UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

A SUMMATIVE EVALUATION OF THE EFFECTIVENESS OF CLASSROOM-EMBEDDED, INDIVIDUALISTIC, COMPUTER-BASED LEARNING FOR MIDDLE SCHOOL STUDENTS PLACED AT ACADEMIC RISK IN SCHOOLS WITH A HIGH PROPORTION OF TITLE I ELIGIBLE STUDENTS

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

Degree of

DOCTOR OF EDUCATION

By

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Norman, Oklahoma
2011

A SUMMATIVE EVALUATION OF THE EFFECTIVENESS OF CLASSROOM-EMBEDDED, INDIVIDUALISTIC, COMPUTER-BASED LEARNING FOR MIDDLE SCHOOL STUDENTS PLACED AT ACADEMIC RISK IN SCHOOLS WITH A HIGH PROPORTION OF TITLE I ELIGIBLE STUDENTS

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF EDUCATIONAL LEADERSHIP AND POLICY STUDIES

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Acknowledgements

I would like to first thank the members of my doctoral committee for their support and commitment. Dr. Jeffrey Maiden, my chairperson, provided the leadership and quantitative research knowledge that was necessary for me to reach my goal. The remainder of my committee includes: Dr. James Gardner, Dr. Courtney Vaughn, Dr. Gregg Garn, and Dr. Leslie Williams. I would like to thank each of them for volunteering their time and efforts on my behalf.

I would also like to thank Mrs. Teresa Jackson, the building principal I have worked for during this past year. She provided me the flexibility in my work schedule as well as the encouragement necessary to fulfill the requirements of my degree. Mrs. Teresa Jackson's support and understanding is very much appreciated.

Moreover, I want to thank my parents and brothers, Mr. Rudgerick Van Brown and Mr. Thomas Brown III. Even though school has always been easy for me, school did not seem to be as easy for both of my brothers. Nevertheless, my brothers have excelled in both education and their chosen professions. Mr. Rudgerick Brown is a building principal of a Title I elementary school. Mr. Thomas Brown III is a senior noncommissioned officer and retiree from the United States Air force. Finally, my parents have taught me a work ethic that has allowed me to accomplish all of my dreams.

To my husband and sons, I extend a great deal of gratitude and love. In this past year, there have been many times when I have closed the door of my office to complete my paper, while sacrificing precious time with my husband and sons, Eugene Jr. and Brandon. My husband is a tremendous supporter of every dream that I have. LTC(R) Eugene DeLoach Sr., I love you and thank you for your unconditional love.

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Abstract

The purpose of this two-phase, *post hoc*, transformative, sequential mixed method, summative study was to evaluate the effectiveness of classroom-embedded, individualistic, computer-based learning for middle school students placed at academic risk in schools with a high proportion of Title I eligible students. Data were mined from existing school district databases, supplemented by a follow up analysis with pre-existing surveys and interview data to explore the quantitative results in more depth. In the quantitative component, two factorial analyses of covariance of data (n=393) were used. Qualitatively, pre-existing and de-identified parallel sample student survey and interview data (n=1,972) were analyzed generically. The dominant qualitative themes that emerged were presented as well as coded from the data. The results revealed (a) Fundamentals of mathematics had a higher post test mean than the "I Can Learn Lab;" (b) the seventh grade students had statistically significant differences in the two-way interaction of gender and ethnicity; (c) the eighth grade students had statistically significant three-way interaction effects, including group, gender, and ethnicity; and (d) from 2006-2009, 1,121 students stated that the "I Can Learn" lab had provided remediation and enhancement in their mathematics classes. The principal conclusion was that gaps remain between ethnic groups, male and female students, and people with different levels of income.

Chapter One

Introduction

At a time in history when most new job opportunities demand basic math, reading, and writing skills as well as a high level of technical and communication skills, educational credentials that attest to an individual's skill are also necessary in the work force (Davis, 2006). Further, for the United States to maintain its position in the world as a powerful nation both in finance and military strength, Americans who can perform in science, technology, engineering, and math (STEM) professional careers must be cultivated (Scott, 2004; Demski, 2009; Machi, 2009; & Viadero, 2009). Low achievement in STEM fields for both males and females has become the norm in American society (Scott, 2004; Demski, 2009; Machi, 2009; & Viadero, 2009).

Therefore, dropping out of school prior to earning a diploma has many negative repercussions, such as higher rates of unemployment and lower salaries (Franklin, Kim, Streeter, and Tripoli, 2007). Machi (2009) wrote that in America thirty percent of eighteen to twenty-two year old male and female students do not graduate from high school. Therefore, recent research has centered on contrasting dropout rates across racial/ethnic groups and discovering possible influencing factors of dropouts (Davis, 2006).

Hall and Isreal (2004) stated that family economic status and negative self-perceptions have been cited as factors that have been barriers to the education of at-risk students. Page (2002) found that computer-based instruction could increase the self-esteem of at-risk youth. Nevertheless, Day (2002) discovered through his research that at-risk students felt more motivated to learn, received better grades, and accepted more responsibility for their work in the computer lab environment.

However, Kvasny and Payton (2005) have written that the digital divide has been cited as a factor that has been detrimental to the education of many minority male and female students. Minority students, who reside in low or moderate income families in urban areas, have been left behind the most (The Digital Divide, 2010). Of the "left behind" minorities, African Americans have been hurt the most by the digital divide (Le, 2002). Also, the divide left African Americans unskilled with technology. Moreover, a gender divide exists for minority females because some females have demonstrated a lack of knowledge and interest in work force computer technology (Scott, 2004; & Shotick & Stephens, 2006). Therefore, this divide has created gaps for African American males and females in the labor market (Le, 2002).

To complicate the plight of minority at-risk male and female students even more, "It is well documented that there continues to be a gap between white and nonwhite student achievement" (Ramey, 2000, p. 3). Light was shed on the achievement gap of minority male and female students by gap research that was conducted in math and reading. The gap research indicated that: (a) an achievement gap existed between

Caucasian American students and African American students in each grade and curricular area; (b) an achievement gap existed between male and female students in low-poverty schools and those in high-poverty schools; (c) In mathematics, male and female students enrolled in high-poverty schools tended to grow less academically during the school year than students who were attending low-poverty schools; and (d) African American students grew less academically during the school year than students in other groups (Ramey, 2000; Beglau, 2005; Cronin, Houser, Kingsbury, & McCall, 2006). However, achievement gap reduction was dependant on classroom factors. Interactive classrooms that integrated technology into the curriculum lessoned the effect factors of (a) race, (b) gender, (c) poverty, and (d) learning disabilities (Ramey, 2000, & Beglau, 2005).

Background of Problem

Computer usage has been valuable because this technology acts as an avenue for employment opportunities (Newburger, 2000). "The Internet has rapidly become a critical, not optional, tool for many people in their day-to-day activities at work and school" (Newburger, 2000, p. 11). According to the Annie E. Casey Foundation (2001), computer technology has been a beneficial skill for job seekers. Therefore, the lack of technology integration in schools is limiting the future employment opportunities for some male and female children.

Nevertheless, in an American society dominated by computer-driven technology, the following realities exist. First, forty percent of public school teachers who have computer or the Internet available in their schools use them for classroom instruction (National Center for Education Statistics [NCES], 2010). Second, teachers in low minority and low poverty schools are more inclined to utilize computer technology in classroom instruction (NCES, 2010). Third, teachers with the fewest years of experience are more likely to use their computers or the Internet at home to gather information for classroom lesson plans (NCES, 2010). Finally, the National Center for Education Statistics collected the preceding information from the (a) Fast Response Survey System (FRSS), (b) National Assessment of Educational Progress (NAEP), and (c) Current Population Survey (CPS).

Problem

When minority male and female students do not meet the minimum standards on standardized tests, they are remediated. Presently, state revenues are used to create remediation programs for the at academic risk male and female students. Unfortunately, there are researchers who support all technology integration into the classroom as well as researchers who question the effectiveness of technology integration into the classroom. Therefore, administrators have a difficult task of discerning how to both successfully and cost effectively integrate technology into their individual campus culture.

For example, disadvantaged and at-risk students commonly have not been successful learning the basic skills of reading, writing, and math, as well as strong critical-thinking and problem solving skills (Bialo & Sivin, 1992; Ramey, 2000). Remedial classes have only added to the failure of at-risk students in the basic skill areas (Bialo & Sivin, 1992; Ramey, 2000). Moreover, Sanchez (2007) states, that ranging from lack of academic achievement to decreased employment opportunities, technology just widens the gap between: (a) the socioeconomic classes, (b) gender educational experiences, and (c) racial inequities (Warren-Sams, 1997, & Sanchez, 2007). Further, "persistent gaps remain between different racial and ethnic groups, people with and without disabilities, single and dual parent families, the old and the young, and people with different levels of income" (Digital Divide, 2010, p. 3). Therefore, technology has created a digital divide of inequities (Bauer, 2000, p. 15).

Conversely, computer technology is especially useful as a learning tool for basic skills and problem-solving methods due to several inherent features (Lowther, Inan, Strahl, & Ross, 2008). "These features include computer technology's interactive, involving nature, immediate and positive feedback, engaging applications for problem-solving and higher-order thinking skills, individualized learning paces, activities and difficulty-levels, and support of student independence and autonomy. The use of computers diminishes the role of authority figures and decreases opportunities for public embarrassment or peer pressure" (Inan, Lowther, Ross, & Strahl, 2008). Consequently, technology helps to eliminate the negative self-perceptions that create barriers to the education of academically at-risk male and female students.

Purpose of the Study

The purpose of this *ex post facto,* summative study was to evaluate of the effectiveness of classroom-embedded, individualistic, computer-based learning for middle school students placed at academic risk in schools with a high proportion of Title I eligible students. Data were mined from existing school district databases. The research questions addressed the comparison of the seventh and eighth grade ICL and Fundamentals of Mathematics students with OCCT and EOI scores at a Title I middle school.

Significance of the Study

The transformative evaluation paradigm is based on the improvement of conditions that affect gender, race or ethnicity, disability, sexual orientation, and socioeconomic classes. Historically, these transformative researchers position themselves with traditionally underrepresented individuals to bring about change in the environment of these individuals (Creswell, 2003; & Mertens, 2010). This mixed method, transformative evaluation, focuses on both the possible effects of classroom-embedded, individualistic, computer-based learning activities and an interactive mathematics class activities on the standardized test score performance of academically at-risk male and female students in a Title I school. This study examines these effects with regard to race, gender, standardized test scores, and student survey perceptions of the overall campus integration of technology. The final conclusions will serve as a data focus on the overall effectiveness of a classroom-embedded, individualistic, computer class with a comparison to students in an interactive classroom for educators, administrators, and politicians (Creswell, 2003).

Moreover, the philosophical cornerstone of using computers as an instrument for promoting positive attitudes toward school for at-risk students is the concept that students' participation in a math computer laboratory class will have potential lifelong benefits for their achievement in education. Research studies have indicated that students' participation in computer technology courses can enhance academic achievement (Fisher, 1992; Perlman, 1989; Tierney, 1993; Blume,Garcia, Mullinax, & Vogel, 2001; Christensen, Griffin, & Knezek, 2001, Beglau, 2005; & Critical Issue, 2010).

Research Questions

My interest in improved middle school students' academic achievement has led me to the following research questions. What were the effects of participation in classroom-embedded, individualistic, computer-based learning activities by minority middle school male and female students placed at-risk in schools with a high proportion of students who are eligible for Title I? How did the effectiveness of the classroom-embedded, individualistic, compute-based learning activities compare to interactive learning activities for students placed at-risk?

Overview of Design

This researcher chose an *ex post facto* design that performs a summative evaluation of the possible effects of a classroom-embedded, individualistic, computer activity classroom and an interactive mathematics classroom on the standardized test score performance of academically at-risk students in a Title I school. Quantitative data will be collected or mined from existing school district databases. In the quantitative research, I will utilize stratified purposeful sampling. To account for any pre-existing differences, each group will be matched with the consideration of important variables such as gender, race, OCCT scores, and Algebra I EOI scores.

Specifically, the *ex post facto*, summative evaluation research study has been designed to investigate the relationships and possible effects between computer use and the academic success of seventh and eighth grade students on the Oklahoma Core Curriculum Math Tests (OCCT) as well as the Algebra I End of Instruction (EOI) exam. This is a summative evaluation research study. For seventh and eighth grade students, a score that is below seven hundred (satisfactory) Oklahoma Performance Index (OPI) on the OCCT resulted in assignment to the "I Can Learn" (ICL) math class or to a Fundamentals of math class. The "I Can Learn" Math class is the program group. The Fundamentals of Math class is an interactive classroom that is not an individualistic, computer-embedded classroom environment. Therefore, the Fundamentals of Math classes are used as a comparison group for the *ex post facto* criterion group research. Further, socioeconomic status is not used as a level of the independent variable because there was not enough variability in the individualistic, computer- embedded classroom environment. Socioeconomic status is a control variable. Approximately seventy-three percent of the students in the individualistic, classroom-embedded computer-based learning environment are participating in the free or reduced lunch program. Further, to gauge the future possible effects of the individualistic, classroom-embedded computer learning activities, pre-existing and anonymous data from the Algebra I EOI will be analyzed.

Moreover, historical or pre-existing data were collected from Comprehend Pro Online (http://pro.alcaweb.org). The 2006-2010 seventh and eighth grade "I Can Learn" (ICL) lab and Fundamentals of Mathematics classrooms, the data will be analyzed with Predictive Analytics Software (PASW Statistics 18). To analyze the data, I utilized descriptive statistics (number of years in the ICL program and OCCT and Algebra I EOI scores), including mean and standard deviations. The descriptive statistics were used to find answers for each of my two research questions. The overall descriptive statistics were discussed by grade level, gender, and race.

Organization of the Study

Research question one was addressed using descriptive statistics including the summary of means and standard deviations. For the second research question, two factorial ANCOVAs were used to examine the differences between the means of seventh and eighth grade students' scores on the mathematics OCCT. For both ANCOVAs, independent variables were: (a) program group verses comparison group with two levels for the ANCOVA in both the seventh grade and eighth grade; (b) gender had two levels for both the seventh grade and eighth grade ANCOVAs; and (c) ethnicity had three levels for both ANCOVAs in the seventh grade and eighth grade. The covariates were previous years' OCCT scores in both ANCOVAs. Dependent variables were seventh grade and eighth grade OCCT scores, respectively. Because two ANVOVAs were employed, the level of significance (α-level) was set at .05/2 = .025 (Wiersma, 1995, p. 377).

Summary of the Study Organization

Chapter one includes an introduction to the study, background of the problem, the problem, purpose of the study, significance of the study, research questions, the study design, organization of the study, definition of terms, the assumptions of the study, and the limitations of the study. Chapter two consists of a review of the related literature and research. Chapter three describes the methodology and procedures used in designing and conducting this study. Chapter four presents the results of the study in the context of the research question and hypotheses. Chapter five reports the conclusions taken from the study as well as suggests recommendations for future research.

The Definition of Terms

Achievement gap. The difference between the academic performance of poor students and wealthier students and between minority students and their non-minority peers (Cronin, Hauser, Houser, Kingsbury, & McCall, 2006).

At-risk. At-risk describes students who have higher odds of dropping out of public secondary school than non at-risk students (Kaufman, 1992).

Basic math skills. Basic math skills include addition, subtraction, multiplication, and division of fractions, whole numbers, and decimals.

Client. Client refers to teachers, parents and students.

Comprehend Pro. Comprehend Pro is an online database that contains the OCCT and EOI assessment scores (2005-2010) of Lawton Public Schools students.

Computer Adaptive Testing (CAT). A testing technique used to judge an examinee's aptitude based on questions that become harder as the person continues to answer correctly.

Digital Divide. Digital divide is difference between both students who have the physical access to computers and the Internet in the home and students who do not have access to computers and the Internet in their home (Kvasny, & Payton, 2005).

Dropout Rate. Dropout rate is the percentage of all students in an entering class completing a program of study within the prescribed period of time. For this study, a dropout is an individual who, according to the school or according to the school and home, is not attending school (i.e., has not been in school for four consecutive weeks or more and is not absent due to accident or illness). Additionally, a dropout is a student who has been in school less than two weeks after a period in which he or she is classified as a dropout (McMillen, 1994).

Formative Evaluation. A formative evaluation is a study that is conducted during the operation of a program to provide information to improve the program (Mertens, 2010).

Individualized Instruction. Individualized instruction involves curriculum content, instructional materials, and activities designed for individual learning. The pace, interests, and abilities of the learner are taken into consideration.

Interactive Instruction. Interactive instruction is a teacher facilitated classroom curriculum that integrates technology, hands-on, small group, and authentic learning activities.

Learner-Centered Instruction. Learner-centered instruction involves curricula that focus on the needs and attitudes of the individual student as opposed to curricula that does not focus on the needs and attitudes of the individual student.

Predictive Analytics Software (PASW Statistics 18). "PASW Statistics 18" is a software program used for statistically analyzing data.

School Climate. School climate focuses on individual perceptions of group behavior and interpersonal interaction. There are six divisions of school climate (a) leadership qualities of the principal, (b) teacher-peer relations, (c) parent-teacher relations, (d) student-teacher interpersonal relations, (e) student-teacher instructionally related interactions, and (f) school buildings and facilities (ERIC Clearinghouse on Educational Management, 1988).

Self-efficacy. Self-efficacy is a person's belief about their ability to produce at designated levels of performance (Bandura, 1998).

