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A Relationship between Grades Earned by Sixth Grade Core Science Students and their End of Year Grades

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A Relationship between Grades Earned by Sixth Grade Core Science
Students and Their End of Year Grades

A Research Paper

Presented to

The Faculty and the Department of Occupational and Technical Studies

At

Old Dominion University

In Partial Fulfillment for the Requirements for the Master of Science in
Occupational and Technical Studies

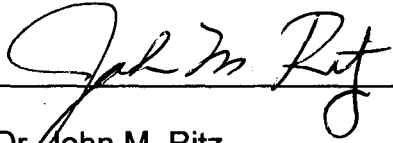
By

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November 2003

Approval Page

This research paper was prepared by Denise W. Padrick under the direction of John M. Ritz in OTED 636, Problems of Occupational and Technical Education. This paper was submitted to the Graduate Program Director as partial fulfillment of the requirements for the degree of Master of Science in Occupational and Technical Studies.

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Chapter I

Introduction

The *No Child Left Behind Act* (NCLB) of 2001 reestablished the role of the federal government regarding monetary assistance to states. It unequivocally established the need for data-based decision making and accountability. Statements of cause and effect were not merely to rely on experience, expertise, or opinions, but to be the results of scientific research and the correlation of accurate data. The NCLB Act called for the development of challenging state standards in reading and math and assessments each year to measure student progress and achievement. The National Assessment of Educational Progress (NAEP) test was devised to collect data regarding the academic progress of students across the United States. Prior to the passage of the NCLB Act of 2001, the Virginia Department of Education created the Standards of Learning to address matters of data-based accountability and to ensure that all students were educated.

The United States educational standards came under scrutiny in 1995 when the Third International Math and Science Study (TIMSS) assessed students globally for math and science skills. Out of thirty-four participating nations, the United States eighth grade students ranked nineteenth in math and eighteenth in science. A follow-up study of fourth graders was performed in 1999 when the students were in the eighth grade. There were no significant improvements in scores. In a New York Times article dated December 6, 2000, then Secretary of Education Richard W. Riley stated, "American children continue to learn, but their peers in other countries

are learning at a higher rate. We need to work harder and better.” (Schemo, 2000, p.1)

In response to the TIMSS study and the standards movement, the Virginia Department of Education (VDOE), through the Standards of Learning, developed high standards for math, science, social studies, language arts, and instructional technology for grades K-12 with measurable assessment instruments in grades 5, 8, and at the high school level. Specific scores have been established to indicate whether students rank as Not Passing, Pass Proficient, or Pass Advance. These assessments are given appropriately at the end of the school year when students have completed their Standard of Learning objectives. However, the end of the school year is not the time to identify inadequacies in subject matter comprehension.

Virginia Public Schools incorporate data-based research in the decision making process. Teachers are required to produce pre-test and post-test data to measure growth. However, data collection does not prevent all students from failing to succeed. Identifying at-risk students and providing interventions remain controversial. Which factors are related to a student's success? Which factors contribute to a student's failure? Ensuring that no child is left behind in the academic arena requires that the variables which lead or do not lead to success be identified. It was the view of this researcher that grades students earn by the first nine weeks grading period remain the best and earliest indicator that a student is at-risk and is in need of additional academic interventions.

Statement of Problem

The purpose of this study was to determine if the grades students earned in sixth grade core science in the first nine weeks of an academic class were reflective of the grades they earned by the end of the year.

Research Hypothesis

To solve this problem, the following hypothesis was tested:

H₀: A relationship does not exist between sixth grade level academic grades earned at the end of a first nine weeks grading period and the year end grades.

Background and Significance

In 1983 the United States Department of Education's Commission on Excellence in Education published the report, *A Nation at Risk*. This document unmasked the intolerable level of education that students in the United States were acquiring. The study revealed that approximately, "23 million Americans were functionally illiterate by simple tests of everyday writing, reading, and comprehension and about 13% of all 17 year-olds were functionally illiterate." (A Nation, 1983, np.) The report stated, "If an unfriendly power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war." (A Nation, 1983, np.) The students in the United States were not acquiring an education that was globally competitive.

