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Exploring the factors that influence attitudes and achievement when students take computerized tests

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COLLEGE OF EDUCATION

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2009

ABSTRACT

Exploring the Factors that Influence Attitudes and Achievement when Students Take Computerized Tests

by

Jessie E. Kilgore, Jr.

M.A., Wayne State University, 1997
B.G.S., University of Michigan, 1991

Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy
K-12 Educational Leadership

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ABSTRACT

Currently, a problem exists in K-12 education related to the use of technology for the assessment of student learning. Specifically, due to the lack of access to and infrequent use of computers for middle school students, the rise in the use of high stakes computer-based tests may negatively impact student test scores in poor, urban schools. The conceptual framework of this study was informed by Albert Bandura's theory of self-efficacy, the work of The National Center for Fair and Open Testing regarding ending the misuses and flaws of standardized testing, and James Popham's research on quality assessment. The central research question explored the influence of socioeconomic status, computer access/use, attitudes towards computers, and student achievement levels on computerized tests. This research study was a case study involving 2 charter schools in Michigan. The researcher assumed the role of a non-participant observer and was the primary source for data collection and analysis. The participants for this study were students in Grades 6, 7, and 8 at one suburban and one urban charter school. Multiple sources of evidence were collected, including observations, surveys, and documents. Data analysis was conducted at two levels: category construction was used to examine data for each single case, and a cross-case analysis was used to examine the data for patterns and themes, using the research questions as a guide. A key finding was that home computer access coupled with sole use had a positive influence on student achievement, a positive influence on self-perceptions of computer ability, and significantly influenced the amount of computer usage. Implications for positive social change in education were that practitioners would become aware of the negative effects of computerized testing and implement strategies to mitigate the negative effects.

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DEDICATION

This dissertation is dedicated to my father, Jessie E. Kilgore, Sr. It is my sincere hope and prayer that, while currently battling serious illness, he will be able read this dissertation in its final form. If he meets his final demise prior to final publication, I dedicate this dissertation to his loving memory.

ACKNOWLEDGMENTS

First and foremost, I would like to thank God for giving me the strength and fortitude to make to this point in my educational journey. I am a living example that through Christ Jesus, all things are possible. Additionally, I would like to thank my wife Tonya who has encouraged me through the completion of both my master's and Ph.D. studies. I consider myself blessed and highly favored to have a wife that is so understanding and willing to put her goals on hold so that I could accomplish mine. Tonya, I give you my word; after this the ball is truly in your court. I owe you every ounce of support that I can muster for any endeavor you desire to pursue. I also want to thank my kids for being my inspiration. While I have multiple reasons from completing my doctorial studies, one reason is that I want my children to truly believe that they can accomplish anything that they put their minds to. In order to cement this concept, I must lead by example.

I also want to thank my parents who always believed in me even when I did not believe in myself. At every step of the way, they encouraged me, supported me and pushed me whenever necessary. While I can never repay the sacrifice they made both financially and otherwise, I hope that the completion of this degree will in some way pay down my debt.

Finally, to all of my ancestors, known and unknown, who fought, shed blood, and died so that I could have this opportunity – thank you. It is upon the shoulders of many that I stand.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION TO THE STUDY

Background to the Study

The National Center for Education Statistics (NCES) reported significant differences in computer access for low socioeconomic (SES) students as compared to students at higher income levels (Attewell, 2001; NCES, 2003) with the least access experienced by African American students and non-English speaking students (Hedges, Konstantopoulos, & Thoreson, 2000). Additionally, in a study about the factors influencing student resistance to computer administered testing, researchers found that "less negative attitudes about computers (specifically, computers used for testing) are significantly but weakly associated with higher levels of computer use and experience" (Bernt, Bugbee, & Arceo, 1990, p. 3). These researchers further found that “the extent to which computer experience and computer anxiety influence one's willingness to use a computer may depend upon the task to be accomplished with the computer” (Bernt et al., p. 1). As such, they suggested that “it may become necessary to address situation-specific anxieties (e.g., computer test-taking anxiety) rather than assuming a general computer anxiety construct” (Bernt, Bugbee, & Arceo, 1990, p. 1). Finally, in a study on computer use and its relation to academic achievement in mathematics, reading and writing, Hedges et al. cited numerous studies that suggested “technology can bolster student outcomes” (p. 1). However, Hedges et al. also suggested that “there is some evidence that the access to computers and the academic benefits that can be derived from computer use are not the same for all students” (p. 1).

As a result of the rapid rise in technology use in virtually every aspect of life, it should come as no surprise that technology use in schools has risen as well. In fact, in the last 15 years, schools have moved from a paper-ridden environment to one that will soon be paperless. Mundane functions such as attendance tracking that were once time-consuming tasks have been replaced by school-wide student information systems such as Win School, Mac School, and Zangle that are used to track attendance and discipline, conduct student enrollment, generate student transcripts and report cards, and create master and student schedules. In many cases, student records are now sent electronically, special education forms are electronic, employees swipe in and call computers when they are sick, and school records are stored in digital format. Moreover, even at the state and federal level, the majority of reports that schools must submit, such as Title I applications and grant applications, are now strictly available online.

Because many of these previously stated functions have increased efficiency throughout K-12 education, it was only a matter of time before the concept of efficiency would directly impact the daily lives of students. Whereas calculators, computerized tutorials, and, more recently, personal digital assistants (PDAs) and laptop computers are now integral parts of many schools and districts, the use of computers for standardized testing was simply off limits in the minds of most educators. However, as accountability in education increasingly became the new catch phrase, the importance of standardized tests increased exponentially.

Prior to federal mandates such as the No Child Left Behind (NCLB) Act, standardized tests were designed to assess the effectiveness of curriculum and instruction and to provide data for schools to target their school improvement efforts. However, the results from these tests are now highly scrutinized and are often tied to accreditation and funding. In fact, schools who fail to make adequate yearly progress (AYP) on these tests now face a range of sanctions that include (a) the implementation of whole school reform, b) replacement of the entire staff , c) the requirement that 20% of Title I funds be set aside for tutoring; d) providing students in failing schools the opportunity to transfer to a better school, e) the forced hiring of an outside management company to run the school, 5) converting the school to a charter school, or 7) closing the school.

Additionally, American political leadership, like the population in general, has been impacted by “an increased reliance on technology, the Internet and mass media . . . [and the] ever-increasing fast-paced American culture” that has resulted (McHenry, Griffith, & McHenry, 2004, pp. 1-2). It should come as no surprise, therefore, that “the No Child Left Behind Act requires that schools close achievement gaps much faster than before (McHenry et al., pp. 1-2). This need for speed, however, has left school districts “scrambling to conceptualize the triadic relationship among NCLB, computerized testing and their school district” (Recio, Clark, & Sevol, as cited in McHenry, Griffith, & McHenry, 2004, pp. 1-2). As a result, due to their ability to produce “immediate results for students, parents and school personnel, as well as the potential for quicker and more effective changes in both curricular and pedagogical delivery” (McHenry et al., p. 2), school districts feel pressured to utilize computerized tests.

Like school districts, state departments of education have also been forced to respond to NCLB accountability measures. As a result, as noted by Irving (2006):

> the increased testing requirements of the No Child Left Behind Act (2001) resulted in serious efforts to develop statewide computer-based testing programs to assess student learning. As of the 2004-2005 school year, 16 states have statewide computer-based testing programs in place while 4 additional states are piloting these programs (p. 13).

Fast results clearly seem to be the order of the day.

Endeavoring to obtain student test results sooner so that curriculum can be adjusted quickly is a noble goal. However, many districts have not properly analyzed the extent to which differences in computer access and use among their student body impact their attitudes towards computerized test-taking and ultimately, their test scores. It is imperative that this emerging problem in K-12 education be quickly and effectively addressed.

Statement of the Problem

Currently, a problem exists in K-12 education related to the use of technology for the assessment of student learning. Specifically, in spite of clear evidence of the digital divide that exists in poor, urban, minority schools, many schools and districts insist on administrating high stakes tests via the computer (Thomas, 2003, pp. 4-6). While the federal government as well as many community, social, and corporate organizations have attempted to fill the technology gap via computer give-away programs and technology grants, these efforts have had mixed results. This problem specifically impacts minority groups and other socioculturally marginalized learners. As a result of the lack of access to and infrequent use of computers that is part of the problem of the digital divide, the test scores of minority groups and other socioculturally marginalized learners, when administered via computer, may be negatively impacted. This fact is significant because school funding, recommendations for special services, and the decision to promote or retain teachers and students are often based, at least in part, on standardized test scores. Possible contributing factors are diverse ethnic backgrounds and other demographic characteristics. Moreover, "a host of other contextual factors, such as the user's gender, cultural traditions, peer expectations, role models, perception of needs, and opportunities to apply their proficiency" contribute to the problem (Subramony, 2007, p. 57). However, a gap in the literature exists, namely, the extent to which lack of access and/or infrequent use of computers impacts attitudes towards computers and computerized test scores.

To address the gap in the literature, this study will contribute to the body of knowledge needed to address this problem by examining the extent to which lack of access and/or infrequent use of computers impacts attitudes towards computers and resulting scores on computerized tests with a specific focus on the onset of computerized test-taking anxiety. Moreover, the theme of computerized test-taking anxiety will also be analyzed to determine differences based on gender, socioeconomic status and ethnicity.

Purpose of the Study

The main purpose of this exploratory multiple case study was to explore the influence of lack of access to and infrequent use of computers on attitudes toward computers and on resulting test scores of middle school students at two charter school districts in Michigan using computerized tests. In addition, this study also sought to explore how socioeconomic status, gender, computerized test-taking anxiety, and the type of computer access (sole home, shared home, community only, school only) influences the amount and type of computer usage, attitudes towards computers, and student test scores.

Research Questions

Central Questions

1. What is the influence of computer access/use and attitudes towards computers on student achievement using computerized tests?
2. What is the influence of the type of computer access (sole home, shared home, community only, school only) on computer access/use, attitudes towards toward computers and student achievement levels on computerized tests?

Related Questions

a) What is the influence of socioeconomic status and computer access/use on student attitudes toward computers?

b) What is the influence of student attitudes towards computers on student achievement levels on computerized tests?

c) What is the influence of socioeconomic status and gender on computerized test-taking anxiety?

d) What is the impact of the type of computer access (sole home, shared home, community only, school only) on students' computerized test-taking anxiety?

Conceptual Framework

This study will be informed by Albert Bandura's research on self-efficacy as well as the work of The National Center for Fair and Open Testing (FairTest), and the work of W. James Popham, a nationally recognized expert in educational assessment.

The construct of self-efficacy, first introduced by Albert Bandura (1977) in his article, *Self-efficacy:Toward a unifying theory of behavioral change*, "is based on the principal assumption that psychological procedures, whatever their form, serve as means of creating and strengthening expectations of personal efficacy" (Bandura, 1977, p. 193). As such, the extent to which one will choose to cope with various situations will be based in large part on how strongly they feel about their own effectiveness (Bandura, 1977). More specifically, "people fear and tend to avoid threatening situations they believe exceed their coping skills, whereas they get involved in activities and behave assuredly when they judge themselves capable of handling situations that would otherwise be intimidating" (Bandura, 1977, p. 194). Finally, those who continue to engage in safe activities once thought to be threatening "will gain corrective experiences that reinforce their sense of efficacy, thereby eventually eliminating their defensive behavior [whole] those who cease their coping efforts prematurely will retain their self-debilitating expectations and fears for a long time" (Bandura, 1977, p. 194).

According to Bandura (1977), there are four major sources upon which expectations of personal efficacy are based. These four sources include 1) performance accomplishments, 2) vicarious experience, 3) verbal persuasion and, 4) emotional arousal. Performance accomplishment is viewed as the most influential source of efficacy information “because it is based on personal mastery experiences” (Bandura, p. 195. The basic theory behind the performance accomplishment is that as successes increase, the expectation of mastery increases with the opposite true for failure; as failures increase, the expectation of mastery decreases (Bandura, 1977). However, “after strong efficacy expectations are developed through repeated success, the negative impact of occasional failures is likely to be reduced” (Bandura, p. 195).

In addition to performance accomplishments, individuals also receive information relative to their own self-efficacy through vicarious experiences. Unlike performance accomplishments that rely on personal mastery, the source for vicarious experience is based on a belief in one’s ability to complete any task that was previously completed by others. Essentially, “seeing others perform threatening activities without adverse consequences can generate expectations in observers that they too will improve if they intensify and persist in their efforts” (Bandura, p. 197).

Moreover, efficacy expectations can also be induced by verbal persuasion. While this source is “likely to be weaker than those arising from one’s own accomplishments because they do not provide an authentic experiential base” (Bandura, 1977, p. 198), it is nonetheless the most “widely used because of its ease and ready availability” (Bandura, p. 198). The basic theory behind this source is that through verbal suggestion, people can be led “into believing they can cope successfully with what has overwhelmed them in the past” (Bandura, p. 198).

Finally, efficacy expectations can be induced by emotional arousal. According to Bandura (1977), “stressful and taxing situations generally elicit emotional arousal that, depending on the circumstances, might have informative value concerning personal competency [that can] affect perceived self-efficacy in coping with threatening situations" (Bandura, p. 198). The basic premise here is that by intentionally invoking fear in one's own mind regarding an inability to achieve success means that "individuals can rouse themselves to elevated levels of anxiety that far exceed the fear experienced during the actual threatening situation" (Bandura, p. 199).

Because this study is focused on the extent to which lack of access and/or infrequent use of computers impacts attitudes towards computers and resulting scores on computerized tests with a specific focus on the onset of computerized test-taking anxiety, self-efficacy theory is relevant to this case study. This is especially true in light of the many unresolved issues with regard to computerized testing that The National Center for Fair and Open Testing (FairTest), as well as other organizations, has endeavored to resolve. FairTest "advances quality education and equal opportunity by promoting fair, open, valid, and educationally beneficial evaluations of students, teachers, and schools" (About FairTest, ¶ 1). To this end, FairTest has outlined the following unresolved issues regarding computerized testing:

1. Test-makers claims that the scores of computerized and pencil-and-paper tests are equivalent are inadequately supported.
2. Computerized tests constrain test-takers compared to paper-and-pencil tests.
3. Most computerized tests show only one item on the screen at a time, preventing test-takers from easily checking previous items and the pattern of their responses
4. Test-takers with the ability to manipulate computer keys rapidly may be favored.

5. Test-makers may try to use computerized exams to circumvent truth-in-Testing disclosure requirements.
6. Computers may worsen test bias.
7. Schools with large minority or low-income populations are far less likely to have computers.
8. The additional cost of computerized tests is certain to have a large effect on who chooses to take them.
9. Girls may be adversely affected by computerized tests.

(Fact Sheets, Computerized Testing: More Questions than Answers, ¶ 4-12).

Additionally, FairTest places "special emphasis on eliminating the racial, class, gender, and cultural barriers to equal opportunity posed by standardized tests and preventing their damage to the quality of education" (About FairTest, ¶ 2). Because this case study specifically includes issues of race, class and gender with regard to computer access, and the impact on attitudes towards computerized testing, the work of FairTest is relevant.

In addition to the work of FairTest, significant contributions to the body of research on assessment have been made by W. James Popham. According to Popham (2000), the quality of a test is based upon four important factors: instructional contribution, validity, reliability and the absence of bias. Popham (2000) contended that "a test's instructional contribution [is] the most important factor to be used in judging the test's quality" (p. 65). More specifically, he contends that quality assessments must "help a teacher's instructional decision-making" (p. 65). Additionally, Popham argued that the validity of the instrument must be taken into consideration. When considering evidence of a test's validity, Popham suggests using "the three categories of validity evidence: content-related evidence of validity, criterion-referenced evidence of validity (predictive and concurrent), and construct-related evidence of validity" (p. 95). Moreover, because "unreliable tests cannot possibly yield valid score-based inferences" (Popham, p. 121), test reliability is of the utmost importance. Popham defined reliability as "the consistency of results produced by measurement devices" (p. 121).

While instructional contribution, validity, and reliability are all important factors with regard to a test's quality, arguably the most important factor with regard to minority groups and other socioculturally marginalized learners, a major focus of this study, is test bias. According to Popham (2000):

> test bias is operative whenever there are qualities in (a) the test itself, (b) the way in which the test is administered, or (c) the manner in which the test's results are interpreted that unfairly penalize or give an advantage to members of a subgroup because of their membership in that subgroup (p. 145).

As Popham noted, African American and Latino American students suffer most from test bias as a result of "testing practices that are unquestionably in favor of individuals from the majority culture [as] educational tests have typically been written by European American, middle-class Americans; tried out on European American, middle-class students; and normed on European American, middle-class students" (pp. 144-145).

Thus, the current study has three separate yet interrelated foci: student learning with an emphasis on the assessment of student learning; the interrelationship of race, class and gender with regard to computer access and the impact on attitudes towards computerized testing and the impact of inadequate computer access and use on minority groups and socioculturally marginalized learners. As such, Bandura's self-efficacy theory, the work of FairTest, and the work of Popham are relevant to this case study.

Nature of the Study

This study was based on a qualitative paradigm as opposed to a quantitative paradigm. A quantitative approach "is one in which the investigator primarily uses post-positivist claims for developing knowledge" (Creswell, 2003, p. 18). A qualitative approach, however, involves making "knowledge claims based primarily on constructivist perspective" (Creswell, p. 18). This paradigm was chosen because the research is exploratory in nature and because "the researcher does not know the important variables to examine" (Creswell, p. 22).

This study followed the case study tradition. A case study is a qualitative approach "in which the researcher explores in depth a program, an event, an activity, a process, or one or more individuals…that is bounded by time and activity" (Creswell, 2003, p.15). Moreover, Yin (2003) noted that "case studies are the preferred strategy when 'how' or 'why' questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context" (p. 1). Because the scope of this current study was a bounded system and met the conditions of preference as outline by Yin (2003), case study was the most logical tradition to utilize.

Additionally, this case study was exploratory in nature. According to Yin (1994), there may be exploratory case studies, descriptive case studies, or explanatory case studies. Yin argued that the researcher should determine the type of case study based on (a) the type of research questions posed (b) the extent of control that a researcher has over the actual behavioral events and (c) the degree of focus on contemporary as opposed to historical events. In relation to these three conditions, 'what' questions are generally exploratory in nature whereas 'how' and 'why' questions are more explanatory in nature. This study used 'what' questions. Concerning the extent of control that the researcher has over the actual events, the case study is preferred in examining contemporary events but when the relevant behaviors cannot be manipulated. That would be true in this study. In other words, an exploratory case study would be used when "what" questions are being asked about a contemporary set of events over which the researcher has little or no control.

The participants in this exploratory multiple case study consisted of 68 suburban students in Grades 6-8 with one class each of Grade 6, 7, and 8 students. There were 44 urban students in Grades 6-8 with one class each of Grade 6, 7, and 8 students for a total of 112 students.

Each charter school was considered as a single case. In this study, the researcher played the role of a non-participant observer. To this end, while the role as researcher and observer were clearly known by all participants, the presence of this researcher was kept as passive as possible even though this researcher served as the primary source for data collection, interpretation, and analysis.

The sources of evidence collected for this study were observations, surveys, and documents. The construct validity for this study was increased through the use of these multiple sources of evidence as well as through the establishment of a case study database. In addition, an observational protocol was created that included both descriptive and reflective notes.

This researcher created a computer use survey for students designed to measure computer access including ownership, computer usage, and attitudes towards computer use including computerized testing anxiety. Yin (2003) argued that a survey can be used in case study research because the survey is viewed as a type of interview with more structured questions. The documents collected included the pre- and posttest Scantron Performance Series scores in reading and math and free and reduced lunch records from each charter school.

With regard to data analysis, this study was based in general upon the following five components that are critical to case study design: the research questions, the theoretical proposition, units of analysis, the logic linking the data to the proposition, and the criteria for interpreting the findings (Yin, 2003). Specific data analysis techniques were conducted at two levels as recommended by Merriam (1998), using a general analytic strategy of theory development and a more specific analytic strategy of category construction. Additionally, both single and cross case analysis were utilized with the research questions as the guide to the cross-case analysis. Because much of the survey data was quantitative in nature, descriptive statistics were used to analyze this data, and simple frequency charts and figures were used to display the data.

Definition of Terms

Adequate Yearly Progress: AYP is an individual state's measure of progress toward the goal that all students will meet the state academic standards in at least reading/language arts and math. AYP sets the minimum level of proficiency that the state, its school districts, and individual schools must achieve each year on annual tests and related academic indicators (U.S. Department of Education, 2008).

Charter Schools: Charter schools are nonsectarian public schools of choice that operate with freedom from many of the regulations that apply to traditional public schools. The "charter" establishing each such school is a performance contract detailing the school's mission, program, goals, students served, methods of assessment, and ways to measure success. Charter schools are accountable to their sponsor-- usually a state or local school board-- to produce positive academic results and adhere to the charter contract. The basic concept of charter schools is that they exercise increased autonomy in return for this accountability (U.S. Department of Education, 2008).

Community Only (computer access): The situation in which an individual's only computer access is in a community setting (i.e., church, library, home of a friend or relative).

Computerized Testing: Any testing that involves a student directly typing his or her answers into a computer (Testing, 2007, ¶ 3).

Computerized Test-Taking Anxiety: An uneasiness or apprehension experienced before, during, or after [administration of computerized examination] because of concern, worry, or fear (Test Anxiety, 2007, ¶ 1).

Digital Divide: The term digital divide refers to "inequities of access to technology based on factors of income, education, race, and ethnicity" (National Telecommunications and Information Administration & U.S. Department of Commerce as cited in O'Brien & Scharber, 2008, p. 67).

High Stakes Testing: Standardized tests that produce either "1) important contingencies for the student test-takers or; 2) evidence that [is] used by the public to rate the quality of schools and districts (Popham, 2000, p. 68).

No Child Left Behind (NCLB): The No Child Left Behind Act of 2001 (NCLB) reauthorized the Elementary and Secondary Education Act (ESEA) -- the main federal law affecting education from kindergarten through high school…NCLB is built on four principles: accountability for results, more choices for parents, greater local control and flexibility, and an emphasis on doing what works based on scientific research. (U.S. Department of Education, 2008).