Socioeconomic Status. Socioeconomic status pertains to or signifies the combination or interaction of social and economic factors. Status is the position of an individual in relation to another or others, especially in regard to social or professional standing. For this study, the socioeconomic status is below poverty line (a) if family size is one to three and family income is $10,830 or less or; b) if family size is four to six and income is $22,050 or less or; (c) if family size seven or more and income is under $33,270 (Federal Poverty Guidelines, 2010); (d) if the family receives school free or reduced lunch. The socioeconomic level is above poverty for all other cases. In this study, socioeconomic status is determined by participation in the free or reduced lunch program.

Summative Evaluation. A study used to make decisions about the continuation, revision, elimination, or merger of a program (Mertens, 2010).

Teacher-Centered Instruction. Teacher-centered instruction involves a curriculum in which each subject is treated as a largely autonomous body of knowledge. Emphasis is on the traditional subjects that have dominated United States education since the late nineteenth century, including English, history, science, and mathematics.

Technology. Technology is equipment, such as computers, calculators, televisions, overhead projectors, INFOCUS machines, SMART boards, CPS units, etc., which is used to teach in the classroom.

Traditional Classroom Setting. A traditional classroom setting is a teacher-controlled environment in which the teacher relies on the lecture method to teach the class.

Assumptions

The following assumptions guide the current study:

1. The OCCT instrument used to determine the math knowledge was validly and reliably employed with the seventh and eighth grade students.
2. The Algebra I instrument used to determine the math knowledge was validly and reliably employed with the ninth grade students.
3. The "I Can Learn" (ICL) software was valid and reliable.
4. The samples used in the study are representative of the larger populations of middle schools in similar school districts in the United States.

Limitations of the Study

1. The study has been conducted in a south western school district.
2. One Title I middle school campus (N=796) has been described in the study.

Summary

This chapter presents the “big picture” that serves as the catalyst for the summative evaluation research study. To expound on the research problem, when minority at-risk male and female students do not meet the minimum standards on standardized mathematics tests, they are remediated. Therefore, administrators need to know an effective remediation technique for at-risk male and female students.

Ramey (2000) writes that remediation programs are not successful for many at-risk male and female students. Therefore, the task for an administrator is to develop remediation programs for at-risk male and female students that improve each student’s performance on the standardized tests. As a solution, many researchers state that computer technology is a tool that facilitates successful remediation of at-risk male and female mathematics students.

Computer technology helps to eliminate the negative self-perceptions of academically at-risk male and female students. Therefore, the utilization of computer technology for mathematics remediation ensures increased academic performance for at-risk male and female students in the mathematics classroom. Also the utilization of computer technology improves job opportunities for at-risk males and females in the workforce of the United States.

Chapter Two

Literature Review

Introduction

My research study will be based at a mid-western, Title I middle school that has a high level of poverty as well as a 55% student population that has been classified as minority. As a researcher, the purpose of this chapter is to guide the reader through the complex world of a Title I school during the "No Child Left Behind" (NCLB) era. The following research studies focused on barriers and solutions to negative academic achievement for at-risk males and females who are being educated in elementary and secondary schools in both urban and rural environments.

Based on my experience as an administrator, I chose to study the complex problem that is related to negative student achievement for at-risk male and female students on standardized tests because normally the negative student achievement was not created in middle schools. In many instances, the negative achievement was initially manifest in elementary schools. Unfortunately, the negative achievement does not end in the middle schools. Finally, I studied the urban and rural perspective of negative academic achievement of at-risk male and female students as a means of discovering solutions to the extremely complex problems associated with the academic achievement of at-risk male and female students.

Therefore, to create a picture of the reality of the school in this study, the literature review began with Technology issues, NCLB and Title I research. This reader journeyed through "Achievement Gap" studies about at-risk male and female students who were students in: elementary, secondary, urban and rural schools. In addition, the dropout rate for at-risk males and females was framed along with dropout prevention strategies. For a deeper understanding of at-risk male and female students who matriculated in high-poverty schools, an investigation of the "Gender Divide" as well as science, technology, engineering, and science (STEM) research was presented. Finally, studies that effectively integrated technology into classrooms with the improved achievement of all students was introduced. In closing, many researchers have written that technology integration into content areas has caused American classrooms to evolve into successful learning environments for all students. Therefore, as a result of technology integration, at-risk male and female students have performed positively on standardized tests.

Technology Issues in Schools

Valdez and Duran (2007) stated that Caucasian Americans and Asian Americans had higher rates of both home computer and Internet use than African Americans and Hispanic Americans. Valdez and Duran (2007) found in a study that home computer use was highest for Asian Americans (71.2%) and Caucasian Americans (70.0%), followed by African Americans (55.7%) and Hispanic Americans (48.8%). Moreover, U.S.

schools mirrored the trends mentioned above in computer ownership and Internet connectivity. Overall Internet use at home and school for Hispanic American and African American children was 47.8% and 52.3% respectively, compared to Asian American (79.4%) and Caucasian American children (79.7%) who were far more likely to us the Internet (Valdez & Duran, 2007).

Judge, Puckett, and Bell (2006) the researchers studied the progress made toward equitable technology access and use over children's first four years of school. The sample consisted of 8,283 public school children who attended kindergarten, first, and third grades. In third grade, high-poverty schools had significantly more computers for instruction and a smaller ratio of children to computers than did low-poverty schools. Over the first four years of school, however, children attending low-poverty schools had significantly more access to home computers than did those attending high-poverty schools.. Children's use of computers during the third grade differed by school-poverty status. Results indicated that access to, and use of, a home computer, the presence of a computer area in classrooms, frequent use of the Internet, proficiency in computer use, and low-poverty school status were correlated positively with academic achievement (Judge, Puckett, and Bell, 2006).

Barron (2004) conducted a study that investigated participation of 98 high school seniors enrolled in AP-level calculus in technological fluency-building activities. Males and females who were classified as more experienced in technology utilized a broader range of learning resources and were more likely to learn from out-of-school classes and distributed resources such as online tutorials and reading material. Gender differences emerged with respect to participation in certain activities such as computer programming, even when controlling for overall extent of experience and an analysis of course-taking history helped explain the phenomenon. Four times as many males as females had taken a programming class. Analysis of reasons for taking courses indicated that the majority of females who chose to take programming did so with the encouragement of family members. Both confidence and interest were related to experience (Barron, 20004).

Cooper (2006) studied the evidence for the digital divide based on gender. An overview of research published in the last 20 years drew to the conclusion that females were at a disadvantage relative to men when learning about computers or learning other material with the aid of computer-assisted software. The evidence showed that the digital divide was fundamentally a problem of computer anxiety whose roots were deep in socialization patterns of boys and girls and that interacted with the stereotype of computers as toys for boys. A model of the digital divide was presented that examined gender stereotypes, attribution patterns, and stereotype threat as antecedents of computer anxiety. Computer anxiety in turn led to differences in computer attitudes and computer performance (Cooper, 2006).

Moreover, Cooper (2006) found that the design of software packages that were built to conform to the formal features of what boys like rather than what girls like and the social context of computer learning that relied on mixed-gender group learning. The effects of gender stereotypes were exacerbated by the ways in which boys and girls were taught by their parents and teachers to make attributions for success and failure at computers. Cooper (2006) reported that schools should make it possible for girls to interact with computers either in small same-sex groupings or alone.

No Child Left Behind (NCLB)

The National Longitudinal Study of No Child Left Behind (NLS-NCLB)was a report presented in 2009 by the RAND Corporation and the American Institutes for Research (AIR) under contract to the U.S. Department of Education. The study was an exploratory analyses of the effects of elements of the No Child Left Behind (NCLB) liability system on the achievement of students in influenced Title I schools. The analyses utilized school-level and student-level standardized test data from two states and three school districts. The analyses utilized a quasi-experimental regression discontinuity (RD) method to investigate whether schools that did not meet "adequate yearly progress" (AYP) or were labeled for improvement under NCLB showed subsequent improvements in student achievement (USDE, 2009).

The purpose of the analysis was to determine the usefulness of the regression discontinuity (RD) method by examining the effects of the NCLB accountability system. To summarize the key findings of the report, the quasi-experimental regression discontinuity (RD) analyses in a small number of states and districts did not find consistent effects on student achievement in schools that did not meet AYP or were identified for improvement. A few effect estimates were positive, but they were not the same across years and outcomes. None of the studies found negative effects on student achievement (USDE, 2009).

The National Assessment report (NAEP) described new data from the second round of data collection for the two studies that are the main data sources for this report: the National Longitudinal Study of No Child Left Behind (NLS-NCLB), which surveyed: (a)districts, (b) principals, (c) teachers, and (d) parents; and (e) the Study of Implementation of Accountability and Teacher Quality Under No Child Left Behind. Data were gathered in 2004-2005 and 2006-2007. NAEP trends for middle and high school students were mixed. Eighth grade students made significant gains in mathematics but not in reading or science. At the twelfth grade level, the most recent reading and science assessments (from 2005) showed no change from the preceding assessments (2002 for reading and 2000 for science) and showed significant declines from the first years (1992 for reading and 1996 for science) those assessments were administered (U.S. Department of Education NCLB [USDENCLB], 2009).

Next, the analysis focused on the implementation of individual state standardized test and accountability systems. Replacement of the school staff (12%) was the strategy employed the most by the states. "Replacement of the principal, which was not specified in the law as a restructuring strategy, was reported by forty percent of schools in restructuring status, compared with twenty-nine percent of schools in corrective action and thirteen percent of schools in Year 1 or school improvement status" (U.S. Department of Education NCLB, 2009).

Moreover, the requirements of NCLB have presented special challenges and opportunities for rural schools (Reeves, 2003). Researchers have suggested that one way rural schools may be able to overcome these challenges was through an increase in the level of technology integration in their school (Collins & Dewees, 2001). The Collins and Dewees (2001) case study reported on one school's attempt to use grant resources funded through NCLB to integrate specific instructional technologies to facilitate increased student achievement. Through interviews and observations, the roles, attitudes, and difficulties of teachers and administrators in implementing a technology initiative in a rural middle school were observed, examined and discussed (Collins & Dewees, 2001).

Brush, Cullen, Frey, Hinshaw, and Warren (2006) believed that two factors influence teacher attitude-change about technology integrations: (a) having a willingness to change, and (b) the control structure of the school environment. The emerging research themes included: (a) issues related to teacher ownership of the technology, (b) teacher feelings of power and participation, (c) differing goals of teachers and administrators, (d) technical difficulties, (e) school wide support, and (f) changes in school culture. The key findings of the study included: (a) teachers wanted to be involved in decisions about the grant and felt that they were not included in the decision making process for this grant;

(b)student-outcomes were difficult to measure in this short period of time; (c) the technology initiatives were successful in increasing teachers' comfort level when using technology for instructional purposes; and (d) this study provided evidence of a willingness to change as shown by teachers who had not used technology in the past (Brush, Cullen, Frey, Hinshaw, & Warren, 2006).

Title I

Rubenstein and Wodatch (2000) conducted a study that examined the role of Title I in eighteen secondary schools (nine intermediate and nine high schools) that served (a) disadvantaged students, (b) were engaged in comprehensive school improvement efforts, and (c) had consistently high or improving student achievement. Justification of the study came from the changes to Title I under the 1994 Improving America's Schools Act. The schools in the study reflected geographic and racial or ethnic diversity and used varied approaches to school improvement. Data were collected in three-day site visits, with interviews with administrators and instructional staff. The schools relied on three major strategies to improve and maintain the quality of teaching in their classrooms (a) to provide teachers with multiple opportunities to expand their professional expertise, (b) to institute school accountability systems that required students to demonstrate their intellectual growth, and (c) to use data collection and analysis to guide the school's decisions.

Moreover, the larger middle schools and half of the high schools created smaller learning communities to combat the impersonality of the large schools. The schools attempted (a) to engage students in the life of the school, (b) offered support services for students, and (c) made strong efforts to involve parents. For the schools in the study, Title I provided valuable academic assistance, although Title I played a limited role in supporting other aspects of school wide improvement efforts. District Title I coordinators exerted minimal control over the schools' use of Title I resources (Rubenstein, & Wodatch, 2000).

The U.S. Department of Education (2001) employed a longitudinal Evaluation of School Change and Performance to follow the progress of students in high-poverty schools as they moved from third to fifth grade, investigating the impact on student achievement of specific classroom practices fostered by school, district, and state level policies. This analysis, conducted between the years of 1996-1999 as part of the National Assessment of Title I, tested the effects of changes in curriculum and instruction recommended by advocates of standards-based reform. It used data from (a) standardized achievement tests, (b) teacher surveys, (c) district administrator and principal surveys, (d) focus groups of school staff and parents, (e) classroom observations, (f) state and district policy statements, and (g) student records

Nevertheless, where poverty was at least fifty percent, the school could have used Title I funds for school wide improvements, which would benefit the at-risk student population. Poverty negatively influenced students' performance. Students made greater gains in reading and mathematics when teachers rated highly their own professional development in reading and mathematics. Low-achieving students made faster gains in reading and mathematics when third grade teachers actively reached out to their parents. Implementing reforms that involved more student-initiated activities and more complicated assignments in mathematics had a positive effect on student achievement (Department of Education in Washington, D.C. [DEWDC], 2001).

The best circumstances for mathematics gains were the following: (a) relatively higher amounts of exploration in instruction (b) a teacher who believed he or she had more to learn in mathematics instruction, and (c) higher teacher rating of professional development. In contrast, students whose fifth grade teachers spent significant time engaged in very basic reading instruction made fewer gains than students whose teachers spent only average amounts of time in very basic instruction. More challenging curriculum and instruction were associated, in general, with greater student gains in both subjects. All these instructional conditions combined to help lessen the serious negative effects of poverty, at both the student and school levels, on achievement (DEWDC, 2001).

Summary of NCLB and Title I

It is imperative for the reader to comprehend the federal legislation that dominates the curricular changes on this campus. NCLB puts in place a complex accountability system for Title I schools. However, to gauge the effectiveness of NCLB, a national longitudinal study was conducted. From the research the U.S. Department of education determines that some of the programs are effective.

Further, the U.S. Department of Education produced a study that deals with the implementation of NCLB by Title I schools. First, for eighth grade students, significant gains were made on the NAEP in mathematics. Second, the most frequently reported restructuring intervention was replacement of all or most of the school staff. Finally, teachers in schools identified for improvement reported more often that they participated in professional development that focused on reading and mathematics.

Challenges were created by NCLB. Researchers have suggested that rural schools may be able to overcome the challenges with an increased level of technology integration. However, effective computer integration is necessary to cause a change in the schools. Teachers are mentioned as the key factor to successful technology integration. Brush, Cullen, Frey, Hinshaw, and Warren (2006) believe that two factors influenced teacher attitude-change about technology integrations: (a) having a willingness to change, and (b) the control structure of the school environment.

Additionally, in Title I schools, poverty negatively influences students' performance. Students make greater gains in reading and mathematics when teachers rated highly their professional development in reading and mathematics. Low-achieving students make faster gains in reading and mathematics when their teachers actively reach out to the students' parents.

The next sections deal with the following question: What happens to some low-achieving students who do not improve their academic performance? I am interested in the previous question because this research study involves a campus that has eighty percent of the students on free or reduced lunch. Consequently, the academic remediation of at-risk male and female students requires an understanding of many concepts.

Achievement Gaps

Cronin, Hauser, Houser, Kingsbury, and McCall (2006) stated, "the difference between the academic performance of poor students and wealthier students and between minority students and their non-minority peers was commonly known as the achievement gap." The study investigated the achievement gap by measuring student achievement and student growth along a continuous, cross-grade measurement scale, using a large sample of students from many school districts across the United States. The research design consisted of three research studies: (a) Study #1, an investigation of overall status and growth using mean scale scores and scale score differences for one year; (b) Study #2, analysis of the overall status and growth using a multilevel model for two years with multiple tests; and (c) Study #3, presented an examination of scale score status and growth by score point.

Further, Cronin, Hauser, Houser, Kingsbury, and McCall (2006) found that reading and math scores across the third and eighth graders yielded the following results:

(a)an achievement gap existed between Caucasian American students and African American students in each grade and subject studied; (b) an achievement gap existed between Caucasian American students and Hispanic American students in each grade and subject studied; (c) an achievement gap existed between students in low-poverty schools and those in high-poverty schools; (d) achievement gaps existed among Caucasian American students, Hispanic American students, and African American students in schools with similar levels of poverty; (e) in mathematics, students enrolled in high-poverty schools grew less academically during the school year than students enrolled in low-poverty schools; (f) African American students grew less academically during the school year than students in other groups and this difference was more noticeable in mathematics than in reading; (g) low-performing students in all groups continued to grow during summer months, but African American students, Hispanic American students, and students enrolled in high-poverty schools grew less; (h) high-performing students lost achievement during the summer months, and African American students and Hispanic American students lost more achievement than similar Caucasian American students; and (i) high-performing students enrolled in high-poverty schools lost more achievement during the summer than similar students who were enrolled in low-poverty schools (Cronin, Hauser, Houser, Kingsbury, & McCall, 2006).

Ramey (2000) wrote, "It is well documented that there continues to be a gap between white and nonwhite student achievement" (p. 3). Ramey (2000) employed a study that developed and tested a measure of Caucasian American and minority student achievement gap reduction. The ultimate purpose of the study was to measure, as the dependent variable in a qualitative study what worked in reducing the achievement gap. The strategy used was to propose a measure of gap reduction, examine its properties, use gap reduction to identify classrooms that appeared successful in reducing the gap, and to study these classrooms in an attempt to identify key characteristics (Ramey, 2000).

As a result, data were supplied by the Seattle School District; its 1999-2000 enrollment was approximately 47,000 students, of which 23% identified themselves as African American. The study focused on students who were in the fourth grade in 1998-1999. The measure of gap reduction appeared adequate to the task of identifying classrooms that narrow the test score gap between minority and Caucasian American children. The variance in the measure that was attributable to classrooms was large (Ramey, 2000).