In 1995 a study of math and science achievement was conducted on a global level with 34 countries participating in the study. According to the National Center for Educational Statistics in their publication, Trends in International Math and Science Study, U.S. students performed inconsistently.

The 1995 TIMSS assessed the mathematics and science performance of U.S. students in comparison to their peers in other nations at three different grade levels. The 1995 TIMSS assessments revealed that U.S. fourth-graders performed well in both mathematics and science in comparison to students in other nations. U.S. eighth-grade students performed near the international average in both mathematics and science, and U.S. twelfth-graders scored below the international average and among the lowest of the TIMSS nations in mathematics and science general knowledge, as well as in physics and advanced mathematics. (NCES, no year, np.)

The TIMSS report supported the findings of *A Nation at Risk* and again put educators in the United States on notice to strengthen the curriculum taught in public schools.

Education is directly related to income and employment. (Educational Level, 2003, np.) According to the United States Department of Labor, Bureau of Labor Statistics, the median earning for persons with less than a high school degree was \$19,700, while those achieving a minimum of an associate's degree earned an average of \$31,700 per year. The Bureau also states that "the unemployment rate among people who have a professional degree is significantly lower than that of people who

have a high school diploma or less than a complete high school education.”

(Educational Level, 2003, np.)

The United States Department of Labor in its *Occupational Outlook Handbook* (2003) projects educational needs through to the year 2010. The current edition projects an increase need for the following educational requirements in the workplace:

Associate Degree	35%
Doctoral Degree	25%
Master's Degree	25%
Bachelor's Degree	23%
Post Secondary Vocational	20%
Long Term on the Job Training	8%

In order to fill the demand for an educated workplace, students must be equipped with the skills to pursue post secondary educational venues. The standards that the students meet must be comparative with global standards of achievement as measured on instruments such as the TIMSS. It is imperative that the *No Child Left Behind* philosophy be aggressively upheld and all students be prepared to compete in the global workplace of the future.

Currently the state of Virginia implements Standards of Learning (SOL) to ensure that all students are educated and to measure academic progress. School administrators seek to emphasize the importance of education and develop strategies to improve student scores. The middle school involved in this study has not compiled

data regarding the correlation between grades earned by students in the first nine weeks and year end grades. It is the request of the administration that this correlation be addressed.

Limitations

The following limitations were recognized during the course of this study:

- The students were promoted to sixth grade.
- The students were enrolled in a core science course in Virginia in 2002 and 2003.
- The 166 students involved in the study started and ended the year with the same instructor.
- The data collected regarding student grades were from one instructor.

Assumptions

The researcher made the following assumptions regarding this study:

- Students were capable of working at a sixth grade level.
- Grades reflected unbiased evaluations of achievement.

Procedures

Student grades from the first nine weeks of a core science class will be compared with corresponding end of the year grades. Chi-Square statistics will be applied to

the data to determine if a correlation exists between first nine weeks grades and end of the year grades.

Definition of Terms

The following definitions were provided to clarify terms related to this study.

Core classes: Classes attended by average students

Not Passing: Below acceptable score on an SOL exam

Pass Advance: Indicates that one passed an SOL exam with a high level of mastery

Pass Proficient: Minimum requirement for passing an SOL exam

National Center for Educational Statistics: (NCES) subdivision of the U.S.

Department of Education

No Child Left Behind Act of 2001: (NCLB) Federal legislation written to increase accountability in our nation's public schools and ensure that all children are educated.

Standards of Learning: (SOL) Objectives and goals for education K-12 as outlined by the Virginia Department of Education for the core academic areas.

Third International Math and Science Study: (TIMSS) global assessment of students from 34 countries in math and science skills

Overview of Chapters

The *No Child Left Behind Act of 2001* requires that all schools be held accountable for showing continuous improvement for all students. Research-based decision making is the norm. All children must be educated. The State of Virginia adheres to

the established guidelines by continually strengthening its assessment instruments, the Standards of Learning examinations. Through writing samples and multiple choice tests, data are collected and assessed according to gender, ethnicity, and disability status.

It is clear that students must be ready to engage in rigorous math and science courses in order to be competitive in the global marketplace. According to *A Nation at Risk*, the United States allowed its standards to drop or at least maintain a mediocre level of education. The TIMSS study further stated that the United States was falling behind other nations in the comprehension of math and science concepts especially at the high school level.

