for all measures. The null hypotheses to be tested were:

H₀6- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having less than two parents in the household (G3, G5, G7 or G8), on the Biology Gateway examination.

H₀7- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having less than two parents in the household (G3, G5, G7 or G8), on the Algebra Gateway examination.

H₀8- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having less than two parents in the household (G3, G5, G7 or G8), on the English Gateway examination.

H₀9- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having less than two parents in the household (G3, G5, G7 or G8), on the ACT test.

H₀10- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of having less than two parents in the household (G3, G5, G7 or G8), on GPA.

Based on the results of the AVOVA, the null hypotheses were rejected; indicating that there were differences between the groups tested and as the ANOVA indicated, these differences were considered to be statistically significant. Table 10 shows the ANOVA tables for each of these tests, indicating that the differences were significant at a high level $p<.001$.

Table 4.9 ANOVA (A2)

		ANOVA				
		Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
GPA	Between Groups	58.431	4	14.608	59.306	.000
	Within Groups	51.725	210	.246		
	Total	110.156	214			
ACT	Between Groups	3056.749	4	764.187	66.966	.000
	Within Groups	2385.027	209	11.412		
	Total	5441.776	213			
English	Between Groups	3417.764	4	854.441	24.112	.000
	Within Groups	7370.809	208	35.437		
	Total	10788.573	212			
Algebra	Between Groups	2272.903	4	568.226	19.745	.000
	Within Groups	5985.867	208	28.778		
	Total	8258.770	212			
Biology	Between Groups	4712.773	4	1178.193	26.385	.000
	Within Groups	9288.100	208	44.654		
	Total	14000.873	212			

Post-Hoc Tests for ANOVA (A2)

To interpret the findings of ANOVA (A2) a post-hoc Tukey HSD test was performed to determine which groups had means that differed, statistically, with regard to each academic measure.

Biology

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on The Biology Gateway Exam interpreted the results of the ANOVA (A2) and showed that there were two distinct subsets in which to place the five groups. The group of students who possessed no negative factors, the group of students who had fewer than two parents as their only negative factor and the group of students who had fewer than two parents and received free or reduced price lunches were shown to be in a separate subset from the other groups that were a part of Test Group A. The results of the Tukey HSD are displayed in Table 4.10.

Table 4.10 Post-Hoc Tukey HSD test for ANOVA (A2) Biology

Biology

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05	
		1	2
All 3 Neg Group 8	51	30.12	
Pars & Abs Neg Group 5	35	32.46	
FRL & Par Neg Group 7	9		39.22
No Neg Group 1	94		39.84
ParOnlyNeg Group 3	24		42.79
Sig.		.749	.356

The mean of Biology (39.83) of G1 students, and the mean of G3 students (42.79) and the mean of G7 students (39.22) were not significantly different, statistically, from each other. The mean of these three groups were significantly different, statistically, from the mean of G5 students (32.46) and the mean of G8 students (30.12), at the .05 level of significance.

Algebra

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on The Algebra Gateway Exam interpreted the results of the ANOVA (A2) and showed that there were two distinct subsets in which to place the five groups. The group of students who possessed no negative factors, the group of students who had fewer than two parents as their only negative factor and the group of students who had fewer than two parents and received free or reduced price lunches were shown to be in a separate subset from the other groups that were a part of this ANOVA Test. The results of the Tukey HSD are displayed in Table 4.11.

Table 4.11 Post-Hoc Tukey HSD test for ANOVA (A2) Algebra

Algebra

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05	
		1	2
All 3 Neg Group 8	51	38.14	
Pars & Abs Neg Group 5	35	40.60	
No Neg Group 1	94		45.26
FRL & Par Neg Group 7	9		46.22
ParOnlyNeg Group 3	24		46.50
Sig.		.513	.931

The mean of Algebra (45.26) of G1 students and the mean of G3 students (46.50) and the mean of G7 students (46.22) were not significantly different, statistically, from each other. The mean of these three groups were significantly different, statistically, from the mean of G5 students (40.60) and the mean of G8 students (38.14) at the .05 level of significance.

English

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on The English Gateway Exam interpreted the results of the ANOVA (A3) and showed that there were three distinct subsets in which to place the five groups. The group of students who possessed no negative factors, the group of students that had fewer than two parents as their only negative factor and the group of students who had fewer than two parents and received free or reduced price lunches were shown to be in a separate subset from the other groups that were a part of this ANOVA Test. The group of students who possessed all three negative factors and the group of students who had fewer than two parents and also had more than nine absences were considered to be in a separate subset and a fringe group consisting of the group of students who had fewer than two parents and also had more than nine absences and the group of students who had fewer than two parents and received free or reduced price lunches were considered to be in a separate subset. The results of the Tukey HSD are displayed in Table 4.12.

Table 4.12 Post-Hoc Tukey HSD test for ANOVA (A2) English

English

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05		
		1	2	3
All 3 Neg Group 8	51	34.18		
Pars & Abs Neg Group 5	35	36.34	36.34	
FRL & Par Neg Group 7	9		41.00	41.00
No Neg Group 1	94			43.19
ParOnlyNeg Group 3	24			43.29
Sig.		.721	.059	.677

The mean of English (43.19) of G1 students, and the mean of G3 students (43.29) and the mean of G7 students (41.00) were not significantly different, statistically, from each other. G1 was significantly different, statistically, from the mean of G5 students (36.34) and the mean of G8 students (34.18) at the .05 level of significance. There was not a statistical difference between G5 and G7.

ACT

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on the ACT test interpreted the results of the ANOVA (A1) and showed that there were two distinct subsets in which to place the five groups. The group of students who possessed no negative factors, the group of students who had fewer than two parents as their only negative factor and the group of students who had fewer than two parents and received free or reduced price lunches were shown to be in a separate subset from the other groups that were a part of this ANOVA Test. The results of the Tukey HSD are displayed in Table 4.13.

Table 4.13 Post-Hoc Tukey HSD test for ANOVA (A2) ACT

ACT

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05	
		1	2
All 3 Neg Group 8	52	15.40	
Pars & Abs Neg Group 5	35	17.29	
FRL & Par Neg Group 7	9		22.78
No Neg Group 1	94		23.77
ParOnlyNeg Group 3	24		24.04
Sig.		.312	.699

The mean of ACT (23.77) of G1 students and the mean of G3 students (26.04) and the mean of G7 students (22.78) were not significantly different, statistically, from each other. The mean of these three groups were significantly different, statistically, from the mean of G5 students (17.29) and the mean of G8 students (15.40) at the .05 level of significance.