The study concluded that gap reduction depended mostly on classroom factors, as distinct from characteristics of the student. Moreover, the composite classroom gap reduction index correlated highly with a measure of overall classroom achievement growth. Correlation size suggested that success in reducing the gap tended to occur with success in increasing achievement overall (Ramey, 2000).

Beglau (2005) presented the third annual report on the impact of the enhancing Missouri's Instructional Networked Teaching Strategies (eMINTS) program with a focus of student performance on the Missouri Assessment Program (MAP) tests. The eMINTS instructional model of inquiry-based teaching, combined with multimedia tools in the classroom was examined in the research study. The report analyzed MAP test results from the thirty-nine schools that participated in the FY02 cohort. The analysis reported the observed MAP score differences between eMINTS and non-eMINTS students in the 2002-2003 school years (Beglau, 2005).

Finally, a summary of the eMINTS data concluded that enrollment in an eMINTS classroom improved performance on the MAP achievement examinations for both African American and Caucasian American students as well as decreased the achievement gap and that the average performance of African American students enrolled in eMINTS classrooms in the FY01 and FY02 cohorts was considerably higher across all subject areas than the average performance of African American students not enrolled. The results for African American students in the FY00 cohort were mixed. In the FY01 cohort, those differences in average total MAP score ranged from 7.6 points higher in communication arts to 19.6 point in mathematics, and in the FY02 cohort, they ranged from about twelve to thirteen points higher depending on the subject area that was tested. Also, these differences were seen for all students, including low income students and for special education students. Finally, there were significant improvements for students who were enrolled in Title I schools (Beglau, 2005).

Dropouts

Balfanz and Legters (2004), along with the Center for Research on the Education of Students Placed At-Risk (CRESPAR), had a mission to conduct the research, development, evaluation, and dissemination needed to transform schooling for students placed a- risk. The Center for Research on the education of Students Placed At-Risk (CRESPAR), organized as a partnership of John Hopkins University and Howard University, was one of twelve national research and development centers supported by a grant for the Institute of Education Sciences (IES). The work of the CRESPAR was steered by three concepts: (a) ensuring the success of all students at key development point, (b) building on students' personal and cultural assets, (c) scaling up effective programs, and (d) conducting research and development programs in the areas of early and elementary studies, middle and high school studies school, family, and community partnerships; and systemic supports for school reform, as well as a program of institutional activities (Balfanz, & Legters, 2004).

Analyses in this study were based on data drawn from the National Center for Educational Statistics' (NCES) Common Core of Data (CCD). In an initial analysis of the data, the researchers focused on two cohorts of high school students—the classes of 1993 and 1996—with a focus on high schools in the thirty-five largest metropolitan areas in the United States. An additional study added the class of 1999 as a third cohort and included an extended analysis on high schools in nearly one hundred of the largest metropolitan areas. Recently, this study added the class of 2002 to bring the analyses up to date (Balfanz, & Legters, 2004).

Additionally, Balfanz and Legters (2004) created promoting power variables, which addressed a school's ability to graduate students by calculating the ratio of twelfth grade enrollment in 1992 and 1993 to ninth grade enrollment in 1989 and 1990, twelfth grade enrollment in 1995 and 1996 to ninth grade enrollment in 1992 and 1993, twelfth grade enrollment in 1998 and 1999 to ninth grade enrollment in 1995 and 1996, and twelfth grade enrollment in 2001 and 2002 to ninth grade enrollment in 1998 and 1999. For ten to twelve schools, the researchers calculated the ratio of twelfth grade enrollment in 1992 and 1993 to tenth grade enrollment in 1990 and 1991, twelfth grade enrollment in 1995 and 1996 to tenth grade enrollment in 1993 and 1994, twelfth grade enrollment in 1998 and 1999 to tenth grade enrollment in 1996 and 1997, and twelfth grade enrollment in 2001 and 2002 to tenth grade enrollment in 1999 and 2000. Variables for school size, location, and student enrollment by race/ethnicity and by gender were drawn directly for the Common Core data files.

Moreover, proportions of students of various races/ethnicities in the total enrollment were calculated by dividing the enrollment of a given ethnic group (Native American, Asia American, Hispanic American, African American, or Caucasian American) into the total school enrollment. An additional variable for total school minority concentration was also calculated from the data using the proportion of Native

American, Asian American, Hispanic American, or African American students in the total enrollment. The data used in calculating additional variables and in analysis were taken from the final (twelfth grade) year of each cohort (Balfanz, & Legters, 2004).

There were about two thousand high schools in the United States where graduation was not the norm. These were high schools in which the senior class routinely shrank to sixty percent or less, often much less, of the freshman class that had entered four years earlier. These high schools were located throughout the nation but were concentrated in about fifty large cities and fifteen primarily southern and southwestern states. High schools with weak promoting power were overwhelmingly attended by minority students. Outside of the rural South, it was rare to find Caucasian American students in large numbers attending high schools with the high dropout and low graduation rates signaled by weak promoting power (Balfanz, & Legters, 2004).

In addition, strategies to deal with the weak promotion power were diverse. For example, the strategy that was useful in Detroit might not be beneficial in rural South Carolina. In fact, the data in the research study suggested that three different strategies might be needed. First, a district strategy must be created for cities in which half or more of the students attended a high school with weak promoting power. Second, a state solution must be found for southern and southwestern states where weak promoting power schools existed though out the state. Finally, a school-level intervention plan for states and school districts in which weak promoting power schools were present, but were not the norm, was necessary (Balfanz, & Legters, 2004).

Further, the middle school relationship to a weak promoting power for the high school could not be over looked. "Every high school with weak promoting power was fed by one or more low-performing middle schools" (Balfanz, & Legters, 2004). The major reason students repeated the ninth grade and entered the dropout track was that they failed too many ninth grade courses. Ninth grade course failure, in turn, was in good part driven by students' lack of intermediate academic skills, weak reading comprehension and fluency abilities, and underdeveloped mathematical knowledge. The connection between a poor middle school education and weak promoting power high schools was seen in the fact that the very areas which had the highest concentration of weak promoting power high schools, the urban North and the South, were also the areas with the lowest eighth-grade National Assessment of Educational Progress (NAEP) scores, particularly among minorities. Finally, the weak promoting power allowed the researchers to identify the number and location of the high schools that produced the bulk of the United State's dropouts (Balfanz & Legters, 2004).

Davis (2006) wrote that the intersection of racial and gender identities was important in understanding the processes of school engagement. Each year hundreds of thousands of students have left school without completing their education or acquiring adequate job skills. Conservative estimates indicated that nearly four million youth aged eighteen to twenty-four have dropped out of high school. For African American youth in major urban areas, these dropout figures surpass fifty percent, and in some urban districts the dropout rate is more than seventh percent.

According to Davis (2006) the new information economy required new technical skills that were often denied to inner-city students trapped in factory-model schools that were unable to compete with the postindustrial global economy. High school dropouts had trouble finding and keeping a job, had lower projected future income, and had lower occupational expectations. For example, high school dropouts were four times more likely that high school graduates to be arrested, and 82% of the adult prison population never finished high school.

Davis' article (2006) focused on explaining race and cultural differences in educational attainment, achievement and experience. By examining how African American male students construct meanings of masculinity, a realistic and complex path of schooling was captured. Using qualitative data from a group of African American male high-school dropouts who participated in a national alternative high school program, the researcher highlighted the means associated with racial and gender identities as well as the consequence for schooling experiences and outcomes (Davis, 2006).

As a result of research, the data for Davis (2006) was drawn from a larger national study of former "Youthbuild" participants at various sites nationally. "YouthBuild" was a program that offered job training, education, and life skills assistance to dropouts at one hundred and forty-five sites in cities and rural areas around the United States. For the research study, data were collected from audio-taped interviews that lasted between one and two hours (Davis, 2006).

Based only on those interviews, a total of twenty-four African American males were included in the larger study and data for this paper. All interviews with African American males were transcribed and coded, resulting in about four hundred pages of text. The conclusion for the study was that the number of African American males placed at-risk of school failure was predicted to increase in coming years, not decline (Davis, 2006).

Dropout Prevention

Franklin, Kim, Streeter, and Tripoli (2007) conducted a study that evaluated the effectiveness of a solution-focused, alternative school in preventing students from dropping out of high school. Eight characteristics that are possessed by a solution-focused alternative school (SFAS) follow (a) faculty emphasis on building students' strengths, (b) attention given to individual relationships and progress of the students, (c) emphasis on the students' choices and personal responsibility, (d) overall commitment to achievement and hard work, (e) trust in students' evaluations, (f) focus on students' future success instead of past difficulties, (g) celebration of small steps toward success, and (h) reliance on goal-setting activities.

Students who dropped out of high school were more likely to be (a) depressed, (b) feel alienated, (c) join gangs, (d) use drugs, and alcohol, (e) engage in violent behaviors, and (f) end up in prison. Next, students who drop out have higher rates of unemployment, and when employed they tend to have lower salaries. Finally, high school dropouts existed across all socioeconomic groups (Franklin, Kim, Streeter, & Tripoli, 2007).

Consequently, all programs in SFAS were designed the four characteristics (a) nonthreatening environment for learning, (b) caring and committed staff who accepted personal responsibility for students' success, (c) school culture that encouraged staff risk taking, self-governance, and professional collegiality, and (d) low student-teacher ratio and a small class size to promote student encouragement. In this study, a quasi-experimental, pretest-posttest group design was used with eighty-five students to examine differences in credits earned, attendance, and graduation rates. Follow-up data on students in the experimental group were also obtained to track their postsecondary education decisions (Franklin, Kim, Streeter, & Tripoli, 2007).

A chi-square analysis on demographic characteristics was used to assess the comparability between the SFAS students and the comparison regular high school students. There were no statistically significant differences between the experimental group and the comparison group on any of the variables. In addition, t-tests were performed on two variables, age and grade level, to further assess similarities or differences between the two groups. The t- test results were also not significant, providing evidence that there were no statistically significant differences between the experimental group and the comparison group regarding demographic variables. Also, results demonstrated that students in the experimental group earned significantly more credits over time than students from the comparison group (Franklin, Kim, Streeter, & Tripoli, 2007).

Since 1982, studies have shown statistical evidence that career and technical education (CTE) could have reduced the number of high school dropouts, especially among students who were at high risk of dropping out. Case studies at several “High Schools That Work” sites showed improvement in retention and graduation at the same time that academic achievement and graduation requirements were increased (Wonacott, 2002). Strong evidence that CTE helped reduce dropout rates also came from studies of career academics (Wonacott, 2002).

In particular, statistical evidence seemed strongest when CTE involved an emphasis on learning both academic and CTE knowledge and skills. For some time there has been statistical evidence that CTE could play a role in reducing dropout rates. Data were analyzed from the New Youth cohort of the National Longitudinal Surveys of Labor Force Behavior and found a very small (about 0.1 percent) but statistically significant effect of vocational education in reducing the likelihood of dropping out, particularly for at-risk students (Wonacott, 2002).

Summary of Gaps, Dropouts and Dropout Prevention

Before the dropout problem could be totally understood, achievement gaps had to be discussed. A difference between the academic performance of poor students and wealthier students and between minority students and their non-minority peers was commonly known as the achievement gap. To reduce the achievement gaps, the individual classroom had to be examined. Additionally, Missouri's Instructional Networked Teaching Strategies (eMINTS) research study found that the achievement gaps on a standardized test reduced for all students with the effective integration of technology into the classroom environment.

To examine the dropout crisis, each year hundreds of thousands of students left school, without completing their education or acquiring job skills. For African American youth in major urban areas these dropout figures surpassed 50% and in some urban districts the dropout rate was more than 70%.

Further, there were about two thousand high schools in the United States where graduation is not the norm. These high schools were located throughout the nation, but were concentrated in about fifty large cities and fifteen primarily southern and southwestern states. High schools with weak promoting power were overwhelmingly attended by minority students (Balfanz, & Legters, 2004).

Moreover, every high school with weak promoting power was fed by one or more low-performing middle schools. The major reason, students repeated the ninth grade and entered the dropout tract was that they fail too many ninth grade courses. Ninth grade course failure, in turn, was driven by students' lack of intermediate academic skills, weak reading comprehension and fluency abilities, and underdeveloped mathematical knowledge (Balfanz, & Legters, 2004).

Dropout prevention was mentioned in the form of two programs. First, a solution-focused alternative school (SFAS) was presented (Franklin, Kim, Streeter, & Tripoli, 2007). Second, career and technical education (CTE) was addressed (Wonacott, 2002). Both of the programs were successful with reduction the dropout rate of students.

Gender Gap or Divide

Johnson (2000) stated that the gap between males and females in mathematics achievement and overall mathematics attitude had lessened. However, Johnson (2000) wrote that female participation in advanced mathematics courses as well as advanced mathematics achievement had not improved. Therefore, Johnson (2000) conducted a research study that examined the relationship of Productivity Factors with mathematics achievement in testing and coursework for eleven thousand four hundred and fourteen eighth grade female students. The Productivity Factors included (a) achievement and attitude, (b) the effects of student aptitude, (c) instruction, and (d) the learning environment. Multiple and logistic regression analyses were employed to focus on the relationship of the Productivity Factors with mathematics achievement (Johnson, 2000).

In conclusion, Johnson (2000) found that an advanced mathematics achievement gap existed. Johnson (2000) stated that one strategy to increase the numbers of females in mathematics involved positively influencing the females in elementary and middle school. Additionally, the researcher stated that the removal of gender bias from the classroom and home had to be addressed as a means of positively swaying the females to advanced mathematical professions (Johnson, 2000).

Shotick and Stephens (2006) conducted an inquiry that investigated the impact of growing technology use on gender disparity. The researchers used the social cognitive theory to create methodology of self-efficacy reporting. Shotick and Stephens (2006) provided an analysis of gender differences in computing self-efficacy. The skills to be analyzed for gender self-efficacy were technology skills that were used in the modern business world (Shotick & Stephens, 2006).

Prior to the inquiry, Shotick and Stephens (2006) found significant proof of the existence of gender differences in (a) interest, (b) beliefs, (c) access to computers, (d) utilization of computers, and (e) learning experiences in schools. The researchers discovered that the male and female gap was manifested during middle school and continued through college. Also, the gap was found in the business world for females (Shotick & Stephens, 2006). Shotick and Stephens (2006) found that females had a preference for using pre-existing computer languages rather than developing new computer language systems (Shotick & Stephens, 2006).

For Shotick and Stephens (2006), the inquiry results confirmed the existence of a gender gap with computer use. The researchers used a variance t- test to estimate the significant gender differences in students' personal perceptions of their ability to use various software packages or technology. With more technical and mathematics related experimental tasks, females rated their level of confidence significantly lower than males.

Further, the Center on Education Policy (2009) analyzed data on the academic achievement of male and female students in Oklahoma. The data represented the achievement of male and female students in the fourth through eighth grades. The state of Oklahoma showed a noticeable trend of gains in mathematics at all grade levels for both male and female students except in the advanced level on the standardized assessments. At the advanced level, male students demonstrated a pattern of more gains in academic achievement (Center on Education Policy, 2009).

Summary of Gender Gap

A gender gap or divide existed for female students in academic achievement and advanced mathematics coursework as well as professions that required advanced mathematics knowledge. In comparison to males, the gap in lower level mathematics coursework and assessments had been lessened for females. However, females were underrepresented in professions that required the advanced use of mathematics (Johnson, 2000; Shotick & Stephens, 2006; & Center on Education Policy, 2009).

Johnson (2000) stated that the Productivity Factors could be used to investigate the gender gap or divide. Productivity Factors included (a) achievement and attitude, (b) the effects of student aptitude, (c) instruction, and (d) the learning environment. Johnson (2000) suggested increasing the advanced mathematics participation of females by positively swaying the students toward mathematics in elementary and middle/junior high school. Additionally, Johnson (2000) emphasized the need to remove gender bias from the classroom and home environment of the female students.

Finally, Shotick and Stephens (2006) analyzed the gender differences in computing self-efficacy. The skills to be analyzed by computing female self-efficacy were technology skills that were used in the modern business world. The researchers found significant proof of the existence of gender differences in (a) interest, (b) beliefs, (c) access to computers, (d) utilization of computers, and (e) learning experiences in classrooms.

As a transitional question to the next sections in the literature review, Why do schools have problems integrating technology into classrooms? From research studies, technology has been mentioned as an equalizer for the effects of poverty, gender and ethnicity. However, technology integration has not improved very much in the last ten years.

Technology Integration

Lowther, Inan, Strahl, and Ross (2008) created a research study to gauge the effectiveness of Tennessee EdTech Launch (TnETL), a statewide technology program designed to meet the No Child Left Behind (NCLB) mandate, was investigated in this matched treatment-control quasi-experimental study. The federal government addressed technology issues by enacting the Enhancing Teaching Through Technology (ETTT) initiative as Title-II-D of the No Child Left Behind (NCLB) Act of 2001. The Tennessee EdTech Launch (TnETL) was an ETTT funded initiative. Teacher-level and school-level quantitative data were analyzed by utilizing multivariate analysis of variance (MANOVA) to determine program effects.

Further, student outcomes on Tennessee Comprehensive Assessment Program (TCAP) were analyzed by using a one-way MANOVA. The goal of the program was to provide full-time, on-site technology coaches to prepare teachers to create lessons that engaged students in critical thinking and use of computers as tools in order to increase learning. The study examined TnETL impact on student achievement, teachers' skills and attitudes toward technology integration; use of research-based practices; and students' skills in using technology as a tool (Inan, Lowther, Ross, & Strahl, 2008).