Virginia school administrators diligently work to educate the entire student body. Recent Standard of Learning assessments suggest that not all students are experiencing success. In order to increase the success rate of the student body, it is imperative that at-risk students be identified and appropriate interventions developed. The researcher believes that grades earned by students and assigned by grade level teachers are an indicator of a student's ability to be successful.

Teachers are a primary source for recognizing student achievement. This researcher believes that through assessments of classwork, projects, homework, tests, quizzes, and participation, teachers can predict which students will be successful and which students will need intervention.

Chapter I has identified the problem, need for intervention indicators, and reasons to complete this study. Chapter II provides an overview of legislation, SOL reviews and comparative studies that will demonstrate the need to establish high standards and the benefits of early academic interventions. Chapter III details the population studied, the method of data collection, and the method of data analysis. Chapter IV provides the findings of the study. Chapter V explains the conclusion that was drawn from the findings and establishes recommendations and future applications.

Chapter II

Review of Literature

The purpose of this review is to establish the role of the Virginia Standards of Learning (SOL) in the public education system, examine the validity of the SOL assessments, and explore the controversies surrounding high stakes testing in education. In conjunction, this researcher will present information regarding the validity of teacher assigned grades and the use of student grades as indicators of future academic success. Information in this chapter was obtained through U.S. Department of Education documents, Virginia Department of Education documents, Virginia Beach Department of Education documents, professional texts, and electronic media from the Internet.

Role of the Virginia Standards of Learning

Virginia Senate Bill No. 1304 as offered on January 17, 2003, is "A BILL to amend and reenact 22.1-253.13:3 of the Code of Virginia, as it is currently effective and as it shall become effective, relating to the validity and reliability of Standards of Learning assessments." (Senate Bill No. 1304, 2003, p.1). According to this Bill, The "General Assembly recognizes the need for the Board of Education to prescribe requirements to ensure that student progress is measured and that school boards and school personnel are accountable." (Senate Bill No. 1304, 2003, p.1). This legislation mandates that the Virginia State Board of Education develop measurable objectives regarding curriculum content at all grade levels and measure student

outcomes at various grade levels. The Bill further requires that the Superintendent of Public Instruction develop and the Board of Education approve, “criteria for determining and recognizing educational performance in the Commonwealth’s public school divisions and schools.” (Senate Bill 1304, 2003, p.10). The Superintendent of Public Instruction was further instructed to report to the Board of Education those schools which exceed or do not meet the approved criteria.

The Virginia Board of Education in response to legislation created the SOLs which established measurable objectives for grade levels K-12. Students are assessed at the end of the third, fifth, and eighth grades. Students in high school are required to earn six verified credits for a standard diploma and nine verified credits for an advanced diploma. (Graduation Requirements, 2003, np.)

Standards of Learning Validity

The validity of the SOL assessments was reported in the document titled *Review of Selected Technical Characteristics of the Virginia Standards of Learning (SOL) Assessments*. According to the report, the purpose for the SOL assessments is “to inform parents and teachers about what students are learning in relation to the SOL and to hold schools accountable for teaching the SOL content.” (Review of Selected, 2003, p.1) The validity of the SOL assessments for which schools will be held accountable is questionable. The report states, “There is no limit to the amount of evidence that might be compiled to address the validity of the SOL scores in relation to their stated purposes and there is no amount of evidence that could ever

prove that the scores from the assessments are valid.”(Review of Selected, 2003, p. 2) However, the Technical Advisory Committee (TAC) does note that a reasonable person should be able to accept the scores and the classifications of pass proficient and pass advance as valid.