Scantron Performance Series: The performance series is a standards-based adaptive measurement (SAM) that utilizes an innovative computer-adaptive, Internet based model to target the instructional level of each student by altering question difficulty based on previous answers (Performance Series Web Based Diagnostics: How it Works, ¶ 1).

School only *(computer access):* The situation in which an individual's only computer access is in the school setting.

Shared home (computer access): The situation in which in individual has computer access in their home but must share access with one or more family members.

Socioeconomic Status: An individual's or group's position within a hierarchical social structure. Socioeconomic status depends on a combination of variables, including occupation, education, income, wealth, and place of residence (Socioeconomic Status, 2007). In K-12 schools, students who participate in their schools free and reduced lunch program are categorized as “low SES”.

Sole home (computer access): The situation in which an individual has computer access in their home and is not required to share access with any family members.

Standardized Tests: Any test administered, scored, and interpreted in a standard, predetermined manner (i.e., Terra Nova, MAT-7, CAT) (Popham, 2000, p. 390).

Assumptions

For the purposes of this study, it was assumed that the environment of accountability that was established with the passage of the No Child Left Behind Act will be maintained in future education legislation. Moreover, as more schools are impacted by NCLB accountability measures, it was assumed that the demand for instantaneous standardized test score data would increase the prompting of school districts and state education boards to phase out paper and pencil tests in favor of computerized tests.

Further, it was assumed that all study participants would have some level of computer access (no matter how minimal) either at their home, at their school, at the home of a friend or family member, or at their church or in their community. It was also assumed, for the purposes of survey completion, that participants would understand that the word *computer* refers to a desktop or laptop computer and not other devices such as video games, iPods, iPhones, calculators, MP3 players, Palm Pilots, and Handheld PCs.

Scope, Delimitations, and Limitations

The scope and delimitations served to narrow the focus of this study. The scope of this case study was limited to two charter schools in the State of Michigan with an emphasis on student participants in Grades 6 through 8. While delimitations help researchers maintain a manageable study, they also may inhibit the credibility of the results. The current study was delimited by the fact that it only included middle school students in Grades 6 through 8 at two charter schools located in the State of Michigan. The current study was also delimited by the fact that only those students whose parents or guardians consented to their participation were surveyed. Finally, the current study was delimited by that fact that only English-speaking students were interviewed because the researcher is fluent only in English. While a translator would have been made available in the case of non-English speaking parents, this limited the credibility of the findings to only English speaking students. As a result of these delimitations, the findings of this study may or may not be applicable to other subpopulations, locations, and/or time periods.

Like all research designs, case studies “can be discussed in terms of their relative strengths and limitations” (Merriam, 1998, p. 40). With regard to strengths, “the case study offers a means of investigating complex social units consisting of multiple variables of potential importance in understanding the phenomenon (Merriam, 1998, p.

41). Additionally, because the insights that are gained from the case study methodology "can be construed as tentative hypotheses that help structure future research" (Merriam, 1998, p. 41), case studies also help advance the knowledge base of the field under study (Merriam, 1998). As a result of the aforementioned strengths, "case study has proven particularly useful for studying educational innovations, for evaluation of programs, and for informing policy" (Merriam, 1998, p. 41).

While the case study design has significant strengths, it also has inherent limitations or "conditions that restrict the scope of the study or may affect the outcome and cannot be controlled by the researcher" (Qualitative Dissertation Framework, Study Limitations and Delimitations, 2007, ¶ 1). According to Merriam (1998), case study research is time consuming, costly, and is often "too lengthy, too detailed, or too involved for busy policy makers and educators to read and use" (p. 42). Moreover, case studies "can oversimplify or exaggerate a situation leading the reader to erroneous conclusions about the actual state of affairs" (Guba & Lincoln, 1981, p. 377). Also, due to the lack of adequate training for novice case study researchers in the areas of observation, interviewing, final report construction, and data analysis, "the investigator is left to rely on his or her own instincts and abilities throughout most of [the] research effort" (Merriam, 1998, p. 42). Finally, due to researcher subjectivity and bias as well as the "lack of rigor in the collection, construction, and analysis of the empirical materials that give rise to [the] study," case study research is also limited with regard to reliability, validity and generalizability (Merriam, 1998, p. 43).

In addition to these general limitations of case study research, several limitations exist with regard to this current study. Due to fear of ridicule, students may not have been truthful when answering questions about home computer ownership and computer anxiety. Also, because the researcher was the sole designer of the survey, it may have been unintentionally biased as a result of the researcher's personal views, experiences and expectations regarding computer access and use. As such, the survey instrument may not have obtained the appropriate information for this study. Moreover, outside experiences such as fear of ridicule, peer pressure, parents' past experiences with surveys, privacy concerns, and lack of teacher or administrator encouragement may have had an impact on how participants responded to the survey questions.

The current study was further limited by the fact that much of the data with regard to ethnicity and free/reduced lunch was self-reported. With regard to ethnicity, students and parents had the option to provide or not provide this information. Moreover, in the case of "mixed" or "bi-racial" students, their selection of a racial designation may have been impacted by personal preference, parental preference or the ethnicity that was most accepting of them. With regard to free/reduced lunch forms, which are used to make a determination regarding socioeconomic status, numerous reasons existed as to why this information may not have been reported. The most obvious reason, fear of ridicule, is the most common. However, pride on the part of the parent may also have come into play. Additionally, some schools simply fail to collect the necessary forms from all parents, some of which may not even be aware that they qualify. As a result, the true percentage of low socioeconomic students at many schools is underreported.

Finally, the current study was limited by this researcher's decision not to subject the data collected to review by independent researchers. Specifically, if this researcher were to conduct this study again, he would include a review of notes, memos and other raw data by two independent researchers to determine if they would have arrived at the same conclusions. This would serve to solidify the reasonableness of the conclusions drawn from the data.

Significance of the Study

As a result of the environment of accountability established by the passage of NCLB and the ever increasing gap between the performance of American students and students from other countries, states and school districts have been forced to implement high-stakes testing programs to "gather data about student achievement over time and to hold schools and students accountable" (AERA, 2000, ¶ 3). These tests are called high stakes because of the severe consequences for the failure to perform.

> Schools may be judged according to the school-wide average scores of their students. High school-wide scores may bring public praise or financial rewards; low scores may bring public embarrassment or heavy sanctions. For individual students, high scores may bring a special diploma attesting to exceptional academic accomplishment; low scores may result in students being held back in grade or denied a high school diploma (AERA, 2000, ¶ 3).

The significance of this study is linked to an increase in the administration of high-stakes tests via computer. Specifically, the administration of high stakes tests via computer is only now increasing in districts across the nation. As a result, this study may justify the continuation of the practice or may cause practitioners to become aware of the possible negative implications of the practice. Moreover, this study may cause legislators to realize that, in their zeal to hold schools and districts more accountable, the various manifestations of the increased pressure (i.e., quick adoption of computerized tests without exploring the unresolved issues) were not properly addressed. Finally, this researcher is hopeful that this study will spark additional research regarding standardized testing safeguards in general and more specifically, guidance for states and districts considering the implementation of computerized standardized tests. This researcher is also hopeful that this research and related studies will prove useful during the development of future education legislation related to student accountability.

Organization of the Remainder of the Dissertation

The remainder of this dissertation consists of four additional chapters. Chapter 2 is a review of the literature and includes the following sections: introduction, assessment of student learning, computer access and usage, attitudes towards computers, computerized testing and achievement and conclusion. Chapter 3 provides an overview of the research methodology. Specifically, this chapter includes an explanation of the research paradigm and design and a restatement of the research questions. This chapter also includes a methodology section which describes the setting and participants, the researcher's role, and the data collection and data analysis protocols for the observations, surveys, and documents. The methodology section concludes with information regarding evidence of quality, study feasibility, ethical issues, and a summary. Utilizing well defined data collection and data analysis protocols, Chapter 4 presents results and findings. Chapter 4 opens with an introduction to the purpose of the study and presents results and findings for each individual case as well as an analysis of the results and findings across both cases. Chapter 5 presents an introduction, study summary, summary and interpretation of the findings, presentation of a theoretical proposition, recommendations for action and future research, implications for social change and reflections of the researcher.

CHAPTER 2: LITERATURE REVIEW

Introduction

The purpose of this chapter is to provide a succinct review of the literature surrounding a) the assessment of student learning, b) computer access and usage, c) attitudes towards computers, d) computerized testing and achievement. These four areas represent literature related to the conceptual framework as well as literature related to the participants and setting in this case study. Previous research studies related to the current case study will be discussed as well as similar and differing methodologies. An explanation of each of these sections follows.

The first section is titled “Assessment of Student Learning.” Without an understanding of what constitutes quality assessment, the various issues related to computerize testing cannot be fully explained. In this section, the work of Popham is more fully discussed. Additional studies regarding quality assessment are also discussed.

The second, third and fourth sections are related to the conceptual framework and are also related to the participants and the setting of this case study. These sections focus on some of the unresolved issues with regard to computerized testing as outlined by FairTest. More specifically, these sections focus on the differences in computer access, frequency and type of computer use, self-efficacy, computerized test taking anxiety, general attitudes towards computers and the differences in the achievement levels of low and high SES students on computerized tests. Chapter 2 concludes with a summary of the literature on assessment of student learning, computer access and usage, attitudes towards computers and the impact of these factors on student achievement. The chapter 2 summary also includes a summary of the conceptual framework, gaps, and deficiencies in the prior studies that require qualitative exploration, and the placement of the current study in the body of the literature.

The search strategies that were used to review the literature included Internet searches, review of books related to the current study, and database searches. The names of the databases that were used for the current study are outlined in Table 1 below.

Table 1

Database Names and Descriptions

1. Academic Search Premier
2. Computers & Applied Sciences Complete
3. Education Research Complete
4. ERIC
5. PsycARTICLES
6. PsycINFO
7. SocINDEX
8. Teacher Reference Center

During the various database and Internet searches, the following key words were used: digital divide, computer anxiety, computer phobia, computer access, computer attitudes, computerized testing, score comparability, pencil and paper test, computerized test, computer aided testing, computer adaptive testing, computer access, educational measurement, test mode, computer experience, computer self-efficacy, gender gap, academic achievement, computer usage, high-stakes testing, effective assessment, and assessment systems.

Assessment of Student Learning

As stated in the conceptual framework, significant contributions to the body of research on assessment have been made by Popham. According to Popham (2000), the quality of a test is based upon four important factors: instructional contribution, validity, reliability and the absence of bias. Popham (2000) contended that “a test’s instructional contribution [is] the most important factor to be used in judging the test’s quality” (p. 65). More specifically, he contends that quality assessments must “help a teacher’s instructional decision-making” (p. 65). To make this determination, Popham (2000) contended that the following question must be answered affirmatively: “Will the test, and/or the descriptive information accompanying it, help a teacher make sensible decisions about how to promote students’ mastery of the target instructional domain represented by the test?” (p. 74). Simply put, the test should “help answer the questions of ‘what should the teacher do next?’”(Popham, 2000, p.74). Once it is determined that a test makes an instructional contribution, the next evaluative factor that must be taken into consideration is the validity of the instrument.

Popham (2000) contended that educators often erroneously speak of tests in terms of their validity. This is often based upon a lack of understanding of the most commonly used definition of validity, namely, “the degree to which a test measures what it purports to measure" (Popham, 2000, p. 94). Popham (2000) argued, however, that "tests themselves are never valid" (p. 94) and tests simply yield scores "from which valid score-based inferences can be drawn" (p. 94). As such, Popham (2000) contended that it is the evidence of validity with which educators must be concerned.

When considering evidence of a test's validity, Popham (2000) suggested using "the three categories of validity evidence endorsed" by the American Educational Research Association's (AERA) Standards for Educational and Psychological Testing. The three categories include "content-related evidence of validity, criterion-referenced evidence of validity (predictive and concurrent), and construct-related evidence of validity" (p. 95).

Content-related evidence of validity is defined as "evidence indicating that an assessment suitably reflects the content domain it represents" (Popham, 2000, p. 96). This form of test validity is "produced by a set of (1) test-development operations designed to secure suitable content representativeness, and (2) subsequent appraisals of the resulting content" (Popham, 2000, p. 96). Criterion-related evidence of validity, on the other hand, is defined as "evidence demonstrating the systematic relationship of test scores to a criterion variable" (Popham, 2000, p. 102). Simply put this form of validity "is based on the extent to which a student's score on a test allows you to infer the student's performance on a criterion variable" (Popham, 2000, p. 101). Finally, construct-related evidence of validity, "is based on the accumulation of empirical evidence that (1) the hypothetical construct being measured actually exists, and (2) the assessment device in use does, in fact, measure the construct" (Popham, 2000, p. 115). However, because both content-related and criterion-related evidence of validity can be considered “as forms of construct-related validity evidence”, it is by far the most “comprehensive form of validity” (Popham, 2000, p. 115).

Because “unreliable tests cannot possibly yield valid score-based inferences, test reliability is of the utmost importance. Popham (2000) defined reliability as “the consistency of results produced by measurement devices” (p. 121). Reliability, however, can be approached in various ways, namely, through “stability, alternate-form, and internal consistency” (p. 122). “Stability estimates of reliability are based on the consistency of a test’s measurement over time” and are determined through re-administration of the same test to the same examinees after a predetermined period of time (Popham, 2000, p. 123). Whereas stability reliability is concerned with the consistency of a test’s measurement over time, alternate-form reliability is concerned with “the consistency of measured results yielded by different forms of the same test” (Popham, 2000, p. 126). Due to the concern for test security, this form of reliability is often used by publishers of standardized tests. Also, the two previously mentioned forms of reliability, stability and alternate-form are often combined to create what is known as stability and alternate-form reliability. This hybrid form focuses on “the consistency of measured results over time using two different test forms” (Popham, 2000, p. 129). This form of reliability is also widely used as it produces “the lowest reliability coefficients” (Popham, 2000, p. 129).

The final type of reliability, internal consistency, is substantially different from stability and alternate-form reliability. Whereas stability and alternate-form reliability "relate an examinee's scores on two tests (or two forms)…internal consistency… focuses on the consistency of a test's internal elements, namely, its test items" (Popham, 2000, p. 132). More specifically, internal consistency reliability measures "the degree to which a test's items are functioning in a homogeneous fashion" (Popham, 2000, p. 132). While not used with timed tests, this form of reliability can be determined based upon "data from only a single test administration" (Popham, 2000, p. 132). The underlying premise of this form of reliability is the notion of test variance. "Simply put …if a test's items are relatively homogeneous, there will be lots of variance on the test" (Popham, 2000, p. 133). Therefore, students well versed in the tested subject will do well because "most of the items are measuring the same thing" (Popham, 2000, p. 133), and students not so well versed will be unsuccessful across the board (Popham, 2000).

While all factors used to determine test quality are important, arguably the most important factor with regard to minority groups and other socioculturally marginalized learners is test bias. According to Popham (2000), "test bias is operative whenever there are qualities in (1) the test itself, (2) the way in which the test is administered, or (3) the manner in which the test's results are interpreted that unfairly penalize or give an advantage to members of a subgroup because of their membership in that subgroup" (p. 145). As Popham (2000) noted, African American and Latino American students suffer most from test bias as a result of "testing practices that are unquestionably in favor of individuals from the majority culture [as] educational tests have typically been written by European American, middle-class Americans; tried out on European American, middle-class students; and normed on European American, middle-class students" (p. 144-145).

Popham (2000) cautioned, however, that one should not immediately conclude that because minority students score lower than their European American counterparts on a test item, the item is biased. “Although such a test item may be biased, it may also be totally unbiased and may merely be detecting deficits in the instruction received by minority children” (Popham, 2000, p. 146).

As previously stated, if the qualities in a test or the way in which it is administered “unfairly penalize or give an advantage to members of a subgroup because of their membership in that subgroup” (Popham, 2000, p. 145), test bias is operative. If this is the case, then issues of computer access and usage take on greater significance when tests are given via computer.

Computer Access and Usage

The concept of the digital divide, or the difference in the level of computer ownership and access between ethnic groups, has been the subject of much controversy. In fact, the problem was so severe that The National Telecommunications and Information Administration (NTIA) in their 1999 report considered the problem of the digital divide “one of America’s leading economic and civil rights issues” (p. 14). Further, NTIA’s 1999 report found that while overall “the number of Americans connected to the nation’s information infrastructure is soaring…a digital divide still [existed], and, in many cases, [was] actually *widening* over time” (NTIA, p. 14).

The NTIA (2002), citing “the rapidly growing use of new information technologies across all demographic groups and geographic regions” (pp. 7-8) and the fact that “more than half of all Americans [were] using computers and the Internet” (pp. 7-8) claimed victory and boldly stated that we were “truly a nation online” (NTIA, 2002, p. 8). Additionally, while increased home use of computers was encouraging, the fact that more Americans were “using them at work, school, and other locations for an expanding variety of purposes” (NTIA, 2004, p. 7) was deemed significant.

While the information contained in the 2002 NTIA report seemed encouraging on the surface, others contended that reports such as the NTIA report simply obscured what Attewell (2001) categorized as the first and second digital divides. The first digital divide, according to Attewell, is the difference in computer ownership levels among the various ethnic groups whereas the second digital divide is “social differences in the way computers are used at school and at home” (Attewell, p. 253).

With regard to the first digital divide, Attewell (2001) noted that minorities and low SES families were less likely than their European American counterparts to have the necessary combination of Internet access and a home computer. Similarly, Thomas (2008) notes that survey results of her study revealed “a significant relationship between socioeconomic status and a student’s ability to access a computer and the Internet at home (p. 13). Attewell’s (2001) findings were further supported by data from the United States Census Bureau (2005). According to a report on Computer and Internet use in the United States in 2003 conducted by the U.S. Census Bureau (2005), while 67% of European American households had a computer in the household, this was only true for 45% of African American households and 44% of Latino American households. Similarly, whereas 60% of European American households had Internet access in 2003, the same was only true for 36% of both African American and Latino American households.

Additionally, "from 1994 to 2000, the technology gap between African Americans and European Americans widened, giving the impression that the problem was not correcting itself over time," according to the U.S. Department of Commerce (Attewell, 2001, p. 253). However, because the technology gap was almost nonexistent "at higher levels of income and education" (Attewell, p. 253), it followed that income and education rather than race were the main contributors to the technology gap (Attewell). Again, the conclusions of Attewell were supported by data from the U.S. Census Bureau. As outlined in Figure 1 and Figure 2, there was a direct relationship between education level, family income, computer ownership and Internet access. As a result, it seems likely that "the digital divide will shift to the bottom fifth of the income distribution, demarcating families with incomes below [$25,000] from the rest of our society" (Attewell, p. 253).

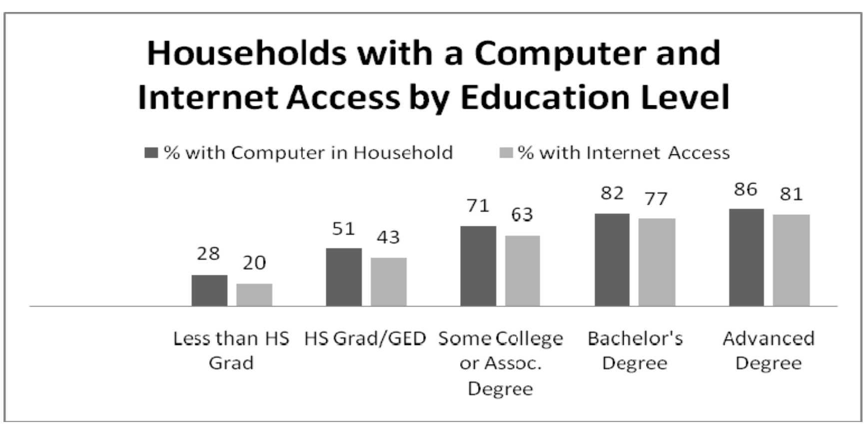

Figure 1. Bar graph showing households with a computer and internet access by educational level. From U.S. Census Bureau, Current Population Survey, October 2005.

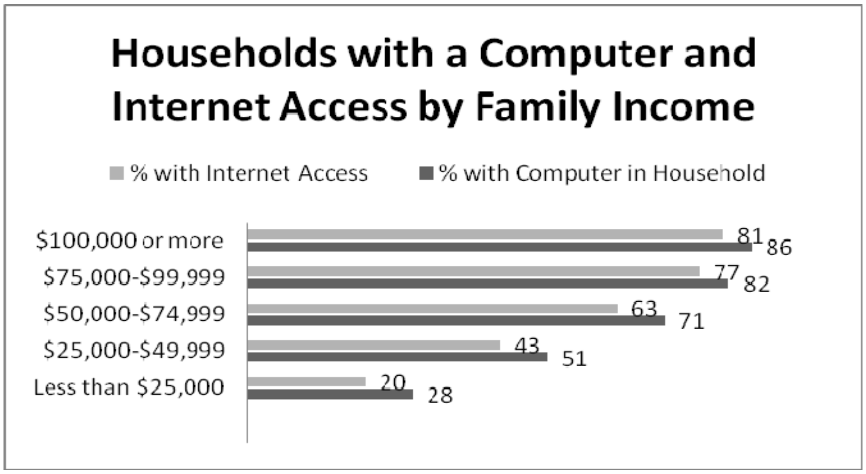

Figure 2. Bar graph showing households with a computer and Internet access by family income. From U.S. Census Bureau, Current Population Survey, October 2005.

It is also interesting to note that the census data reported computer ownership and Internet access in households with married couples at 74% and 67%, respectively. However, for female headed households, the numbers dropped to 56% and 48% for computer use and Internet access respectively (U.S. Census Bureau, Current Population Survey, October 2005).

While Attewell (2001) stated that income and education rather than race were the main contributors to the technology gap, this researcher believes that it is important to understand the connection between income, education and race to gain a clear understanding regarding the impact of the technology gap on certain groups. With regard to education, the U.S. Census Bureau provides statistics regarding the conferring of degrees in 2004 as outlined in Table 2.