GPA

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on GPA interpreted the results of the ANOVA (A2) and showed that there were four distinct subsets in which to place the five groups. The group of students who possessed no negative factors and the groups of students who had less than two parents were shown to be in a separate subset. The group of students who had fewer than two parents and the group of students who had more than nine absences were shown to be in a separate subset. The group of students who possessed all three negative factors were shown to be in a separate subset and a fringe group consisting of the group of students who were receiving free or reduced price lunches along with having fewer than two parents in the home as well as the group of students who possessed no negative factors shared membership in a fourth subset. The results of the Tukey HSD are displayed in Table 4.14.

Table 4.14 Post-Hoc Tukey HSD test for ANOVA (A2) GPA

GPA

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05			
		1	2	3	4
All 3 Neg Group 8	52	2.3005			
Pars & Abs Neg Group 5	35		2.8183		
FRL & Par Neg Group 7	10			3.2208	
No Neg Group 1	94			3.5121	3.5121
ParOnlyNeg Group 3	24				3.6127
Sig.		1.000	1.000	.235	.953

The mean of GPA (3.51) of G1 students, the mean of G3 students (3.61) and the mean of G7 students (3.22) was not significantly different, statistically, from each other: the mean of these three groups were significantly different, statistically, from the mean of G5 students (2.82); and was significantly different, statistically, from the mean of G8 students (2.30) at the .05 level of significance.

Summary of ANOVA (A2)

Based upon the results of the ANOVA (A2) and the five Post-Hoc Tukey HSD tests, the null hypotheses six through ten were rejected. With the rejection of these five null hypotheses, the alternative stands that most groups that had members with fewer than two parents in their household, with this being the lone negative factor, or combined with one or more negative factor, were statistically different from the group that possessed no negative factors on these five academic measures. Most importantly, G1, with no potential negative factors, differed significantly, statistically, from most other negative groupings compared.

ANOVA (A3)

The third ANOVA (A3) compared the mean scores for the following five separate groups. The mean of the scores of the group with no negative factors (G1) was compared to the means of the scores of all of the groups containing the negative factor of having less than two parents in the household. Those groups were the group of students receiving free or reduced price lunches and no other negative factor (G6), the group of students receiving free or reduced price lunches, with less than two parents in the household and no other negative factor (G7), the group of students that have all three negative factors (Group 8). Symbolically, G1 was compared

to G4, G6, G7 and G8. The results of this ANOVA (A3) addressed research questions Q11 through Q15.

The third ANOVA and post-hoc HSD tests provided the responses to the research questions eleven through fifteen. Those questions were:

Q11- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of receiving free or reduced price lunches (G4, G6, G7 or G8), on the Biology Gateway examination?

Q12- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of receiving free or reduced price lunches (G4, G6, G7 or G8), on the Algebra Gateway examination?

Q13- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of receiving free or reduced price lunches (G4, G6, G7 or G8), on the English Gateway examination?

Q14- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of receiving free or reduced price lunches (G4, G6, G7 or G8), on the ACT test?

Q15- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of receiving free or reduced price lunches (G4, G6, G7 or G8), on GPA?

For these analyses, most group mean score comparisons were shown to be significantly different for $\alpha=.001$. That means that there were significant differences in the mean scores for these groups for all measures. The null hypotheses to be tested were:

H₀11- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of receiving free or reduced price lunches (G4, G6, G7 or G8), on the Biology Gateway examination.

H₀12- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of receiving free or reduced price lunches (G4, G6, G7 or G8), on the Algebra Gateway examination.

H₀13- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of receiving free or reduced price lunches (G4, G6, G7 or G8), on the English Gateway examination.

H₀14- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of receiving free or reduced price lunches (G4, G6, G7 or G8), on the ACT test.

H₀15- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess the factor of receiving free or reduced price lunches (G4, G6, G7 or G8), on GPA.

Based on the results of the AVOVA, the null hypotheses were rejected; indicating that there were differences between the groups tested and as the ANOVA indicated, these differences were considered to be statistically significant. Table 16 shows the ANOVA tables for each of these tests, indicating that the differences were significant at a high level ($p < .001$).

Table 4.15 ANOVA (A3)

		ANOVA				
		Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
GPA	Between Groups	56.039	4	14.010	53.374	.000
	Within Groups	46.459	177	.262		
	Total	102.498	181			
ACT	Between Groups	2686.748	4	671.687	53.943	.000
	Within Groups	2191.496	176	12.452		
	Total	4878.243	180			
English	Between Groups	3494.845	4	873.711	26.214	.000
	Within Groups	5799.368	174	33.330		
	Total	9294.212	178			
Algebra	Between Groups	1970.159	4	492.540	16.527	.000
	Within Groups	5185.461	174	29.801		
	Total	7155.620	178			
Biology	Between Groups	4099.992	4	1024.998	24.051	.000
	Within Groups	7415.450	174	42.618		
	Total	11515.441	178			

Post-Hoc Tests for ANOVA (A3)

To interpret the findings of ANOVA (A3) a post-hoc Tukey HSD test was performed to determine which groups had means that differed, statistically, with regard to each academic measure.

Biology

The post-Hoc Tukey HSD test evaluating the results of this ANOVA Test on The Biology Gateway Exam interpreted the results of the ANOVA (A3) and showed that there were two distinct subsets in which to place the five groups. The group of students who possessed no negative factors, the group of students who received free or reduced price lunches as their only negative factor and the group of students who received free or reduced price lunches and having fewer than two parents were shown to be in a separate subset from the other groups that were a part of this ANOVA Test. The results of the Tukey HSD are displayed in Table 4.16.

Table 4.16 Post-Hoc Tukey HSD test for ANOVA (A3) Biology

Biology

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05	
		1	2
FRL & Abs Neg Group 6	14	28.21	
All 3 Neg Group 8	51	30.12	
FRLOnlyNeg Group 4	11		36.82
FRL & Par Neg Group 7	9		39.22
No Neg Group 1	94		39.84
Sig.		.919	.674

The mean of Biology (39.84) of G1 students, and the mean of G7 students (39.22) and the mean of G4 students (36.82) were not significantly different, statistically, from each other. The mean of these three groups were significantly different, statistically, from the mean of G8 students (30.12) and the mean of G6 students (28.21) at the .05 level of significance.