The TAC committee studied the areas of content, domain, and construct validity. The committee found that the SOL assessments contain evidence of content validity. The assessments do test the intended information from the SOLs. The TAC committee also checked for domain validity, the extent to which the test is reflective of SOL objectives. Here the committee noted the extensive use of multiple choice questions and concluded that, “...it is possible that some of the standards are not fully reflected in the assessment.”(Review of Selected,”2003, p. 4) Regarding construct validity, the committee found the correlation between SOL scores in fourth, sixth, and eighth grade and Stanford 9 Achievement tests to be, “neither too high or too low, lending some support for the validity of SOL scores.”(Review of Selected, 2003, p. 4)

The TAC committee studied reliability, accuracy, and consistency. Reliability is defined by the committee as the characteristic of the scores and their accuracy and consistency in assigning students performance levels. Scores were reviewed for the 1999, 2000, and 2001 school years. The committee wrote that, “It is important to demonstrate that student scores are consistent over short-time periods and content samples, and that the performance category classifications being made with the

scores are consistent and accurate over two administrations.”(Review of Selected, 2003, p. 5) The Board of Education utilized the Kuder-Richardson Formula 20 (KR-20) and the person separability index to estimate reliability. The committee determined that the accuracy and consistency of the performance levels of Pass Proficient, Pass Advance, and Not Passing were acceptable. They stated, “Taken collectively, the reliability evidence for the SOL assessments is solid and is typical of high quality assessments.” (Review of Selected, 2003, p. 8)

The Board of Education has established the following scores, Table I, in order to assign students to the performance levels of Not Passing, Pass Proficient, and Pass Advance for grade eight.

Table I. Virginia Standards of Learning Assessments-Pass Scores Established by the Board of Education

SOL Grade 8	Pass Proficient	Percentage Correct	Pass Advance	Percentage Correct
English-Reading, Literature, and Research	27 out of 42	64	37 out of 42	88
English – Writing	30 out of 44	68	41 out of 44	93
Mathematics	37 out of 60	62	55 out of 60	92
History and Social Studies	33 out of 50	66	45 out of 50	90
Science	29 out of 50	58	45 out of 50	90
Computer/Technology	26 out of 40	65	36 out of 40	90

For schools to be fully accredited, 70% of the eighth grade students who take the SOL assessments must score in the Pass Advance or Pass Proficient performance level. However, not all educators are convinced that high stakes tests enhance or improve student learning.

Controversy over High Stakes Testing

SOL assessments in Virginia and other high stakes assessment remain controversial. In *Standardization Versus Standards*, published in *Phi Delta Kappan* (2002), Meier notes that these tests only show whether or not teachers are teaching to the test and students are learning what is on the test. She states that often these tests are politically motivated and pass/fail rates for the tests are not determined until after the results are in and states can analyze their impact. She questions their validity by citing the following situations:

- Only 28% of eighth graders scored as proficient on the Massachusetts science exam, although their scores on the international tests show them outranking every nation except Singapore.
- North Carolina's state tests showed 68% of the students proficient in math, whereas only 20% were judged proficient on a national science exam.
- Only 2% of high school seniors were labeled advanced on the NAEP math test, but twice that number alone passes the Advanced Placement exams in math each year and about 10% score above 600 on the SAT math subtest. (Meier, 2002, p. 194)

Determining whether one set of scores is more acceptable than another set of scores has become a gamble.

Meier points out that the only difference between prior achievement tests and current tests is that teachers are now allowed to teach to the test. Teachers are not

only encouraged but mandated to teach selective material. By doing so, all spontaneous educational events are ignored. Events like a hurricane and historical exhibits are ignored because they will not be on the test. Student interest is ignored except for test items. It becomes clear that the unintended negative aspects of high-stakes testing outweigh the intended positive effects.

Most worrisome to Meier is the notion that high-stakes testing causes parents and teachers to doubt their own assessments of student achievement. Adults no longer are sure of their child's ability to read until they see the test scores even though they see the level of literature that their children read. Teachers are no longer certain that content has been absorbed by the students until they receive the test scores even though they have seen students perform at acceptable levels. Children confuse their intelligence with their test scores. They do not understand that making mistakes is apart of learning. Meier states that there is no magic in the "cut scores" used by politicians to determine who passes and who fails and that the public should not be lead to believe there is. There has to be a balance between parent, teacher, and test assessments. (Meier, 2002, p. 190)

High stakes testing is not the only area of controversy. The level of achievement attached to student grades sometimes differs across schools. (What do Student, 1994, np.)