The study was implemented in two cohorts, "Launches" 1 and 2. This paper presented the findings of Launch 1, a three-year program that involved twenty-six schools, twelve thousand four hundred and twenty students and nine hundred and twenty-seven teachers. The key barriers that inhibited successful technology integration were considered. Those key barriers follow (a) availability and access to computers, (b) availability of curriculum materials, (c) teachers' beliefs, (d) teachers' technological and content knowledge, and (e) technical, administrative, and peer support. (Inan, Lowther, Ross, & Strahl, 2008).

Moreover, program effectiveness was measured via direct classroom observations, surveys, student performance assessments, focus groups, and student achievement analysis. Survey results showed that program teachers had significantly higher confidence to integrate technology and in using technology for learning. Observation results revealed that program compared with control students more frequently used computers as tools, worked in centers, and engaged in research and project-based learning. Although the TnETL program demonstrated progress in changing school culture to benefit students through the use of technology, student gains on high-stakes tests were mixed. The implications of the results were discussed relative to implementation successes and barriers, sustainability prospects, and the observed impacts of technology integration on teaching and student learning (Inan, Lowther, Ross, & Strahl, 2008).

The Will, Skill, Tool (WST) model of technology integration postulated that enhancing an educator's will, skill, and access to technology tools lead to higher stages of classroom technology integration, which in turn lead to greater student achievement. While the effectiveness of the teaching and learning process has long been recognized as a complicated issue, technology added another dimension to the assessment of elements that were contributing factors to a student's quality of education. A new model for integrating technology into the classroom was presented along with analysis showing that technology investment could contribute to student achievement (Christensen, Knezek, & Fluke, 2003).

Also, the model includes three key elements for successful integration of technology (a) Will or attitude of the teacher, (b) Skill or technology competency, and (c) Technology Tools, which deals with the access of the teacher to technology tools. The research study utilized regression analyses and structural equation modeling techniques for a variety of data sets from Texas public schools in order to test combinations of observed variables that optimized the WST model fit statistics. Data sets were (a) survey responses of thirty-nine teachers in a metropolitan area, (b) data from one hundred public school districts about funding and student achievement, (c) data about integration of technology from twelve teachers and their one hundred and seventy first and second grade students, (d) technology integration data from the same twelve teachers, and (e) data from one thousand two hundred and seven kindergarten through twelfth grade teachers about classroom technology integration. The analyzed data sets supported the use of the WST model (Christensen, Knezek, & Fluke, 2003).

Finally, two self-report measures of technology integration were introduced along with a formal model illustrating their utility as outcome measures for level of technology integration in classroom environments. Findings from two Texas studies involving more than five hundred teachers from a large metropolitan school district, and technology expenditures from a random sample of one hundred Texas school districts illustrate that (a)technology integration as measured by stage of adoption could be predicted with high accuracy based on secondary school teachers' self-reported will, skill, and access to technology tools; (b) higher classroom technology integration as measured by Concerns-Based Adoption Model Level of Use was positively associated with higher average elementary school classroom scores in Iowa Test of Basic Skills vocabulary, reading, and writing; and (c) average school district Scholastic Aptitude Test scores can be reasonable well predicted based on knowledge of district level technology expenditures. Several years of classroom computer usage was necessary to produce measurable results on standardized achievement tests. Also, research cited in this paper indicated that not every educator was best served by training aimed at some arbitrary level, and differentiated training was necessary to train each one of the teachers. Teacher professional development became more target-focused if instruments were used to pretest and entire campus before the training began (Christensen, Griffin, & Knezek, 2001).

Sanchez (2007) stated, "Students need programs and instructional approaches that will help them grow in their ability to use mathematics to make sense of their world." Therefore, Sanchez (2007) created a research study to prove that students exposed to computer literacy performed better on math tests than students who were not exposed to computer literacy. This research described the Teaching and Learning Informational Technology Process (TLITP). The research study discussed the way that new ideas and concepts aid students with their mastery of math concepts.

Further, Sanchez (2007) wrote that the research study would help students to become more math literate as well as investigate the affects computer usage had on achievement in mathematics. The research procedures used provided surveys to five high schools, two junior high schools and two community school programs. Charted percentages were discussed to analyze the number of student answer patterns. After contrasting similar information, the data were collected and compiled. The final results of the research were based on given information verses national averages.

In conclusion, technology enhanced student's achievement on the Math Regents Exams despite the pressure of NCLB. Effective technology usage in the classroom led to individualized learning that put less emphasis on large-group instruction. While they used technology, students worked in small groups or individually. As students spent more time learning with the computers teachers became facilitators. The students were engaged in hands-on research (Sanchez, 2007).

Blume, Garcia, Mullinax, and Vogel (2001) created research that described the effect of integrating math and science as well as technology to bridge the gap in academic achievement for all students. The targeted population consisted of primary and secondary students in a diverse, blue-collar, rural community located in northeast central Illinois. The problem of low test scores and errors on assignments in mathematics was evident and documented through daily work, student portfolios, and teacher generated tests.

Moreover, analysis of probable cause data revealed that low student achievement in math skills was evident in the daily work, portfolios of students, and tests by teachers. Students were not motivated to learn math and science skills in a traditional classroom setting. Teaching strategies utilized (a) technology, (b) thematic units, and (c) an integrated math and science course in order to make learning relevant to the students (Blume, Garcia, Mullinax, & Vogel, 2001).

Further, a review of solution strategies such as literary articles, surveys, and an analysis of the problem setting resulted in (a) the creation of an integrated math and science course, (b) the utilization of thematic units, and (c) increased usage of technology. These strategies were implemented to improve student motivation and achievement. Post intervention data strengthened mathematical computation skills, increased problem solving skills, and increased student interest (Blume, Garcia, Mullinax, & Vogel, 2001).

The possible reasoning for the overall progress in math and science might have been related to the real life situations that were brought into the classroom in order to reinforce mathematics and science. Students learned about insulation, forces, and acceleration through situations that related to them. In addition to the relevance of the content, technology allowed the students to learn by way of circumstances that were unique to them (Blume, Garcia, Mullinax, & Vogel, 2001).

Summary of Technology Integration

The key barriers that inhibit successful technology integration were considered. First, Lowther, Inan, Stranl, and Ross (2008) stated that the key barriers were (a) availability and access to computers, (b) availability of curriculum materials, (c) teachers' beliefs, (d) teachers' technical, administrative, and peer support. Second, Christensen, Knezek, and Fluke (2003) wrote that three key elements for successful integration of technology included (a) will or attitude of the teacher, (b) skill of technology competency, and (c) technology tools, which dealt with the access of the teacher to technology tools.

As a result, Christensen, Griffin, & Knezek (2001) found that: (a) technology integration as measured by stage of adoption was predicted with high accuracy based on secondary school teachers' self-reported will, skill, and access to technology tools; (b) higher classroom technology integration as measured by Concerns-Based Adoption Model Level of Use is positively associated with higher average scores on the Iowa Basic Skills Test; and (c) average school district scholastic aptitude test scores are predicted based on knowledge of district level of technology expenditures. Finally, the research indicated that not every educator was best served by "one size fits all" professional development.

However, technology use did improve student achievement. First, technology enhanced students' achievement on the Math Regents Exams despite the pressure of

NCLB. Second, Blume, Garcia, Mullinax, and Vogel (2001) determined through research that integrating math and science as well as technology to bridge the gap in academic achievement for all students created a positive effect.

Literature Review Summary

The mid-western Title I middle school in my research study had 73% of the student population who are at-risk. In the student population, 55% are classified as minorities. According to Valadez and Duran (2007, February/March), overall Internet use at home and school for Hispanic American and African American children was 47.8% and 52.3% respectively, compared to Asian American (79.4%) and Caucasian American children (79.7%). Additionally, research indicated that access to, and use of, a home computer, the presence of a computer area in classrooms, frequent use of the Internet, proficiency in computer use, and low-poverty school status were correlated positively with academic achievement (Judge, Puckett, and Bell, 2006). Finally, the digital divide did exist (Barron, 2004; & Cooper, 2006).

As stated previously, in Title I schools, poverty negatively influenced students' performance. Students made greater gains in reading and mathematics when teachers rated highly their own professional development in reading and mathematics. Low-achieving students made faster academic gains in reading and mathematics when their teachers had a relationship with the students' parents.

Some low-achieving students became participants in the dropout crisis. Each year hundreds of thousands of students left school, without completing their education or acquiring job skills. For African American youth in major urban areas these dropout figures surpassed 50% and in some urban districts the dropout rate was more than 70%.

Moreover, every high school with weak promoting power was fed by one or more low-performing middle schools. The major reason, students repeated the ninth grade and entered the dropout tract when they failed too many ninth grade courses. Ninth grade course failure was driven by students' lack of intermediate academic skills, weak reading comprehension and fluency abilities as well as underdeveloped mathematical knowledge.

Nevertheless, technology use did improve student achievement. First, technology enhanced students' achievement on the Math Regents Exams despite the pressure of NCLB. Second, research determined that integrating math and science along with technology helped to bridge the gap in academic achievement for all students.

Consequently, the key barriers that inhibited successful technology integration were considered. First, the key barriers were (a) availability and access to computers, (b) availability of curriculum materials, (c) teachers' beliefs, (d) teachers' technical, administrative, and peer support. Second, the key elements of successful integration of technology followed (a) will or attitude of the teacher, (b) skill of technology competency, and (c) access to technology tools.

Finally, chapter one included an introduction to the study, background of the problem, problem, purpose of the study, significance of the study, research hypotheses, the study design, the definition of terms, the assumptions of the study, and the delimitations of the study. Chapter two consisted of a review of the related literature and research. Chapter three described the methodology and procedures used in designing and conducting this study. Chapter four presented the results of the study in the context of the research questions. Chapter five reported the conclusions that were taken from this study as well as suggested recommendations for future research.

Chapter Three
Design

Purpose of the Study

The purpose of this *ex post facto*, summative study was to evaluate of the effectiveness of classroom-embedded, individualistic, computer-based learning for middle school students placed at academic risk in schools with a high proportion of Title I eligible students. Data were mined from existing school district databases, supplemented by a follow up analysis with pre-existing surveys and interview data to explore the quantitative results in more depth. Quantitative research questions addressed the comparison of the seventh and eighth grade ICL and Fundamentals of Mathematics students' OCCT and EOI scores at a Title I middle school (Creswell, 2003).

Mertens (2010) defines evaluation as "an applied research process for collecting and synthesizing evidence that culminates in conclusions about the state of affairs, value, merit, worth, significance, or quality of a program, product, person, policy, proposal, or plan." The value concept separates evaluation from other types of research (Mertens, 2010). The format for evaluation research is either formative or summative (Mertens, 2010). A conclusion made in evaluations deals with whether or not something exists and has value (Mertens, 2010). In this research study, an *ex post facto*, summative evaluation will be made about the possible effects of embedded individualistic, computer-based learning on the standardized test scores of academically at-risk male and female students in a Title I school.

Problem

When male and female students do not meet the minimum standards on standardized tests, they are remediated. Presently, state revenues are used to create remediation programs for the academically at-risk male and female students. Unfortunately, there are researchers who support all technology integration into the classroom as well as researchers who question the effectiveness of technology integration into the classroom. Therefore, administrators have a difficult task of discerning how to both successfully and cost effectively integrate technology into their individual campus culture.

For example, disadvantaged and at-risk students commonly have not been successful at learning the basic skills of reading, writing, and math as well as strong critical-thinking andproblem solving skills (Bialo & Sivin, 1992; Ramey, 2000). Remedial classes have only added to the failure of at-risk students in the basic skill areas (Bialo & Sivin, 1992; Ramey, 2000). Moreover, Sanchez (2007) states that ranging from lack of academic achievement to decreased employment opportunities, technology just widens the gap between (a) the socioeconomic classes, (b) gender educational experiences, and (c) racial inequities (Warren-Sams, 1997, & Sanchez, 2007). Further, "persistent gaps remain between different racial and ethnic groups, people with and without disabilities, single and dual parent families, the old and the young, and people with different levels of income" (Digital Divide, 2010, p. 3). Finally, Bauer (2000) states that technology has created a digital divide or inequities (Bauer, 2000, p. 15).

Conversely, computer technology is especially useful as a learning tool for basic skills and problem-solving methods due to several inherent features (Inan, Lowther, Ross, & Strahl, 2008). These features include interactivity, immediate feedback, development of problem solving ability, and individualized learning activities. Also, computer use lessons the public embarrassment of students (Inan, Lowther, Ross, & Strahl, 2008). Consequently, these researchers believe that the integration of technology helps to eliminate the negative self-perceptions that create barriers to the education of academically at-risk male and female students.

Moreover, several studies have determined the effects of computer-based instruction on at-risk student learning and attitudes. At-risk students who have an opportunity to support their learning through the use of computers learn more, do better on tests, attend school more, and receive better grades than students who do not have that opportunity to use computers (Bangert-Drowns, 1993; Kulik & Kulik, 1989; Kulik & Kulik, 1994; Kaufman, 1994; McCoy, 1995; Niemiec & Walberg, 1992; Blume, Garcia, Mullinax, & Vogel, 2001; Beglau, 2005; Inan, Lowther, Ross, & Strahl, 2008; & Critical Issue, 2010). Student motivation and self-esteem are enhanced through the inclusion of computers in an educational setting (Emmett, 1983; Ploeger, 1993; Beglau, 2005). According to Beglau (2005), when used properly, technology leads to gains in academic achievement and possibly influences the social environment of the school, reduces absenteeism and increases morale of at-risk students (Kaufman, 1992). Finally, the previously mentioned researchers state that technology helps to eliminate the negative self-perceptions that create barriers to the education of academically at-risk male and female students.

Research Questions

My interest in improved middle school students' academic achievement has led me to the following research questions: (a) What were the effects of participation in classroom-embedded, individualistic, computer-based learning activities by minority middle school male and female students placed at-risk in schools with a high proportion of students who are eligible for Title I? (b) How did the effectiveness of the classroom-embedded, individualistic, computer-based learning activities compare to interactive learning activities for students placed at-risk?

Setting

This study was conducted in the fourth largest metropolitan area in a mid-western state with a total population of more than 90,000. The main industry is the military base, followed by the a Tire and Rubber Company. In the 2000 census, the average income was $40, 790. In 2009, the ethnic characteristics of the city were 46% Caucasian American, 32% African American, 8% Native American, 12% Hispanic American, and 2% Asian American (Appendix A). In terms of education, 14% of the adult community had less than twelfth grade education, 60% had a high school diploma without a college degree, and 26% had a college degree (Public Schools [PS], 2009).

The Title I middle school in the research study has a one hundred year-legacy. In February 1997, the middle school was added to the National Register of Historic Places. Because student and faculty safety became a concern for the community, voters approved a 1999 bond issue to allow construction of a new building (PS, 2009).

The Title I middle school in the study is staffed by 76 certified personnel (four administrators, three counselors, one librarian, and 68 teachers). National Board Certification has been earned by two teachers. In 2009, the average experience level is 14.5 years with experience ranging from zero to 37 years. Some staff members are pursuing advanced degrees such as doctoral and masters degrees. All of the teachers are highly qualified under the provisions of No Child Left Behind and meet North Central/ADVANC-ED accreditation standards. Finally, the middle school has adopted teaming and co-teaching intervention strategies to reduce the student-teacher ratio, as well as to serve the needs of all students in an inclusive educational environment (PS, 2009).

As a result of the campus educational goals, the campus offers 407 sections of 97 courses, which include Fundamentals of Math, ICL (I Can Learn) Lab, teaming, & co-teaching as well as a full year of reading in the sixth, seventh, and eighth grades. The Title I middle school has seven instructional periods of 47 minutes, followed by a 39 minute eighth period study time. In addition, a zero (before school) and flex (middle of the instructional day) period remediation sessions are a part of each school day (PS, 2009).

Moreover, several computer labs are used at the Title I middle school. Three of the labs have the following configurations: (a) used for basic computer skill remediation daily; (b) accessed all day as well as before and after the instructional day; and (c) aligned to state learning objectives in math, reading, social studies, and science. The fourth lab is used exclusively as a self-paced math instructional medium. Two mobile labs are available for research-based core curriculum instruction as well as an after-school twenty first century remediation and acceleration program. In addition, the library has computers with internet access (PS, 2009).

The middle school library and media center features a computerized catalogue system that allows access to information about and location of 15,000 fiction and nonfiction books. Monthly circulation averages 2,100 books with an academic year circulation of 18,000 books. The library has 23 computers connected to the internet. A teacher and parent center is a place to go to borrow educational resources. Further, community members may borrow from a large selection of teacher and parent support material (PS, 2009).

Participants

The Title I middle school includes a diverse student population, with 55% minority students. The largest minority population is African American followed in order by Hispanic American, Native American, and Asian American (PS, 2009). The majority of the student population occupies the lower end of the socioeconomic scale. Seventy-three percent of the students participate in the free or reduced lunch program. Thirty-five percent of the student population is comprised of military dependants. As a result to the military dependant student population, the annual student mobility rate is 30% to 35%. Eighteen percent of the student population meets the criteria for special needs programs. The special needs students are provided services in a variety of venues. Finally, another 14% of the student population is designated as gifted and talented (PS, 2009).

The Title I middle school has district bus service for 60% of the total student population. This transportation dilemma has had a definite impact on developing extensive extracurricular programs because the school district does not have any late bus transportation. Coaches and club sponsors not only plan activities, practice sessions, and game strategies but also give consideration to arranging transportation home for students whose families do not have access to personal transportation. The transportation problem has been given local city support by public transportation buses (PS, 2009).