Algebra

The post-Hoc Tukey HSD test evaluating the results of this ANOVA Test, on The Algebra Gateway Exam interpreted the results of the ANOVA (A3) and showed that there were two distinct subsets in which to place the five groups. The group of students who possessed no negative factors, the group of students who received free or reduced price lunches as their only negative factor and the group of students who received free or reduced price lunches and having fewer than two parents were shown to be in a separate subset from the other groups that were a part of this ANOVA Test. The results of the Tukey HSD are displayed in Table 4.17.

Table 4.17 Post-Hoc Tukey HSD test for ANOVA (A3) Algebra

Algebra

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05	
		1	2
All 3 Neg Group 8	51	38.14	
FRL & Abs Neg Group 6	14	39.79	
FRLOnlyNeg Group 4	11		45.18
No Neg Group 1	94		45.26
FRL & Par Neg Group 7	9		46.22
Sig.		.909	.982

The mean of Algebra (45.26) of G1 students and the mean of G7 students (46.22) and the mean of G4 students (45.18) were not significantly different, statistically, from each other. The mean of these three groups were significantly different, statistically, from the mean of G6 students (39.79) and the mean of G8 students (38.14) at the .05 level of significance.

English

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on The English Gateway Exam interpreted the results of the ANOVA (A3) and showed that there were two distinct subsets in which to place the five groups. The group of students who possessed no negative factors, the group of students who received free or reduced price lunches as their only negative factor and the group of students who received free or reduced price lunches and having fewer than two parents were shown to be in a separate subset from the other groups that were a part of this ANOVA test. The results of the Tukey HSD are displayed in Table 4.18.

Table 4.18 Post-Hoc Tukey HSD test for ANOVA (A3) English

English

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05	
		1	2
FRL & Abs Neg Group 6	14	32.71	
All 3 Neg Group 8	51	34.18	
FRL & Par Neg Group 7	9		41.00
FRLOnlyNeg Group 4	11		42.64
No Neg Group 1	94		43.19
Sig.		.950	.812

The mean of English (43.19) of G1 students and the mean of G4 students (42.64) and the mean of G7 students (41.00) were not significantly different, statistically, from each other. The mean of these three groups were significantly different, statistically, from the mean of G8 students (34.18) and the mean of G6 students (32.71) at the .05 level of significance.

ACT

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on the ACT test interpreted the results of the ANOVA (A3) and showed that there were two distinct subsets in which to place the five groups. The group of students who possessed no negative factors, the group of students who received free or reduced price lunches as their only negative factor and the group of students who received free or reduced price lunches and having fewer than two parents were shown to be in a separate subset from the other groups that were a part of this ANOVA test. The results of the Tukey HSD are displayed in Table 4.19.

Table 4.19 Post-Hoc Tukey HSD test for ANOVA (A3) ACT

ACT

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05	
		1	2
All 3 Neg Group 8	52	15.40	
FRL & Abs Neg Group 6	15	16.27	
FRLOnlyNeg Group 4	11		21.82
FRL & Par Neg Group 7	9		22.78
No Neg Group 1	94		23.77
Sig.		.955	.501

The mean of ACT (23.77) of G1 students, and the mean of G7 students (22.78) and the mean of G4 students (21.82) were not significantly different, statistically, from each other. The mean of these three groups were significantly different, statistically, from the mean of G6 students (16.27) and the mean of G8 students (15.40) at the .05 level of significance.

GPA

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on GPA interpreted the results of the ANOVA (A3) and showed that there were two distinct subsets in which to place the five groups. The group of students who possessed no negative factors, the group of students who received free or reduced price lunches as their only negative factor and the group of students who received free or reduced price lunches and having fewer than two parents were shown to be in a separate subset from the other groups that were a part of this ANOVA Test. The results of the Tukey HSD are displayed in Table 4.20.

Table 4.20 Post-Hoc Tukey HSD test for ANOVA (A3) GPA

GPA

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05	
		1	2
All 3 Neg Group 8	52	2.3005	
FRL & Abs Neg Group 6	15	2.4041	
FRLOnlyNeg Group 4	11		3.1931
FRL & Par Neg Group 7	10		3.2208
No Neg Group 1	94		3.5121
Sig.		.975	.356

The mean of GPA (3.51) of G1 students and the mean of G7 students (3.22) and the mean of G4 students (3.19) were not significantly different, statistically, from each other. The mean of these three groups were significantly different, statistically, from the mean of G6 students (2.40) and the mean of G8 students (2.30) at the .05 level of significance.

Summary of ANOVA (A3)

Based upon the results of the ANOVA (A3) and the five Post-Hoc Tukey HSD tests, the null hypotheses eleven through fifteen were rejected. With the rejection of these five null hypotheses, the alternative stands that most groups that had members which receive free or reduced price lunches, with this being the lone negative factor, or combined with one or more negative factor, were different, statistically, from the group that possessed no negative factors on these five academic measures. Most importantly, G1, with no potential negative factors, differed significantly, statistically from most other negative groups with which it was compared.

ANOVA (A4)

The fourth ANOVA (A4) compared the mean scores for the following eight separate groups. The mean of the scores of the group with no negative factors (G1) was compared to all of the groups that have one or more negative factor. Those groups were the group of students with nine, or more absences and no other negative factor (G2), the group of students with nine, or more absences plus less than two parents in the household and no other negative factor (G5), the group of students with nine, or more absences plus receiving free or reduced price lunches and no other negative factor (G6), the group of students with less than two parents in the

household and no other negative factor (G3), the group of students with less than two parents in the household, receiving free or reduced price lunches and no other negative factor (G7), the group of students receiving free or reduced price lunches and no other negative factor (G4), and the group of students with all three negative factors (G8). Symbolically, Group 1 was compared to G2, G3, G4, G5, G6, G7 and G8.

ANOVA 4 compared all of the groups simultaneously whereas ANOVAs 1, 2 and 3 each compared only the groups that possessed a particular negative factor with the group that possessed no negative factors. This approach was used in order to highlight each negative factor independently as well as to corroborate the results when all factors were examined simultaneously. The results of this ANOVA (A4) addressed research questions Q16 through Q20.

The fourth ANOVA and post-hoc HSD tests provided the responses to the research questions six through ten. Those questions were:

Q16- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess any of the predicted, negative factors (G2, G3, G4, G5, G6, G7, or G8), on the Biology Gateway examination?