The National Education Longitudinal Study (1988) (NELS) was conducted by the National Center for Educational Statistics to determine how grades earned by students compared with their scores from the NELS test. A sample of eighth grade students from all economic levels was included in the study. The test consisted of five passages followed by twenty-one comprehension and interpretation questions and forty math items. The study found that:

Reading: Students in high poverty schools (those where more than 75 percent of the students receive free or reduced price lunch) who received mostly A's in English got about the same reading score as did the "C" and "D" students in the most affluent schools.

Math: The "A" students in the high poverty schools most closely resembled the "D" students in the most affluent schools. (What do Student, 1994, np.)

The study suggests that grade inflation exists because student work is often compared to other student work with the best work in class receiving an "A". The "A" received in poverty level schools is not comparable to the "A" received in affluent schools. This trend renders grades useless as a feedback tool to parents for assessing their children's academic progress and supports a need for standardized accountability. However, student grades are being used as indicators for academic intervention.

According to Gustafson, assistant principal at Princess Anne High School, Virginia Beach, Virginia, current grades earned in core classes through teacher assessments have successfully identified students who were at risk at not passing SOL assessments. Gustafson was influenced by the book, *Professional Learning Communities at Work, Best Practices for Enhancing Student Achievement* (1998),

by Richard DuFour and Robert Eaker. One of the key concepts involved letting educators test their strategies for improving the success rate in education. At Princess Anne High School, students entering with a "D" or "E" on any core subject or earning a "D" or "E" in a core class were assigned to remediation courses to re-teach the material until the students were earning a "C" on teacher assessments. Since implementing this plan, Princess Anne High School has recorded the following data to support continuing this strategy (Table II):

**Table II. Princess Anne High School How Are We Doing?
Second Nine Weeks Report Card**

Number of Students Failing One or More Subjects				
Grade	2002-03	2001-02	2000-01	1999-00
09	237/38.5%	247/40%	349/46%	310/40.6%
10	181/32.1%	230/36.2%	192/34.5%	225/41.5%
11	175/34.4%	147/27.1%	170/32.8%	153/31.3%
12	114/23.4%	136/28.5%	112/23.6%	145/31.2%
Total	707/32.4%	711/32.3%	861/36.1%	802/34.5%

Note: The first number is a raw score stating the exact number of students who are failing one or more subjects. The second number is the percentage of students at the grade level who are failing one or more subjects.

Princess Anne High School was assigned full accreditation in 2001.

Summary

Virginia standards for education were mandated by the General Assembly and designed by the State Board of Education. These standards or measurable objectives were written for each grade level in Virginia with assessments at the end

of third, fifth, and eighth grade and at the end of high school courses. The Board of Education commissioned the TAC committee to address issues of validity and reliability. The TAC Committee found that the Virginia SOL assessments did what they were intended to do and did it consistently.

Although standardized tests have become the norm, some educators feel that they have negative impacts on education. The spontaneous discussion of items that interest students has either been eliminated or limited to topics which pertain to the standards. Student curiosity is subdued. The barrage of conflicting test scores causes parents, teachers, and students to doubt their abilities. However, data does exist that support a need for standardized testing.

In a study completed by the National Center for Educational Statistics, grades earned by students from poverty level schools were shown to be inconsistent with grades earned by students in affluent schools. Eighth grade students from various economic levels were tested in math and reading. An "A" from a poverty level school equated with a "C" or "D" from an affluent level school. This inconsistency supports the need to state-wide testing.

Princess Anne High School in Virginia Beach, Virginia, draws from several poverty level areas and has been successful in improving student performance. Student grades are used as the indicator that an intervention is warranted.

To determine if grades are a viable indicator, a study was conducted utilizing student first nine weeks grades and end of the year scores from middle school science students. Chapter III of this study outlines the population critiqued, the methods of data collection, and the method of data analysis.

Chapter III

Methods and Procedures

The research being conducted was a correlation study designed to investigate how student grades at the end of the first nine weeks corresponded with end of the year grades. This chapter will describe the population being examined, the methods of data collection, and statistical analysis.

Population

The population was composed of 166 students who were enrolled in a sixth grade science curriculum in a Virginia middle school in 2002 and 2003. The students were all assessed by the same instructor.