Table 2

Degrees conferred in 2004 by degree type and race

(Year = 2004) - Degree Type	% of Total Conferred – European American	% of Total Conferred - African American
Associate	68%	12%
Bachelor	73%	9%
Master	66%	9%
Doctor	58%	6%

(Degrees earned by level and race/ethnicity, 2007)

Similar disparities existed with regard to the number of households with incomes under $25,000 with 25% and 43% being reported for European Americans and African Americans, respectively, for the year 2004 (Degrees earned by level and race/ethnicity, 2007). Also, for family groups with children less than 18 years old that were maintained by mother only, 55% were headed by single African American mothers whereas 18% were headed by single European American mothers (Family groups with children under 18 years old by race and Latino American Origin, 2007). Therefore, while race itself was not the main contributor to the technology gap, it was nonetheless a significant factor as a result on the non-race factors of education and income that disproportionately negatively impact certain groups, namely, African Americans and Latino Americans.

Additionally, according to Attewell (2001), the first digital divide also manifested itself in K-12 schools. While "the percentage of public schools with access to the Internet jumped from 35% in 1994 to 95% in 1999" (Attewell, p. 253), low SES schools still tended to have less sophisticated equipment, less equipment overall, and were less likely to have high speed connections such as DSL, cable, to TI (Attewell, 2001). Moreover, research suggests that the "technology available in schools with a majority of students from low-income families is usually 1 to 2 years behind that offered in schools with students from middle-income families, and 3 to 4 years behind schools serving students from high-income families" (Becker as cited in Judge, Puckett & Bell, 2006, p. 53). Also, according to the National Center for Education Statistics, it was often the case that low SES students attended schools completely void of Internet access altogether. NCES found that "students from families with lower SES and those who did not have home computer access were more likely to attend schools that did not have Internet access" (Morgan & VanLengen, 2004, p. 708). Moreover, "public schools that serve the poorest populations average 16 children per computer, while more affluent schools average 7 students per computer" (Williams, as cited in Attewell, 2001, p. 253).

Similar to the first digital divide, various reports obscured the reality of the second digital divide. For example, NAEP (National Assessment of Educational Progress) studies "in the mid- to late 1990s found that African American and Latino American fourth graders were more likely than European American fourth graders to report almost daily use of computers" (Attewell, 2001, p. 253). However, their use of the computer tended to be more recreational and less educational in nature at home and more geared towards drill and practice in school than their European American counterparts (Attewell, 2001; Jackson, Ervin, Gardner & Schmitt, 2001; Morgan & VanLengen, 2004). Moreover, similar to the issue of the technology gap, the connection between income, education and race with regard to the type of computer use cannot be ignored.

As Table 3 illustrates, a direct relationship exists between the level of education and family income and the use of computers to complete school assignments.

Interestingly, Table 4 also shows that a similar relationship exists with regard to the use of computers to play games. More specifically, as family income and parent educational attainment increases, the number of students that use computers to play games also increases. However, this likely has less to do with student desire to play games and more to do with the amount of disposable income available to purchase computer games. The issue of the second digital divide then is not simply use, but rather, the "social differences in the ways computers are used at school and at home" (Attewell, 2001, p. 253).

Insofar as school computer use is concerned, significant differences existed in students used computers in low SES and high SES schools. Specifically, "according to surveys conducted by the CEP Forum (2001), teachers in schools with low-poverty concentrations assigned many more technology activities involving word processing and spreadsheets, multimedia, Internet research, graphic presentations, and simulations than did teachers in schools with the highest poverty concentrations" (Judge, et al., 2006, p. 53). Additionally, reports suggest that "students in high-poverty schools used computers for drill and practice 35% of the time, compared with students in low-poverty schools who used computers for drill and practice 26% of the time" (Judge, et al., 2006, p. 53). However, according to Attewell (2002), a variety of factors accounted for the reason why use by minority and low SES students tended to be geared more towards drill and practice including inadequate number of computers, outdated hardware and software, limited technology budgets and IT support and inadequate teacher training).

Table 3

Percentage of children using home computers for specific activities in 2003

Student/Family Characteristic	Play Games	Complete School Assignments
Race/Ethnicity		
European American	66	54
Latino American	37	34
African American	38	35
Asian American	54	52
Native American	30	27
Parent Educational Attainment		
Less than high sch. Credential	27	24
High school credential	45	39
Some college	61	51
Bachelor's degree	68	57
Graduate education	74	61
Family/household type		
Two-parent married household	62	49
Female householder	42	32
Poverty Status		
In poverty	32	26
Not in poverty	64	53
Family Income		
Under $20,000	31	25
$20,000-$34,999	44	37
$35,000-$49,999	59	49
$50,000-$74,999	66	55
$75,000 or more	75	63
Metropolitan status		
Metropolitan, central city	46	40
Metropolitan, not central city	60	51
Non-metropolitan	55	44

(Adapted from National Center for Education Statistics, Computer and Internet Use by Students in 2003, Statistical Analysis Report, 2006)

Additionally, because educating "effectively with computing requires as much if not more adult support and effort as traditional teaching methods" (Attewell, 2001, p. 255), affluent districts with higher per pupil allotments have a distinct advantage in terms of employing additional student support staff. Because districts that serve poor and minority students are often unable to employ as many student support personnel, they gravitate towards the use of drill and practice software in hopes “that children can learn at the computer with minimal interventions from adults” (Attewell, p. 255). In these situations, the computer essentially functions “as an educational laborsaving device” (Attewell, p. 255).

Additional disadvantages with regard to home computer use further illustrate the problem of the second digital divide. In a 1993 study of computer use by children from affluent families (Giacquinta, Bauer, & Levin as cited in, Attewell, 2001), it was found that “even among these privileged children, little educational computing was going on” (Attewell, p. 256). However, “those children who came closest to involvement with academic computing had received substantial encouragement and involvement from their parents and older siblings” (Attewell, p. 257). The authors concluded that all students, regardless of race or socioeconomic status, if left to their own devices, will use computers as “game machines and word processors” (Attewell, p. 257). The key to ensuring adequate educational use, they further concluded, was dependent upon the “social envelope around computing, the attitudes, competencies, and involvement of parents and siblings” (Attewell, p. 257) that the child experiences. Because the strength of the “social envelope” is directly related to the socioeconomic status and education levels of the parents, then “by implication, children of poor families would be disadvantaged when using home computers for education” (Attewell, p. 257).

Attewell (2001) concluded that the mere access to computers may do little to close achievement gaps and in fact may “at least initially, exacerbate existing educational differences between social classes” (Attewell, p. 257). This likelihood is increased by the “real possibility that computing for already-disadvantaged children may be dominated by games at home and unsupervised drill-and-practice or games at school, while affluent children enjoy educationally richer fare with more adult involvement” (Attewell, p. 257).

In addition to the disadvantages that children experience as a result of the relationship between socioeconomic status and limited computer use and access, students may be further disadvanatged when attitudes towards computers are impacted. More specifically, as discussed the next section, the lack of access to and infrequent use of computers may have a negative impact on student attitudes towards computers.

Attitudes Towards Computers

Attitudes towards computers can be impacted by a host of contextual factors, such as socioeconomic status, parent’s stereotypes based on gender roles , age, and “the user’s gender, cultural traditions, peer expectations, role models, perception of needs, and opportunities to apply their proficiency” (Subramony, 2007, p. 57). Moreover, the previously mentioned contextual factors all related to this case study in that they were directly related to the issue of access and use and can impact a user’s level of computer self-efficacy or computer anxiety.

In an early study that examined the extent to which family SES, parent behaviors, and parental beliefs about how boys and girls should interact with computers (Shashaani,

1994) impacted attitudes toward computers, the researcher found that “SES, including the parents’ occupations and education, had significant effects on students’ attitudes towards computers” (Shashaani, p. 1). Specifically, Shashaani found that the higher the father’s SES from both an occupational and educational perspective, the more interested their sons were in computers (Shashaani, 1994). However, the impact of the father’s SES on the attitudes of daughters was more profound. “Girls whose fathers had higher occupational prestige and educational levels expressed more interest in computers and were more in favor of sex equity in ability for computer users” (Shashaani, p. 9). When the SES of mothers was taken into account, however, higher SES resulted in increased interest in computers by the daughters but not the sons. With regard to SES, this study found that “children, specifically girls from low-SES families, are less interested in computers than those from high-SES families” (Shashaani, p. 9).

In addition to the impact of SES on attitudes towards computers, Shashaani found that the ‘sex-typed views’ of parents and their level of encouragement were “highly significant and directly associated with student attitudes about computing” (Shashaani, 1994, p. 8). Specifically, both father’s and mother’s sex-typed beliefs increased their sons’ interest and confidence in computers while decreasing their daughter’s and contributed to both their son’s and daughter’s belief that computer were for boys (Shashaani, 1994).

Finally, Shashaani, utilizing stepwise regression, found that “parental attitudes and encouragement substantially overshadowed the effect of SES on children’s computer attitudes” (Shashaani, 1994, p. 10). While it was encouraging to learn that parental attitudes and encouragement could moderate the impact of low-SES on attitudes toward computers, Shashaani argued that a larger problem exists, namely, self-fulfilling prophecy. Shashaani contended that as long as “the dominate culture reinforces the educational and occupational gender segregation with respect to computing” and “significant persons in the family environment continue to define the computer profession as a male domain, the outcomes will fulfill the initial definition” (p. 10). However, in addition to impacting attitudes toward computers in general, gender-based self-fulfilling prophecies based on stereotypes can also impact attitudes by increasing or decreasing levels of computer self-efficacy and computer anxiety.

Computer self-efficacy is the belief in one’s ability to perform effectively with computers and “is positively related to attitudes, intentions, and behaviors with regard to computers and their applications” (Wiechmann & Ryan, 2003, p. 217). Research has shown that computer self-efficacy is “an important variable in understanding people’s decisions to use computers (Hill et al., 1987), reaction to computers (Compeau & Higgins, 1995; Webster & Martocchio, 1995), and performance when using computers (e.g., Gist, Schwoerer, & Rosen, 1989; Karsten & Roth, 1998)” (Wiechmann and Ryan, 2003, p. 217). Moreover, research suggests that individuals with high computer self-efficacy are more likely to have positive attitudes towards information technology in general and are more likely to be frequent users of information technology, including computers (Thatcher, 2002, p. 382).

The exact opposite of computer self-efficacy is computer anxiety. According to McDonald (2002), “computer anxiety refers to the fear experienced when interacting with a computer or anticipating an interaction" (p. 305). More specifically, computer anxiety "refers to fears about the implications of computer use such as the loss of important data or fear of other possible mistakes" (Sievert et al. as cited in Thatcher & Perrewé, 2002, p. 384). One could easily be tempted into viewing computer anxiety as simply a different manifestation of test-taking anxiety. However, "Heinssen, Glass, & Knight (1987) found that although a measure of computer anxiety was correlated with trait anxiety, it was not correlated with a test anxiety scale" (Wiechmann & Ryan, 2003, p. 217). Others have found that no relationship existed between "measures of computer and test anxiety" (Shermis and Lombard as cited in, Wiechmann & Ryan, p. 217). Therefore, the research seems to indicate that computer anxiety captures a "unique variance in people's reactions to computers beyond that of test anxiety" (Wiechmann & Ryan, p. 217).

According to Cooper (2006), gender stereotypes "unleash a number of influences that lead girls, even at the youngest ages in the educational process, to experience computer anxiety" (p. 331). One such influence is the male focused nature of computer aided instruction games. As a result of the popularity of arcade video games, mixed use facilities such as Chuckie Cheese and Major Magic and home systems such Atari, Nintendo, Playstation and Xbox, the marriage between educators and computer software manufacturers was seen as the prefect union. However, "the problem that went unnoticed for too long was that is predominantly boys who visit video arcades and it is predominantly boys who spend hours with their favorite games" (Cooper, p. 323). As a result, whereas games such as "TimezAttack" and "The ArithmAttack" were interesting for boys, "for girls, the result [was] lowered interest, negative attitudes, lowered performance, and computer anxiety" (Cooper, p. 323).

To support this reasoning, Cooper (2006) described an experiment conducted by Littleton et al. (1998) using a game called King and Crown. In this game, "children are taught a series of spatial reasoning skills as they attempt to navigate a computer-generated adventure" (Cooper, p. 323). For purposes of this experiment, both an aggressive version (the original) and a non-aggressive version were used. When the aggressive version of King and Crown was used, "boys learned the skills necessary for the game and fully succeeded in the adventure approximately 50% of the time. Girls, however, were successful only 8% of the time" (Cooper, p. 323-324). However, when the non-aggressive version of King and Crown was used, both "girls and boys performed at equal levels with 50% of both genders achieving the maximum solution" (Cooper, p. 324). As this experiment showed, girls were more than capable of matching the achievement of their male counterparts when CAI lessons were not male focused. When this was not the case, however, rather than experiencing a positive learning experience, girls experience increased anxiety and decreased interest and performance (Cooper, 2006).

Another influence that led to anxiety among girls was the "social context of computer learning that relies on mixed-gender group learning" (Cooper, 2006, p. 331). The research seemed to suggest that for girls, "having boys present has the effect of increasing computer anxiety and decreasing learning" (Cooper, p. 324). Several studies support this assertion. In a study by Rovingson-Staveley and Cooper (1990), "men and women students at Princeton University played the game of Zork in which players compete to find a buried treasure in an adventure game format" (Cooper, p. 324). Upon completion, the female students reported stress and anxiety and performed poorly. The male students performed better and did not report anxiety. However, when the students played the same game in complete privacy, "the women did well (better than the men) and experienced only a slight computer anxiety" (Cooper, p. 324). Cooper (2006) cites similar results in studies completed by Light et al. (2000) and Nicholson et al. (1998).

While the previously mentioned studies have essentially viewed computer attitudes as a monolithic construct, other studies view them as more multidimensional. More specifically, research suggests that there may be "different relationships between categories of use and attitudes toward computers" (Mitra, 1998, p. 9). In her study, categories of computer use and their relationships with attitudes toward computers, Mitra (1998) explored these relationships. Using a four page questionnaire administered to 1,444 undergraduate students, Mitra (1998) assessed general attitudes toward computers as well as the type of tasks for which computers were used. The questions related to task "…were organized around [five] primary categories of use [which included] (a) use of networks such as the Internet and World Wide Web for task-based purposes, (b) use of networks for non-task purposes, (c) use of computers for data-management operations, (d) use of computers for mathematical computations" and (e) word processing (Mitra, 1998, p. 5-6). After an analysis of the survey data, the researcher found what she called "an emerging relationship between category of computer use, context of computer use (voluntary/involuntary), and attitude toward computers" (Mitra, 1998, p. 8). As expected, a relationship between attitude and non-task related computer use existed. However, in task-based situations, such as the requirement to complete papers using a computer word processing program, “negative attitudes are overwritten by the academic requirement for computer use” (Mitra, 1998, p. 9).

Thus far, this researcher has discussed the disadvantages that children experience as a result of the relationship between socioeconomic status and limited computer use and access as well as gender and the impact of these factors on attitudes towards computers. However, as discussed the next section, students may be further disadvanatged when computerized testing is added to the equation. More specifically, attitudes towards computers, as outlined in the previous section, can increase or decrease levels of computer self-efficacy and computer anxiety, both of which may impact performance on computerized tests. Also, as a result of limited use and access, students lack of familiarity with computers may cause the comparability of computerized and pencil-and-paper tests and test mode effects to impact achievement levels on computerized tests.

Computerized testing and achievement

Arguably the most important factor regarding achievement on computerized tests is the interplay between computer anxiety, computer experience and computer self-efficacy. According to Bandura (1977), self-efficacy “is based on the principal assumption that psychological procedures, whatever their form, serve as means of creating and strengthening expectations of personal efficacy” (Bandura, 1977, p. 193). As such, the extent to which one will choose to cope with various situations will be based in large part on how strongly they feel about their own effectiveness (Bandura, 1977). More specifically, “people fear and tend to avoid threatening situations they believe exceed their coping skills, whereas they get involved in activities and behave assuredly when they judge themselves capable of handling situations that would otherwise be intimidating” (Bandura, 1977, p. 194). Therefore, “reduced anxiety and increased experience only facilitate performance upon tasks indirectly by increasing levels of self-efficacy which, in turn, leads to improved performance” (Bandura; Schunk as cited in, Brosnan, 1998, p. 225). In applying Bandura’s self-efficacy theory to computer-based learning, Meier (1985) “confirmed that high levels of computer anxiety reduce levels of self-efficacy which in turn lowers computer-based performance attainment” (Brosnan, 1998, p. 225). Likewise, computer experience by its very nature may not lead to improved performance. Additional experience will “only improve subsequent computer performance if the experience leads to increased levels of self-efficacy” (McInerney et al., as cited in, Brosnan, 1998, p. 225). Stated simply, “anxiety and experience predicts levels of self-efficacy which in turn predicts performance” (Brosnan, 1998, p. 225).

The relationship between anxiety, experience and self-efficacy was further confirmed both by the work of Thatcher & Perrewé (2002) and Fagan, Neill and Wooldridge (2004). In their study, “An empirical examination of individual traits as antecedents to computer anxiety and computer self-efficacy”, the researchers acknowledged the reciprocal relationship that exists between computer anxiety and computer self-efficacy. However, while acknowledging the aforementioned reciprocal relationship, they agreed with Bandura’s (1997) assertion that “efficacy beliefs are the primary influence on behaviors" (Thatcher & Perrewé, 2002, p. 384) and contended that "it makes sense to model computer anxiety as an antecedent to computer self-efficacy" (Thatcher & Perrewé, 2002, p. 384).

Further confirming the relationship between anxiety, experience and self-efficacy, Fagan, Neill and Wooldridge (2004) in their study, "An empirical investigation into the relationship between computer self-efficacy, anxiety, experience, support and usage", conducted a survey of 978 business school students in an effort to prove or disprove several hypotheses. The hypotheses related to the current study were as follows:

1. Computer self-efficacy will be negatively related to computer anxiety.
2. Computer experience will be positively related to computer self-efficacy.
3. Computer experience will be negatively related to computer anxiety.

The first hypothesis was based on research studies that "found that individuals with lower levels of anxiety will have higher levels of computer self-efficacy" (Fagan, et.al., 2004, p. 97). The second hypothesis was based upon research that concluded that "prior computer experience [was] a key individual difference variable that predict[ed] computer self-efficacy in a variety of IT applications" (Fagan, et. al., 2004, p. 97). Finally, the third hypothesis was based on research that suggested that, "in general, people with less experience are more likely to be anxious when confronted with IT with which they are unfamiliar" (Fagan, et. al., 2004, p. 98). All three hypotheses were confirmed.

In addition to the interplay between computer anxiety, computer experience and computer self-efficacy, comparability of pencil-and-paper vs. computerized tests and test mode effect can also impact student achievement on computerized tests. According to

The National Center for Fair & Open Testing (FairTest), one of the unresolved issues regarding computerized testing is lack of sufficient evidence regarding their comparability to pencil-and-paper tests. FairTest argues that while test makers often state that both versions of their tests are comparable, such assertions have not been universally supported. “In fact, research studies find there usually is a difference. Most studies show higher scores for paper-and-pencil exams, but a few studies have found advantages for those who take computerized tests” (Fact Sheets, 2007, ¶ 4). Clearly, the current literature on comparability is both limited and mixed.

According to Bugbee (1996), the research regarding the comparability of computerized and pencil-and-paper tests generally falls within two distinct time frames: pre-1993 and post-1993. The year 1993 is used here as the “shift” date as comparability studies in K-12 education were rare prior to 1993. Additionally, based upon this researcher’s review of the relevant literature, 1993 also appears to be about the time that advances in technology began to lead to innovation in the field of computerized testing.

Bugbee, (1996) offered one of the most complete and succinct reviews of the literature regarding the comparability of computerized and pencil-and-paper tests prior to 1993, *The Equivalence of Paper-and-Pencil and Computer-based Testing*. According to Bugbee (1996), one of the earliest studies to cover the issue of comparability was a report prepared for the College Board and ETS by Mazzeo and Harvey (1988) (Bugbee, 1996, p. 2). While many of the topics covered in the report have been rendered irrelevant due to advances in technology, the following remained relevant as of 1996: “(a) the number of omitted questions on a computerized test may differ from those on a paper-and-pencil test; (b) test scores from computer-based personality inventories are lower than those from paper-and-pencil tests; (c) test scores from computer-based speed tests are not likely to be comparable with paper-and-pencil versions; (d) graphics (graphs, pictures, etc.) in computer-based tests may affect the test scores and, consequently, their equivalence with paper-and pencil versions; and (e) tests with reading passages may be more difficult when given on computers" (Bugbee, 1996, p. 3). Ultimately, Mazzeo & Harvey (1998) concluded that "despite the tentative nature of our conclusions, it is clear that test publishers need to perform equating and/or norming studies when computer-administered versions of standardized tests are introduced" (Bugbee, 1996, p. 3).

The next major study cited by Bugbee (1996) was conducted by Bunderson, Inouye, and Olsen (1989). Similar to Mazzeo & Harvey (1998) as well as much of the current literature, Bunderson, et al., found the literature on comparability to be mixed. Specifically, they found "three studies that showed computer-based tests yielded higher mean scores than paper-and-pencil tests, nine studies in which computer based tests had lower mean scores than paper-and-pencil tests, and eleven studies in which no difference was found" (Bugbee, p. 3). Finally, in one of the last reviews of this subject during the pre-1993 era, Wise and Plake (1989) concluded that "either separate norms should be developed for computer-based and paper-and-pencil tests or the test developer should instruct the test user how to rescale computer-based scores to make them comparable with paper-and pencil scores" (Bugbee, p. 4).

Unlike the literature review by Bugbee and others, the current research on comparability is more specific in focus. In a 2001 study, Yasuyo Sawaki reviewed the literature on the “effect of mode of presentation on comparability of the information obtained from computerized and paper-and-pencil (P&P) tests” (Sawaki, 2001, p. 38). The researcher contended that investigation into this area must occur promptly because: (a) the computerization of L2 reading comprehension tests are “proceeding without sufficient empirical evidence that reading from a computer screen is the same as reading in print for L2 readers” (Sawaki, p. 38), (b) comparability research in the area of L2 language assessments is scarce (Sawaki, p. 38) and (c) it is important to conduct “comparability studies in local settings to detect any potential test-delivery-medium effect when a conventional tests is converted to a computerized test” (Sawaki, p. 38).