Q17- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess any of the predicted, negative factors (G2, G3, G4, G5, G6, G7 or G8), on the Algebra Gateway examination?

Q18- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess any of the predicted, negative factors (G2, G3, G4, G5, G6, G7 or G8), on the English Gateway examination?

Q19- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess any of the predicted, negative factors (G2, G3, G4, G5, G6, G7 or G8), on the ACT test?

Q20- Is there a significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess any of the predicted, negative factors (G2, G3, G4, G5, G6, G7, or G8), on GPA?

For these analyses, all group mean score comparisons were shown to be significantly different for $\alpha=.001$. That means that there were significant differences in the mean scores for these groups for all measures. The null hypotheses to be tested were:

H₀16- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess any of the predicted, negative factors (G2, G3, G4, G5, G6, G7 or G8), on the Biology Gateway examination.

H₀17- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess any of the predicted, negative factors (G2, G3, G4, G5, G6, G7 or G8), on the Algebra Gateway examination.

H₀18- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess any of the predicted, negative factors (G2, G3, G4, G5, G6, G7 or G8), on the English Gateway examination.

H₀19- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess any of the predicted, negative factors (G2, G3, G4, G5, G6, G7 or G8), on the ACT test.

H₀20- There is no significant difference between the group of students who possess no negative factors (G1) versus the respective groups of students who possess any of the predicted, negative factors (G2, G3, G4, G5, G6, G7 or G8), on GPA.

Based on the results of the AVOVA, the null hypotheses were rejected; indicating that there were differences between the groups tested and as the ANOVA indicated, these differences were considered to be statistically significant. Table 22 shows the ANOVA tables for each of these tests, indicating that the differences were significant at a high level, $p < .001$.

Table 4.21 ANOVA (A4)

		ANOVA				
		Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
GPA	Between Groups	67.639	7	9.663	35.651	.000
	Within Groups	74.536	275	.271		
	Total	142.175	282			
ACT	Between Groups	3658.900	7	522.700	46.498	.000
	Within Groups	3080.097	274	11.241		
	Total	6738.996	281			
English	Between Groups	4845.666	7	692.238	18.199	.000
	Within Groups	10346.331	272	38.038		
	Total	15191.996	279			
Algebra	Between Groups	3682.220	7	526.031	18.554	.000
	Within Groups	7711.765	272	28.352		
	Total	11393.986	279			
Biology	Between Groups	6733.773	7	961.968	20.661	.000
	Within Groups	12664.213	272	46.560		
	Total	19397.986	279			

Post-Hoc Tests for ANOVA (A4)

To interpret the findings of ANOVA (A4) a post-hoc Tukey HSD test was performed to analyze the findings of the ANOVA (A4) and to statistically allocate which groups should be grouped together, with regard to each academic measure. A HSD test was performed for each academic measure.

Biology

The post-Hoc Tukey HSD test evaluating the results of this ANOVA test on The Biology Gateway Exam interpreted the results of the ANOVA (A4) and showed that there were three distinct subsets in which to place the eight groups. The lowest performing subset included the group of students who possessed all three negative factors, the groups of students who received free or reduced price lunches as well as had more than nine absences, the group of students who had fewer than two parents as well as had more than nine absences and the group of students who had more than nine absences as their only negative factor.

The highest performing subset contained four of the eight groups. It included the group of students who had no negative factors, the group of students who were receiving free or reduced price lunches and no other negative factor, the group of students who were receiving free or reduced price lunches and less than two parents at home and the group of students who had less than two parents at home with no other negative factor.

A third subset was shown consisting of the group of students who had more than nine absences as their only negative factor, the group of students who had fewer than two parents at home as well as having more than nine absences and the group of students who received free or

reduced price lunches as the only negative factor. The results of the Tukey HSD are displayed in Table 4.22.

Table 4.22 Post-Hoc Tukey HSD test for ANOVA (A4) Biology

Biology

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05		
		1	2	3
FRL & Abs Neg Group 6	14	28.21		
All 3 Neg Group 8	51	30.12		
AbsOnlyNeg Group 2	42	30.60	30.60	
Pars & Abs Neg Group 5	35	32.46	32.46	
FRLOnlyNeg Group 4	11		36.82	36.82
FRL & Par Neg Group 7	9			39.22
No Neg Group 1	94			39.84
ParOnlyNeg Group 3	24			42.79
Sig.		.503	.078	.105

The mean of Biology (39.84) of G1 students and the mean of G3 students (42.79) and the mean of G7 students (39.22) and the mean of G4 students (36.82) were not significantly different, statistically, from each other; the mean of G1 (39.84) was significantly different, statistically, from the mean of G5 students (32.46) and the mean of G2 students (30.60); and from the mean of G8 students (30.12) and the mean of G6 students (28.21) at the .05 level of significance.

Algebra

The post-Hoc Tukey HSD test evaluating the results of the ANOVA test on The Algebra Gateway Exam interpreted the results of the ANOVA (A1) and showed that there were three distinct subsets in which to place the eight groups. The lowest performing subset included the group of students who possessed all three negative factors, the groups of students who received free or reduced price lunches as well as had more than nine absences, the group of students who had fewer than two parents as well as had more than nine absences and the group of students who had more than nine absences as their only negative factor.

The highest performing subset contained four of the eight groups. It included the group of students who had no negative factors, the group of students who were receiving free or reduced price lunches and no other negative factor, the group of students who were receiving free or reduced price lunches and less than two parents at home and the group of students who had less than two parents at home with no other negative factor.

A third subset was shown consisting of the group of students who had no negative factors, the group of students who had fewer than two parents at home as well as having more

than nine absences and the group of student who received free or reduced price lunches as the only negative factor. The results of the Tukey HSD are displayed in Table 4.23.

Table 4.23 Post-Hoc Tukey HSD test for ANOVA (A4) Algebra

Algebra

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05		
		1	2	3
AbsOnlyNeg Group 2	42	37.05		
All 3 Neg Group 8	51	38.14		
FRL & Abs Neg Group 6	14	39.79		
Pars & Abs Neg Group 5	35	40.60	40.60	
FRLOnlyNeg Group 4	11		45.18	45.18
No Neg Group 1	94		45.26	45.26
FRL & Par Neg Group 7	9			46.22
ParOnlyNeg Group 3	24			46.50
Sig.		.407	.106	.994

The mean of Algebra (45.26) of G1 students and the mean of G3 students (46.50) and the mean of G7 students (46.22) and the mean of G4 students (45.18) were not significantly different, statistically, from each other: the mean of G1 (45.26) was significantly different, statistically, from the means of G5 students (40.60) and G2 students (37.05) and of G6 students (39.79) and of G8 students (38.14) at the .05 level of significance.