Finally, at the Title I middle school, the development of coping skills is also a part of the students' education. Grade level academic and guidance counselors and several mentoring and tutorial endeavors support this aspect of learning. Student attendance and retention rates are currently 94% and 1.63%, respectively (PS, 2009).

From 2004-2010, the pre-existing surveys and interviews that were created by the Title I middle school asked open and closed questions. The format of the survey emulated a Likert scale instrument with a free response section for students to record their perceptions about the middle school curriculum and culture (Wiersma, 1995). Annually, it is a school district requirement that student survey data must be collected. Further, the pre-existing surveys and interviews asked general questions about the effectiveness of classroom technology, ICL, and Fundamentals of Mathematics classroom at the Title I middle school as well as questions about the campus culture (Creswell, 2003). For clarification, a flaw in the survey design was the fact that the entire student population, which had a range of N=678 to N=750, completed the questionnaires. Also, from 2005 through 2007, the junior high school was transitioning to a middle school.

In 2004-2005, a free student response section of a survey stated that this junior high school's technology programs were some of the worst that the student had ever seen. As an example of one student's comments, "if the programs do not improve, I will personally write to congress and demand that all of the middle school Title One funding be revoked." Therefore, as part of the response to the previous student statement, the "I Can Learn" Math Lab along with other computer technology resources was integrated into the junior high school campus.

In 2005-2006, the survey results from students who completed the "The Junior

High School Title I School Planning and Improvement Team Questionnaire" answered the following statement. The new "I Can Learn" Math Lab has provided remediation and enhancement. The possible answers to the statement were as follows (a) Not applicable to me, (b) No, (c) Somewhat, and (d) Yes. However, two hundred and forty students (N=750) responded that the program helped to remediate and enhance mathematics.

At the end of the 2006-2007 school years, the entire student population (N=728) responded to the "The Middle School Title I School Planning and Improvement Team Questionnaire." At the middle school, the students answered the following statement. The "I Can Learn" Math Lab has provided remediation and enhancement. The students chose their responses from (a) Not applicable to me, (b) No, (c) Somewhat, and (d) Yes. In summary, 678 students stated that the "I Can Learn" Math Lab had provided remediation and enhancement.

For 2008-2009 school years, 678 students completed the "The Middle School End of Year Survey." As mentioned above, students responded to the following statement. The "I Can Learn" Math Lab has provided remediation and enhancement. Because the survey questions' format did not vary from 2005-2009, the students' response choices were (a) Not applicable to me, (b) No, (c) Somewhat, and (d) Yes. Two hundred and three students replied to the survey question by stating the "I Can Learn" Math Lab remediated and enhanced the curriculum.

In 2009-2010, the summative end of the year Title I survey was not administered to the middle school students. The survey was replaced with a "Technology Survey." Four hundred and twenty-six seventh and eighth grade surveys were completed. Students were asked the following five questions.

I have opportunities to learn and use technology	YES: 395 NO: 32
The technology equipment at school is working available for student use.	YES: 317 NO: 109
The technology is helping me improve my math.	YES: 193 NO: 233
The technology is helping me improve my reading.	YES: 171 NO: 255
The technology helps me learn in a different way.	YES: 402 NO: 24

Survey Emergent Themes

From the coding of 2006-2010 pre-existing survey data, emergent themes helped to create a better understanding of the Title I middle school population. The analysis of these themes offered explanations for the significant effect of gender and ethnicity on OCCT data of both seventh and eighth grade mathematics students. Additionally, at the end of the 2009-2010 school years, the Title I math coordinator conducted an interview with 27 mathematics students at the Title I middle school.

Remediation. Two thousand and ninety-one students stated that they were provided opportunities for all school assistance and remediation through an individual classroom after school program, Upward Bound, Open Doors, and after school computer labs. If a student was failing a lesson or an entire class, the student was given access to an individual classroom after school program and after school computer labs. To inspire students about their professional future, assistance programs such as Upward Bound and Open Doors were used.

Computer software and web based programs. Two thousand two hundred and twenty-eight students stated that computer software and web based computer programs provided opportunities for the remediation and enhancement of regular lessons that were provided in the classrooms. This theme was present from 2005 through 2009. Computer software and web based programs included ICL, Study Island, PASS key, Gizmo, Reading 180 and My Skills Tutor.

The middle school campus had two hard wired computer labs that were scheduled for the core classes. One lab was purchased with Title I funds and had a highly qualified teacher to assist in the lab. Therefore, the reading and mathematics classes were rotated through the lab. The second hard wired lab was purchased with district and campus funds. It follows that the remaining core classes were scheduled for this lab

Additional access to computer technology with internet access existed on the campus. First, the campus had four mobile labs that contained 30 laptop computers in each lab. Three of the mobile labs were bought with a Twenty First Century grant; the remaining mobile lab was purchased by Title I. Also, the mobile lab had a lab assistant, who inventoried and ensured that repairs were performed on the lab. Second, the middle school library had 23 computers with internet access that were reserved by all classroom teachers. Third, a reading web based program had hardware that was located in one classroom for each grade level of students. Finally, each classroom had a computer that had internet access.

Administration Leadership. Seventy-three percent of the students said that the principals had given direction and discipline which supported the school mission statement: The Middle School seeks to promote positive growth through excellence in education. The administrators provided the necessary leadership for the middle school campus. For conflict resolution with students, the administrators ensured that counseling was used to prevent and analyze discipline incidents.

The middle school had one head principle and three assistant principals. The administrators were required to attend district, state, and national professional development training, yearly. Additionally, head principals attended monthly district meetings, where curriculum and vision issues were discussed.

Moreover, the middle school was a successful Title I school that was accredited by ADVANC-ED. The campus represented the district model for co-teaching. Also, teaming was integrated into the campus culture. For special education students, the inclusion philosophy was utilized to raise standardized test performance.

Parent Communication. Two thousand one hundred and eleven students responded positively to the following statement: I feel that parent/teacher conference days, progress reports, the school newsletter, and notification by mail or telephone have helped my parents stay connected to the school and my progress. Weekly, all teachers were required to prepare a remediation plan for each failing child. Then, the teachers were required to counsel students who were failing as well as to contact the failing student's parent or guardian by email, regular mail, or telephone.

Next, parents were given the option of contacting the teachers via email because each teacher had an email account with the school district. If parents did not have access to the internet at home, then they could contact the grade level counselor bi-weekly via the telephone to request progress reports that focused on their child's academic performance and behavior. Monthly, Title I teachers held campus-wide informational parent meetings.

Additionally, written communication was maintained between the student's home and school. A school newsletter was mailed to parents as well as accessible on the school web site. Next, each student was given a planner by Title I. The planner was an organizer for classroom assignments as well as an avenue to foster communication between teachers and parents because written communication was exchanged from the parents to the teachers.

Technology Evaluation. Eight hundred and eighty-five students stated that the technology at the Title I middle school was effectively used in the mathematics and reading classrooms. As a result of altered survey questions, this technology evaluation theme appeared in 2005 and 2010. In 2010, a Title I teacher summarized the perceptions that 27 students gave about technology. The Title I teacher wrote, “I found it easier to get clear preferences and opinions about the math programs. I did gather that students enjoy using computers in reading and math, but some students prefer a book in reading. My Skills Tutor was obviously preferred by students, especially in math. Students interviewed showed measurable improvement in basic math facts fluency after using the Math Facts Fluency portion of My Skills Tutor, and believed that they were much better and faster with their math facts since beginning the program.”

Sample Selection

The sample (n=459) consisted of all seventh and eighth grade “I Can Learn” (ICL) and Fundamentals of Mathematics students from 2006-2010 school years. As a result of OCCT (Oklahoma Core Curriculum Test) failure, students are assigned to either the “I Can Learn” (program group) or Fundamentals of Math (comparison group) classes. Sometimes the students are assigned to both the ICL and Fundamentals mathematics classrooms. “I Can Learn Lab” assignment is based on the capacity of the lab as well as the number of students who have failed the OCCT. When the lab is filled, other students who have failed the OCCT are assigned to the Fundamentals of Math classes. It would be unethical to hinder student assignment to the ICL or Fundamentals of Math classes.

Therefore, these will be naturally occurring classrooms in the study.

In this *ex post facto* study, stratified purposeful sampling was employed (Patton, 1990; Creswell, 2003; & Mertens, 2010). The sample consisted of students who were assigned to ICL and Fundamentals. Students who are placed in both remediation programs were not included in the stratified purposeful sampling. To account for any pre-existing differences, each group (ICL and Fundamentals Mathematics) was matched according to variables such as gender, ability, and ICL and Fundamentals of Math participation (Wiersama, 1995; Creswell, 2003; & Mertens, 2010).

Instruments

This section contains a description of the test instruments that were used in a mid-western, Title I middle school study. This researcher used The Oklahoma Core Curriculum Tests (OCCT) and Algebra I End of Instruction (EOI) in math, and the "I Can Learn" computer software program. As a result of low OCCT math scores, the "I Can Learn" computer software program was given to Central Middle School in 2005 by the Oklahoma State Department of Education (PS, 2009).

The Oklahoma Core Curriculum Tests (OCCT). In August 30, 2001, Harcourt Educational Measurement (Harcourt) was contracted to develop, print, disseminate, and score the criterion-referenced tests (OCCTTR, 2002). An item review committee process analyzed the field-test items (OCCTTR, 2002). "Test items were reviewed for content alignment to the PASS, relevance, reasonableness, format, bias and sensitivity, and accuracy" (OCCTTR, 2002). For the eighth grade OCCT, test scores of regular education students were used to calculate the standard error of measurement (SEM) and reliability coefficient. Committee members measured the SEM (2.8) and reliability (0.87).

Algebra I End of Instruction (EOI). The Oklahoma Achieving Classroom Excellence (ACE)/ End of Instruction (EOI) for Algebra I was created by Pearson. Committees of Oklahoma educators determined the academic skills that were to be assessed. In the spring of 2008, seven forms of the Algebra I assessment existed. Each form of the Algebra I test contained 55 multiple choice test items as well as an additional 20 multiple choice field questions (The Oklahoma State Department of Education [OSDE], 2008).

Initially, the Algebra I test was administered as a paper and pencil assessment. To measure the internal consistency of the Algebra I EOI, Cronbach's alpha was used to gauge reliability of the EOI. During the winter, Cronbach's alpha was 0.91. In the spring, Cronbach's alpha was 0.88 (OSDE, 2008).

Finally, to determine possible effects of converting the Algebra I EOI paper and pencil testing to online testing, a quasi-experimental design was utilized. In the design there were computer and paper groups of student assessments. Nevertheless, the two groups did not have random assignment. To account for any pre-existing differences, each group was matched with the consideration of important variables such as gender, ability, social economic status, and so on. In the initial raw assessment data, the differences between online and paper testing was 0.87 of a raw score point (OSDE, 2008).

I Can Learn (ICL). "I Can Learn (ICL)" is a computerized Algebra curriculum program designed primarily to help ethnically diverse, inner-city students in grades seven through ten achieve equity in higher level mathematics and thinking skills (I Can Learn Education Systems [ICLES], 2009). In 1995 and 1996, two studies were conducted. The research participants were 124 ninth grade beginning Algebra I students who were assigned to five treatment classrooms with a mixture of computer and teacher instruction. Additionally, 68 students (control group) received teacher-only instruction (ICLES, 2009). In conclusion, these studies found statistically significant math gains (acquiring knowledge and retention) in the students, who were utilizing the ICL (ICLES, 2009).

Fundamentals of Mathematics. Fundamentals of Mathematics is an interactive instruction classroom that was designed in 2004 by this researcher. Students were assigned to the classroom based on OCCT failure. The purpose of the Fundamentals of Mathematics class was to focus on each student's basic math and OCCT weaknesses. The curriculum integrated technology, hands-on, small group, and authentic learning activities. The students had direct and indirect teach sessions in the classroom as well as a highly, qualified teacher who was a facilitator during computer lab learning activities.

Methodology

I chose an *ex post facto* design that performed a summative evaluation of the possible effects of classroom-embedded, individualistic, computer- based learning activities in comparison to an interactive mathematics class on the standardized test score performance of minority academically at-risk male and female students in a Title I school. I used an *ex post facto* criterion group analysis of data with two factorial analyses of covariance (ANCOVA). Predictive Analytics Software (PASW Statistics 18) was utilized for the quantitative data analysis. Also, stratified purposeful sampling was used with naturally occurring ICL and Fundamentals of Mathematics classes.

The quantitative research addressed the following research questions. First, what were the effects of participation in classroom-embedded, individual, computer-learning activities? Second, how did the effectiveness of the classroom-embedded, individual, computer-learning activities compare to interactive learning activities for students placed at-risk?

Specifically, the study was designed to investigate the relationships and possible effects between computer use and the academic success of seventh and eighth grade students on the OCCT as well as the Algebra I EOI exam. For seventh and eighth grade students, a score that was below seven hundred (satisfactory) Oklahoma performance Index (OPI) on the OCCT resulted in assignment to the ICL math class or to a Fundamentals of Math class. The ICL Math class was the program group. In summary, the study is a summative evaluation.

Socioeconomic status was not used as a level of the independent variable because variability did not exist in the classroom-embedded, individualistic, computer-based environment. Seventy-three percent of the students in the classroom-embedded, individualistic, computer-based environment were participating in the free or reduced lunch program. Therefore, socioeconomic status was a control variable.

Historical data were collected from Comprehend Pro Online (http://pro.alcaweb.org). The data were analyzed from both the seventh and eighth grade ICL lab and Fundamentals of Mathematics students from 2006-2010 school years. For the Algebra I EOI scores, this researcher obtained the scores of the eighth grade students, who participated in the ICL and Fundamentals of Mathematics classrooms.

Research question one was addressed using descriptive statistics including the summary of means and standard deviations. For the second research question, two factorial ANCOVAs were used to examine the differences between the means of seventh and eighth grade students' scores on the mathematics OCCT and Algebra I EOI. For both ANCOVAs, independent variables were (a) program group verses comparison group with two levels for the ANCOVA in both the seventh grade and eighth grade, (b) gender had two levels for both the seventh grade and eighth grade ANCOVAs, and (c) ethnicity had three levels for both ANCOVAs in the seventh grade and eighth grade. The covariates were previous years' OCCT scores in both ANCOVAs. Dependent variables were seventh grade and eighth grade OCCT scores, respectively. Because two ANCOVAs were employed, the level of significance (α-level) was set at .05/2 = .025 (Wiersma, 1995, p. 377).

Summary

This chapter included a description of the methods and procedures adopted for conducting the *ex post facto*, summative evaluation. It focused on a description of the overall research design and procedures. The data will be analyzed with a design that utilizes descriptive statistics and two factorial ANCOVAs. The setting, population, and sample have also been presented. The details of these methods and procedures were vital factors to consider when conducting the *ex post facto* criterion, data mining, summative evaluation.

Chapter Four
Results of the Study

The purpose of this *ex post facto*, summative study was to evaluate of the effectiveness of classroom-embedded, individualistic, computer-based learning for middle school students placed at academic risk in schools with a high proportion of Title I eligible students. Data were mined from existing school district databases. Quantitative research questions addressed the comparison of the seventh and eighth grade ICL and Fundamentals of Mathematics students' OCCT and EOI scores at a Title I middle school (Creswell, 2003).

Methodology

This researcher chose an *ex post facto* design that performed a summative evaluation of the possible effects of classroom-embedded, individualistic, computer-based learning activities in comparison to an interactive mathematics class on the standardized test score performance of minority academically at-risk male and female students in a Title I school. This researcher used an *ex post facto* criterion group analysis of data with two factorial analyses of covariance (ANCOVA). Predictive Analytics Software (PASW Statistics 18) was utilized for the quantitative data analysis. Also, stratified purposeful sampling was used with naturally occurring ICL and Fundamentals of Mathematics classes. The research addressed the following research questions. First, what were the effects of participation in classroom-embedded, individual, computer-learning activities? Second, how did the effectiveness of the classroom-embedded, individual, computer-learning activities compare to interactive learning activities for students placed at-risk?

Socioeconomic status was not used as a level of the independent variable because variability did not exist in the classroom-embedded, individualistic, computer-based environment. Seventy-three percent of the students in the classroom-embedded, individualistic, computer-based environment were participating in the free or reduced lunch program. Therefore, socioeconomic status was a control variable.

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Participants

The Title I middle school included a diverse student population, with 55% minority students. The largest minority population was African American followed in order by Hispanic American, Native American, and Asian American (Appendix A). The majority of the student population occupied the lower end of the socioeconomic scale. Seventy-three percent of the students participated in the free or reduced lunch program. Thirty-five percent of the student population consisted of military dependants. Eighteen percent of the student population met the criteria for special needs programs. The special needs students were provided services in a variety of venues. Finally, another 14% of the student population was designated as gifted and talented (PS, 2009).

The Title I middle school had district bus service for 60% of the total student population. This transportation dilemma had a definite impact on developing extensive extracurricular programs. Coaches and club sponsors not only planned activities, practice sessions and game strategies, but also gave consideration to arranging transportation home for students, who had families that did not have access to personal transportation. The transportation problem was given local city support by public transportation buses

(PS, 2009).

Additionally, at the Title I middle school the development of coping skills was also a part of the students' education. Grade level academic and guidance counselors and several mentoring and tutorial endeavors supported this aspect of learning. Student attendance and retention rates were ninety-four percent and 1.63%, respectively (PS, 2009).