To this end, the study reviewed “two distinct areas of previous literature: (a) [Assessment Literature] studies that addressed general construct validity issues of computerized tests in cognitive ability as well as language assessment, and (b) [Mode of Presentation and Reading Literature] studies that shed light on the effects of mode of presentation on reading performance conducted mainly in ergonomics, education, psychology, and L1 reading research” (Sawaki, 2001, p. 39). The researcher further contended that while “the criteria used for assessing the equivalence of test forms across modes seem to be sufficiently standardized with the Guidelines (APA, 1986) as the base, the empirical findings as to comparability of conventional and computerized tests are rather mixed” (Sawaki, p. 44).

Sawaki (2001) also reviewed potential “task” changes when the testing mode is changed from a paper-and-pencil test (P&P) to a computerized test (computer based test [CBT] or a computer adaptive test [CAT]) and the psychometric equivalence of P&P and computerized tests. Additionally, the researcher discussed “the impact of mode of presentation on examinees, namely, the interaction of test taker characteristics with testing conditions and the comparability of decisions made across modes” (Sawaki, p. 39).

Task change, as defined by Sawaki (2001), was “the possibility that the nature of a test task may be altered when the item is presented in a different mode, which may in turn induce unexpected changes in item difficulty” (p. 39). If the switch from a conventional version to a computer based version changed the task such that “the correlation between scores on the computer and conventional versions is low, then validity is threatened” [Green as cited in, Sawaki, 2001, p. 39). The researcher reported two studies that reported low cross-mode correlations.

The first study discussed by Sawaki (2001) to report low cross-mode correlations was conducted by Greaud and Green (1986). In this study, they administered the numerical operations and coding speed subtests of the Armed Services Vocational Aptitude Battery to fifty college students (Sawak, p. 39) in both P&P format as well as a CAT format. The researchers found that “the CAT versions were completed faster by the subjects, who did better on the CAT versions in general” (Sawaki, p. 39). It was further found that “when the average number of correct responses per minute was used as the test score, the between-mode correlation coefficients for the coding speed subtest remained low to moderate when corrected for attenuation, while the within-mode correlations for both subtests and the between-mode correlations for the numerical operations subtest were high” (Sawaki, p. 39). With regard to performance on speeded tests, these findings were supported by Mead and Drasgow's (1993) meta-analysis (Sawaki, p. 39). However, these results were refuted by Neuman and Baydoun (1998) in "their study of mode effects on a speeded clerical test" (Sawaki, p. 40).

In addition to the previously mentioned mode effects, the research further suggested that differences in cognitive workload associated with paper-and-pencil versus computer-based tests may also impact achievement. "Cognitive (mental) workload has been defined as the interaction between the demands of a task that an individual experiences and his or her ability to cope with these demands. Hence, it arises due to a combination of the task demands and the resources that a particular individual has available" (Noyes, Garland, & Robbins, 2004, p.111).

While numerous instruments exist to measure cognitive workload, one of the most widely used is the NASA-TLX (Task Load Index) (Noyes, et.al, 2004). Further tests of this instrument indicate that it is high in both validity and reliability and favored by users (Noyes, et. al). The workload score generated by the NASA-TLX "is based on a weighted average of ratings on the following six scales: mental demand, physical demand, temporal demand, own performance, effort and frustration level" (Noyes, et. al, p. 112).

In their study, "Paper-based versus computer-based assessment: is workload another test mode effect?", Noyes, Garland and Robbins (2004), sought to determine if any differences existed with regard to the "perceived cognitive workload associated with a paper-based and a computer-based comprehension task" (Noyes, et. al, 2004, p. 112). This study focused on 'perceived cognitive workload' because a 2001 study by Mayes and his colleagues had already established that "a significant negative relationship [existed] between workload (as measured by the NASA-TLX) and comprehension scores (10 multiple-choice questions) in a comparison of an identical comprehension task presented on paper and on computer" (Noyes, et. al, p. 112). The study generated the following two significant findings: "(1) more effort appears to be needed to complete a computer-based test and (2) those with lower comprehension scores experienced greater workload" (Noyes, et. al, pp. 112-113). The researchers concluded that "lower-performing individuals will be disadvantaged when carrying out computer-based assessment" (Noyes, et. al, p. 113).

Finally, in her study, "The mode effect: A literature review of human and technological issues in computerized testing, Leeson (2006) sought to determine the impact of both human and technological issues on student computerized test performance. Based upon her review of the literature, the researcher made several discoveries relevant to the current case. First, the researcher noted that "cross-cultural and gender comparisons of performance on computerized versions of tests has been largely overlooked" (Leeson, 2006, p. 17). Moreover, she noted that while she found significant research that addressed the issue of computer anxiety and computer familiarity, "empirical evidence regarding the actual impact of these correlated characteristics on CBT performance is largely conflicting" (Leeson, 2006, p. 19). Finally, the researcher found that the ability to review items is both beneficial for and desired by examinees. To this end, "having multiple items on screen may have a facilitating effect allowing examinees to skip, scan and build off previous information" (Leeson, 2006, p. 18) whereas having only one item on the screen at a time “tends to increase errors and hurried responses” (Leeson, 2006, p. 18)

Review of Differing Methodologies

While this researcher found no studies that address the very specific questions outlined in the current study, numerous studies related to various aspects of the current study do exist. Additionally, while the current study employs the case study tradition, many of the aforementioned studies, while quantitative in nature, provide valuable insight into the current study. Each of the studies to follow provides a quantitative view of one or more aspects of the current study.

In the first study, Comber, Colley, Hargreaves & Dorn (1997), sought to “examine age and gender differences in the computer experience and computer attitudes of secondary school students and to explore the association between prior computer experience and computer attitudes” (Comber, Colley, Hargreaves & Dorn, 1997, p. 125). Further, the researchers predicted that “boys would report greater experience with and more positive attitudes towards computers than girls, and that older girls would be less positive than younger girls” (Comber, et al., 1997, p. 125). Moreover, the researchers further predicted that “controlling for prior or extracurricular experience with computers would reduce gender differences in attitudes towards the use of computers” (Comber, et al., p. 125). To conduct the study, the researchers surveyed 147 male and 131 female secondary students in two age groups, 11-12 years and 15-16 years (Comber, et al., p.

125). The survey questions included questions that focused on use and experience of computers and general computer attitudes.

The researchers found boys had greater experience with computers, had a higher level of computer ownership or access, used computers with greater frequency and "had wider general experience computing" (Comber, Colley, Hargreaves & Dorn, 1997, p. 129). Additionally, the study found that recreational computer use was more frequent among young users and that "boys showed greater liking for computing than girls overall" (Comber, et al., p. 131) in both age groups to whom the survey was administered. However, age differences did exist with regard to the age groups with girls. More specifically, "whereas younger girl reported liking computers almost as much as younger boys, older girls were less positive" (Comber, et al., p. 131). The researchers concluded that while home computer use may "make computing more enjoyable for girls [it] does not necessarily develop their self-confidence with computers" (Comber, et al., p. 132).

In the second study, Shashaani (1994), sought to "examine the effect of parents' SES and sex-role stereotypes on their children's attitudes toward computers" (Shashaani, 1994, p. 4). Moreover, it was "hypothesized that parental SES and their gender-stereotyped beliefs and behaviors would cause children to develop gender-stereotyped attitudes towards computers" (Shashaani, p. 4). Utilizing a 39-item computer attitude survey, data were collected from Grade 9 and Grade 12 students only. The participants included 907 Grade 9 students and 823 Grade12 students. The survey instrument itself was "derived from previously validated instruments used by Collis and Williams (1987) and Dambrot et al. (1985) to measure students' attitudes toward computers" (Shashaani, 1994, p. 4). The SES status of the participants was based on four predictors: "father's occupation, father's education, mother's occupation, and mother's education" (Shashaani, p. 5). The dependent variables included interest, confidence, and stereotype while the independent variables included sex, father's occupation, mother's occupation, father's education, mother's education, parental sex-typed attitudes, and encouragement (Shashaani, 1994, p. 5). "Sex differences in attitudes were determined by using multivariate analysis of variance (MANOVA) for each attitude subscale. The relationship of SES and parental attitudes/encouragement to students' attitudes was measured by using a one-way analysis of variance (ANOVA)" (Shashaani, p. 5). Additionally, Pearson correlations were used to "examine the direction of variable change [while] multiple regression analysis was applied to determine which independent variables had more effect on the dependent variables" (Shashaani, p. 5).

After analyzing the data, four major results emerged from this study. First, gender had a significant impact on attitudes towards computers. "Specifically, the study found consistent, significant gender differences in computer interest, computer confidence, and gender-stereotyped views about computer users among the students" (Shashaani, 1994, p. 7). Second, parental attitudes and the level of encouragement by parents "were found to be highly significant and directly associated with student attitudes about computing" (Shashaani, 1994, p. 8). More specifically, the data showed that "perceived fathers' sex-typed views positively affected their sons, but negatively affected their daughters in all aspects of computer attitudes" (Shashaani, p. 8). However, perceived mothers' sex-typed views positively affected their sons, but “negatively affected their daughters’ interest in computers, confidence in working with computers and stereotyped views” (Shashaani, p. 8). A third outcome of the study centered on the impact that SES had on student attitudes towards computers. Specifically, the study found that “the higher the fathers’ occupational status and educational levels, the more interested their sons were in computing” (Shashaani, 1994, p. 9). Additionally, daughters of fathers similarly situated as previously mentioned, “expressed more interest in computers and were more in favor of sex equity in ability for computer users” (Shashaani, p. 9). However, while the high SES of the father had a positive impact on both boys and girls, the same was not found to be true of mothers’ SES status. Specifically, “when SES was measured by mothers’ occupation and education, high SES contributed positively to their daughters’ computer attitudes, but not to their sons” (Shashaani, p. 9). The fourth and final outcome of this study focused on the impact of parental encouragement. Specifically, “in assessing the impact of the independent variables (parental sex-typed views, encouragement and SES), a stepwise regression showed that parental attitudes and encouragement substantially overshadowed the effect of SES on children’s computer attitudes” (Shashaani, 1994, p. 10). In terms of ranking the impact of various variables, the stepwise regression indicated that “parental encouragement had the greatest effect, and fathers’ and mothers’ attitudes were ranked next, with a stronger effect on daughters than sons. SES had the least effect for both males and females” (Shashaani, p. 10).

Conclusion

This chapter has reviewed the previous research studies related to the current study in the areas of assessment of student learning, computer access and usage, attitudes towards computers and computerized testing and achievement. While all studies previously discussed are in some way important to the current study, the most important studies are as follows: a) the first and second digital divides (Attewell, 2001), b) socioeconomic status, parents' sex role stereotypes and the gender gap in computing (Shashaani, 1994), c) reactions to computerized testing in selection contexts (Wiechmann & Ryan, 2003), d) the digital divide involving the special case of gender (Cooper, 2006), and e) the equivalence of paper-and-pencil and computer-based testing (Bugbee, 1996). Additionally, the text *Modern Educational Measurement* (Popham, 2000), the website www.fairtest.org and current population studies from the U.S. Census Bureau proved invaluable in the completion of this chapter.

The placement of the present study in the body of literature is directly related to the status of the research related to the current study. More specifically, in spite of the significant amount of literature covering the areas under study, much of the research is dated and has not kept pace with the rapid growth of both technology and users of technology. As such, many of the gaps and deficiencies in the prior work still exist and in many cases have been exacerbated. Therefore, this study contributes to the body of knowledge needed to address the problem under study by attempting to fill the gap in the literature regarding the extent to which lack of access and/or infrequent use of computers impacts attitudes towards computers and resulting scores on computerized tests with a specific focus on the onset of computerized test-taking anxiety. Moreover, the theme of computerized test-taking anxiety was analyzed to determine differences based on socioeconomic status and gender.

CHAPTER 3: RESEARCH METHOD

Introduction

The main purpose of this exploratory multiple case study was to explore the influence of socioeconomic status and lack of access to and infrequent use of computers on attitudes toward computers and on resulting test scores of middle school students at two charter school districts in Michigan using computerized tests. In addition, this study sought to explore how socioeconomic status, gender, computerized test-taking anxiety, and the type of computer access (sole home, shared home, community only, school only) influences the amount and type of computer usage, attitudes towards computers, and student test scores.

This chapter describes the research paradigm and research design as well as the data collection and data analysis protocols of this study. Moreover, because human participants are used in the current study, ethical issues including informed consent and institutional permission involving the Institutional Review Board (IRB) at Walden University are also discussed. This chapter concludes with a preview of chapters 4 and 5.

Research Paradigm and Design

This research study was based on a qualitative paradigm. According to Creswell (2003), three primary approaches to research exist, namely, quantitative, qualitative and mixed methods. The definitions for these three approaches are as follows:

1. "A quantitative approach is one in which the investigator primarily uses post positivist claims for developing knowledge (i.e., cause and effect

thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of the theories), employs strategies of inquiry such as experiments and surveys, and collects data on predetermined instruments that yield statistical data" (Creswell, 2003, p. 18).

2. "A qualitative approach is one in which the inquirer often makes knowledge claims based primarily on constructivist perspectives (i.e., the multiple meaning of individual experiences, meanings socially and historically constructed, with an intent of developing a theory or pattern) or advocacy/participatory perspectives (i.e., political, issue-oriented, collaborative, or change oriented or both. It also uses strategies of inquiry such as narratives, phenomenologies, ethnographies, grounded theory studies, or case studies. The researcher collects open-ended, emerging data with the primary intent of developing themes from data" (Creswell, 2003, p. 18).
3. "A mixed methods approach is one in which the researcher tends to base knowledge claims on pragmatic grounds (e.g., consequence-oriented, problem-centered, and pluralistic). It employs strategies of inquiry that involve collecting data either simultaneously or sequentially to best understand research problems. The data collection also involves gathering both numeric information (e.g., on instruments) as well as text information

> (e.g., on interviews) so that the final database represents both quantitative and qualitative information" (Creswell, 2003, p. 18).

When deciding which approach to utilize, this researcher considered the three criteria for selecting an approach as suggested by Creswell (2003). When selecting an approach, Creswell (2003) suggests the use of three criteria: 1) match between problem and approach; 2) personal experiences; and 3) audience.

In terms of matching the problem to the approach, a quantitative approach should be used "if the problem is identifying factors that influence an outcome, the utility of an intervention, or understanding the best predictors of outcomes" (Creswell, 2003, pp. 21-22). A quantitative approach should also be used when there is a need, as Simon (1995) notes, to "investigate one or more characteristics of a group to discover the extent to which the characteristics vary together…examine variables in the natural environments and do not include researcher-imposed treatments… [or] display the relationships among variables by such techniques as cross-tabulation and correlations" (P. 43). Finally, quantitative research should be used when, as Simon (1995) notes, there is a need to look at [the] present characteristics of a problem, view them as the result of past causal factors, and … examine the past factors "to discover the causes, critical relationships, and meanings suggested by the characteristics. Usually two or more groups are compared using these criteria" (p. 44).

When a quantitative approach does not fit a particular study, a mixed methods approach may be more appropriate. "A mixed methods approach is one in which the researcher tends to base knowledge claims on pragmatic grounds (e.g., consequence-oriented, problem-centered, and pluralistic). It employs strategies of inquiry that involve collecting data either simultaneously or sequentially to best understand research problems. The data collection also involves gathering both numeric information (e.g., on instruments) as well as text information (e.g., on interviews) so that the final database represents both quantitative and qualitative information" (Creswell, 2003, pp. 19-20). However, a mixed methods approach should only be used if the researcher wants to "both generalize the findings to a population and develop a detailed view of the meaning of a phenomenon or concept for individuals" (Creswell, p. 22).

The topic for this current study is exploratory in nature and has not been extensively researched. Moreover, the current study does not determine the relationship between variables but instead will explore the factors that influence attitudes and achievement in reading and math when students use computerized testing. Finally, the current study does not seek to "generalize the findings to a population and develop a detailed view of the meaning of a phenomenon or concept for individuals" (Creswell, 2003, p. 22). For the previously mentioned reasons, the problem under study more closely matches the qualitative paradigm.

In addition to matching the problem with the approach, Creswell (2003) stated that personal experiences must also be considered when deciding on an approach. More specifically, whereas individuals "trained in technical, scientific writing, statistics and computer statistical programs" (Creswell, 2003, p. 22) may be more comfortable with the quantitative approach, those who prefer a "more creative, literary-style writing" (Creswell, p. 23) or who intend to write on issues related to "marginalized people" may find the qualitative approach more suitable. Finally, those who desire both structure and flexibility will benefit from a mixed methods approach. Because this researcher is not a trained technical writer and does not possess the resources required for a mixed methods approach, this researcher's personal experiences were more closely aligned with the qualitative approach.

Finally, in addition to meeting these criteria, Creswell (2003) states that researchers must also consider their audience which could range from "journal editors, journal readers, graduate committees, conference attendees, or colleagues in the field" (Creswell, 2003, p. 23). Because the members of this researcher's graduate committee had experiences in both quantitative and qualitative approaches, the audience was likely to be receptive to this approach. Moreover, because case studies are narrative in nature and familiar to those in the field of education, parents, teachers and administrators are more likely to gravitate towards this type of research.

The specific tradition of inquiry that was chosen for this research study is that of the case study. According to Creswell (2003), the case study is an exploration of a bounded system or a case or multiple cases over time through a detailed, in-depth collection of data involving multiple sources of information that are rich in context. Moreover, this bounded system is bounded by time and place and the case being studied which could be a program, an event, an activity, or individuals. Additionally, Yin (2003) noted that "case studies are the preferred strategy when 'how' or 'why' questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context" (p. 1). For the current study, specific places (two Charter schools in Michigan) and specific individuals (middle school students) were examined. Moreover, the current study met the conditions of preference as outline by Yin (2003). As such, the case study tradition was appropriate for this research study.

Additionally, other reasons exist as to why case study tradition is appropriate for this research study. First, “the case study offers a means of investigating complex social units consisting of multiple variables of potential importance in understanding the phenomenon (Merriam, 1998, p. 41). Additionally, because the insights that are gained from the case study methodology “can be construed as tentative hypotheses that help structure future research” (Merriam, p. 41), case studies also help advance the knowledge base of the field under study (Merriam, 1998). As a result of these strengths, “case study has proven particularly useful for studying educational innovations, for evaluation of programs, and for informing policy” (Merriam, p. 41).

Prior to selecting a qualitative, exploratory multiple case study approach, several other paradigms and traditions, namely, ethnography, grounded theory, phenomenology and narrative research were considered but rejected. Because the current study is short in nature and does not focus on an intact cultural group, the ethnography tradition was deemed inappropriate. Moreover, because the current study is not an attempt to “derive a general, abstract theory of a process, action, or interaction grounded in the views of participants in a study” (Creswell, 2003, p. 14), grounded theory was also deemed not appropriate. Additionally, the phenomenological approach was deemed inappropriate for the current study as it does not involve the identification of “the ‘essence’ of human experiences concerning a phenomenon, as described by participants in [the] study" (Creswell, p. 15). Finally, the narrative research approach was not considered as participants in the current study are not being asked "to provide stories about their lives" (Creswell, p. 15).

Restatement of Research Questions

Central Questions

1. What is the influence of computer access/use and attitudes towards computers on student achievement using computerized tests?
2. What is the influence of the type of computer access (sole home, shared home, community only, school only) on computer access/use, attitudes towards toward computers and student achievement levels on computerized tests?

Related Questions

1. What is the influence of socioeconomic status and computer access/use on student attitudes toward computers?
2. What is the influence of student attitudes towards computers on student achievement levels on computerized tests?
3. What is the influence of socioeconomic status and gender on computerized test-taking anxiety?
4. What is the impact of the type of computer access (sole home, shared home, community only, school only) on students' computerized test-taking anxiety?

Methodology

Setting and Participants

The setting for this exploratory multiple case study was two Michigan charter schools, one suburban school and one urban, inner-city school. Each charter school was considered as a single case. The schools were purposefully selected because they were the most likely schools to provide the rich sources of information necessary to explore the factors that influence attitudes and achievement for students who take computerized tests differ, based on race, socioeconomic status, gender, and geographic location.

The suburban school is located in an affluent suburb and has a poverty count of 12.2%. With its primarily white collar workforce and high home values, the taxes generated per capita are significantly higher than those in the urban area. Moreover, the residents of the suburb, from a socioeconomic perspective, have the ability to take advantage of the rich resources not only in their community but also of those in and around the urban area.

The urban school, on the other hand, has a poverty count is 42.7%. In addition to a high poverty count, the area has experienced significant population declines over the past 15 years, significantly shrinking its tax base. Additionally, the downward spiral of the primary industry in the area, and a statewide recession has placed urban area at the head of the class in several categories, namely, unemployment, crime, illiteracy and mortgage foreclosures. As a result of its struggles, the urban area has experienced significant budget deficits forcing the closure of one city zoo, transferring the operation of the other to a private entity, reductions in the police force, and elimination of bulk trash pickup as well as the closing of numerous community centers and the city aquarium.

The participants in this exploratory multiple case study consisted of 68 suburban students in Grades 6-8 with one class each of Grade 6, 7, and 8 students and 44 urban students in Grades 6-8 with one class each of Grade 6, 7, and 8 students for a total of 112 students. Every attempt was made to ensure that the number of male and female participants is evenly split at each grade level. With regard to ethnicity and race, the students at the two schools were in stark contrast to each other. At the urban, inner-city school, the population is 99.3% African American, .2% Asian American. .2% Multiracial, and .4% European American. The suburban school, however, was somewhat more diverse with population percentages as follows: 92.8% European American, 1.4% Latino American, .3% Asian American and 5.5% African American (School Performance Reports, 2007).