English

The post-Hoc Tukey HSD test evaluating the results of the ANOVA test on The English Gateway Exam interpreted the results of the ANOVA (A4) and showed that there were three distinct subsets in which to place the eight groups. The lowest performing subset included the group of students who possessed all three negative factors, the groups of students who received free or reduced price lunches as well as had more than nine absences, the group of students who had fewer than two parents as well as had more than nine absences and the group of students who had more than nine absences as their only negative factor.

The highest performing subset contained four of the eight groups. It included the group of students who had no negative factors, the group of students who were receiving free or reduced price lunches and no other negative factor, the group of students who were receiving free or reduced price lunches and less than two parents at home and the group of students who had less than two parents at home with no other negative factor.

A third subset was shown consisting of the group of students who had more than nine absences as their only negative factor, the group of students who had fewer than two parents at home as well as having more than nine absences and the group of student who received free or

reduced price lunches and had less than two parents in the household. The results of the Tukey HSD are displayed in Table 4.24.

Table 4.24 Post-Hoc Tukey HSD test for ANOVA (A4) English

English

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05		
		1	2	3
FRL & Abs Neg Group 6	14	32.71		
All 3 Neg Group 8	51	34.18		
AbsOnlyNeg Group 2	42	35.26	35.26	
Pars & Abs Neg Group 5	35	36.34	36.34	
FRL & Par Neg Group 7	9		41.00	41.00
FRLOnlyNeg Group 4	11			42.64
No Neg Group 1	94			43.19
ParOnlyNeg Group 3	24			43.29
Sig.		.576	.067	.938

The mean of English (43.19) of G1 students and the mean of G3 students (43.29) and the mean of G7 students (41.00) and the mean of G4 students (42.64) were not significantly different, statistically, from each other, statistically. The mean of G1 (43.19) was significantly different, statistically, from the mean of G5 students (36.34) and the mean of G2 students (35.26) and the mean of G6 students (32.71) and the mean of G8 students (34.18) at the .05 level of significance.

ACT

The post-Hoc Tukey HSD test evaluating the results of the ANOVA on the ACT test interpreted the results of the ANOVA (A4) and showed that there were two distinct subsets in which to place the eight groups. The lowest performing subset included the group of students who possessed all three negative factors, the groups of students who received free or reduced price lunches as well as had more than nine absences, the groups of students who had fewer than two parents as well as had more than nine absences and the group of students who had more than nine absences as their only negative factor.

The highest performing subset contained four of the eight groups. It included the group of students who had no negative factors, the group of students who were receiving free or reduced price lunches and no other negative factor, the groups of students who were receiving free or reduced price lunches and less than two parents at home and the group of students who had less than two parents at home with no other negative factor. The results of the Tukey HSD are displayed in Table 4.25.

Table 4.25 Post-Hoc Tukey HSD test for ANOVA (A4) ACT

ACT

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05	
		1	2
All 3 Neg Group 8	52	15.40	
FRL & Abs Neg Group 6	15	16.27	
Pars & Abs Neg Group 5	35	17.29	
AbsOnlyNeg Group 2	42	17.50	
FRLOnlyNeg Group 4	11		21.82
FRL & Par Neg Group 7	9		22.78
No Neg Group 1	94		23.77
ParOnlyNeg Group 3	24		24.04
Sig.		.487	.407

The mean of ACT (23.77) of G1 students (23.77), and the mean of G3 students (24.04) and the mean of G7 students (22.78) and the mean of G4 students (21.82) were not significantly different, statistically, from each other. The mean of G1 students (23.77) was significantly different, statistically, from the mean of G5 students (17.29) and the mean of G2 students (17.50) and the mean of G6 students (16.27) and the mean of G8 students (15.40) at the .05 level of significance.

GPA

The post-Hoc Tukey HSD test evaluating the results of the ANOVA test on GPA interpreted the results of the ANOVA (A4) and showed that there were four distinct subsets in which to place the eight groups. The lowest performing subset included the group of students who possessed all three negative factors, and the groups of students who received free or reduced price lunches as well as had more than nine absences.

The highest performing subset contained four of the eight groups. It included the group of students who had no negative factors, the group of students who were receiving free or reduced price lunches and no other negative factor, the groups of students who were receiving free or reduced price lunches and less than two parents at home and the group of students who had less than two parents at home with no other negative factor.

A third subset was shown consisting of the group of students who had more than nine absences as their only negative factor, the groups of students who had fewer than two parents at home as well as having more than nine absences and the groups of student who received free or reduced price lunches and had less than two parents in the household.

A fourth subset was shown consisting of the group of students who had more than nine absences as their only negative factor, the groups of students who had fewer than two parents at home as well as having more than nine absences, the group of students who received free or reduced price lunches as their only negative factor and the groups of student who received free or reduced price lunches and had less than two parents in the household. The results of the Tukey HSD are displayed in Table 4.26.

Table 4.26 Post-Hoc Tukey HSD test for ANOVA (A4) GPA

GPA

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05			
		1	2	3	4
All 3 Neg Group 8	52	2.3005			
FRL & Abs Neg Group 6	15	2.4041	2.4041		
Pars & Abs Neg Group 5	35		2.8183	2.8183	
AbsOnlyNeg Group 2	42		2.8190	2.8190	
FRLOnlyNeg Group 4	11			3.1931	3.1931
FRL & Par Neg Group 7	10			3.2208	3.2208
No Neg Group 1	94				3.5121
ParOnlyNeg Group 3	24				3.6127
Sig.		.998	.167	.198	.157

The mean GPA (3.51) of G1 students and the mean of G3 students (3.61) and the mean of G7 students (3.22) and the mean of G4 students (3.19) were not significantly different, statistically, from each other. The mean of G1 students (3.51) was significantly different, statistically, from the mean of G5 students (2.82) and the mean of G2 students (2.82): The mean of these two groups were significantly different, statistically, from the mean of G6 students (2.40) and the mean of G8 students (2.30) at the .05 level of significance.