Sample Selection

The sample (n=393) consisted of both seventh and eighth grade ICL and Fundamentals of Math students from the 2006-2010 school years. As a result of OCCT failure, students were assigned to either the ICL (program group) or Fundamentals of Math (comparison group) classes. Sometimes the students were assigned to both the ICL and Fundamentals mathematics classrooms. The ICL assignment was based on capacity of the lab as well as the number of students, who had failed the OCCT. When the lab was filled, other students who had failed the OCCT were assigned to the Fundamentals of Math classes. It would have been unethical to hinder student assignment to the ICL or Fundamentals of Math classes. Therefore, there will be naturally occurring classrooms in the study.

In this *ex post facto* study, stratified purposeful sampling was employed (Patton, 1990; Creswell, 2003; & Mertens, 2010). The sample consisted of students who were assigned to ICL and Fundamentals. However, students who were placed in both remediation programs were not included in the stratified purposeful sampling. To account for any pre-existing differences, both the ICL and Fundamentals of Mathematics groups were paired according to variables such as gender, ability, and ICL and Fundamentals of Math participation (Wiersama, 1995; Creswell, 2003; & Mertens, 2010).

Missing Data

The program and comparison population was not n=459. The ICL and Fundamentals of mathematics classroom assignment was based on student failure on the OCCT. However, in 2010, no seventh grade students were assigned to the ICL. Also, it became problematic to follow ICL and Fundamentals of Mathematics students' academic performance on the Algebra I EOI for the following reasons. First, the high school had a high mobility rate for students. Second, large numbers of students, who attended the Title I middle school, did not complete Algebra I. The high school dropout rate of 21.4 percent negatively affected the Algebra I completion rate for the ICL and Fundamentals of Mathematics students. Also, students who participated in both the ICL and Fundamentals of Mathematics classrooms were eliminated from the research study. Further, (n=393) was the sample size for the research study. Moreover, n=58 was the sample size for the Algebra I EOI data. Therefore, a factorial ANCOVA was not used to analyze the Algebra I EOI data.

Research Question One (RQ1) Results

Descriptive statistics were used to address research question one. What were the effects of participation in classroom-embedded, individual, computer-learning activities? The means and standards deviations for the seventh grade Oklahoma Core Curriculum Test scores by research group, gender and ethnicity were summarized in Table 1 through Table 3. Each table was subdivided into the pretest and post test means and standard deviations for the seventh grade ICL lab and Fundamentals of Mathematics students. The OCCT scores represented the post test, while previous years OCCT scores were the covariates. Depending on the measured variable, the number of data points ranged from n=162 to n=44. The sample was collected from seventh grade student participation in the ICL and Fundamental of mathematics from 2006-2010 school years.

Fundamentals of Mathematics had a higher post test mean (655.5) than the ICL lab. Both the pretest and post test means for all males (687.1) remained unchanged. African American students had a higher post test mean (693.7) than pretest mean (680.7).

Table 1

Seventh Grade OCCT Test Scores by Group

	Mean	SD	n
Whole Sample			
Pretest (Covariate)	691.2	68.19	162
Post Test	674.9	71.89	162
Fundamentals (Comparison)			
Pretest	653.6	94.68	53
Post Test	655.5	72.77	53
ICL (Program)			
Pretest	709.5	39.81	109
Post Test	684.4	69.85	109

Table 2

Seventh Grade OCCT Scores by Gender

	Mean	SD	n
Male			
Pretest	687.1	86.91	86
Post Test	687.1	63.23	86
Female			
Pretest	695.9	37.12	76
Post Test	661.2	78.76	76

Table 3

Seventh Grade OCCT Scores by Ethnicity

	Mean	SD	n
African American			
Pretest	680.7	96.38	50
Post Test	693.7	52.60	50
Caucasian American			
Pretest	705.0	54.10	68
Post Test	672.7	72.06	68
Other American			
Pretest	681.8	41.76	44
Post Test	657.1	85.82	44

The eighth grade descriptive statistics are summarized in Table 4 through Table 6. The means and standard deviations for the eighth grade OCCT test scores by group, gender, and ethnicity were mentioned. Each table is subdivided into the pretest and post test means and standard deviations for the eighth grade ICL and Fundamentals of Mathematics students. OCCT scores represented the post test, while previous years OCCT scores were the covariates. Depending on the measured variable, the number of data points ranged from n=173 to n=42. The sample was collected from the eighth grade student participation in the ICL and Fundamentals of Mathematics classes from 2007-2010 school years.

The eighth grade had a higher post test mean (699.4). The Fundamentals of Mathematics post test (688.3) was higher than the pretest mean. On the other hand, the ICL post test mean (708.8) was not higher than the pretest mean (713.3). Both the male (694.3) and female (704.8) post test means were higher than each group's pretest mean. Finally, the post test means for each ethnic group were higher than each group's pretest mean.

Table 4

Eighth Grade OCCT Test Scores by Group

	Mean	SD	n
Whole Sample			
Pretest	686.1	70.42	173
Post Test	699.4	58.65	173
Fundamentals			
Pretest	653.7	76.98	79
Post Test	688.3	59.54	79
ICL			
Pretest	713.3	50.60	94
Post Test	708.8	56.52	94

Table 5

Eighth Grade OCCT Scores by Gender

	Mean	SD	n
Male			
Pretest	684.4	74.83	88
Post Test	694.3	66.51	88
Female			
Pretest	687.9	65.93	85
Post Test	704.8	49.05	85

Table 6

Eighth Grade OCCT Scores by Ethnicity

	Mean	SD	n
African American			
Pretest	682.9	64.87	77
Post Test	693.6	47.76	77
Caucasian American			
Pretest	695.9	61.97	54
Post Test	715.8	65.57	54
Other American			
Pretest	679.2	88.55	42
Post Test	689.2	64.19	42

The EOI score data are included in Table 7 through Table 9. To obtain the Algebra I EOI scores, eighth grade student completion of the Algebra I course was necessary. It was problematic to follow ICL and Fundamentals of Mathematics eighth grade students' academic performance on the Algebra I EOI for the following reasons. First, the high school had a high mobility rate for the students. Forty percent of the student population was military dependents. If a military family was housed on the army post, the high school aged students were required to attend the high school that was a part of the research study. Additionally, the free and reduced lunch student population was 56%. Second, large numbers of students, who attended the Title I middle school, did not complete Algebra I. The high school dropout rate of 21.4% negatively affected the Algebra I completion rate for the ICL and Fundamentals of Mathematics students. Further, n=58 was the sample size during this phase of the research study. Therefore, a factorial ANCOVA was not used to analyze the Algebra I EOI data. Moreover, none of the ethnic and gender groups had higher post test means than pretest means.

Table 7

Ninth Grade Algebra I EOI Scores by Gender

	Mean	SD	n
Male			
Pretest	701.8	53.29	40
Post Test	671.5	54.85	40
Female			
Pretest	711.5	66.34	18
Post Test	689.8	46.41	18

Table 8

Ninth Grade Algebra I EOI Scores by Ethnicity

	Mean	SD	n
African American			
Pretest	692.0	34.41	21
Post Test	677.3	42.71	21
Caucasian American			
Pretest	715.6	67.39	25
Post Test	681.2	61.90	25
Other American			
Pretest	704.6	65.84	12
Post Test	668.3	50.72	12

Table 9

Ninth Grade Algebra I EOI Scores by Group

	Mean	SD	n
Whole Sample			
Pretest	704.8	57.24	58
Post Test	677.2	52.66	58
Fundamentals			
Pretest	713.0	50.07	9
Post Test	687.8	29.02	9
ICL			
Pretest	703.3	58.80	49
Post Test	675.2	55.93	49

Research Question Two (RQ2) Results

Two factorial ANCOVAs for both seventh and eighth grade students, with follow-up statistics, were utilized to address research question two. How did the effectiveness of the classroom-embedded, individual, computer-learning activities compare to interactive learning- activities for students placed at-risk? Because two ANCOVAs were employed, the level of significance (α-level) was set at .05/2 = .025 (Wiersma, 1995, p. 377).

An ANCOVA was conducted with gender, ethnicity, and the research group assignment as independent variables. The seventh grade results, summarized in Table 10, indicated there were statistically significant differences in the two-way interaction of gender and ethnicity. Partial Eta squared showed that 24% of the variance was accounted in the entire model. The two-way interaction was 5.5% of the variance. These results are consistent with the descriptive statistics results presented in research question one. Because the interaction did not include the Program group, then it is viable to include the main effect results that follow. There was no statistically significant difference found with assignment to the Program group. Therefore, the Program did not have any effect on the male and female seventh grade mathematics students, across ethnic categories

Table 10

Seventh Grade ANCOVA Results

Source	df	F value	Sig.	Partial Eta Squared
Corrected Model	12	3.904	.000	.239
Intercept	1	19.62	.000	.116
Pre7	1	9.738	.002	.061
Group	1	2.122	.147	.014
Gender	1	3.953	.049	.026
Ethnicity	2	1.881	.156	.025
Group vs. Gender	1	.457	.500	.003
Group vs. Ethnicity	2	1.749	.177	.023
Gender vs. Ethnicity	2	4.348	.015*	.055
Group vs. Gender vs. Ethnicity	2	1.666	.193	.022

*Significant level at .025

A factorial ANCOVA was also conducted for the eighth grade OCCT scores. The eighth grade results, summarized in Table 11, indicate there were statistically significant three-way interaction effects, including group, gender, and ethnicity. Partial Eta squared showed that 32% of variance was accounted for in the entire model. In the model, 5.3% of the variance was the three-way interaction.

Table 11

Eighth Grade ANCOVA Results

Source	df	F value	Sig.	Partial Eta Squared
Corrected Model	12	6.363	.000	.323
Intercept	1	114.5	.000	.417
Pre8	1	36.87	.000	.187
Group	1	.030	.862	.000
Gender	1	1.484	.225	.009
Ethnicity	2	3.344	.038	.040
Group vs. Gender	1	.384	.537	.002
Group vs. Ethnicity	2	2.565	.080	.031
Group vs. Gender vs. Ethnicity	2	4.490	.013*	.053

*Significant level at .025

To further clarify the seventh grade ANCOVA results, additional descriptive statistics (including the gain scores) are included in Tables 12 and 13. Gain scores are being reported to elicit a better understanding of the ANCOVA data. For the seventh grade Program students, performance on the OCCT was a result of ethnicity and gender. In the Program Group, African American females had a sample mean difference of 12.18. Moreover, African American males had a sample means difference of 3.21. Additionally, “other” minority males obtained a sample mean difference of 25.83. Finally, all African American students in the Program Group had a sample mean difference of 6.50. In the

Comparison Group for the seventh grade students, the following results are presented. First, Caucasian American female students had a sample mean difference of 8.10. Also, "other" minority males acquired a sample mean difference of 22.67

Table 12

Seventh Grade Descriptive Statistics by Group

	Program Group							Comparison Group					
	Pretest			Posttest				Pretest			Posttest		
	Mean	SD	n	Mean	SD	n		Means	SD	n	Means	SD	n
AF Am Females	712.4	23.83	11	724.6	31.89	11		678.7	25.12	6	658.8	94.22	6
Other Females	700.9	26.37	19	641.7	81.25	19		660.9	24.79	7	602.4	103.23	7
Caucasian Females	706.8	34.51	23	654.7	79.10	23		677.9	59.9	10	686.0	28.93	10
AF Males	704.9	46.78	19	708.1	37.19	19		666.7	18.42	14	664.8	41.82	14
Other Males	681.9	47.60	12	707.8	63.64	12		645.7	56.65	6	668.3	80.54	6
Caucasian Males	733.9	38.94	25	697.2	63.51	25		655.6	73.41	10	639.4	88.49	10
ALL MALES	712.9	47.57	56	703.2	55.24	56		658.8	49.47	30	657.0	67.04	30
ALL FEMALES	705.8	29.53	53	664.5	78.25	53		672.9	42.98	23	653.5	81.14	23
ALL AF AMER	707.6	39.59	30	714.1	35.69	30		670.3	20.73	20	663.0	59.50	20
ALLCAUCASIAN	720.9	38.97	48	676.8	73.83	48		666.8	66.22	20	662.7	68.39	20
ALL OTHER	693.6	36.55	31	667.3	80.71	31		653.9	41.31	13	632.9	95.92	13
TOTAL SAMPLE	709.5	39.81	109	684.4	69.85	109		664.9	46.87	53	655.5	72.77	53

Table 13

Seventh Grade Gain Scores by Group

	Program Group				Comparison Group		
	Mean	SD	N		Mean	SD	N
AF Am Females	12.18	45.16	11		-19.83	87.24	6
Other Females	-59.16	73.18	19		-58.43	113.04	7
Caucasian Females	-52.13	71.41	23		8.10	70.97	10
AF Males	3.21	35.89	19		-1.93	42.49	14
Other Males	25.83	63.27	12		22.67	102.19	6
Caucasian Males	-36.64	56.00	25		-16.20	113.38	10
ALL MALES	-9.73	57.04	56		-1.78	82.43	30
ALL FEMALES	-41.30	71.95	53		-19.43	90.02	23
ALL AF AMER	6.50	39.01	30		-7.30	57.52	20
ALLCAUCASIAN	-44.06	63.63	48		-4.05	92.90	20
ALL OTHER	-26.26	80.32	31		-21.00	111.85	13
TOTAL SAMPLE	-25.08	66.34	109		-9.43	85.41	53

To further clarify the eighth grade ANCOVA results, additional descriptive statistics (including gain scores) are included in Tables 14 and 15. For the eighth grade Program students, performance on the OCCT was a result of three-way interactions between group, ethnicity, and gender. In the Program Group, Caucasian American female students received a sample mean difference of 6.50. Moreover, “other” minority males had a sample mean difference of 10.72.

The results for eighth grade students indicate that all African American students had a sample mean difference of 32.54. Second, all Caucasian American students received the largest sample mean difference of 55.00 in this research study. However, Caucasian American males had a larger mean difference (61.36) than Caucasian American females (40.17). Third, all other minority American students had a sample mean difference of 19.45. Yet, the "other" minority males had a negative mean difference (-2.88). "Other" minority males was the only ethnic or gender category with a negative mean difference. Fourth, all males had a sample mean difference of 31.30 as well as a sample mean difference of 37.95 for all females. Finally, the entire eighth grade comparison group had a sample mean difference of 34.58.

Table 14

Eighth Grade Descriptive Statistics by Group

	Program Group							Comparison Group					
	Pretest			Posttest				Pretest			Posttest		
	Mean	SD	n	Mean	SD	n		Means	SD	n	Means	SD	n
AF Am Females	710.0	46.7	23	709.7	37.72	23		654.8	75.45	19	696.3	38.96	19
Other Females	700.8	39.00	9	686.7	37.67	9		648.6	86.80	14	680.9	69.81	14
Caucasian Females	736.1	31.65	14	742.6	49.64	14		667.3	16.88	6	707.5	27.66	6
AF Males	699.2	48.90	17	677.0	56.54	17		662.6	71.66	18	685.7	55.14	18
Other Males	729.4	80.41	11	740.1	32.74	11		639.5	112.87	8	636.6	67.51	8
Caucasian Males	710.0	49.56	20	704.0	76.68	20		648.1	77.94	14	709.4	71.51	14
ALL MALES	710.6	57.55	48	702.7	65.27	48		652.9	81.45	40	684.2	67.40	40
ALL FEMALES	716.1	42.61	46	715.2	45.51	46		654.5	73.15	39	692.5	50.79	39
ALL AF AMER	705.4	47.33	40	695.8	48.81	40		658.6	72.72	37	691.1	47.15	37
ALLCAUCASIAN	720.7	44.49	34	719.9	68.75	34		653.9	65.67	20	708.9	60.84	20
ALL OTHER	716.5	65.24	20	716.1	43.66	20		645.3	94.50	22	664.8	70.78	22
TOTAL SAMPLE	713.3	50.60	94	708.8	56.52	94		653.7	76.98	79	688.3	59.54	79

Table 15

Eighth Grade Gain Scores by Group

	Program Group				Comparison Group		
	Mean	SD	N		Mean	SD	N
AF Am Females	-.30	41.11	23		41.47	74.18	19
Other Females	-14.11	44.94	9		32.21	85.20	14
Caucasian Females	6.50	45.89	14		40.17	31.28	6
AF Males	-22.18	49.09	17		23.11	70.79	18
Other Males	10.72	72.98	11		-2.88	88.37	8
Caucasian Males	-5.59	66.45	20		61.36	77.06	14
ALL MALES	-7.88	62.41	48		31.30	78.49	40
ALL FEMALES	-.93	42.96	46		37.95	72.37	39
ALL AF AMER	-9.60	45.41	40		32.54	72.14	37
ALLCAUCASIAN	-.82	58.40	34		55.00	66.48	20
ALL OTHER	-.45	61.76	20		19.45	86.00	22
TOTAL SAMPLE	-4.48	53.61	94		34.58	75.12	79

Summary of the Findings

The results of the quantitative analyses were provided in this chapter. The questions were restated. Each of the two research questions were addressed and analyzed by descriptive and inferential (parametric) statistics. As a result of current findings, the following conclusions were reached for each research question.

RQ1. For the seventh grade students, Fundamentals of Math had a higher post test mean than the ICL lab. Next, the post test means for all males remained unchanged. Further, African American students had a higher post test mean than pretest mean.

Further, the eighth grade had a higher post test mean than pretest mean. Both the male and the female post test means were higher than each group's pretest mean. The post test means for each ethnic group were higher than each group's pretest mean.

Moreover, the Algebra I EOI sample group was n=58. Therefore, a factorial ANCOVA was not used to analyze the data. Moreover, none of the ethnic and gender groups demonstrated higher post test means, descriptively.