Researcher's Role

In this study, the researcher played the role of a nonparticipant observer. To this end, while the role as researcher was clearly known by all participants, the presence of this researcher was kept as passive as possible. This researcher also served as the sole instrument for data collection and analysis. Due to the very nature of qualitative research, part of the researcher's role is to manage the fallible nature of serving as a human research instrument. To this end, it was necessary for this researcher, as Merriam

(1998) noted, to have tolerance for ambiguity, to be highly intuitive, and to be a skilled communicator. With regard to ambiguity, because qualitative research does not include a defined “set of procedures or protocols that can be follow step by step” (Merriam, 1998, p. 20), this researcher had to “be able to recognize that the best way to proceed will not always be obvious” (Merriam, 1998, p. 20). Additionally, this researcher had to “be sensitive to the context and all the variables within it, including the physical setting, the people, the overt and covert agendas, and the nonverbal behavior” (Merriam, 1998, p. 21). Moreover, regarding the data collection process, this researcher had been sensitive and intuitive enough to know when enough has been observed or gathered (Merriam, 1998). Finally, this researcher had to be a skilled communicator that “empathizes with respondents, establishes rapport, asks good questions, and listens intently” (Merriam, 1998, p. 23).

Data Collection Protocols: An Overview

According to Merriam (1998), the data collection techniques used in a study are determined by the researcher’s theoretical orientation, by the problem and purpose of the study and by the sample selected. As such, the following multiple sources of evidence were collected for this case study: observations, surveys, and documents.

As Merriam (1998) noted, observations are valuable because they “take place in the natural field setting…[and] represent firsthand encounter with the phenomenon of interest rather than a secondhand account of the world obtained in an interview” (Merriam, 1998, p. 94). This is the primary reason why this researcher opted to utilize observations and to avoid formal interviews. However, as Merriam (1998) also notes, "informal interviews and conversations are often interwoven with observation" (p. 94) as was the case with this study.

In addition to observations, surveys were utilized. While surveys are typically utilized in quantitative research, in the qualitative tradition, they can be "treated as documents in support of a qualitative investigation" (Merriam, 2003, p. 119) that require some quantitative analysis. Yin, (1994) further noted that surveys could be considered as a type of interview that entail more structured questions (p. 85). Because the Computer Use Survey is critical in determining the level and type of computer access as well as the level of comfort with computers in general and computerized testing specifically, it was utilized in the current study as a structured interview.

Moreover, several documents were collected for this study including the Scantron Performance Series test scores, MEAP test scores and free/reduced lunch reports. In the case of the current study, these documents were necessary to determine what impact, if any, socioeconomic status played with regard to computer access, computer use, type of computer use and the impact on academic achievement. These documents were also necessary to determine the impact that testing mode had on achievement level both separately and collectively with the previously mentioned factors. Finally, because the ethnicity designation on the survey and the data on free/reduced lunch applications were self-reported, gender served as the major data set whereas ethnicity and free/reduced lunch served as supporting data sets.

Observation Data Collection Protocol

For the current study, this researcher collected observational data during administration of the Scantron Performance Series testing window. All observations took place in the computer lab or a wireless accessible classroom at each individual school. During the testing window, one set of students from each grade (Grade 6 through Grade 8) were observed. Each observation lasted approximately 30-45 minutes. During each observation, this researcher made every effort to remain inconspicuous. All observations were recorded with handwritten notes on an observation data collection form (see Appendix). During the observations, the following were observed:

1. *The Physical Setting*: What is the age and condition of computers and other hardware? Is the computer to student ratio adequate? "What is the physical environment like? How is the space allocated? What objects, resources, technologies are included in the setting? (Merriam, 1998).
2. *The Participants*: Which gender is the majority? Are technology resource personnel present during testing? Who is in the scene, how many people are in the scene and what are their roles? What are the relevant characteristics of the participants? (Merriam, 1998).
3. *Activities and Interactions*: Are keyboarding ability differences obvious? Are their differences in the number of requests for assistance generated as a function of gender or race? Is there a definable sequence of activities? How do the people interact with the activity and with one another? What

norms or rules that structure the activities or interactions? When did the activity begin? How long does it last? (Merriam, 1998).

4. *Conversations*: What is the content of conversations in this setting? Who speaks to whom? Who listens? (Merriam, 1998)
5. *Subtle Factors*: Are there instances of visible frustration? Are there instances of daydreaming and other off-task behaviors? Do any “informal and unplanned activities” take place? What does not happen that should have happened? (Merriam, 1998).
6. *Observer Behavior*: How does the role of the observer affect the scene? What does the observer say and do during the course of the observation? What thoughts regarding what is going on run through the mind of the observer? (Merriam, 1998)

Survey Data Collection Protocol

This researcher created a computer use survey designed to measure computer access including ownership, computer usage, and attitudes towards computer use including computerized testing anxiety. The survey was four pages long and consisted of 18 questions, 4 short answer and 14 multiple choice. The survey was separated into four sections: computer access, home and community computer use, school computer use, and general information. The questions within each of these sections were selected or created because they relate directly to one or more of the research questions. The reliability and validity of this survey were established via a pilot study completed by this researcher.

The surveys were administered after-school in the computer lab of each respective school. Each grade level (6th, 7th and 8th) were assigned two days to complete the surveys and were broken down into groups of 24 students (i.e., 2 groups of 24 students per grade). The researcher's goal for the first day for each grade was to have 48 surveys completed during the 1.5 hour after-school block. The surveyed students were the same students that were previously observed as discussed in the section titled "Observation Data Collection Protocol".

The second day was reserved for students who were absent or otherwise unable to participate on the first day. The survey took approximately 10-15 minutes to complete and was administered by two Ph.D. candidate students trained by the researcher.

Document Data Collection

The documents that were collected are the Scantron Performance Series scores in reading and mathematics, MEAP scores in reading and mathematics and free and reduced lunch records from each charter school. The Scantron Performance Series tests are published by the Scantron Corporation.

> Performance Series is a standards-based assessment that uses an innovative computer-adaptive, Internet model to target the instructional level of each student. This is accomplished by adjusting question difficulty based on previous answers…this enables Performance Series to provide an accurate evaluation of the student's abilities, either at, above, or below grade level. Once the test has been completed, the results are immediately available online, by student, class, school, and district (Performance Series Web Based Diagnostics: How it works, ¶ 1).

While the authorizer of the two charter school districts participating in this study requires all of their schools to assess students annually with a norm-referenced test, the Scantron

Performance Series test is not mandated. However, about 95% of their schools utilize this instrument.

In terms of the format and organization of the score reports, the Student Report (Figure. 3) “shows individual student performance, so classroom teachers get data to help them create learning groups” (Performance Series Web Based Diagnostics: How it works, ¶ 3). Additionally, the Summary Report, as seen in Figure 4, “shows average performance data at the school level, so that district administrators can target schools in need of help. Report data can be viewed in many different layouts, by groups, locations, staff members, or individual student” (Performance Series Web Based Diagnostics: How it works, ¶ 4).

In addition to the Scantron Performance Series test, the two schools under study also participated in the Michigan Educational Assessment Program (MEAP). The MEAP program:

> was initiated by the State Board of Education… [and] first administered during the 1969-70 school year for the purpose of determining what students know and what students are able to do, as compared to standards set by the State Board of Education, at key checkpoints during the students' academic career (Design and Validity of the MEAP Test: An Overview, 2007).

The MEAP mathematics and language arts tests are mandated by the State of Michigan for all public school students in Grades 3 through 8.

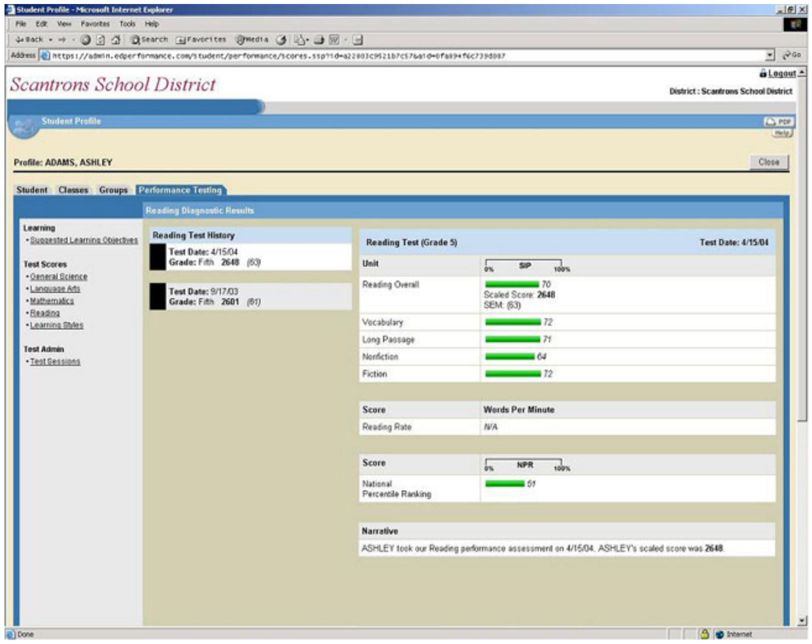

Figure 3. Scantron Performance Series sample student report. From www.scantron.com/performanceseries/howitworks.aspx, 1/10/2008).

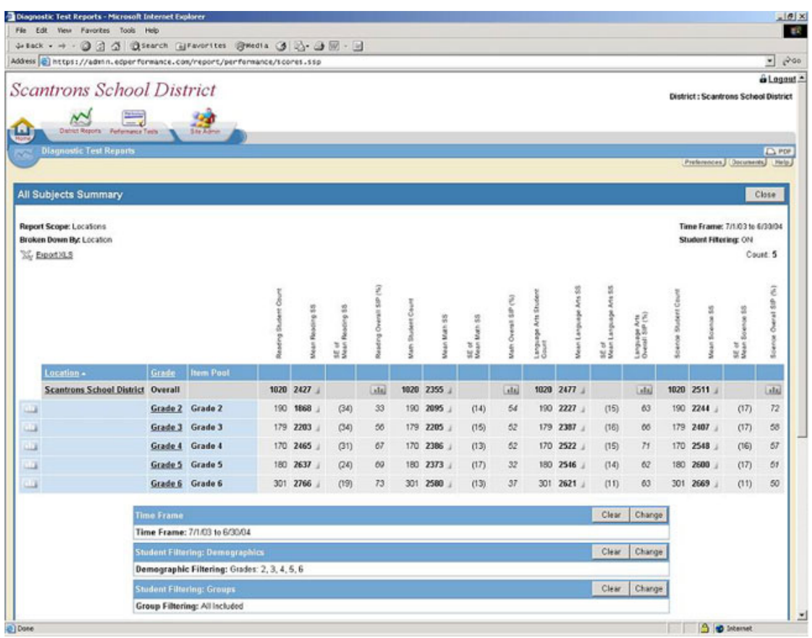

Figure 4. Scantron Performance Series sample summary report. From www.scantron.com/performanceseries/howitworks.aspx, 1/10/2008

The individual student reports for both the mathematics and reading tests contained three sections. The first section included the subject area tested, the grade level tested, the test administration year, the school name, the school code and the district code. The second section included the student name, student demographic information (i.e., gender, ELL status, DOB, ethnicity), special education status and if the test was given with accommodations. This section also listed the number of points earned out of the total possible, the scale score and the performance level (1=Exceeded Standards; 2= Met Standards; 3=Basic; 4=Did Not Meet Standards). The third section provided a detailed analysis of how the student performed in each strand or domain of the core areas. Specifically, this section listed the GLCE (grade level content expectation) or strand code, described the content of each strand, the number of students who chose each possible answer, indicated if the student chose the correct answer and listed the total number of the points the students received for each strand or GLCE.

Finally, the free and reduced lunch reports were obtained. These reports were generated from the Single Record Student Database (SRSD) files. Once generated from the SRSD database, the document was exported into an Excel spreadsheet and included the following columns: student number, last name, first name, middle initial, grade, gender and free/reduced lunch status.

All of the previously mentioned documents were collected by this researcher from the school principal or his/her designee (i.e., testing coordinator). Copies of these documents are included in the case study database located in the appendix. All documents were scanned into PDF files and stored on a secure, password protected FTP site with 128-bit encryption to secure the data against hackers.

Data Analysis Protocols

With regard to data analysis, this study in general, was based upon the following five components that are critical to case study design: the research questions, the theoretical proposition, units of analysis, the logic linking the data to the proposition, and the criteria for interpreting the findings (Yin, 2003). Specific data analysis techniques were conducted at two levels as Merriam (1998) and Yin (1994) recommend, using a general analytic strategy of theory development and a more specific analytic strategy of category construction. Additionally, both single and cross case analysis were utilized.

Additionally, as suggested by Merriam (1998), the data collection and analysis were "a simultaneous process" (p. 155). To this end, Bogdan and Biklen's (1992) 10 suggestions for analyzing data as outlined by Merriam (1998) (Appendix A), were utilized. Additionally, various qualitative research software packages were evaluated but utilized as the researcher did not deem such software beneficial to the data analysis process.

First Level of Analysis: Category Construction

In addition to this plan for data management, the actual process of data analysis for this case study began with the specific units of analysis or the single case. Category construction was used for each single case in relation to the source of evidence.

With regard to observational data, the step-by-step process suggested by Merriam (1998) was utilized. First, the researcher read the first interview transcript. Throughout the process of reading the transcript, “notes, comments, observations, and queries” (Merriam, 1998, p. 181) were made in the margins and served to “isolate the initially most striking, if not ultimately most important, aspects of the data (LeCompte, Preissle, & Tesch as cited in, Merriam, 1998, p. 181). After the process of reading and notation was complete, the researcher attempted to logically group the various notations (Merriam, 1998).

This same process of reading and making notations was utilized for additional sets of data such as field notes and documents. However, this was done “keeping in mind the list of groupings that [were] extracted from the first transcript, checking to see if they are also present in” (Merriam, 1998, p. 181) the second set of data. After a separate list of notations was completed for the second data set, the two lists were compared and “merged into one master list of concepts derived for the [various] sets of data” (Merriam, 1998, p. 181). Once completed, the “patterns and regularities [will] became the categories or themes into which subsequent items were sorted” (Merriam, 1998, p. 181).

In relation to the survey, data analysis involved both quantitative and qualitative analysis by case due to the structure of the survey. Descriptive statistics were used from each single case to visually depict the data through frequency tables and charts. Unlike inferential statistics which are used to make inferences from a set of data to more general conditions; “descriptive statistics are used to present quantitative descriptions in a manageable form or to simply to describe what's going on in our data” (Trochim, 2006). As such, with the exception of Questions 14-15 and 17-18 (18 total questions), all remaining portions of the survey (14 questions) were analyzed utilizing descriptive statistics. With regard to the open-ended questions included in the survey, the process of categorization previously outlined for observational data was employed.

The documents that were analyzed or “mined for data” as Merriam (1998) stated included reading and mathematics scores from both the Scantron Performance Series test and MEAP tests, and free and reduced lunch records from each school’s Single Record Student Database. These documents related to the central research questions and related questions of the current study in that they provided information regarding socioeconomic status as well as student achievement levels on both computerized and pen and paper tests. The analysis of these documents were important to the current study because they shed light on the relationship between socioeconomic status and lack of access to and infrequent use of computers and the impact that this relationship has on attitudes toward computers and resulting test scores.

The free and reduced lunch reports served as an indicator of low socioeconomic status. The two sets of test scores were used to determine if student performance levels on computerized versus pen and paper tests differed and if so, the extent of the difference.

Second Level of Analysis: Theory Development

Once the data from these specific units of analysis or single cases was coded into categories according to sources of evidence, a cross-case analysis was conducted, using what Yin refers to as the idea of a theoretical proposition or as Merriam identifies as ‘developing theory’. This researcher conducted this second level of analysis by examining the coded data from the surveys and the interviews across both cases in order to find themes, patterns, and relationships that could form one or more unifying ideas or a theory. The research questions were also used as a guide in this search for themes, patterns, and relationships in the data. From this cross-case analysis, a theoretical proposition was developed. This cross-case analysis was based on the theoretical proposition that socioeconomic status limits computer access/use, creating negative attitudes towards computers and leading to low student achievement levels on computerized tests. An alternative proposition was considered, namely, that the type of computer access (sole home, shared home, community only, school only) can positively or negatively influence the relationship between computer access/use, attitudes towards toward computers and student achievement levels on computerized tests. The cross-case analysis was also organized according to the research questions designed for this case study.

Evidence of Quality

The construct validity for this study was increased through the use of multiple sources of evidence that include surveys, interviews, and documents. By using these multiple sources of data to confirm the findings, Merriam (1998) argues that the data can be triangulated as a way to establish validity in a case study. In addition, threats to data quality were protected through the establishment of a case study database which generally includes case study notes, case study documents, and related materials (Yin, 1994). This case study database included the survey instrument, the observation data collection sheet, Scantron Performance Series test results, MEAP test results, free/reduced lunch student list, survey letter, survey parent consent form, survey student consent form, observation letter, observation parent consent form, observation student consent form, and the data use agreement form.

Prior to this study, a pilot study was also conducted in an effort to protect the quality of the current study. To this end, the phenomenon of interest in the pilot study was the clarity of the survey directions and questions and their collective ability to answer the research questions in the full study. Therefore, to assess the effectiveness of the survey, the pilot study attempted to answer the following question: To what extent does the survey collect sufficient evidence regarding computer access, computer usage and attitudes towards computer use? After analyzing the data from the pilot study, it became clear that several questions required rewording to improve clarity, and others required elimination from the survey. There were also instances where additional directions were required to improve understanding. The researcher's findings were confirmed via peer examination by two Ph.D. candidate colleagues.

Feasibility of the Study

This study was feasible in terms of scope, time and resources. With regard to scope, this study involved 68 suburban students in Grades 6-8 with one class at each grade level and 44 urban students in Grades 6-8 with one class at each grade level for a total of 112 students. Therefore, the scheduling of the students id not have to be altered and also made the survey completion and collection relatively easy. Additionally, the two schools were in close proximity to each other. Therefore, travel time was minimal between the two schools. Finally, this researcher had the necessary financial resources to cover all costs associated with this study including, but not limited to, purchase of a software package, survey preparation via paid subscription to Key Survey, copying costs and postage.

Ethical Issues

Because human participants were utilized in this case study, all necessary safeguards with regard to the use of human subjects were taken including application to the Institutional Review Board (IRB) at Walden University. Students in this study received invitations to participate. Also, students were required to submit parent consent forms as well as student assent forms. Finally, letters of cooperation and data use agreements were obtained from each school as required with signatures from one or more of the following: School Principal, Chief Administrative Officer and Board President. All documents were scanned into PDF files and stored on a secure, password protected FTP site with 128-bit encryption to secure the data against hackers.

Summary

Chapter 3 described the research design and the data collection and data analysis protocols of this study. Because this case study was exploratory in nature, the researcher was not a trained technical writer, and the intended audience would gravitate towards this type of research, the qualitative paradigm was selected. In line with the qualitative paradigm, the data collection included multiple sources of evidence including observations, surveys, and documents which also increased construct validity. Also in line with the qualitative paradigm, the data analysis for this study was based upon five components that are critical to case study design, namely, the research questions, the theoretical proposition, units of analysis, the logic linking the data to the proposition, and the criteria for interpreting the findings (Yin, 2003). Additionally, specific data analysis techniques were conducted at two levels as Merriam (1998) recommended, using a general analytic strategy of theory development and a more specific analytic strategy of category construction. Also, this study was feasible in terms of scope, time and resources and all necessary safeguards with regard to the use of human subjects were taken. Finally, in the chapters that follow, the results of the study are described and conclusions and recommendations are offered.

CHAPTER 4: RESULTS

Introduction

The main purpose of this exploratory multiple case study was to explore the influence of lack of access to and infrequent use of computers on attitudes toward computers and on resulting test scores of middle school students at two charter school districts in Michigan using computerized tests. In addition, this study also sought to explore how socioeconomic status, gender, computerized test-taking anxiety and the type of computer access (sole home, shared home, community only, school only) influences the amount and type of computer usage, attitudes towards computers, and student test scores.

Central Questions

1. What is the influence of computer access/use and attitudes towards computers on student achievement using computerized tests?
2. What is the influence of the type of computer access (sole home, shared home, community only, school only) on computer access/use, attitudes towards toward computers and student achievement levels on computerized tests?

Related Questions

1. What is the influence of socioeconomic status and computer access/use on student attitudes toward computers?
2. What is the influence of student attitudes towards computers on student achievement levels on computerized tests?

3. What is the influence of socioeconomic status and gender on computerized test-taking anxiety?
4. What is the impact of the type of computer access (sole home, shared home, community only, school only) on students' computerized test-taking anxiety?

Data Collection Protocols

Multiple sources of evidence were generated, collected and recorded for this case study, including observations, surveys, and documents. What follows is a description of the protocols that were conducted by this researcher for each source of evidence in this study.

Observation Data Collection Protocol

This researcher collected observational data during administration of the Scantron Performance Series test. All observations took place in the computer lab at each individual school. A total of three classrooms were observed, one each from Grades 6, 7, and 8; each observation lasted approximately 30-45 minutes. During each observation, this researcher made every effort to remain inconspicuous. All observations were recorded with handwritten notes on an observation data collection form (see Appendix F). During the observations, the following criteria, as recommended by Merriam (1998), were observed:

1. *The Physical Setting*: What is the age and condition of computers and other hardware? Is the computer to student ratio adequate? "What is the physical environment like? How is the space allocated? What objects, resources, technologies are included in the setting?

2. *The Participants*: Which gender is the majority? Are technology resource personnel present during testing? Who is in the scene, how many people are in the scene and what are their roles? What are the relevant characteristics of the participants?
3. *Activities and Interactions*: Are keyboarding ability differences obvious? Are their differences in the number of requests for assistance generated as a function of gender or race? Is there a definable sequence of activities? How do the people interact with the activity and with one another? What norms or rules that structure the activities or interactions? When did the activity begin? How long does it last?
4. *Conversations*: What is the content of conversations in this setting? Who speaks to whom? Who listens?
5. *Subtle Factors*: Are there instances of visible frustration? Are there instances of daydreaming and other off-task behaviors? Do any "informal and unplanned activities" take place? What does not happen that should have happened?
6. *Observer Behavior*: How does the role of the observer affect the scene? What does the observer say and do during the course of the observation? What thoughts regarding what is going on run through the mind of the observer?