Data Collection

Data regarding the scores were obtained from the official records that the instructor generated. Student grades were established through a weighted assessment system. Of the total grade, tests were worth 30%, quizzes were worth 25%, projects were worth 25%, class participation was worth 10%, and homework assignments were worth 10%.

Statistical Analysis

Data were organized using Chi-Square analysis. A two by two matrix was constructed to show the relationship between students who earned an A, B, or C

and a D or E during the first nine weeks and for year end grades. Student names and identification numbers were not revealed.

Summary

This study was a correlation study designed to determine if grades earned in the first nine weeks of school are an indicator of end of year grades. The study was exclusive to sixth grade students in a core science class in Virginia. Data were obtained from the official records generated by the instructor. Data were analyzed utilizing Chi- Square.

The following chapters will reveal the findings from this study, draw a conclusion from the findings, and establish an application and generalizations for the information obtained through this study.

Chapter IV

Findings

The problem of this study was to determine if a relationship exists between grades earned at the end of the first nine weeks grading period and end of the year grades. The data were composed of sixth grade science scores from a single instructor from the school years ending in 2002 and 2003. A total of 166 student grades were compared in the study. A chi-square was applied as the basis for analyzing the data.

As illustrated in Table III, at the end of the first nine weeks grading period, 120 students received a grade of A, B, or C. During this same period, 46 students received a grade of D or E. When final grades were tallied, 105 students received a grade of A, B, or C and 61 students received a grade of D or E.

Table III. Frequency Observed

	A B C End of Year	D E End of Year	Row Total
A B C First Nine Weeks	99	21	120
D E First Nine Weeks	6	40	46
Column Total	105	61	166

Table IV reflects an expected frequency rate for the nominal data. The frequency rate was determined by multiplying diagonally adjacent columns and rows then dividing by the total. The frequency of receiving an A, B, or C in the first nine weeks

and at the end of the year is 71.5662506. The frequency of earning an A, B, or C in the first nine weeks and having a D or E at the end of the year is 44.09638554. The frequency of receiving an D or E in the first nine weeks and an A, B, or C as a final grade is 29.09638554. The frequency of receiving a D or E in both the first nine weeks and as a final grade is 16.903614666.

Table VI. Table Chi-square Calculations

	A B C End of Year	D E End of Year
A B C First Nine Weeks	10.51626506	12.09720521
D E First Nine Weeks	18.33365262	31.55792665

The degree of difference (df) was 1. Because a null hypothesis was utilized, a two tailed test was applied to the data. p at .05 was 2.710 and p at .01 was 5.410. The chi-square statistic of 72.50505 exceeds both critical values.

The nominal data shows that of the 46 students that received a D or E in the first nine weeks, only 6 students managed to improve their grade to an A, B, or C by the end of year. The 40 D-E students who failed to improve their grades comprised 87% of the test group. Conclusions and recommendations regarding the findings will be presented in Chapter V.

Chapter V

Summary, Conclusion, and Recommendations

Chapter V will serve to summarize the information in the previous four chapters, draw a conclusion based on the findings, and offer recommendations.

Summary

Our educational institutions must graduate students with employable skills or the ability to be trained at a skill. According to the U.S. Department of Labor's *Occupational Outlook Handbook* (2003), by the year 2010, 35% of the employers will be looking for prospective employees to have earned an associates degree and only 8% of the jobs will involve less education thus long term training. President Bush recognizes the need for an educated workforce and has offered the *No Child Left Behind Act* to ensure that all students are given the support and opportunity to be successful. NCLB also requires school systems be accountable for their instruction and support their academic progress with data.

The Virginia Department of Education has been mandated by the Virginia General Assembly to require that students pass a series of Standards of Learning assessments to provide the data that students are making academic progress. Students earn a rank of Failing, Pass Proficient or Pass Advance. Students at risk of academic shortcomings must be identified early in a school year. The first reporting period ends by nine weeks. It was the belief of this researcher that grades

earned in the first nine weeks would be reflective of grades earned at the end of the year.

Data supplied from the official records of one sixth grade science teacher were compared using Chi-square analysis. Data from 166 first nine week grades were compared with the corresponding end of the year grades. All students involved in the study were placed by the school system in a core science class.