RQ2. A seventh grade factorial ANCOVA yielded the following results. First, there were statistically significant differences in the two-way interaction of gender and ethnicity. Second, the ICL did not have any effect on the male and female seventh grade mathematics students, across ethnic categories.

For the eighth grade, the factorial ANCOVA yielded the following results. First, there were statistically significant three-way interaction effects, including group, gender, and ethnicity. Second, Fundamentals of Mathematics had a larger sample mean difference than ICL. Third, all Caucasian American students earned the largest sample mean difference of all ethnic groups. Finally, all African American students had an increased post test mean difference of 32.54.

Chapter Five
Summary and Discussion

Summary of the Study

Computer usage has been valuable because this technology acts as an avenue for employment opportunities (Newburger, 2000). “The Internet has rapidly become a critical, not optional, tool for many people in their day-to-day activities at work and school” (Newburger, 2000, p. 11). According to the Annie E. Casey Foundation (2001), an eight-year project designed to find employment for low-income residents of designated neighborhoods, computer technology has been a beneficial skill for job seekers. Therefore, the lack of technology integration in schools is limiting the employment opportunities for some male and female children.

Nevertheless, in American society dominated by computer-driven technology, the following realities exist. First, 40% of the public school teachers, who have computer or the Internet available in their schools, use them for classroom instruction (National Center for Education Statistics [NCES], 2010). Second, teachers in low minority and low poverty schools are more inclined to utilize computer technology in classroom instruction (NCES, 2010). Third, teachers with the fewest years of experience are more likely to use their computers or the Internet at home to gather information for classroom lesson plans (NCES, 2010). Finally, the National Center for Education Statistics collected the preceding information from the (a) Fast Response Survey System (FRSS), (b) National Assessment of Educational Progress (NAEP), and (c) Current Population Survey (CPS).

Problem. When minority male and female students do not meet the minimum standards on standardized tests, they are remediated. Presently, state revenues are used to create remediation programs for the at academic risk male and female students. Unfortunately, there are researchers who support all technology integration into the classroom as well as researchers who question the effectiveness of technology integration into the classroom. Therefore, administrators have a difficult task of discerning how to both successfully and cost effectively integrate technology into their individual campus culture.

For example, disadvantaged and at-risk students commonly have not been successful at learning the basic skills of reading, writing, and math, as well as strong critical-thinking and problem solving skills (Bialo & Sivin, 1992; Ramey, 2000). Remedial classes have only added to the failure of at-risk students in the basic skill areas (Bialo & Sivin, 1992; Ramey, 2000). Moreover, Sanchez (2007) states that ranging from lack of academic achievement to decreased employment opportunities, technology just widens the gap between (a) the socioeconomic classes, (b) gender educational experiences, and (c) racial inequities (Sanchez, 2007). Further, "persistent gaps remain between different racial and ethnic groups, people with and without disabilities, single and dual parent families, the old and the young, and people with different levels of income" (The Digital Divide, 2010, p. 3). Finally, Bauer (2000) states that technology has created a digital divide or inequities (Bauer, 2000, p. 15).

Conversely, computer technology is especially useful as a learning tool for basic skills and problem-solving methods due to several inherent features (Inan, Lowther, Ross, & Strahl, 2008). These features include interactivity, immediate feedback, development of problem solving ability, and individualized learning activities. Also, computer use lessons the public embarrassment of students (Inan, Lowther, Ross, & Strahl, 2008). Consequently, technology helps to eliminate the negative self-perceptions that create barriers to the education of academically at-risk male and female students.

Research Questions. My interest in improved middle school students' academic achievement has led me to the following research questions. What were the effects of participation in classroom-embedded, individualistic, computer-based learning activities by minority middle school male and female students placed at-risk in schools with a high proportion of students who are eligible for Title I? How did the effectiveness of the classroom-embedded, individualistic, computer-based learning activities compare to interactive learning activities for students placed at-risk?

Methodology. I chose an *ex post facto* design that performed a summative evaluation of the possible effects of classroom-embedded, individualistic, computer-based learning activities in comparison to an interactive mathematics class on the standardized test score performance of minority academically at-risk male and female students in a Title I school. I used an *ex post facto* criterion group analyses of data with two factorial analyses of covariance, ANCOVA. Predictive Analytics Software (PASW

Statistics 18) was utilized for the data analyses. Also, stratified purposeful sampling was utilized with naturally occurring "I Can Learn" Lab and Fundamentals of Mathematics classes. The research addressed the following research questions. First, what were the effects of participation in classroom-embedded, individual, computer-learning activities? Second, how did the effectiveness of the classroom- embedded, individual, computer-learning activities compare to interactive learning activities for students place at-risk?

Socioeconomic status was not used as a level of the independent variable because there was not enough variability in the classroom-embedded, individualistic, computer-based environment. Seventy-three percent of the students in the classroom-embedded, individualistic, computer-based environment were participating in the free or reduced lunch program. Therefore, socioeconomic status was a control variable.

Historical data were collected from Comprehend Pro Online (http://pro.alcaweb.org). In a *post hoc* manner, the data was analyzed from the seventh and eighth grade ICL lab students from 2006-2010 school years. For the Algebra I EOI scores, I obtained the scores of the eighth grade students, who participated in the ICL and Fundamentals of Mathematics classrooms.

Summary of Results. What were the effects of participation in classroom-embedded individual, computer-learning activities? For the seventh grade students, Fundamentals of Math had a higher post test mean than the ICL lab. The post test means for all males remained unchanged. Further, African American students had a higher post test mean than pretest mean.

The eighth grade had a higher post test mean than pretest mean. Both the male and the female post test means were higher than each group's pretest mean. The post test means for each ethnic group were higher than each group's pretest mean. Because the Algebra I EOI sample group was n=58, an ANCOVA was not used to analyze the data. Moreover, none of the Algebra I EOI ethnic and gender groups demonstrated higher post test means, descriptively.

How did the effectiveness of the classroom-embedded, individual, computer-learning activities compare to traditional learning activities for students placed at-risk? A seventh grade factorial ANCOVA yielded the following results. First, there were statistically significant differences in the two-way interaction of gender and ethnicity. Second, the ICL did not have any effect on the male and female seventh grade mathematics students, across ethnic categories.

For eighth grade students there were statistically significant three-way interaction effects, including group, gender, and ethnicity. Fundamentals of Mathematics had a larger sample mean difference than ICL. All Caucasian American students earned the largest sample mean difference of all ethnic groups. Finally, all African American students had an increased post test mean difference of 32.54.

Conclusion

Gaps remain between ethnic groups, male and female students, and people with different levels of income. For example, there were statistically significant differences in the two-way interaction of gender and ethnicity, in the seventh grade data. Another example was found in the fact that there were statistically significant three-way interaction effects, including group, gender, and ethnicity, in the eighth grade data.

Within the study, gaps were prevalent. An example existed in the finding that Caucasian American students had the greatest OCCT score gain. Another example was that the majority of the students who were assigned to either the ICL or the Fundamentals of Mathematics classrooms, as a result of OCCT failure, were participating in the free or reduced lunch program. For an explanation of the study's findings, in some instances, standardized tests were created in such a manner that test items contained ethnic and gender biases. The descriptive language that created an image in the individual student's mind to facilitate the correct problem solving techniques did not act as a link to all students' vertical knowledge on the specified topic. For example, find the speed and the velocity of the object in the following problem. "A helicopter is descending for a landing at a rate of six feet per second" (McDougal Littell, 2004). To find the solution to the previous mathematics problem, if the student has seen a helicopter land, then the problem is easier to understand and solve. Therefore, a lack of life experiences hindered the performance of some students on the mathematics OCCT.

Further, exposure to computer technology at home was important. Many of the students who were involved in the research study did not have a computer at home to use. As a result, the lack of technology exposure could have created a barrier between the mastery of mathematics objectives and OCCT performance. It follows that some of the students may have been intimidated and embarrassed in the individualized computer lab. Many students may have been hesitant about asking questions that may have caused ridicule from their peers.

Moreover, the design of the software and web based programming could have hindered the mastery of mathematical concepts. For twenty first century students, the software or web based program needed to be interactive and interesting. These students needed fast moving and entertaining software that satisfied their need for immediate gratification. Additionally, the format of the problems may have contained gender and ethnic biases that impeded the students' grasp of the problem solving process.

Inan, Lowther, Ross, and Strahl (2008) found that the key barriers that inhibited the successful technology integration included (a) availability and access and computers, (b) availability of curriculum materials, (c) teachers' beliefs, (d) teachers' technological and content knowledge, and (e) technical, administrative, and peer support. In the ICL, co-teaching was used. From 2006-2010, the same two ICL teachers were present in the individualized computer lab. Each teacher had more than twenty years of teaching experience. However, the Fundamentals of Mathematics classes were taught by various teachers with less than five years of teaching experience. According to the National Center for Education Statistics (2010), teachers with the fewest years of experience were more likely to use their computers or the Internet at home to gather information for classroom lessons. Therefore, the Fundamentals of Mathematics teachers may have created interactive and fun classroom lessons that facilitated the mastery of more mathematical concepts.

Contribution to the Literature

Basically, this research study supported both the scholars who support all technology integration into the classroom as well as the scholars who question the effectiveness of technology integration into the classroom. Within high poverty middle schools, technology integration into at academically risk minority classrooms was a complex problem to research. For an effective remediation plan design, it was necessary to consider the effects of the program and comparison group influences, across gender and ethnic categories for both the seventh and eighth grade students. Therefore, this study supported the following researchers.

Cronin, Hauser, Houser, Kingsbury, and McCall (2006) state, "that the difference between the academic performance of poor students and wealthier students and between minority students and their non-minority peers was commonly known as the achievement gap." This study supports Ramey (2000), in that there continues to be a gap between white and nonwhite student achievement. Ramey (2000) indicates that an achievement gap exists between Caucasian American students and African American students in each grade and curricular area.

The study demonstrated that persistent gaps remain between different racial and ethnic groups, consistent with Bauer (2000). Also, this study is in agreement with The Digital Divide (2010) research that indicates that technology has created a digital divide or inequities. In this study, a majority of the eighth grade at-risk students improved their OCCT scores in the Fundamentals of Mathematics instruction rather than in the individualistic computer lab class.

Shotick and Stephens (2006) suggest that the gap between male and female achievement is manifested during middle school. The Fundamentals of Mathematics mined data agrees with Shotick and Stephens because a large gap between male and female performance on the OCCT did exist. Additionally, Shotick and Stephens (2006) confirm the existence of a gender gap with computer use. In this study, most females did not have improved OCCT scores as a result of the individualistic computer embedded classroom learning activities.

For Beglau (2005) support is found with the finding that the achievement gap reduction is dependent on classroom factors. Interactive classrooms that integrated technology into the curriculum lesson the factors of race, gender, and poverty. In this study, a majority of the eighth grade students, who are assigned to the Fundamentals of

Mathematics classes, demonstrated improvement on the OCCT.

Because OCCT performance improved for both the seventh and eighth grade Fundamentals of Mathematics students, descriptive statistics indicate that the seventh grade post test, OCCT, Fundamentals of Mathematics mean score rises to 655.5. Further, the eighth grade post test Fundamentals of Mathematics mean score rises to 688.3. Beglau (2005) suggested that standardize test performance for students was improved by Missouri's Instructional Networked Teaching Strategies (eMints) program which integrated inquiry-based teaching, that was combined with multimedia tools. Also, Beglau (2005) stated that statistically significant standardized test differences between eMints and non-eMints students were discovered. In this study, the Fundamentals of Mathematics classes are interactive classrooms that integrate technology, hands-on, small group and authentic learning activities into the classroom.

Also, this study supported the Blume, Garcia, Mullinax, and Vogel (2001) suggestion that integrating math as well as technology to bridge the gap in academic achievement creates a positive effect for students. In this study, a positive effect on OCCT achievement is demonstrated by some students in both the ICL and Fundamentals of Mathematics classes with descriptive statistics. For African American seventh grade students, the pretest mean of 680.7 was improved to 693.7 on the post test. In the eighth grade, the post test mean for males and females as well as all ethnic categories increased on the post test, which is the current year OCCT.

Implications for Practice

In the present educational climate that is being influenced by No Child Left Behind (NCLB) as well as science, technology, engineering, and mathematics (STEM) research, administrators and legislators will find it necessary to understand the complex issues that are associated with remediating academically at-risk minority male and female students. Kvasny and Payton (2005) have written that the digital divide has created a barrier that has caused many minority male and female students to be left behind. Moreover, Le (2002) states that this digital divide has created academic gaps for minority males and females in the labor market.

One result of the current study is that gender and ethnicity effect standardized test performance. As a result of both individualized computer and interactive classrooms, at-risk minority male and female students improved their achievement on the OCCT in mathematics. Nevertheless, African American student achievement was greater in the interactive rather than individualized computer classroom. This study indicates that at-risk students need more teacher intervention into the classroom curriculum. It follows that Ramey (2000) and Beglau (2005) wrote about the success of the interactive classrooms which integrated technology into the curriculum and lessoned the effects of race, gender, and poverty. Therefore, building and district administrators can utilize this information to plan technology resource expenditures for individual schools and districts.

This study supported Inan, Lowther, Ross, and Strahl (2008), who stated that technology helped to eliminate the negative self-perceptions that create barriers to the education of academically at-risk male and female students. The student interviews suggested that at-risk middle school students enjoyed the integration of technology into the classroom lessons. Also, the at-risk students stated that the technology had helped them to improve academically in the mathematics classroom. Logically, professional development designers can use this data to differentiate training in technology for teachers and administrators.

Recommendations for Future Research

Research studies on technology skills and technology beliefs of educators are minimal when compared to all other educational research. This study focuses on the achievement and perceptions of academically at-risk students. However, the key barriers that inhibit successful technology integration require more research.

An in-depth look at gap reduction should be conducted. Ramey (2000) stated that gap reduction depended mostly on classroom factors that are set apart from characteristics of the students. Also, Ramey (2000) continued to state that success in reducing the academic gap tended to happen when overall academic achievement was increased for all students.

Cronin, Houser, Kingsbury, & McCall (2006) stated that an achievement gap between Caucasian American and minority students still exists. This current study indicates that the Caucasian American students demonstrated more improvement on the OCCT than any other ethnic group. For clarification, the purpose of the middle school remediation program in this study was to positively change the minority students' weakness in mathematics. Therefore, this research will contribute to the gap research. In future research, this study will help to eliminate the academic gap for at-risk minority male and female students.

More research studies should be performed on the academic effect of individualistic computer lab classrooms. For emphasis, a focus in the research could be placed on the effects of various software packages and web based programs that are used in the individualistic computer lab classroom lessons. In the future research, questions could be addressed about gender and ethnic biased software packages and web based programs.

Finally, specific studies that address the most effective strategies to use when teaching Algebra to academically at-risk male and female students, who attend high poverty schools, should be conducted. Mathematics is a curriculum area that constantly challenges many academically at-risk middle school students. It follows that improving academic achievement in advanced mathematics courses is the key to preparing more students for STEM professions (Johnson, 2000).

Study Limitations

The *ex post facto* study's sample was limited to a south western Oklahoma middle school. Also, the campus was a Title I middle school with a student population of N=796. Moreover, the research sample consisted of n= 393 at-risk male and female students who participated in program and comparison mathematics classrooms from 2006-2010. All of the summative data were mined for the research.

Chapter Summary

This study provided a clearer image of the effects of race and gender with regards to at-risk students' performance on the OCCT for mathematics. Assignment to the individualistic, computer lab or the interactive mathematics classroom did not have an effect on OCCT performance for seventh graders. However, assignment to either the ICL or Fundamentals of mathematics classrooms did affect the eighth grade students' performance on the OCCT. As a matter of fact, descriptive and inferential statistics data showed that the at-risk students, who were assigned to an interactive mathematics class, performed better on the OCCT. Further, an analysis of race and gender for at-risk students resulted in a statistically significant difference in both the seventh and eighth grade mathematics students.

The information provided by the quantitative data analyses revealed that Caucasian American students benefited from the most improvement while participating in the program and comparison groups. Therefore, an achievement gap existed between

Caucasian American and minority students. However, a majority of African American students did improve their OCCT math scores in the comparison group.

References

Ancess, J. (2008, May). Small alone is not enough. *Educational Leadership, 65(8),* 48-53.

Annie E. Casey Foundation (2001). Stronger links: New ways to connect low-skilled workers to better jobs. Retrieved Annie E. Casey Foundation website: http://www.aecf.org\

Balfanz, R., & Legters, N. (2004, September). Locating the dropout crisis: Which high Schools produce the nation's dropouts? Where are they located? Who attends Them? Retrieved Center for Research on the Education of Students Placed At Risk website: http: //www. csos. jhu. edu

Bangert-Drowns, R. (1993, Spring). Research on word processing and writing instructions. Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

Barron, B. (2004). Learning ecologies for technological fluency: Gender and experience differences. *Educational Computing Research, 31(1),* 1-36.

Bauer, J. (2000). A technology gender divide: Perceived skill and frustration levels Among female pre service teachers. Retrieved from ERIC database. (ED447137)

Beglau, M. (2005). Can technology narrow the black-white achievement gap? Retrieved from EBSCO database. (EJ762421)

Berry, B., Wade, C., & Trantham, P. (2009, January). Usinging data,changing teaching: An elementary school and a university find out what teachers need—and give it to them. *Educational Leadership, 66(4),* 80-84.

Bialo, E.. & Sivin, J. (1992). Report on the effectiveness of microcomputers in schools. *Teaching Exceptional Children, 21(3),* 55-56.