Summary of ANOVA (A4)

Based upon the results of the ANOVA (A4) and the five Post-Hoc Tukey HSD tests, the null hypotheses sixteen through twenty were rejected. With the rejection of these five null hypotheses, the alternative stands that most groups were different from each of the other groups, and thus, the groups that possessed negative factors were often different, statistically, from the group that possessed no negative factors on these five academic measures. Most importantly, G1, with no potential negative factors, differed significantly, statistically, from most other groups compared.

CHAPTER V

SUMMARY, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Summary

At the heart of this research project was the idea that our educational delivery system in America needs help. Over the past few decades, our educational system has seen a decrease in graduation rates, a decline in test scores and the production of college students that are not as academically prepared as our colleges desire. Coupled with this belief was the realization that wave after wave of educational reforms seemed to have provided little impact upon these problematic educational results. As an educator, this researcher could not envision how the educational reforms that have been made during the past twenty years could have a positive impact upon the typical students that flow through our local school system.

According to the literature, the goals provided for in these reforms were unrealistic. The reforms themselves centered around remediation of problems with the faculties and staffs of schools with little or no focus on the problems brought to our schools by the student. The reforms offered only a (one-size fits all) set of new guidelines that each school system had to follow in order to receive the funding that was the main ingredient of these programs, in the first place. Each and every school system wanted the money. With the adoption of the NCLB program came the onset of faculty meetings, group training sessions, teacher workshops, school improvement committee meetings, in numbers that can only be estimated in the millions. After

all of these meetings and all of the time invested in the implementation of this program and all of the billions and billions of dollars that were spent, what was gained? It appears that we have actually lost more ground, academically.

This research posited that the reforms needed in education should be focused on the needs of the students. Some students don't require any help. They are on target for success without any changes needed to the schools they attend. Other groups of students require more. Educational reforms need to be targeted toward these students. Can these groups of students be identified? This research project attempted to determine if an association could be made between groups of students who possessed a potential negative factor and academic under-achievement.

The research used three negative factors, high absenteeism, low income and lack of a two-parent household to determine if groups of students who possessed one or more of these factors would perform differently, statistically, in a series of five academic measures. It was hypothesized that students who possessed a negative factor would perform at a lower level on academic achievement tests and other academic measures, such as Grade Point Averages, than those students from the gold standard. The academic achievement tests that were studied included the Biology Gateway examination, the Algebra Gateway examination, the English Gateway examination and ACT scores. The fifth academic measure, which was used in the study, was the student's high school grade point average.

Using a series of four ANOVA tests the research was able to determine that there was a statistical difference between most of these groups that possess one or more of the negative factors and the group of students that possess no negative factors.

Discussion of Results

Do the factors of high absenteeism, low socio-economic standing or the lack of a two-parent household negatively impact the academic success of students? The study focused on the performance of students on a series of tests, namely, the ACT, the Algebra gateway exam, the English gateway exam, and the Biology gateway exam. Also, the grade point average (GPA) was examined for all students in the sample and then students were disaggregated into groups according to low socio-economic status, students with less than two parents at home with the child, students with more than nine absences in a school year. Students who did not possess any of the three potential negative factors mentioned above were used for comparisons to other groups. The purpose of the study was to identify whether there were statistically significant differences in the results of each group, as measured by their mean scores of test scores and GPA measures. It was the expectation of this study that there were statistically significant differences between the mean scores of these academic measurements between these disaggregated groups.

This study made twenty comparisons between groups that had potential negative factors versus a single group of students that possessed no negative factors. The most important finding in the study was that the group of students who had more than nine absences caused all of the dependent variables to be lower. That is, the groups with nine, or more, absences had lower mean scores in the Biology Gateway test, the Algebra Gateway test, the English Gateway test, the ACT test and GPA. When other negative factors were combined, the scores for these groups were most often lower than other groups.

The groups of students that had fewer than two parents at home could only be considered as significantly different from the group of students that possessed no negative factors when they also possessed the factor of having more than nine absences. In light that the absence factor was

necessary for the less than two parent family group to be statistically different, this particular negative factor did not significantly add further impact to the interpretation of the findings.

When the negative factor of receiving free or reduced price lunches was introduced, no added differences from those previously found were identified. Specifically, the only group of students who were receiving free, or reduced price, lunches that were statistically different from the no negative factor group, was the group that additionally had the factor of more than nine absences. Since the absence factor was necessary for the free and reduced price lunch group, to be statistically different, this particular negative factor did not significantly add further impact to the interpretation of the findings.

When all eight groups were analyzed together, no new information could be gleaned. Importantly, although each negative factor contributed to differences in scores, the only negative factor that was confirmed in each and every test was the factor of having nine or more absences.

The differences in the mean scores in each of the twenty (20) comparisons were pronounced. The smallest difference in mean group scores was noticed in the Algebra Gateway test scores between students that have no negative factors with a mean score of 45.28 versus students that have fewer than 2 parents at home with a mean score of 41.16. Although these groups were shown to be significantly different, statistically, their mean scores showed only a difference of ten percent (10%).

The other 19 comparisons showed mean scores and measures to have differences that were much higher. The largest significant difference between mean test scores was with the ACT test between the group of student that had no negative factors, with a mean score of 23.79 and the students that had more than nine absences, with a mean score of 16.56. The non-negative

group had a mean test score that was 43.7% higher than the group of students that had nine or more absences.

The two most important academic measures used in this study were the ACT test scores and the student's grade point averages (GPA). The group comparisons using these measures had important implications for this study. To place this into perspective, the ACT scores and the student's GPA determine the likelihood of admittance into college for the students. In addition they determine the ability of the student to qualify for HOPE scholarship funds. In all eight tests the non-negative group had mean scores that met minimum scores for college admittance as well as qualifying for HOPE scholarship funds. None of the groups with any of the negative factors had mean scores that would qualify for college admittance or funding.

The non-negative group had a mean ACT score of 23.79. This score was on average, 36.1% higher than the four groups that had negative factors. The differences of the mean scores were especially alarming. Equally alarming was the fact that the highest differences in mean scores occurred in this especially significant academic measure. Although the groups were not considered to be significantly different, the mean scores of the two groups are very far apart.