Survey Data Collection Protocol

In an effort to measure computer access including ownership, computer usage, and attitudes towards computer use including computerized testing anxiety, this researcher created a computer use survey. The survey was four pages long and consisted of 18 questions, 4 short answer and 14 multiple choice. The survey was separated into four sections: computer access, home and community computer use, school computer use, and general information.

The surveys were administered after-school during the month of May in the multi-purpose room at each respective school. Selected students at each grade level were given two days to complete the survey. Surveys were administered to one group students per grade per school for a total of 112 surveys. The surveyed students were the same students who were also observed by this researcher.

The second day was reserved for students who were absent or otherwise unable to participate on the first day. Because the labs were being utilized for afterschool activities, the surveys were not able to be administered online as planned. As a result, the surveys were printed and administered as hard copy. After the surveys were completed, the results were entered into the online system Key Survey so that detailed analysis could occur. The surveys took approximately 10-15 minutes to complete and were administered by the researcher and another doctoral colleague trained by the researcher.

Document Data Collection Protocol

The documents that were collected for the current study included Scantron Performance Series scores in reading and mathematics, MEAP scale scores for Mathematics and English Language Arts, school-wide MEAP scores, school specific free and reduced lunch records, and school-wide free and reduced lunch percentage records. The Scantron Performance Series tests scores were obtained via the online report function provided by the Scantron Corporation to their participating schools. Once generated from the website, the resulting reports were printed hard copy. The MEAP scale scores were obtained by school staff from the secured site of the Michigan Department of Education. Once generated, the reports were printed hard copy. The MEAP school-wide scores were located by the researcher on the Michigan Department of Education public access site. The school specific free and reduced lunch reports were obtained by school staff via the Michigan Department of Education website and Single Record Student Database (SRSD) files. The school-wide free and reduced lunch records were generated by the researcher from the Michigan Department of Education website.

Organization and Management of Data

Throughout the data collection and analysis phases if the current study, various systems were used for keeping track of data and emerging understandings. With regard to observation data, the hand written notes taken in the field were retyped into the electronic version of the observation data collection sheet for easy access and ease of use. The hard copies of the observation data sheets were stored in a locked file cabinet and organized by grade level.

Like the observation data, the survey data (hard copy surveys) were sorted primarily by grade level. However, in an effort to minimize unnecessary transitions between data types (i.e., survey data, observation data and document data), a cross reference system was created. Specifically, at the top of each survey, notations were placed regarding the respondent's level of proficiency on the Scantron reading and math tests, level of reported computer use in the week prior to the survey, free and reduced lunch status and type of computer access.

Additionally, for easy access and ease of use, the raw survey data was entered on the online survey tool used to create the survey. Once entered, the data was exported into Microsoft Excel. Individual Excel files were created for each grade level at each school resulting in six Excel spreadsheets (one for each Grade, 6, 7 and 8) for both schools. Also, using the raw data in the Excel sheets, a specific analysis, and both single case and cross case was conducted. The hard copy surveys were filed in individual file folders and organized by school and grade. Finally, because the data from the documents used in the current study were utilized during the data cross referencing process, the hard copy documents were sorted by school and grade level and stored in a locked file cabinet.

Data Analysis Protocols

With regard to data analysis, this study was based on the following five components that are critical to case study design: the research questions, the theoretical proposition, units of analysis, the logic linking the data to the proposition, and the criteria for interpreting the findings (Yin, 2003). Specific data analysis techniques were conducted at two levels as Merriam (1998) and Yin (1994) recommended; at the first level, the more specific analytic strategy of category construction was used, and at the second level, the more general analytic strategy of theory development was used. Additionally, both single and cross-case analyses were utilized, and the research questions were used as a framework for the interpretation of the findings.

Additionally, as suggested by Merriam (1998), the data collection and analysis was "a simultaneous process" (p. 155). To this end, Bogdan and Biklen's (1992) ten suggestions for analyzing data as outlined by Merriam (1998) and previously discussed in chapter 3 were also utilized.

Single Case Data Analysis: Level 1 Coding

Observation Data

With regard to observational data, the step-by-step process suggested by Merriam (1998) was utilized. First, the researcher read the first interview transcript for the first single case, the suburban school. Throughout the process of the reading the transcript, "notes, comments, observations, and queries" (Merriam, 1998, p. 181) were made in the margins and "served to isolate the initially most striking, if not ultimately most important, aspects of the data" (Merriam, 1998, p. 181). After the process of reading and notation was complete, the researcher attempted to logically group the various notations (Merriam, 1998).

Observation data for suburban school Grade 6: Table 4 presents a description of this researcher's field notes and the researcher's reflections that were written during the observation of students in Grade 6 at the suburban school during Scantron testing. These field notes and reflections are organized or coded into categories in relation to the specific criteria developed for the observation data collection form.

Table 4

Observation data grade 6 students at suburban school

Physical Setting	Raw Data/Field Notes	Researcher Reflections
Age of Computers/Condition	The computers were 4 to 6 years in age. All computers were IBM Desktops with flat screen monitors.	With the exception of one computer, all computers were in working order. Based on the age of the computers, all seemed very well maintained.
Computer/Student Ratio	Computer to student ratio was 1 to 1. No computers were shared.	Even though all students were present, 6 stations were still available. Lab was set up for 30 students in spite of obviously lower class sizes.

table continues

Physical Environment	Several of the computer carts in the middle of the room were in need of minor repairs. The room was separately climate controlled. Room seemed overly cool. However, the majority of students wore blue "hoodies" with the school logo. Room dimension was 26 x 26. Walls were beige, carpet was brown, computers were black and chairs were blue. Room included two teacher desks, one in the SW corner and one in the SE corner.	Each computer station had a print out of the student's password (no need to search). Obviously, seats must be assigned. Each computer was set in individual computer stations with pull out ergonomic keyboard trays and foot rests. It seems that thought was given to student comfort and safety. Additionally, battery backup surge protectors were utilized. While very expensive, battery backup surge protectors are an extremely wise investment to help minimize the possibility of data loss during testing.
The Participants		
Gender Differences/Majorit y	28 students participated in the testing, 15 female and 13 male.	This section has almost the same number of boys and girls. Is this an isolated incident or a school-wide or grade level phenomenon? How do these numbers compare to national norms in terms of gender make up of middle school students?
Who is in the scene (how many? roles?)	In addition to the 28 students, two teachers were present – the Grade 6 ELA teacher and the computer lab teacher.	Does the content area teacher's presence in the room have a calming effect?

tables continues

Relevant characteristics of the participants	All 28 of the students were European American.	The ethnic make-up of this school is not representative of the general population of the city in which it is located. The school demographics are as follows: 92.8% European American, 1.4% Latino American, .3% Asian American and 5.5% African American (www.cmucso.org). However, the demographics for Southfield, MI are as follows: 38.4% European American, 1.2% Latino American, 3.1% Asian American and 54.2% African American (http://www.muninetguide.com/states/michigan/municipality/Southfield.php). Is there a reason African American students do not apply to this school?
Activities and Interactions		
Keyboarding ability	N/A as all entries were completed via mouse click.	Does mouse clicking make students more prone to "click" out of routine as opposed to utilizing critical thinking?
#of requests for assistance (race)	2 requests for assistance occurred during observation period. Both students were European American.	All students seemed comfortable with the technology.
#of requests for assistance (gender)	Two requests for assistance occurred during observation period. One student was a European American male and the other was a European American female.	All students seemed comfortable with the technology.

table continues

Interaction w/activity and others	Majority of students were sitting upright and seemed very focused. Some of the smaller Grade 6 students were	Does looking at a computer screen at an angle place a strain on the eyes? Could this impact scores? Adjustable

	not at eye level with the computer and had to look up at an angle to view the screen.	chairs seem in order.
Conversations		
Content of conversations	Unable to determine nature of student request.	Interaction between student and teacher seemed to go unnoticed by remainder of class.
# of computer functionality questions	Two students (one European American female and one European American male) had computer functionality questions.	Interaction between students and teacher seemed to go unnoticed by remainder of class.
Subtle Factors		
Instances of visible frustration	Three instances of frustration occurred. Two of the students were the same as those listed above with computer functionality questions.	Students seemed frustrated throughout the testing period. Why?
Instances of daydreaming and other off- task behaviors	Six instances of daydreaming and other off-task behavior occurred, 5 girls and 1 boy.	Is this an indication that some girls lose interest in computer activities more easily than some boys?
Informal and unplanned activities (i.e., entrants, class passing, PA, other students)	The computer lab was adjacent to an ESL classroom. The class was involved in some sort of language activity that required verbal interaction. One phone call came into the room near the end of testing. However, when the phone rang, only two students remained.	Students had very little reaction to the nose from the adjacent room. Are students simply accustomed to the noise? Could it be that some students were in fact distracted but felt they had no recourse? Is it possible to turn the ringer off during testing?
Observer Behavior		
Observer affect on the scene	Observer was introduced at the start of class.	Students did not seem to be impacted by observer’s presence.
Observer comments and actions	Observer simply said hello.	

table continues

Observer thoughts		Does allowing students to leave early place undue pressure on those that remain? Does it make them rush? Does it make them feel less capable and lose confidence? Does allowing others to leave early cause students to answer more quickly than they normally would have to avoid ridicule from others?

Observation Data for Suburban School Grade 7: Table 5 presents a description of this researcher's field notes and the researcher's reflections that were written during the observation of students in Grade 7 at the suburban school during Scantron testing. These field notes and reflections are categorized or coded according to the specific criteria developed for the observation data collection form.

Table 5

Observation data Grade 7 students as suburban school

Physical Setting	Raw Data/Field Notes	Researcher Reflections
Age of Computers/Condition	The computers were 4 to 6 years in age. All computers were IBM Desktops with flat screen monitors.	With the exception of one computer, all computers were in working order. Based on the age of the computers, all seemed very well maintained.

Computer/Student Ratio	Computer to student ratio was 1 to 1. No computers were shared.	Even though all students were present, 6 stations were still available. Lab was set up for 30 students in spite of obviously lower class sizes.
Physical Environment	The room was separately climate controlled. Room seemed overly cool. However, the majority of students wore blue "hoodies" with the school logo. Room dimension was 26 x 26. Walls were beige, carpet was brown, computers were black and chairs were blue. Room included two teacher desks one in the SW corner and one in the SE corner. Lights were off in 1/3 of room.	Each computer was set in individual computer stations with pull out ergonomic keyboard trays and foot rests. It seems that thought was given to student comfort and safety. Additionally, battery backup surge protectors were utilized. While very expensive, battery backup surge protectors are an extremely wise investment to help minimize the possibility of data loss during testing.
The Participants		
Gender Differences/Majority	29 total students participated in the testing, 20 female and 9 male.	This section has twice as many boys as girls. Is this an isolated incident or a school-wide or grade wise phenomenon? How do these numbers compare to national norms in terms of gender make up of middle school students?

table continues

Who is in the scene (how many? roles?)	In addition to the 29 students, two teachers were present – the Grade 7 ELA teacher and the computer lab teacher.	Does the content area teacher's presence in the room have a calming effect?
Relevant characteristics of the participants	28 of the 29 students were European American and 1 student was African American.	The ethnic make-up of this school is not representative of the general population of the city in which it is located. The school demographics are as follows: 92.8% European American, 1.4% Latino American, .3% Asian

		American and 5.5% African American (www.cmucso.org). However, the demographics for Southfield, MI are as follows: 38.4% European American, 1.2% Latino American, 3.1% Asian American and 54.2% African American (http://www.muninetguide.com/states/michigan/municipality/Southfield.php). Is there a reason African American students do not apply in large numbers to this school?
Activities and Interactions		
Keyboarding ability	N/A as all entries were completed via mouse click.	Does mouse clicking make students more prone to "click" out of routine as opposed to utilizing critical thinking?

table continues

#of requests for assistance (race)	1 request for assistance occurred during observation period. Student was a European American male.	All students seemed comfortable with the technology.
#of requests for assistance (gender)	1 request for assistance occurred during observation period. Student was a European American male.	All students seemed comfortable with the technology.
Interaction w/activity and others	Prior to testing, the computer teacher provided extensive instructions regarding: 1) ways to spoil the test; 2) what to do when finished; 3) how to refresh screen (if necessary). Majority of kids were sitting upright and seemed very	Level of technical language used by the computer teacher was high. Students were expected to know and understand the terminology used. As for the attentiveness of girls, maybe boys are accustomed to more activity

	focused. Girls seemed more attentive than boys in general.	than girls as a result of high video game usage. Students completed tests very fast.
Conversations		
Content of conversations	Student requested assistance because screen went black. Teacher quickly assisted student.	Interaction between student and teacher seemed to go unnoticed by remainder of class.
# of computer functionality questions	One student (European American male) had a computer functionality question when his screen went black.	Interaction between student and teacher seemed to go unnoticed by remainder of class.
Subtle Factors		
Instances of visible frustration	One instance of visible frustration when student's screen went black.	Student, while frustrated, did not over- react.
Instances of daydreaming and other off- task behaviors	Five instances of daydreaming and other off-task behavior occurred, 4 girls and 1 boy.	Is this an indication that some girls lose interest in computer activities more easily than some boys?

table continues

Informal and unplanned activities (i.e., entrants, class passing, PA, other students)	The computer lab was adjacent to an ESL classroom. As is the case with most language courses, a good amount of verbal activity took place. After completing the test, teacher had to inform students on three occasions that in spite of completing the test, that they could not leave until the bell sounded.	Student had very little reaction to the nose from the adjacent room. Are students simply accustomed to the noise? Could it be that some students were in fact distracted but felt they had no recourse?
Observer Behavior		
Observer affect on the scene	Observer was introduced at the start of class.	Students did not seem to be impacted by observer's presence. Testing seemed to go on as if the observer was simply another adult in the room.
Observer	Observer simply said hello and	

comments and actions	thanked students for participating.	
Observer thoughts		Group was well mannered.

Observation Data for Suburban School Grade 8: Because IRB approval was received after the testing cycle started at the suburban school, this researcher was unable to obtain observation data for the Grade 8 students. This is a limitation of this study and will be discussed further in chapter 5.

Survey Data

In relation to the survey, data analysis involved both quantitative and qualitative analysis by case due to the structure of the survey.   Descriptive statistics were used from each single case to visually depict the data through frequency tables and charts. Unlike inferential statistics which are used to make inferences from a set of data to more general conditions, "descriptive statistics are used to present quantitative descriptions in a manageable form or to simply to describe what's going on in our data" (Trochim, 2006, ¶ 3). As such, with the exception of Questions 14 and15 and questions 17 and 18, all remaining portions of the survey (14 questions) were analyzed utilizing descriptive statistics. With regard to the open-ended questions included in the survey, the process of categorization previously outlined for observational data was used.

Survey Data for Suburban School Grade 6

Section 1of the survey, Computer Access (see Figure B1 in the Appendix), was designed to assess the respondent's level of computer access. One hundred percent of the respondents indicated that they had a computer at home. However, none of the respondents indicated that the computer in their home was their personal computer. Thirty-six point four percent shared their computer with siblings and 63.6% shared their computer with the entire family.

Section 2 of the survey, Home and Community Computer Use (see Figure B2 in the Appendix), was designed to determine how students with computer access at home or in their community actually utilized the computers. The questions were split between educational use and leisure use.

1. Thirty-three point three percent of the respondents indicated that they used the computer to play games daily whereas 66.7% indicated such use once per week or less.
2. Ten percent of the respondents indicated that they used the computer for word processing daily whereas 90% indicated such use once per week or less.
3. Twenty-eight point six percent of the respondents indicated that they used the computer to send or read email messages daily whereas 71.4% indicated such use once per week or less.
4. Fifteen percent of the respondents indicated that they used the computer to create web pages (including MySpace and Face book) daily whereas 85% indicated such use once per week or less.

5. Forty-two point eight percent of the respondents indicated that they used the computer to listen to or download music files daily whereas 57.1% indicated such use once per week or less.
6. Ten percent of the respondents indicated that they used the computer to create graphs or charts daily whereas 90% indicated such use once per week or less.
7. Forty-seven point six percent of the respondents indicated that they used the computer to send instant messages daily whereas 52.4% indicated such use once per week or less.
8. Four point eight percent of respondents indicated that they used the computer to create spreadsheets daily whereas 95.2% indicated such use once per week or less.
9. All respondents indicated that they used the computer to create fliers, signs, brochures or greeting cards once per week or less with the majority (42.1%) indicating that they had never used the computer in such a fashion.
10. Ninety-four point four percent of respondents indicated the use of a home computer for other purposes once per week or less with the majority (33.3%) never using a home computer for other purposes.
11. When asked how many hours they used a computer at home during the last week, 28.6% of the respondents indicated 4 hours or more whereas 33.3% of the respondents indicated 1 to 3 hours. 28.6% of the respondents indicated 0-1 hours and 9.5% of the respondents indicated that they had not used a computer at home during the last week.

In addition to simply knowing the number of hours respondents used a computer in the previous week, it also important to know the influence of both the amount of access and type of use on proficiency. Table 6 and Table 7 show the influence of the type of use and the amount of access on the achievement of Grade 6 respondents in mathematics and reading.

Table 6

Grade 6 proficiency in math and reading based on type of computer use

Type of Use	% Grade 6 Proficient on Scantron Math Suburban	% Grade 6 Proficient on Scantron Reading Suburban
Sole Use	N/A	N/A
Shared Use	73%	77%
Community Only	N/A	N/A
School Only	N/A	N/A

Table 7

Grade 6 proficiency in math and reading based on type of use and amout of access

SUBURBAN (Sole & Shared)	Grade 6 % Proficient Math	Grade 6 % Proficient Rdg
3 or Less	62.5% (10/16)	75% (12/16)
4 or More	83% (5/6)	83% (5/6)
SUBURBAN (Shared Only)	Grade 6 % Proficient Math	Grade 6 % Proficient Rdg

3 or Less	62.5% (10/16)	75% (12/16)
4 or More	83% (5/6)	83% (5/6)

SUBURBAN (Sole Only)	Grade 6 % Proficient Math	Grade 6 % Proficient Rdg
3 or Less	N/A	N/A
4 or More	N/A	N/A

Section 3 - School Computer Use

This section of the survey (see Figure B3 in the Appendix) was designed to determine how students with computer access at school actually utilized the computers. The questions were split between educational use and leisure use.

1. Nine point six percent of the respondents indicated that they used the computer to play games daily whereas 90.4% indicated such use once per week or less.
2. Fourteen point three percent of the respondents indicated that they used the computer for word processing daily whereas 85.7% indicated such use once per week or less.
3. Zero percent of the respondents indicated that they used the computer to send or read email messages daily whereas 100% indicated such use once per week or less.

4. Four point eight percent of the respondents indicated that they used the computer to create web pages (including MySpace and Face book) daily whereas 95.2% indicated such use once per month or less.
5. Four point eight percent of the respondents indicated that they used the computer to listen to or download music files daily whereas 95.2% indicated such use once per week or less.
6. Four point eight percent of the respondents indicated that they used the computer to create graphs or charts daily whereas 95.2% indicated such use once per week or less.
7. Four point eight percent of the respondents indicated that they used the computer to send instant messages daily whereas 95.2% indicated such use once per week or less.
8. Four point five percent of respondents indicated that they used the computer to create spreadsheets daily whereas 95.2% indicated such use once per month or less.
9. All respondents indicated that they used the computer to create fliers, signs, brochures or greeting cards once per month or less with the majority (71.4%) indicating that they had never used the computer in such a fashion.
10. One hundred percent of respondents indicated the use of a school computer for other purposes once per week or less with the majority (47.4%) never using a school computer for other purposes.

11. When asked how many hours they used a computer at school during the last week, 0% of the respondents indicated 4 hours or more whereas 18.2% of the respondents indicated 1 to 3 hours. Nine point one percent of the respondents indicated 0-1 hours and the majority, 72.7% of the respondents indicated that they had not used a computer at school during the last week.

Section 4 - General Information

This section of the survey (see Figure B4 in Appendix A) was designed to obtain general information about the respondents including perceived computer abilities, gender, grade level, race/ethnicity and participation in Michigan's Free Lap Top Program. This section also was designed to obtain information on respondent perceptions of their confidence level when taking pencil and paper tests and tests given via computer. This section also collected narrative information in the respondents own words describing why they felt more or less confident or more or less worried when taking pencil and paper tests or tests given via computer.

1. Thirty-six point four percent of respondents rated their computer abilities as average while 63.7 % rated their computer abilities as above average or extremely good.
2. Forty-five point five percent of the respondents were male while 54.5% were female.
3. One hundred percent of the respondents were European American

4. One hundred percent of the respondents indicated that their school did not participate in Michigan's Free Laptop program or that they did not know if their school participated.
5. When asked how they feel when they take pencil and paper tests, 68.2% of the respondents indicated that they felt very or somewhat confident while the remaining 31.8% indicated that they felt somewhat or very worried.
6. When asked how they feel when they take tests on a computer, 70% of the respondents indicated that they felt very or somewhat confident while the remaining 30% indicated that they felt somewhat or very worried.
7. When asked to give narrative responses as to why they felt very confident, somewhat confident, somewhat worried, or very worried when taking either pencil and paper test or computer tests, the vast majority of the answers were grounded in the respondent's perceived self-efficacy or the lack thereof.

In addition to gathering general data about how respondents rate their computer abilities, it is also important to understand the extent to which, if at all, respondent's self-assessments of their computer abilities influences their proficiency on computerized tests. Table 8 describes the respondents' proficiency in math and reading based on their self-assessed computer ability.

Table 8

Grade 6 proficiency in math and reading based on self-assessed computer ability

SUBURBAN	Grade 6	Grade 6

	% Proficient Math	% Proficient Rdg
Average or Less	62.5% (5/8)	87.5% (7/8)
Above Avg. or Greater	71.5% (10/14)	71.5% (10/14)

To address the possible influence of gender and socioeconomic status on computerized test-taking anxiety, it is also necessary to analyze respondent confidence levels by gender and socioeconomic status. With regard to confidence differences by gender presented in Table 9, when male respondents were asked how they feel when they take pencil and paper tests, 60% indicated that they felt very or somewhat confident while the remaining 40% indicated that they felt somewhat or very worried. When asked the same question, 75% of female respondents indicated that they felt very or somewhat confident while the remaining 25% indicated that they felt somewhat or very worried. When male respondents were asked how they feel when they take tests on a computer, 88% indicated that they felt very or somewhat confident while the remaining 12% indicated that they felt somewhat or very worried. When asked the same question, 50% of female respondents indicated that they felt very or somewhat confident while the remaining 50% indicated that they felt somewhat or very worried.