Conclusion

The findings of this study were analyzed according to the protocol for a null-hypothesis. The chi-square statistic was equated to 72.50505. A two tailed test was applied with a $p > .05$ at 2.710 and $p > .01$ at 5.410. Since the chi square statistic of 72.50505 exceeds the critical value of 5.410, the null hypothesis that a relationship does not exist between grades earned in the first nine weeks and final grades is rejected. Therefore, there is an association between grades earned in science by sixth grade students in the first nine weeks and their final grade. In conclusion, students who score D and E's in the first nine weeks are also likely to score D and E's as a final grade.

Recommendations

Based on the findings and conclusion, this researcher makes the following recommendations:

1. Grades earned at the end of the first nine weeks should be utilized by school administrators to determine if academic interventions are warranted. This study should be generalized to include other grade levels and other core curriculums.
2. Exploratory curriculums, those other than the core curriculums of science, mathematics, social studies, and language arts, should write objectives which include SOL standards from one of the core curriculums. Students in need of one core academic intervention should be placed in an exploratory class that complements the necessary academic intervention.
3. Students who are in need of intervention in more than one core academic class should not attend exploratory classes and be placed in tutorial classes that emphasis re-teaching of specific curriculum.

References

Bill Tracking -2003 session. (2003). Senate Bill No. 1304 offered January 17,2003.

Retrieved March 10, 2003. <http://leg1.state.va.us/cgi-bin/legp504exe?031+ful+SB1304>

DeSchryver, D., Petrilli,M., Youssef, S. (1998). *Fifteen years after a nation at risk*.

Retrieved March 22, 2003. <http://edreform.com/pubs/then&now.htm>

Meire, D. (2002). Standardization versus standards. *Phi Delta Kappan*, 190-198.

National Center for Educational Statistics (NCES). (year, month). *Trends in international math and science study*. Retrieved <http://www.hobel.org/lwved/id3.htm>

Schemo, D.J.(2000, December 6). Worldwide survey finds U.S. students are not keeping up. *New York Times*. Retrieved March 15, 2003.
<http://rsvh.addr.com/lwved//NYTTIMMS1999.htm>

U.S.Department of Education. (1983, April) *A Nation at Risk*. Retrieved March 23, 2003. <http://www.hobel.org/lwved/id2.htm>

U. S. Department of Education. (1994, January). *Education reforms and students at risk: historical overview-"A nation at risk"*. Retrieved March 22, 2003.
<http://www.ed.gov/pubs/EdReformStudies/EdReforms/chap1d.html>

U.S. Department of Education. (2003) *No child left behind. Introduction*. Retrieved March 23, 2003. <http://www.nclb.gov/next/overview/index.html>

U.S. Department of Education. (1994, January). *What do student grades mean? Differences across schools*. Retrieved March 18, 2003.
<http://ed.gov/pubs/OR/ReseachRpts/grades.html>

U.S. Department of Labor. (2003). *Bureau of Labor Statistics Educational Level and Pay*. Retrieved March 22, 2003. <http://www.dol.gov/dol/topic/wages/educational.htm>

US Department of Labor. (2003). *Bureau of Labor Statistics Occupational Outlook Handbook Education and Training*. Retrieved March 22, 2003.
<http://www.bls.gov/oco/oco2003.htm>

Virginia Beach City Public Schools. (2003). *Graduation requirements*. Retrieved March 23, 2003. <http://www.pen.k12.va.us/2plus4in2004/>

Virginia Beach City Public Schools. (2003). *Princess anne high school. How are we doing? Second nine weeks record card*.

Virginia Beach City Public Schools.(2003) *Three-year comparative report card 1999-2000 through 2001-2002 school years*. Retrieved March 23, 2003.

<http://www.vbschools.com/reportcrd.html>

Virginia Department of Education.(2003) Division of Assessment and Reporting.
Passing Scores Established by the Board of Education Retrieved March 23, 2003.

<http://www.pen.k12.va.us/VDOE/News/solpass.html>

Virginia Department of Education.(2003) Division of Assessment and Reporting.
Review of Selected Technical Characteristics of the Virginia Standards of Learning (SOL) Assessments. Retrieved March 23, 2003 .

<http://www.pen.k12.va.us/VDOE/Assessment/virginiareport.pdf>