The non-negative group had a mean GPA of 3.5. This was above the level required for HOPE scholarship funding. None of the four groups that possessed negative factors had a mean GPA in excess of the minimum GPA of 3.0 required for a student to qualify for HOPE scholarship funding. The non-negative group had a mean GPA that was 29.2% higher, on average, than the four groups that possessed negative factors. In all four comparative tests, when the groups with negative factors are compared to the group with no negative factors, using ANOVA tests, the non-negative group was significantly different, statistically, from the groups that possessed negative factors when their GPA were compared.

In all twenty comparisons, the non-negative groups had scores or measures that were, at least 10% higher than the groups that possessed negative factors. On average, the non-negative group had scores or measures that were 24.33% higher than the groups that possessed negative factors. In one hundred percent 100% of the group comparisons, the groups were considered to be significantly different, statistically, due to their differences in scores. Statistically significant differences between the groups were supported by four, independent ANOVAs when the mean scores of Biology Gateway examinations, Algebra Gateway examinations, English Gateway examinations, ACT tests and GPAs were compared between the non-negative group and the groups with one or more negative factors.

Statistically, there was a significant difference between the mean scores of most groups when compared to group 1. Negative factors, with the exception of having a household of less than two parents as the only negative factor, were associated with lower test scores and a lower grade point average. The differences in mean scores of the groups were not only statistically significant, but, in most cases show mean score differences that were from ten (10%) percent to forty-three (43%) percent lower than the group that possess no negative factors.

One defining characteristic between each of the groups was the absence or presence of a potentially negative factor. The second characteristic was the level of performance on five academic measures. The hypothesis of this study proposed to determine if there was a relationship between the first defining characteristic and the results on the academic measures. This study showed that there were statistically significant differences between the group that possessed none of the negative factors and the other seven groups that possessed one or more of the negative factors. The group that performed the best was the group that possessed no negative factors compared to the three groups of nine or more absences, less than two parents and low

socio-economic levels. This was true for most every academic measure when examined with all combinations of negative factors. There were factors which influenced the outcome of student success, that were brought into our schools from family, culture or otherwise. These factors were not due to the school, the curriculum, the administration or the school system.

The theoretical framework supporting this research consisted of two theories. The first theory was the Institutional Change Theory (Huerta & Zuckerman, 2009). This theory stated that schools had a direct relationship with their cultural environment. The school was capable of shaping the norms of the culture as well as becoming shaped by the norms of the culture. Our schools now tend to be more influenced by the cultural trends where conformity has altered the traditional school model. The United States has restructured the way all of our children are educated in order to accommodate the special needs of an ever-growing population of potentially dysfunctional students.

The second theory referenced in this research is the Free Market Theory (Marion & Gonzales, 2013). This theory states that educational change occurred when schools compete with each other for excellence. Schools that achieved the greatest success drew more students from under-performing schools. To balance school populations school districts, therefore, had to focus their efforts on the improvement of the under-performing schools. This theory failed to recognize what actually happens within a school district when schools failed (Ravitch, 2011). With the support of local, state and federal funding, many schools just don't improve. Federal regulations made it impossible to create free markets. Increased spending in failing schools, tended to lure failing students into staying at the same school. The students who chose to move to a more successful school were usually the best students that the failing school had. These factors tended

to create failing schools, with ever increasing densities of failing students. This was not what the free market theory had in mind.

These two theories, when used concurrently, provided a powerful context for educational change in America. Their implementation also can be shown to have created unintended consequences for public schools in the United States. This study attempted to show that the Institutional Change Theory could work to improve education if the culture was asked to conform to the institution of education. The study proposed that negative factors impact the success of any student. Such factors could be identified and it could be verified that those factors create a negative impact on student success. If these factors could be identified and verified we should target those factors, not conform to them. Programs should be created that address them. Programs could be created that reduce those factors or their impact within the community and create opportunities to overcome those factors.

This study also attempted to show the Free Market Theory also worked. The institution of the school must not conform to the negative influences of a culture. If the standards of the institution remain constant, the culture will learn to meet those standards. Once these standards are adopted, every school would have the same standards. In a school district with all schools having the same standards, one only needed to address the negative factors that kept the students from achieving those standards. This study only studied three potential negative factors. One of these was high absenteeism. This study suggests that high absenteeism hinders academic success. This study also offers that schools should never conform by accepting absences over a certain number. This study advises that if schools conform their curriculum and methods to students with high absences they would be condoning a culture of high absenteeism. Once the standards are upheld, all schools will be able to compete fairly with each other.

The other two negative factors that this study examined, involved issues that will require a great deal of work to alleviate. Low socioeconomic status and lack of a two-parent household were, unfortunately, an increasing trend in our student's lives. This study attempted to show the impact these circumstances had upon our student's academic success. If it can be shown that these factors contribute to academic stress, we should explore ways to minimize these effects. We shouldn't continue to just pretend that these children were just like everybody else. We should set out to start finding programs that can help them succeed academically, before the effects of these factors can become permanent. These students should be assisted, in such a way, as to not cause any harm to their self-esteem, as our "free and reduced lunch programs" are operated today. Finding a way to break the cycle that has caused these students to find themselves in the situation they are in now, should be our mission.

Conclusions

The factors that were identified in this study only scratched the surface of the many influencers of educational achievement today. Other factors that may have an adverse impact on educational achievement should be explored and identified. Those factors that impact achievement should be extensively analyzed to determine if there are measures that could be taken to minimize their impact on our students. The feasibility of undertaking programs to reduce the number of students that will possess these identified negative factors in the future should be explored. Unless a course is plotted to remove these factors or minimize their impact on educational achievement, the results of our educational system will not improve.

Segregating the students into groups that possess certain factors goes against the current mindset in education and was considered a controversial method. The NCLB philosophy has

been misinterpreted to mean that schools were to offer the same educational programs to all children regardless of their ability or capability to succeed. This misinterpretation has continued to require children with inadequate academic skills to compete with better-equipped students in a contest that, most probably, determine the quality of their lives in the future. When this contest has gone awry, the blame has been laid onto our teachers and our educational system. Using this current, misguided, logic it was inappropriate to suggest any other reason for our lack of success.

Steps need to be taken to introduce logic back into our educational system and the way our public understands how our system could work. To use a healthcare analogy, when one is sick, they are sent to the hospital. If one is diagnosed with heart problems they are sent to a cardiologist. If one is diagnosed with cancer, they are sent to an oncologist. When medical procedures are needed, patients are sent to radiologists, phlebotomists and surgeons. As one recovers they are sent to physical therapists, occupational rehabilitation specialists and psychologists. There has been a strong belief and sense of faith in our approach to assuring the health of each of us. The belief that we have in specialists is strong. To have the best available specialist in the area that relates to our condition is an expectation in our healthcare delivery system. One wouldn't think of having their family doctor operate on their heart. The best-trained professional, a specialist, is what our society has grown to expect. Should the expectation in education be any different?