Table 9

Suburban Grade 6 respondent's confidence responses on pencil & paper tests vs. computerized test by gender

Boys (10)	Pencil & Paper	Computer
Worried	4 (40%)	1 (12%)
Confident	6 (60%)	8 (88%)

Girls (12)	Pencil & Paper	Computer

Worried	3 (25%)	6 (50%)
Confident	9 (75%)	6 (50%)

With regard to confidence differences by SES status as indicated in Table 10, when low SES respondents were asked how they feel when they take pencil and paper tests, 67% indicated that they felt very or somewhat confident while the remaining 33% indicated that they felt somewhat or very worried. When asked the same question, 68% of high SES respondents indicated that they felt very or somewhat confident while the remaining 32% indicated that they felt somewhat or very worried. When low SES respondents were asked how they felt when they take tests on a computer, 67% indicated that they felt very or somewhat confident while the remaining 33% indicated that they felt somewhat or very worried. When asked the same question, 67% of high SES respondents indicated that they felt very or somewhat confident while the remaining 33% indicated that they felt somewhat or very worried.

Table 10

Suburban Grade 6 respondent's confidence responses on pencil & paper tests vs. computerized test by SES status

Low SES (3)	Pencil & Paper	Computer
Worried	1 (33%)	1 (33%)
Confident	2 (67%)	2 (67%)
High SES (19)	Pencil & Paper	Computer
Worried	6 (32%)	6 (33%)
Confident	13 (68%)	12 (67%)

To address the possible influence of socioeconomic status on self-rated computer abilities, it was also necessary to analyze differences in respondent computer ability self-ratings by free and reduced lunch status. As indicated in Table 11, 67% of shared use, free and reduced lunch suburban Grade 6 respondents rated themselves above average or greater while 33% rated themselves average or lower. Additionally, 63% of shared use, non- free and reduced lunch suburban Grade 6 respondents rated themselves above average or greater while 37% rated themselves average or lower.

Table 11

Self-ratings of computer ability based upon type of computer access and free and reduced lunch status

	# Sole use	# Shared Use	# Self-Rated Average or lower Shared	# Self-Rated Above Average or Greater Shared	# Self-Rated Average or lower Sole	# Self-Rated Above Average or Greater Sole
SUBURBAN 6th (FRL)	0	3	1	2	0	0
SUBURBAN 6th (Non-FRL)	0	19	7	12	0	0

To address the possible influence of the type of computer access on self-ratings of computer ability and computerized testing confidence, it was also necessary to analyze differences in shared use and sole use respondent's computer ability self-ratings and computerized testing confidence. As indicated in Table 12, all suburban Grade 6 students had shared use only. Of the shared use respondents, nearly two-thirds rated their computer abilities as above average and were confident when taking computerized tests.

Table 12

The influence of type of computer access on self-rated computer ability and computerized testing confidence

SUBURBAN (Shared Only)	Grade 6	% SUBURBAN 6th
Average or Less	8/22	36%
Above Avg. or Greater	14/22	64%
Worried	7/21	33%
Confident	14/21	67%
SUBURBAN (Sole Only)	Grade 6	% SUBURBAN 6th
Average or Less	N/A	N/A
Above Avg. or Greater	N/A	N/A
Worried	N/A	N/A
Confident	N/A	N/A

Survey Data for Suburban School Grade 7

Section 1 - Computer Access

This section of the survey (see Figure B5 in the Appendix) was designed to assess the respondent's level of computer access. 100% of the respondents indicated that they had a computer at home. 19% of the respondents indicated that the computer in their home was their personal computer. 9.5% shared their computer with siblings and 71.4% shared their computer with the entire family. Based upon this data, it seems clear that the respondents have a high level of computer access overall.

Section 2 - Home & Community Computer Use

This section of the survey (see Figure B6 in the Appendix) was designed to determine how students with computer access at home or in their community actually utilized the computers. The questions were split between educational use and leisure use.

1. Thirty-three point three percent of the respondents indicated that they used the computer to play games daily whereas 66.7% indicated such use once per week or less.
2. Four point eight percent of the respondents indicated that they used the computer for word processing daily whereas 95.2% indicated such use once per week or less.
3. Forty-two point one percent of the respondents indicated that they used the computer to send or read email messages daily whereas 57.9% indicated such use once per week or less.
4. Nineteen point one percent of the respondents indicated that they used the computer to create web pages (including MySpace and Face book) daily whereas 80.9% indicated such use once per week or less.
5. Forty-two point eight percent of the respondents indicated that they used the computer to listen to or download music files daily whereas 57.1% indicated such use once per week or less.
6. Zero percent of the respondents indicated that they used the computer to create graphs or charts daily whereas 100% indicated such use once per week or less.

7. Seventy-one point four percent of the respondents indicated that they used the computer to send instant messages daily whereas 28.6% indicated such use once per week or less.
8. Zero percent of respondents indicated that they used the computer to create spreadsheets daily whereas 100% indicated such use once per week or less. However, the majority (60%) indicated that they had never used a spreadsheet.
9. Five point three percent of the respondents indicated that they used the computer to create fliers, signs, brochures or greeting cards daily whereas 94.7 indicated such use once per week or less with the majority (52.6%) indicating that they had never used the computer in such a fashion.
10. Twenty-two point two percent of respondents indicated the use of a home computer for other purposes daily 77.8 indicated such use once per week or less with the majority (33.3%) using a home computer for other purposes at least once per month.
11. When asked how many hours they used a computer at home during the last week, 47.6% of the respondents indicated 4 hours or more whereas 42.9% of the respondents indicated 1 to 3 hours. Nine point five percent of the respondents indicated 0-1 hours and none of the respondents indicated that they had not used a computer at home during the last week.

In addition to simply knowing the number of hours that respondents used a computer in the previous week, it also was important to know the influence of both the amount of access and type of use on proficiency in math and reading when taking computerized tests. Table 13 and Table 14 show the influence of the type of use and the amount of access on the achievement of Grade 7 respondents in mathematics and reading.

Table 13

Grade7 proficiency in math and reading based on type of computer use

Type of Use	% Grade 7 Proficient on Scantron Math - Suburban	% Grade 7 Proficient on Scantron Rdg. -Suburban
Sole Use	100%	100%
Shared Use	64.70%	76.47%
Community Only	N/A	N/A
School Only	N/A	N/A

Table 14

Grade 7 proficiency in math and reading based on type of use and amout of access

SUBURBAN (Sole & Shared)	Grade 7 % Proficient Math	Grade 7 % Proficient Rdg
3 or Less	73% (8/11)	73% (8/11)
4 or More	70% (7/10)	90% (9/10)
SUBURBAN (Shared Only)	Grade 7 % Proficient Math	Grade 7 % Proficient Rdg
3 or Less	67% (6/9)	67% (6/9)
4 or More	62.5% (5/8)	87.5% (7/8)
SUBURBAN (Sole Only)	Grade 7	Grade 7

	% Proficient Math	% Proficient Rdg
3 or Less	100% (2/2)	100% (2/2)
4 or More	100% (2/2)	100% (2/2)

Section 3 - School Computer Use

This section of the survey (see Figure B7 in the Appendix) was designed to determine how students with computer access at school actually utilized the computers. The questions were split between educational use and leisure use.

1. None of the respondents indicated that they used the computer to play games daily whereas 100%% indicated such use once per week or less. The majority (47.4%) indicated that they never use the school computer to play games.
2. Eleven point eight percent of the respondents indicated that they used the computer for word processing daily whereas 88.2% indicated such use once per week or less.
3. Zero percent of the respondents indicated that they used the computer to send or read email messages daily whereas 100% indicated such use once per week or less. The majority, 50%, indicated that they used the school computer to send or read email messages once per month.
4. Zero percent of the respondents indicated that they used the computer to create web pages (including MySpace and Face book) daily whereas 100% indicated such use once per month or less. Ninety percent indicated that they never used the school computer to create web pages.

5. Zero percent of the respondents indicated that they used the computer to listen to or download music files daily whereas 100% indicated that they never used the school computer for such use.
6. Ten percent of the respondents indicated that they used the computer to create graphs or charts daily whereas 90% indicated such use once per week or less. The majority, 50%, indicated such use at least once per month.
7. Zero percent of the respondents indicated that they used the computer to send instant messages daily whereas 100% indicated such use once per week or less. The majority, 55%, indicated such use at least once per month.
8. Five percent of respondents indicated that they used the computer to create spreadsheets daily whereas 95% indicated such use once per month or less. The majority, 55%, indicated that they never used the school computer for such use.
9. All respondents indicated that they used the computer to create fliers, signs, brochures or greeting cards once per month or less with the majority (57.1%) indicating that they had never used the computer for such use.
10. Four point eight percent of respondents indicated the use of a school computer for other purposes at least once per week. One hundred percent of respondents indicated the use of a school computer for other purposes once per week or less with the majority (47.6%) never using a school computer for other purposes.
11. When asked how many hours they used a computer at school during the last week, 4.8% of the respondents indicated 4 hours or more while 4.8% of the respondents indicated 1 to 3 hours of use. Fourteen percent of the respondents

indicated 0-1 hours and the majority, 76.2% of the respondents indicated that they had not used a computer at school during the last week.

Section 4 - General Information

This section of the survey (see Figure B8 in the Appendix) was designed to obtain general information about the respondents including perceived computer abilities, gender, grade level, race/ethnicity and participation in Michigan's Free Lap Top Program. This section also was designed to obtain information on respondent perceptions of their confidence levels when taking pencil and paper tests and tests via computer. This section also collected narrative information in the respondents' own words describing why they felt more or less confident or more or less worried when taking pencil and paper tests or tests via computer.

1. Thirty-eight point one percent of respondents rated their computer abilities as average while 57.1 % rated their computer abilities as above average or extremely good.
2. Thirty percent of the respondents were male while 70% were female.
3. Ninety-five point two percent of the respondents were European American while 4.8% were African American.
4. One hundred percent of the respondents indicated that their school did not participate in Michigan's Free Laptop program or that they did not know if their school participated.

5. When asked how they feel when they take pencil and paper tests, 65% of the respondents indicated that they felt very or somewhat confident while the remaining 35% indicated that they felt somewhat or very worried.
6. When asked how they feel when they take tests on a computer, 75% of the respondents indicated that they felt very or somewhat confident while the remaining 25% indicated that they felt somewhat or very worried.
7. When asked to give narrative responses as to why they felt very confident, somewhat confident, somewhat worried, or very worried when taking either pencil and paper test or computer tests, the vast majority of the answers were grounded in the respondent's perceived self-efficacy or the lack thereof.

In addition to gathering general data about how respondents rate their computer abilities, it was also important to understand the extent to which, if at all, respondent's self-assessments of their computer abilities influenced their proficiency on computerized tests. Table 15 describes suburban Grade 7 respondents' proficiency in math and reading based on their self-assessed computer ability.

Table 15

Grade 7 proficiency in math and reading based on self-assessed computer ability

SUBURBAN Self-Rated Computer Ability	Grade 7 % Proficient Math	Grade 7 % Proficient Rdg
Average or Less	55.5% (5/9)	67% (6/9)
Above Avg. or Greater	83% (10/12)	92% (11/12)

To address the possible influence of gender and socioeconomic status on computerized test-taking anxiety, it was also necessary to analyze respondent confidence levels by gender and socioeconomic status. With regard to confidence differences by gender as indicated in Table 16, when male respondents were asked how they felt when they took pencil and paper tests, 100% indicated that they felt very or somewhat confident. When asked the same question, 43% of female respondents indicated that they felt very or somewhat confident while the remaining 57% indicated that they felt somewhat or very worried. When male respondents were asked how they feel when they take tests on a computer, 86% indicated that they felt very or somewhat confident while the remaining 14% indicated that they felt somewhat or very worried. When asked the same question, 69% of female respondents indicated that they felt very or somewhat confident while the remaining 31% indicated that they felt somewhat or very worried.

Table 16

Suburban grade 7 respondent's confidence responses on pencil & paper tests vs. computerized test by gender

Boys (7)	Pencil & Paper	Computer
Worried	0 (0%)	1 (14%)
Confident	7 (100%)	6 (86%)

Girls (14)	Pencil & Paper	Computer
Worried	8 (57%)	4 (31%)
Confident	6 (43%)	9 (69%)

With regard to confidence differences by SES status as indicated in Table 17, when low SES respondents were asked how they felt when they took pencil and paper tests, 71% indicated that they felt very or somewhat confident while the remaining 29% indicated that they felt somewhat or very worried. When asked the same question, 57% of high SES respondents indicated that they felt very or somewhat confident while the remaining 43% indicated that they felt somewhat or very worried. When low SES respondents were asked how they feel when they take tests on a computer, 43% indicated that they felt very or somewhat confident while the remaining 57% indicated that they felt somewhat or very worried. When asked the same question, 92% of high SES respondents indicated that they felt very or somewhat confident while the remaining 8% indicated that they felt somewhat or very worried.

Table 17

Suburban Grade 7 respondent's confidence responses on pencil & paper tests vs. computerized test by SES status

Low SES (3)	Pencil & Paper	Computer
Worried	2 (29%)	4 (57%)
Confident	5 (71%)	3 (43%)
High SES (19)	Pencil & Paper	Computer
Worried	6 (43%)	1 (8%)
Confident	8 (57%)	12 (92%)

To address the possible influence of socioeconomic status on self-rated computer abilities, it was also necessary to analyze differences in respondent computer ability self-ratings by free and reduced lunch status. As indicated in Table 18, 17% of shared use, free and reduced lunch suburban Grade 7 respondents rated themselves above average or greater while 83% rated themselves average or lower. Additionally, 64% of shared use, non- free and reduced lunch suburban Grade 7 respondents rated themselves above average or greater while 36% rated themselves average or lower. All (100%) sole use respondents, both free and reduced and non-free and reduced lunch, rated themselves as above average or greater.

Table 18

Self-ratings of computer ability based upon type of computer access and free and reduced lunch status

	Sole use	Shared Use	# Self-Rated Average or lower Shared	# Self-Rated Above Average or Greater Shared	# Self-Rated Average or lower Sole	# Self-Rated Above Average or Greater Sole
SUBURBAN 7th (FRL)	1	6	5 (83%)	1 (17%)	0 (0%)	1 (100%)
SUBURBAN 7th (Non FRL)	3	11	4 (36%)	7 (64%)	0 (0%)	3 (100%)

To address the possible influence of the type of computer access on self-ratings of computer ability and computerized testing confidence, it was also necessary to analyze differences in shared use and sole use respondent's computer ability self-ratings and computerized testing confidence. As indicated in Table 19, there are 17 suburban Grade 7 students with shared use only and 4 with sole use only. Of the shared use respondents, 53% rated their computer abilities as average or less while 75% felt confident when taking computerized tests. Of the sole use respondents, 100% rated their computer abilities as average or less while 75% were confident when taking computerized tests.

Table 19

The influence of type of computer access on self-rated computer ability and computerized testing confidence

SUBURBAN (Shared Only)	Grade 7	% SUBURBAN 7th
Average or Less	9/17	53%
Above Avg. or Greater	8/17	47%
Worried	4/16	25%
Confident	12/16	75%

SUBURBAN (Sole Only)	Grade 7	% SUBURBAN 7th
Average or Less	4/4	100%
Above Avg. or Greater	0/0	0%
Worried	1/4	25%
Confident	3/4	75%

Survey Data for Suburban School Grade 8

Section 1 – Computer Access

This section of the survey (see Figure B9 in the Appendix) was designed to assess the respondent's level of computer access. One hundred percent of the respondents indicated that they had a computer at home. Twenty-four percent of the respondents indicated that the computer in their home was their personal computer. Twenty percent shared their computer with siblings, and 56% shared their computer with the entire family. Based upon this data, it seems clear that the respondents have a high level of computer access overall.

Section 2 - Home & Community Computer Use

This section of the survey (see Figure B10 in the Appendix) was designed to determine how students with computer access at home or in their community actually utilized the computers. The questions were split between educational use and leisure use.

1. Forty-four percent of the respondents indicated that they used the computer to play games daily whereas 56% indicated such use once per week or less.
2. Twenty-two point seven percent of the respondents indicated that they used the computer for word processing daily whereas 77.3% indicated such use once per week or less.
3. Fifty percent of the respondents indicated that they used the computer to send or read email messages daily whereas 50% indicated such use once per week or less.
4. Forty-five point five percent of the respondents indicated that they used the computer to create web pages (including MySpace and Face book) daily whereas 54.5% indicated such use once per week or less.
5. Sixty-two point five percent of the respondents indicated that they used the computer to listen to or download music files daily whereas 37.5% indicated such use once per week or less.
6. Eight point seven percent of the respondents indicated that they used the computer to create graphs or charts daily whereas 91.3% indicated such use once per week or less.

7. Sixty-five point two percent of the respondents indicated that they used the computer to send instant messages daily whereas 34.8% indicated such use once per week or less.
8. Thirteen percent of respondents indicated that they used the computer to create spreadsheets daily whereas 87% indicated such use once per week or less.
9. Sixteen point seven percent of the respondents indicated that they used the computer to create fliers, signs, brochures or greeting cards daily whereas 83.3 indicated such use once per week or less with the majority (44.4%) indicating that they had never used the computer in such a fashion.
10. Fifty-two point nine percent of respondents indicated the use of a home computer for other purposes daily 47.1% indicated such use once per week or less.
11. When asked how many hours they used a computer at home during the last week, 52% of the respondents indicated 4 hours or more whereas 24% of the respondents indicated 1 to 3 hours. Twenty-four percent of the respondents indicated 0-1 hours and none of the respondents indicated that they had not used a computer at home during the last week.

In addition to simply knowing the number of hours respondents used a computer in the previous week, it was also important to know the influence of both the amount of access and type of use on proficiency. Table 20 and Table 21 show the influence of the type of use and the amount of access on the achievement of suburban Grade 8 respondents in mathematics and reading.

Table 20

Grade8 proficiency in math and reading based on type of computer use

Type of Use	% Grade 8 Proficient on Scantron Math Suburban	% Grade 8 Proficient on Scantron Reading Suburban
Sole Use	83.33%	83.33%
Shared Use	78.95%	73.68%
Community Only	N/A	N/A
School Only	N/A	N/A

Table 21

Grade 8 proficiency in math and reading based on type of use and amout of access

SUBURBAN (Sole & Shared)	Grade 8 % Proficient Math	Grade 8 % Proficient Rdg
3 or Less	67% (8/12)	75% (9/12)
4 or More	92% (12/13)	77% (10/13)
SUBURBAN (Shared Only)	Grade 8 % Proficient Math	Grade 8 % Proficient Rdg
3 or Less	73% (8/11)	82% (9/11)
4 or More	87.5% (7/8)	62.5% (5/8)
SUBURBAN (Sole Only)	Grade 8 % Proficient Math	Grade 8 % Proficient Rdg
3 or Less	0% (0/1)	0% (0/1)
4 or More	100% (5/5)	100% (5/5)

Section 3 - School Computer Use

This section of the survey (see Figure B11 in the Appendix) was designed to determine how students with computer access at school actually utilized the computers. The questions were split between educational use and leisure use.

1. Twenty-two point nine percent of the respondents indicated that they used the computer to play games daily whereas 70.8% indicated such use once per week

or less. The minority (16.7%) indicated that they never use the school computer to play games.

2. Sixty-one point nine percent of the respondents indicated that they used the computer for word processing daily whereas 38.1% indicated such use once per week or less.
3. Twenty-five percent of the respondents indicated that they used the computer to send or read email messages daily whereas 75% indicated such use once per week or less.
4. Thirteen percent of the respondents indicated that they used the computer to create web pages (including MySpace and Face book) daily whereas 87% indicated such use once per week or less. 69.6% indicated that they never used the school computer to create web pages.
5. Sixteen point seven percent of the respondents indicated that they used the computer to listen to or download music files daily whereas 83.3% indicated that they never used the school computer for such use.
6. Twenty-nine point two percent of the respondents indicated that they used the computer to create graphs or charts daily whereas 70.8% indicated such use once per week or less. 41.7% indicated such use at least once per week.
7. Forty-five point four percent of the respondents indicated that they used the computer to send instant messages daily whereas 54.6% indicated such use once per week or less. Forty point nine percent indicated that they had never used the computer at school for such use.

8. Fifty-four point six percent of respondents indicated that they used the computer to create spreadsheets daily whereas 45.5% indicated such use once per week or less.
9. Four point three percent of respondents indicated that they used the computer to create fliers, signs, brochures or greeting cards daily whereas 95.7% indicated such use once per week or less with the majority (60.9%) indicating that they had never used the computer at school for such use.
10. Thirty-one point eight percent of respondents indicated the use of a school computer for other purposes daily whereas 68.2% of respondents indicated the use of a school computer for other purposes once per week or less.
11. When asked how many hours they used a computer at school during the last week, 48% of the respondents indicated 0-1 hours and 48% indicated 4-6 hours. The remaining 4% indicated 1-3 hours of computer use at school during the last week.

Section 4 - General Information

This section of the survey (see Figure B12 in the Appendix) was designed to obtain general information about the respondents including perceived computer abilities, gender, grade level, race/ethnicity and participation in Michigan's Free Lap Top Program. This section also was designed to obtain information on respondent perceptions of their confidence level when taking pencil and paper tests and tests given via computer. This section also collected narrative information in the respondents' own words describing why they felt more or less confident or more or less worried when taking pencil and paper tests or tests given via computer.