Blume, J., Garcia, K., Mullinaz, K., & Vogel, K. (2001). Integrating math and science with technology. Retrieved from ERIC database. (ED454088)

Bonferroni Correction (2010). Retrieved from Wikipedia website: http://en.wikipedia.org/wiki/Bonferroni_correction

Brinson, D., Skiner, L. (2007). Building collective efficacy: How leaders inspire teachers to achieve. Retrieved Issue Brief website: http: //www.centerforcsri.org

Brush, T., Cullen, T., Frey, T., Hinshaw, R., & Warren, S. (2006, Fall). *The Rural Educator, 28 (1),* 9-16.

Cambron-McDabe, N. (1991). A new platform for preparing school administrators. Retrieved University Council for Educational Administration website: http: //www.npbea.org/resources. Php

Cantrell, J. (1993). Technology's promise for at-risk students. *Thrust for Educational Leadership, 23(2),* 22-25.

Carnegie Foundation (2000). Recognizing and Encouraging exemplary leadership in america's schools. Retrieved University Council for Educational Administration website: http: //www.npbea.org/resources. Php

Center on Education Policy. (2009). Subgroup achievement and gap trends—oklahoma. Retrieved from ERIC database. (ED507956)

Christensen, R., Knezek, G., & Fluke, R. (2003). Testing a will, skill, tool model of technology integration. Retrieved from ERIC database. (ED475762)

Christensen, R., Griffin, D., & Knezek, G. (2001). Measures of teacher stages of technology integration and their correlates with student achievement. Retrieved from ERIC database. (ED451187)

Collins, T. & Dewees, S. (2001). Challenges and promise: Technology in the classroom. Southern Rural Development Center, Mississippi State University.

Cooper, J. (2006). The digital divide: The special case of gender. *Journal of Computer Assisted Learning, 22,* 320-334.

Crehan, P., Grimmett, P. (1987). A study of the effects of supervisors' intervention on teachers' Classroom management performance. Retrieved from ERIC database. (ED282326)

Creswell, J. (2003). Research Design: Qualitative, Quantitative, and Mixed Methods

Approaches (2nd ed.). Thousand Oaks, CA: Sage Publications.

Critical Issue: Using Technology to Improve Student Achievement. (2010). Retrieved from North Central Regional Educational Laboratory website: http://www.ncrel.org/sdrs/areas/issues/methods/technology/te800.htm

Cronin, J., Hauser, C., Houser, R., Kingsbury, G., & McCall, M. (2006, November). achievement gaps: An examination of differences in student achievement and growth. Retrieved Northwest Evaluation Association database.

Darling-Hammond, L., & Friedlaender, D. (2008, May). Creating excellent and equitable Schools. *Education Leadership, 65(8),* 14-21.

Davis, J. (2006, May-June). *International Journal of Qualitative Studies In Education, 19 (3),* 289-304.

Demski, J. (2009, January). STEM picks up speed. *T.H.E. Journal, 36(1),* 22-26.

Despain, K. (1983). Information society challenges education. Issuegram no. 17. Retrieved from ERIC database. (ED255799)

David, J. (2008, October). Pacing guides. *Educational Leadership, 66(2),* 87-88.

Davidson & Dell (1996). Retrieved University Council for Educational Administration website: http: //www.npbea.org/resources.php

Day, S. (2002). Real kids, real risks: Effective instruction of students at risk of failure. *NASSP Bulletin, 86,* 1-12.

Department of Education in Washington, D.C. (2001). The longitudinal evaluation of school change and performance in title 1 schools. Retrieved from ERIC database. (ED457305)

Developing Instructional Leaders (2002). Retrieved from ERIC database. (ED466023)

Donegan, B. (2008, May). The linchpin year. *Educational Leadership, 65(8),* 54-56.

Educational Leadership Policy Standards: ISLLC (2008). Why a system. Retrieved University Council for Educational Administration website: http: //www.

npbea.org/resources. Php

Emmett, A. (1983). American education: The dead end of the ‘80s. *Personal Computing, 7(8),* 96-105.

ERIC Clearninghouse on Educational Management (1988). Improving school climate. The best of eric on educational management, number 93. Retrieved from ERIC database. (ED292214)

Evertson, C. (1986). Do teachers make a difference? *Education and Urban Society, 18(2),* 195-210.

Federal Poverty Guidelines (2010). 2009 to 2010 Federal poverty guidelines. Retrieved from website: hppt://www.atdn.org/access/poverty.html

Fisher, C. (1992). The influence of high computer access on school work and student empowerment: An exploratory study of the nashville acot site. Retrieved from ERIC database. (ED304100)

Forbes, J., & Saunders, C. (2008, May). How we reinvented the high school experience. *Educational Leadership, 65(8),* 42-46.

Franklin, C., Kim, J., Streeter, L., & Tripoli, S. (2007, July). *Children Schools, 29 (3),* 133-144.

Fredua-Kwarteng, E. (2005). A perspective on gender disparity in mathematics education. Retrieved from ERIC database. (ED493750)

Gladwell, M. (2008). Outliers: The Story of Success. New York: Little, Brown, and Company Publications.

Greenwood, D., & Levin, M. (1998). Introduction to Action Research. Thousand Oaks, CA: Sage Publications.

Gordan, J. (1995). Why minority students don’t teach. *The Educational Digest, 60(7),* 49-52.

Hall, G., & Israel, L. (2004, September). Using technology to support academic achievement for at-risk teens: During out-of-school time. Retrieved American Connects Consortium at Education Development Center

U.S. Department website

Hoachlander, G. (2008, May). Bringing industry to the classroom. *Educational Leadership,65(8),* 22-27.

Inan, F., Lowther, D., Ross, S., & Strahl, D. (2008, September) *Educational Media International, 45(3),* 195-213.

Jackson, F. (1992). The need for african-american teachers. *The High School Journal, 75(4),* 209-212.

Johnson, B. (2001, March). Toward a new classification of nonexperimental quantitative research. *Educational Researcher, 30 (2),* 3-13.

Johnson, R. (2000). Gender differences in mathematics performance: Walberg's Educational productivity model and nels:88 database. Retrieved from ERIC database. (ED440872)

Jordan, W. (1994). Exploring the complexity of early dropout causal structures. Retrieved from ERIC database. (ED375227)

Judge, S., Puckett, K., & Bell, S. (2006, September/October). Closing the digital divide: Update from the early childhood longitudinal study. *The Journal of Educational Research, 100(1),* 52-60.

Kaufman, P. (1992). Characteristics of at-risk students in neis: 88. National educational longitudinal study of 1988. Retrieved from ERIC database. (ED349369)

Kulik, C. & Kulik, J. (1989). Effectiveness of computer-based instruction: An updated analysis. *Computers in Human Behavior, 1,* 59-74.

Kulik, C. & Kulik, J. (1994). Effectiveness of computer- based instruction: An updated analysis. *Computers in Human Behavior, 7,* 75-94.

Kvasny, L., & Payton, F. (2005). Minorities and the digital divide. Retrieved Idea Group Inc.

Langenbach, M., Vaughn, C., & Aagaard, L. (1994). An Introduction to Educational Research. Boston: Allyn and Bacon.

Larson, R., Boswell, L., Kanold, T., & Stiff, L. (2004). Algebra 1: Applications, Equations, Graphs. Evanston, Illinois: Houghton Mifflin Company.

Lawton Public Schools (2010). Central middle school improvement plan. Retrieved Lawton Public Schools website: http://www.lawtonps.org/

Le, K. (2002). The digital divide: African-Americans fighting for equality. Retrieved From http://web.pdx.edu/~kle/page3.html

Machi, E. (2009). Improving u.s. competitiveness: With k-12 stem education and training. Retrieved from ERIC database. (ED505842). The Heritage Foundation website: http://www.heritage.org/Research/Education/sr0057.cfm

McCoy, K. (1995). Accommodation through Technology: Personal Computers. Denver: Love.

McMillen, M. (1994). Dropout rates in the united states: 1993. Retrieved from ERIC database. (ED375222)

McTighe, J., & Wiggins, G. (2008, May). Put understanding first. *Educational Leadership, 65(8)*, 36-41.

Mertens, D. (2010). Research and Evaluation in Education and Psychology (3rd ed.). Thousand Oaks, CA: Sage Publications.

National Center for Education Statistics (2010, May). Teachers' use of educational technology in u.s. public schools: 2009. Retrieved U.S. Department of Education website: http://nces.ed.gov/pubs2010/2010040.pdf

Newburger, E. (2000, August). Home computers and internet use in the united states: August 2000. Retrieved U.S. Census Bureau website: http: //www.census. gov/Population/www/soc…

Niemiec, R., & Walberg, H. (1993). Computers and achievement in the elementary schools. *Journal of Educational Computing Research, 1(4)*, 400-435.

Oklahoma State Department of Education. (2002). Oklahoma core curriculum tests grades 5 and 8 technical report. Retrieved from http: //www. sde. state. ok. us/AcctAssess/pdf…/techmanual/2002Gr5__8.pdf

Ornstein, A. & Levine, D. (1993). Foundations of Education (5th ed.). Boston: Houghton Mifflin.

Page, M. (2002). Technology-enriched classroom: Effects on students of low-socioeconomic status. *Journal of research on Technology in Education, 34(4)*, 389-409.

Patton, M. (1990). Qualitative Evaluation and Research Methods (2nd ed.). Newbury Park, CA: Sage Publications.

Perlman, R. (1989). Technology's role in restructuring schools. *Electronic Learning, 8*, 8-16.

Pisapia, J. (1994). Teaching with technology: Roles and styles. Research brief. Retrieved from ERIC database. (ED411358)

Ploeger, F. (1993). The effectiveness of microcomputers in education. Retrieved from ERIC database. (ED246876)

Price, H. (2008, May). About-face! *Educational Leadership, 65(8)*, 28-34.

Ramey, M. (2000). Reducing the white-nonwhite achievement gap. Retrieved from ERIC database. (ED442717)

Reeves, C. (2003). Implementing the no child left behind act: Implications for rural schools and schools and districts .Retrieved from http: //www.ncrel.org /policy/pubs/html/implicate/

Reeves, D. (2009, February). Model teachers. *Educational Leadership, 66(5)*, 85-86.

Rubensteim, M., & Wodatch, J. (2000). Stepping up to the challenge: Case studies of educational improvement in title 1 secondary schools. Retrieved from ERIC database. (ED446191)

Rutherford, A. (2001). Introducing ANOVA and ANCOVA a GLM Approach. Thousand Oaks, CA: Sage Publications.

Sanchez, L. (2007, May). Teaching and learning informational technology process : from a 25 year perspective-math regents. Retrieved from ERIC database.

(ED507477)

Schmoker, M. (2009, January). Measuring what matters. *Educational Leadership, 66(4),* 70-74.

Schwandt, T. (1997). Qualitative Inquiry: A Dictionary of Terms. Thousand Oaks, CA: Sage Publications.

Scott, B. (2004). Creating passages for young minority girls. Retrieved from ERIC Database. (ED484927)

Shavelson, R. (1996). Statistical Reasoning for the Behavioral Sciences (3rd ed.). Needham Heights: A Simon & Schuster Company.

Shotick, J., & Stephens, P. (2006, May/June). Gender inequities of self-efficacy on Task-specific computer applications in business. *Journal of Education for Business,* 269-273.

Social Change Agents (2005). Retrieval University Council for Educational Administration website: http: //www.npbea.org/resources. Php

Spielhagen, F. (2006, Fall). Closing the achievement gap in math: The long-term effects of eighth-grade algebra. *Journal of Advanced Academics, 18(1),* 34-59.

Tashakkori, A., & Teddlie, C. (1998). Mixed Methodology: Combining Qualitative and Quantitative Approaches. Thousand Oaks, CA: Sage Publications.

Tetenbaum, T., & Mulkeen, T. (1984). Microcomputrs in education: Toomuch too Soon. Retrieved from ERIC database. (ED257425)

The Digital Divide: Its Victims, Implications and Possible Solutions. (2010). Retrieved http: //www.uri.edu/artsci/lsc/Faculty/Carson/508 /03website/Barrett/researchpaper.html

Thomas, R. (2003). Blending Qualitative & Quantitative Research Methods in Theses and Dissertations. Thousand Oaks, CA: Sage Publications.

Thomson, S. (1993). Principals for our changing schools: The knowledge and skill base. Retrieved from ERIC database. (ED354601)

Tierney, R. (1993). The engagement of thinking processes: A two-year study of selected apple classroom of tomorrow students. Retrieved from ERIC database. (ED315061)

Toch, T. (2008, October). Fixing teacher evaluation: Evaluations pay large dividends when they improve teaching practices. *Educational Leadership, 66(2),* 32-37.

U.S. Department of Education. (2009). An exploratory analysis of adequate yearly progress, identification for improvement, and student achievement in two states and three cities. Retrieved from http://www.ed.gov/about/offices/list/opepd/ppss/reports. html#title

U.S. Department of Education. (2009). I can learn education systems. Retrieved from http: //www. icanlearn. com/success/used__article.asp

U.S. Department of Education: NCLB. (2009, January). Title I implementation—update on recent evaluation findings. Retrieved from http://www.edgov/about/offices/list/opepd/ppss/reports. html#title

Valadez, J., & Buran, R. (2007, February/March). Redefining the digital divide: Beyond access to computers and the internet. *The High School Journal*, 31-44.

Viadero, D. (2009, June). Researchers mull stem gender gap. *Education Week, 28(35),* 1.

Warren-Sams, B. (1997). Closing the equity gap in technology access and use: A practical guide for k-12 educators. Retrieved from ERIC database. (ED430556)

Wikipedia. (2010). The free encyclopedia. Website: http://en.wikipedia.org

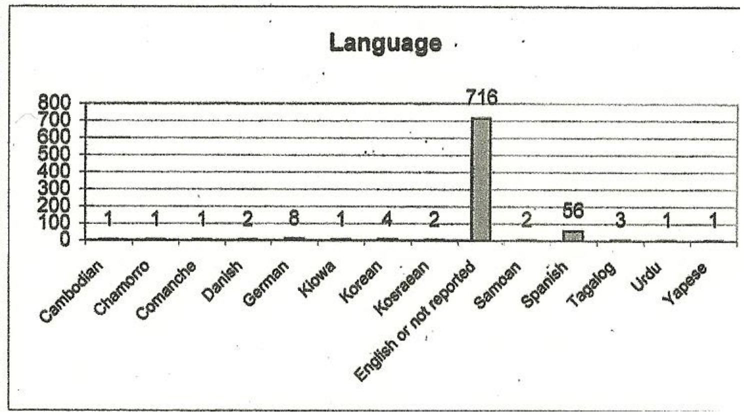
Wiersma, W. (1995). Research Methods in Education: An Introduction (6th ed.). Boston: Allyn and Bacon.

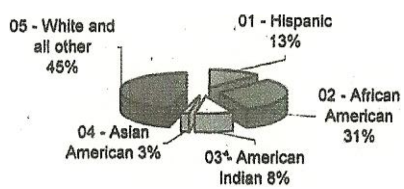
Wonacott, M. (2002). Dropouts and career and technical education. Myths and realities. Retrieved from ERIC database. (ED472364)

Appendices

Appendix A: Demographics

Language	6			7			8			Total
	F	M	Total	F	M	Total	F	M	Total	
Cambodian	0	1	1	0	0	0	0	0	0	1
Chamorro	1	0	1	0	0	0	0	0	0	1
Comanche	0	0	0	0	0	0	1	0	1	1
Danish	1	0	1	0	0	0	1	0	1	2
German	3	0	3	1	1	2	1	2	3	8
Kiowa	0	0	0	1	0	1	0	0	0	1
Korean	1	1	2	0	1	1	1	0	1	4
Kosraean	0	1	1	0	0	0	0	1	1	2
English or not reported	118	127	245	108	121	229	121	121	242	716
Samoan	0	0	0	1	1	2	0	0	0	2
Spanish	13	7	20	6	13	19	13	4	17	56
Tagalog	1	0	1	1	0	1	0	1	1	3
Urdu	0	0	0	0	0	0	1	0	1	1
Yapese	0	0	0	0	0	0	1	0	1	1
Total	138	137	275	118	137	255	140	129	269	799





Central Middle School

Ethnicity	6			7			8			Total
	F	M	Total	F	M	Total	F	M	Total	
01 - Hispanic	21	14	35	16	16	35	26	13	29	99
02 - African American	35	53	88	40	49	74	44	43	80	242
03 - American Indian	15	11	26	8	6	25	11	12	21	72
04 - Asian American	3	2	5	3	4	6	4	3	5	16
05 - White and all other	64	57	121	51	62	115	55	58	123	359
Total	138	137	275	118	137	255	140	129	269	799

Appendix B: Institutional Review Board

The University of Oklahoma®

OFFICE OF HUMAN RESEARCH PARTICIPANT PROTECTION - IRB

Review Date: June 25, 2010

June 28, 2010

Regina M. DeLoach
EACS
39 NW Sandy Trail Lane
Lawton, OK 73505

RE: Determination of Human Subjects Worksheet*: "A Post Hoc Summative Evaluation of the Effectiveness of Classroom Embedded Individualized Computer Based Learning for Middle School Students Placed at Academic Risk in Schools with a High Proportion of Title I Eligible Students"*

Dear Ms. DeLoach,

I have reviewed your submission and have determined this type of research does not meet the criteria to submit an application to the Institutional Review Board (IRB) for approval. This project does not involve human participant interaction. You may proceed with your project.

If you have any questions, please contact the IRB office at (405) 325-8110 or irb@ou.edu.

Cordially,

Aimee Franklin, Ph.D.
Vice-Chair, Institutional Review Board

1816 West Lindsey, Suite 150 Norman, Oklahoma 73069 PHONE: (405) 325-8110