If one has a propensity for contracting a specific condition we seek special care. If one has a family history of diabetes frequent blood tests are called for. If one is over-weight our blood pressure is checked often. If one has high cholesterol, cholesterol-lowering medication is prescribed and taken. If one is female, mammograms are ordered. If one is male prostate exams are ordered. Children receive vaccinations. The elderly receive colonoscopy. Attention is not

sought when procedures are performed, but to maintain our health; being ashamed of them is at the bottom of our concerns. Shouldn't our society feel as strongly about the many special needs that our students have?

Every student is different. There should be no argument with this statement. All students have varying degrees of intellectual assets and liabilities. No one wants our children to carry educational liabilities throughout their school careers without diagnosis and treatment. The result of this approach is evident in this study. One group of students has success. The other groups of students that have, unfortunately, been tendered hardships that have influenced their academic achievement, show less success. Are they not due the help they need for their educational success? Are they not due the help from specialists that are qualified to meet the specific needs of their situation? Are we afraid to offer this help? Can we afford this help? Can we afford the cost of not addressing this problem?

Recommendations for Further Study

This study recommends that the above referenced questions be addressed as soon as possible. To address these questions, research should be performed to determine what the best course of action should be to reach the following goals. First, our educational system should identify the factors that are associated with academic under-achievement. Starting in the early primary grades we need to make certain that each student possess a minimum set of qualifications to enter school. If those qualifications are not met there should be an alternative program in place to identify the factors behind the deficiency and programs to address them.

Second, programs need to be established to offer assistance to those students who possess those factors that are identified. Most importantly these programs should first target

students in their pre-school and early elementary school years. If students can't read they can't be successful in school. The same hold true for math and writing. They are critical components for learning and these skills are developed in the early elementary years.

The factors might not present themselves until later in a student's school career. Absences, for example, are almost a certainty to hinder success. These absences might not become a problem until the middle school years. We know that there is a strong connection between student absenteeism and academic under achievement. We must act. We must insist on the parent's help. We must explore all options. We currently do very little to combat absenteeism as well as a host of other behaviors that could be changed with appropriate help. This needs to change.

Third, communities need to work with schools to provide programs that could reduce the number of students who are at risk of contracting these negative factors. This study has stressed that the focus of educational reform shouldn't be on the teachers, alone. Communities hold a great deal of responsibility in the potential success of our students. Communities must step up to the plate with resources and direct involvement to partner with our schools. It should no longer be acceptable for the school to be solely responsible for the outcome of the student.

Fourth, we must insist upon a more active family to be tethered to each and every one of our students. Responsibility has to start at home. When the parent takes responsibility, and the student takes responsibility and the school takes responsibility and the community takes responsibility we will achieve success in America with regard to our educational programs. The most important component is the family.

Fifth, schools need to continually monitor the students to determine if additional support is needed. If there is one surety, it is that things will change. We can be certain that new factors

will emerge that will cause harm to the educational success of our students. We need to be vigilant in establishing programs that identify trends and influences that affect educational outcomes. From alcohol to marijuana to video games to gangs to Ritalin to bullying to teen pregnancy, we should be more prepared to respond to the negative influences on our student's educational success.

Sixth, if additional support is needed, programs need to be established that offer the assistance that is needed for an affected student to become successful. This might include a special school. This might include a vocational program. This might even include an alternative home placement. The one size fits all approach does not always work. We must not be afraid or embarrassed to provide options for students who don't fit our traditional mold.

This research study has shown that our approach to education has not provided optimum results. Reforms need to be made, but future reforms need to be made logically using sound reasoning. Our next steps should be taken with great care and guided by further research. Such future research should endeavor to identify the source of the problems before reforms are created to solve them.

When a deficiency appears, such as a low graduation rate from a class, a study should commence to determine the source. What caused the poor result? As in this study, the population could be sampled and grouped according to factors hypothesized to be contributing to the problem. If the factors that contributed to the problem can be determined they can be targeted directly. This approach would target the cause of the problem and would, hopefully, minimize the impact to the students that are not affected by or are a part of the problem.

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APPENDIX A

IRB Approval

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IRB Approval



Institutional Review Board
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MEMORANDUM

TO: David Hale **IRB # 13-098**
Dr. Valerie Rutledge

FROM: Lindsay Pardue, Director of Research Integrity
Dr. Bart Weathington, IRB Committee Chair

DATE: August 15, 2013

SUBJECT: IRB #13-098: The Identificatin of Factors that Negaitvely Contribute to Student Achievement: A Case Study of the Students at One High-Performing High School

The IRB Committee Chair has reviewed and approved your application and assigned you the IRB number listed above. You must include the following approval statement on research materials seen by participants and used in research reports:

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project # 13-098.

Please remember that you must complete a Certification for Changes, Annual Review, or Project Termination/Completion Form when the project is completed or provide an annual report if the project takes over one year to complete. The IRB Committee will make every effort to remind you prior to your anniversary date; however, it is your responsibility to ensure that this additional step is satisfied.

Please remember to contact the IRB Committee immediately and submit a new project proposal for review if significant changes occur in your research design or in any instruments used in conducting the study. You should also contact the IRB Committee immediately if you encounter any adverse effects during your project that pose a risk to your subjects.

For any additional information, please consult our web page <http://www.utc.edu/irb> or email instrb@utc.edu

Best wishes for a successful research project.

VITA

David Earl Hale graduated with a B.S. in chemistry from The University of Tennessee at Chattanooga (UTC) in Chattanooga, Tennessee in 1983. He served for eighteen years with CBL and Associates, Fletcher Bright Company and EnCompass South as a commercial property manager and real estate broker. He began teaching in 2001 with the Hamilton County School system in Chattanooga, Tennessee. After earning his Masters Degree in Education and teaching certificate from (UTC) David taught high school chemistry, physical science and biology at 21st Century Academy in Chattanooga, TN, Brainerd High School in Chattanooga, TN, and Ooltewah High School in Ooltewah, TN. During this time, he participated in the Doctoral program in Learning and Leadership at The University of Tennessee at Chattanooga in Chattanooga, Tennessee.