1. Forty percent of respondents rated their computer abilities as average while 56 % rated their computer abilities as above average or extremely good. 4% of respondents rated their computer abilities as below average.
2. Forty-eight percent of the respondents were male while 52% were female.
3. Ninety-six percent of the respondents were European American while 4% were African American.
4. One hundred percent of the respondents indicated that their school did not participate in Michigan's Free Laptop program or that they did not know if their school participated.
5. When asked how they feel when they take pencil and paper tests, 72% of the respondents indicated that they felt very or somewhat confident while the remaining 28% indicated that they felt somewhat or very worried.
6. When asked how they feel when they take tests on a computer, 76% of the respondents indicated that they felt very or somewhat confident while the remaining 24% indicated that they felt somewhat or very worried.
7. When asked to give narrative responses as to why they felt very confident, somewhat confident, somewhat worried, or very worried when taking either pencil and paper test or computer tests, the vast majority of the answers were grounded in the respondent's perceived self-efficacy or the lack thereof.

In addition to gathering general data about how respondents rate their computer abilities, it is also important to understand the extent to which, if at all, respondent's self-assessments of their computer abilities influences their proficiency on computerized tests. Table 22 indicates the suburban Grade 8 respondents' proficiency in math and reading based on their self-assessed computer ability.

Table 22

Grade 8 proficiency in math and reading based on self-assessed computer ability

SUBURBAN	Grade 8 % Proficient Math	Grade 8 % Proficient Rdg
Average or Less	91% (10/11)	82% (9/11)
Above Avg. or Greater	71% (10/14)	71% (10/14)

To address the possible influence of gender and socioeconomic status on computerized test-taking anxiety, it was also necessary to analyze respondent confidence levels by gender and socioeconomic status. With regard to confidence differences by gender (Table 23), when male respondents were asked how they felt when they took pencil and paper tests, 67% indicated that they felt very or somewhat confident while the remaining 33% indicated that they felt somewhat or very worried. When asked the same question, 77% of female respondents indicated that they felt very or somewhat confident while the remaining 23% indicated that they felt somewhat or very worried. When male respondents were asked how they felt when they took tests on a computer, 75% indicated that they felt very or somewhat confident while the remaining 25% indicated that they felt somewhat or very worried. When asked the same question, 77% of female respondents indicated that they felt very or somewhat confident while the remaining 23% indicated that they felt somewhat or very worried.

Table 23

Suburban Grade 8 respondents' confidence responses on pencil & paper tests vs. computerized test by gender

Boys (12)	Pencil & Paper	Computer
Worried	4 (33%)	3 (25%)
Confident	8 (67%)	9 (75%)

Girls (13)	Pencil & Paper	Computer
Worried	3 (23%)	3 (23%)
Confident	10 (77%)	10 (77%)

With regard to confidence differences by SES status as indicated in Table 24, when low SES respondents were asked how they feel when they take pencil and paper tests, 50% indicated that they felt very or somewhat confident while the remaining 50% indicated that they felt somewhat or very worried. When asked the same question, 79% of high SES respondents indicated that they felt very or somewhat confident while the remaining 21% indicated that they felt somewhat or very worried. When low SES respondents were asked how they feel when they take tests on a computer, 83% indicated that they felt very or somewhat confident while the remaining 17% indicated that they felt somewhat or very worried. When asked the same question, 74% of high SES respondents indicated that they felt very or somewhat confident while the remaining 26% indicated that they felt somewhat or very worried.

Table 24

Suburban Grade 7 respondents' confidence responses on pencil & paper tests vs. computerized test by SES status

Low SES (6)	Pencil & Paper	Computer
Worried	3 (50%)	1 (17%)
Confident	3 (50%)	5 (83%)
High SES (19)	**Pencil & Paper**	**Computer**
Worried	4 (21%)	5 (26%)
Confident	15 (79%)	14 (74%)

To address the possible influence of socioeconomic status on self-rated computer abilities, it was also necessary to analyze differences in respondent computer ability self-ratings by free and reduced lunch status. As indicated in Table 25, 40% of shared use, free and reduced lunch suburban Grade 8 respondents rated themselves above average or greater while 60% rated themselves average or lower. Additionally, 50% of shared use, non- free and reduced lunch suburban Grade 8 respondents rated themselves above average or greater while 50% rated themselves average or lower. With regard to sole use respondents, 100% sole use, free and reduced lunch suburban Grade 8 respondents rated themselves above average or greater. Additionally, 80% of non-free and reduced lunch suburban Grade 8 respondents rated themselves as above average or greater while 20% rated themselves average or lower.

Table 25

Self-ratings of computer ability based upon type of computer access and free and reduced lunch status

	# Sole use	# Shared Use	# Self-Rated Average or lower Shared	# Self-Rated Above Average or Greater Shared	# Self-Rated Average or lower Sole	# Self-Rated Above Average or Greater Sole
SUBURBAN 8th (FRL)	1	5	3 (60%)	2 (40%)	0 (0%)	1 (100%)
SUBURBAN 8th (Non FRL)	5	14	7 (50%)	7 (50%)	1 (20%)	4 (80%)

To address the possible influence of the type of computer access on self-ratings of computer ability and computerized testing confidence, it was also necessary to analyze differences in shared use and sole use respondent's computer ability self-ratings and computerized testing confidence. As indicated in Table 26, there were 19 suburban Grade 8 students with shared use only and 6 with sole use only. Of the shared use respondents, 53% rated their computer abilities as average or less while 74% were confident when taking computerized tests. Of the sole use respondents, 83% rated their computer abilities.

Table 26

The influence of type of computer access on self-rated computer ability and computerized testing confidence

SUBURBAN (Shared Only)	Grade 8	% SUBURBAN 8th
Average or Less	10/19	53%
Above Avg. or Greater	9/19	47%
Worried	5/19	26%
Confident	14/19	74%

SUBURBAN (Sole Only)	Grade 8	% SUBURBAN 8th

Average or Less	1/6	17%
Above Avg. or Greater	5/6	83%
Worried	1/6	17%
Confident	5/6	83%

Observation Data for Urban School Grade 6

Table 27 presents a description of this researcher's field notes and researcher reflections written during the observation of students in Grade 6 at the urban school during Scantron testing. The field notes and reflections were organized according to the specific criteria developed for the observation data collection form.

Table 27

Observation data - Grade 6 students at urban school

	Raw Data/Field Notes	Researcher Reflections
Physical Setting		
Age of Computers/ Condition	Staff reported that computers were three months old. All computers were loaded with current XP operating system with flat screen monitors. Acer models were used?	New computers were impressive. However, room was not properly ventilated and did not have A/C which, in the long run, will shorten the useful life of the computers.

Computer/Student Ratio	Computer ratio was 1:1	# of computers was adequate for the size of the lab.
Physical Environment	Computer lab was larger than most computer labs. The room was fully carpeted with adequate artificial lighting. The lighting in the room is boosted by the large amount of natural light that emanates from the 8 large windows in the room. The tables used for the computers were not computer tables but rather fold down tables. Tables were too high for a few of the shorter Grade 6 students. Room was hot and several large fans were going. Staff stated that fans were used to muffle hallway noise. Chairs were traditional hard plastic.	Does the sound of the fan impact the concentration of some students? Would cushioned chairs make students more comfortable during testing? Computer screens had European American background. I wonder what the research says about the influence of the background screen on student learning?
Participants		
Gender Differences/ Majority	32 students total, 19 female and 13 male. This large class was broken down into two sessions: session 1 had 8 males and 8 females; session 2 had 11 females and 5 males.	Is a female majority typical in this school?

table continues

Who is in the scene (how many? roles?)	Three Staff Members: Grade 6 Teacher, Technology Director, Testing Coordinator.	Technology Director was not very active.
Relevant characteristics of the participants	12 African American males, 18 African American females, 1 Latino American female and 1 European American male)	
Activities and Interactions		
Keyboarding	Primarily point and click.	

ability	Keyboarding was not an issue.	
#of requests for assistance (race)	14 requests for assistance by African American students. 1 request for assistance by European American student.	Number of requests seemed high.
#of requests for assistance (gender)	15 total requests, 8 female requests and 7 male requests.	Almost equal number of requests which was unexpected. Is this a gender issue, lack of use issue or an age issue?

table continues

Interaction w/activity and others	Two students had sniffles. Several students physically pointed to and touched the screen as if it were paper; there were 11 instances of this behavior. Student used computer highlighter tool to re-read story problem. All students used scrap paper. Students who completed early were given individual assignments in order not to disturb others. Several students scrolled the text with the mouse wheel. Reading speed of these students seemed slow based on cursor speed. When reading longer passages, students tended to move closer to the screen. Several students visibly tired (yawning, etc.) Several students had tendency to lay their heads on their hands while reading.	Computer testing does not seem to account for vision problems (many African American, inner-city, low-income students do not receive adequate vision care). Because typing is not necessary for testing, proctors could move keyboards in between station so that screens could be moved forward if necessary for student comfort. Are students tired or experiencing computer fatigue?
Conversations		
Content of conversations	Majority of conversations centered on password retrieval and functionality questions.	Interaction between student and teacher seemed to go unnoticed by remainder of class.
# of computer functionality questions	14 computer functionality questions.	

table continues

Subtle Factors		
Instances of visible frustration	8 instances of visible frustration. In one instance, student, out of frustration,	

	skipped question and in another instance, student was distracted by hallway noise.	
Instances of daydreaming and other off- task behaviors	29 instances of daydreaming and other off-task behaviors	This was unexpected. The sounds from the open window (i.e., kids at recess) could be a contributing factor.
Informal and unplanned activities (i.e., entrants, class passing, PA, other students)	During the course of the session, two staff persons entered the room, two students entered the room (one left and slammed the door though not on purpose), one phone call came in on classroom phone, students passed to lunch.	Each time a person entered the room or the door closed, the majority of students reacted to varying degrees.
Observer Behavior		
Observer affect on the scene	Observer was introduced at the start of class.	Students did not seem to be impacted by observer's presence. Testing seemed to go on as if the observer was simply another adult in the room.
Observer comments and actions	Observer simply greeted the students and thanked them for participating in the study.	
Observer thoughts		With the exception of a few disruptive students, group was well mannered.

<u>Observation Data for Urban School Grade 7</u>

Table 28 presents a description of this researcher's field notes and researcher reflections written during the observation of students in Grade 7 at the urban school during Scantron testing. The field notes and researcher reflections are categorized or coded according to the specific criteria developed for the observation data collection form.

Table 28

Observation data - Grade 7 students at urban school

	Raw Data/Field Notes	Researcher Reflections
Physical Setting		
Age of Computers/ Condition	Staff reported that computers were three months old. All computers were loaded with current XP operating system with flat screen monitors. Acer models.	New computers were impressive. However, room was not properly ventilated and did not have A/C which, in the long run, will shorten the useful life of the computers.
Computer/Student Ratio	Computer ratio was 1:1	Number of computers was adequate for the size of the lab.

table continues

Physical Environment	Computer lab was larger than most computer labs. The room was fully carpeted with adequate artificial lighting. The lighting in the room is boosted by the large amount of natural light that emanates from the 8 large windows in the room. The tables used for the computers were not computer tables but rather fold down tables. Tables were too high for a few of the shorter 6th grade students. Room was hot and several large fans were going. Staff stated that fans were used to muffle hallway noise. Chairs were traditional hard plastic. Room was well organized and all walls were white. Water damage to the ceiling (chipping paint). Door closure was broken causing the door to slam when closed.	Does the sound of the fan impact the concentration of some students? Would cushioned chairs make students more comfortable during testing? Computer screens had white background. I wonder what the research says about the influence of the background screen on student learning?
The Participants		
Gender Differences/ Majority	14 female and 8 male	
Who is in the scene (how many? roles?)	3 Staff Members: Grade 7 Teacher, Technology Director, Testing Coordinator.	Technology Director was not very active.
Relevant characteristics of the participants	All students were African American, 14 female and 8 male.	

table continues

Activities and Interactions		
Keyboarding ability	Primarily point and click. Keyboarding was not an issue.	

#of requests for assistance (race)	6 requests for assistance. All African American.	
#of requests for assistance (gender)	5 requests for assistance by female students and 1 by male students.	May be evidence of gender difference in computer ability.
Interaction w/activity and others	Several students physically pointed to and touched the screen as if it were paper; there were 11 instances of this behavior. Students who completed early were given individual assignments so as not to disturb others. All students used scrap paper When reading longer passages, students tended to move closer to the screen. Several students visibly tired (yawning, etc.)	Computer testing does not seem to account for vision problems (many African American, inner-city, low-income students do not receive adequate vision care). Because typing is not necessary for testing, proctors could move keyboards in between station so that screens could be moved forward in necessary for student comfort. Are students tired or experiencing computer fatigue?
Conversations		
Content of conversations # of computer functionality questions	3 computer functionality questions.	
Subtle Factors		
Instances of visible frustration	9 instances of visible frustration, 7 female and 2 male.	
Instances of daydreaming and other off- task behaviors	9 instances of daydreaming and other off-task behaviors.	

table continues

Informal and unplanned activities (i.e., entrants, class passing, PA, other	Technology Director entered the room after testing started. One student entered late.	PA announcements during testing should not be allowed. Any disruptions that can be controlled should be

students)	PA announcement made during testing.	controlled.
Observer Behavior		
Observer affect on the scene	Observer was introduced at the start of class.	Students did not seem to be impacted by observer's presence. Testing seemed to go on as if the observer was simply another adult in the room.
Observer comments and actions	Observer simply greeted the students and thanked them for participating in the study.	
Observer thoughts		With the exception of a few disruptive students, group was well mannered.

Observation Data for Urban School Grade 8

Table 29 presents a description of this researcher's field notes and the researcher's reflections that were written during the observation of students in Grade 8 at the urban school during Scantron testing. The field notes and reflections are categorized or coded according to the specific criteria developed for the observation data collection form.

Table 29

Observation data - Grade 8 students at urban school

Physical Setting	Raw Data/Field Notes	Researcher Reflections

Age of Computers/ Condition	Staff reported that computers were three months old. All computers were loaded with current XP operating system with flat screen monitors. Acer models were used.	New computers were impressive. However, room was not properly ventilated and did not have A/C which, in the long run, will shorten the useful life of the computers.
Computer/Student Ratio	Computer to student ratio was 1:1.	Number of computers was adequate for the size of the lab.
Physical Environment	Computer lab was larger than most computer labs. The room was fully carpeted with adequate artificial lighting. The lighting in the room is boosted by the large amount of natural light that emanates from the 8 large windows in the room. The tables used for the computers were not computer tables but rather fold down tables. Tables were too high for a few of the shorter 6th grade students. Room was hot and several large fans were going. Staff stated that fans were used to muffle hallway noise. Chairs were traditional hard plastic. Room was well organized and all walls were white. Water damage to the ceiling (chipping paint). Door closure was broken causing the door to slam when closed.	Does the sound of the fan impact the concentration of some students? Would cushioned chairs make students more comfortable during testing? Computer screens had white background. I wonder what the research says about the background screen to student learning?

table continues

The Participants		
Gender Differences/ Majority	12 male students and 9 female students.	
Who is in the scene (how many? roles?)	Testing coordinator.	More than one person is needed to properly monitor group.
Relevant	All students African American.	

characteristics of the participants	12 male and 9 female.	
Activities and Interactions		
Keyboarding ability	Primarily point and click. Keyboarding was not an issue.	
#of requests for assistance (race)	10 requests for assistance (All African American students)	
#of requests for assistance (gender)	6 requests by female students and 4 requests by male students.	Interesting. 2/3 of female students requested assistance as opposed to 1/3 of male students.
Interaction w/activity and others	While several student students properly used the highlight function, others played with the function – off task behavior.	With only one adult in such a large room, monitoring for off task behavior is difficult.
Conversations		
Content of conversations	Content of conversations included requests for scratch paper, requests for pencils, computer functionality questions.	Lack of supplies is common in low SES schools.
# of computer functionality questions	7 computer functionality questions, 4 female and 3 male.	
Subtle Factors		
Instances of visible frustration	7 instances of visible frustration.	
Instances of daydreaming and other off- task behaviors	11 instances of daydreaming and other off-task behavior. One female student had head down for the majority of the testing cycle.	Could be due to lack of adult presence during testing or the approaching Grade 8 graduation.

table continues

Informal and unplanned activities (i.e., entrants, class passing, PA, other students)	1 late entrant. 1 loud sneeze by student. School-wide bell rang once. 1 school-wide announcement. Distracting noises from open window (recess outside) Student openly complained of being hot. Middle school class passed in	PA announcements should not be allowed during testing. Could middle school passing schedule be altered during testing?

	hallway – very loud. Bird on window sill chirping.	
Observer Behavior		
Observer affect on the scene	Observer was introduced at the start of class.	Students seemed curious as first. Teacher calmed any apprehension during introduction of researcher.
Observer comments and actions	Observer simply greeted the students and thanked them for participating in the study.	
Observer thoughts		Group was well mannered.

Survey Data for Urban School Grade 6

Section 1 – Computer Access

This section of the survey (see Figure C1 in the Appendix) was designed to assess the respondent's level of computer access. Seventy-eight point nine percent of the respondents indicated that they had a computer at home whereas 21.1% indicated that they did not currently have a computer in their home. None of the respondents indicated that the computer in their home was their personal computer. Twenty-six point seven shared their computer with siblings and 73.3% shared their computer with the entire family. Based upon this data, it seems clear that the respondents have a somewhat high level of computer access overall. When students who indicated that they did not have computer access at home were asked if they were able to access a computer at an alternate site, 25% indicated that they had access at the neighborhood library, 25% indicated that they had access at the home of a nearby friend or relative and 50% indicated that they had access at school.

Section 2 - Home & Community Computer Use

This section of the survey (see Figure C2 in the Appendix) was designed to determine how students with computer access at home or in their community actually utilized the computers. The questions were split between educational use and leisure use.

1. Fifty percent of the respondents indicated that they used the computer to play games daily whereas 50% indicated such use once per week or less.
2. Twenty-six point four percent of the respondents indicated that they used the computer for word processing daily whereas 73.6% indicated such use once per week or less.
3. Forty-two point one percent of the respondents indicated that they used the computer to send or read email messages daily whereas 57.9% indicated such use once per week or less.
4. Twenty-one point one percent of the respondents indicated that they used the computer to create web pages (including MySpace and Face book) daily whereas 78.9% indicated such use once per week or less.
5. Fifty percent of the respondents indicated that they used the computer to listen to or download music files daily whereas 50% indicated such use once per week or less.
6. Ten percent of the respondents indicated that they used the computer to create graphs or charts daily whereas 90% indicated such use once per month or less.

7. Five point six percent of the respondents indicated that they used the computer to send instant messages daily whereas 94.4% indicated such use once per week or less. The majority, 66.7% indicated that they never used the computer to send IM's.
8. Zero percent of respondents indicated that they used the computer to create spreadsheets daily whereas 100% indicated such use once per month or less. However, the majority (73.7%) indicated that they never use the computer to create spreadsheets.
9. Eleven point eight percent of the respondents indicated that they used the computer to create fliers, signs, brochures or greeting cards daily whereas 88.2 indicated such use once per week or less with the majority (52.9%) indicating that they had never used the computer in such a fashion.
10. Fifty-three point four percent of respondents indicated the use of a home computer for other purposes daily. Forty-six point six percent indicated such use once per month or less.
11. When asked how many hours they used a computer at home during the last week, 31.6% of the respondents indicated 4 hours or more. Twenty-one point one percent of the respondents indicated 1 to 3 hours and 21.1% of the respondents indicated 0-1 hours. Twenty-six point three percent of the respondents indicated that they had not used a computer at home during the last week.

In addition to simply knowing the number of hours respondents used a computer in the previous week, it was also important to know the influence of both the amount of access and type of use on proficiency. Table 30 and Table 31 show the influence of the type of use and the amount of access on the achievement of Grade 6 urban respondents in mathematics and reading.

Table 30

Grade 6 proficiency in math and reading based on type of computer use

Type of Use	% Grade 6 Proficient on Scantron Math - Urban	% Grade 6 Proficient on Scantron Rdg. - Urban
Sole Use	N/A	N/A
Shared Use	50%	56.25%
Community Only	0%	50%
School Only	50%	50%

Table 31

Grade 6 proficiecny in math and reading based on type of use and amout of access

URBAN (Sole & Shared)	Grade 6 % Proficient Math	Grade 6 % Proficient Rdg
3 or Less	50% (6/12)	58% (7/12)

4 or More	50% (2/4)	50% (2/4)

URBAN (Shared Only)	Grade 6 % Proficient Math	Grade 6 % Proficient Rdg
3 or Less	50% (6/12)	58% (7/12)
4 or More	50% (2/4)	50% (2/4)

URBAN (Sole Only)	Grade 6 % Proficient Math	Grade 6 % Proficient Rdg
3 or Less	N/A	N/A
4 or More	N/A	N/A

Section 3 - School Computer Use

This section of the survey (see Figure C3 in the Appendix) was designed to determine how students with computer access at school actually utilized the computers. The questions were split between educational use and leisure use.

1. Forty percent of the respondents indicated that they used the computer to play games daily whereas 60% indicated such use once per week or less.
2. Twenty-six point three of the respondents indicated that they used the computer for word processing daily whereas 73.7% indicated such use once per week or less.
3. Thirty-three point three percent of the respondents indicated that they used the computer to send or read email messages daily whereas 66.7% indicated such use once per week or less.
4. Thirty-three point four percent of the respondents indicated that they used the computer to create web pages (including MySpace and Face book) daily whereas 66.6% indicated such use once per week or less.

5. Thirty percent of the respondents indicated that they used the computer to listen to or download music files daily whereas 70% indicated such use once per week or less.
6. Twenty-two point three percent of the respondents indicated that they used the computer to create graphs or charts daily whereas 84.2% indicated such use once per week or less. The majority, 52.6%, indicated that they never use the school computer for such use.
7. Twenty-two point three percent of the respondents indicated that they used the computer to send instant messages daily whereas 77.7% indicated such use once per week or less. The majority, 66.7%, indicated that they never use the school computer for such use.
8. Eleven point two percent of respondents indicated that they used the computer to create spreadsheets daily whereas 88.8% indicated such use once per week or less. Fifty percent of respondents indicated that they never used the school computer for such use.
9. Ten percent of respondents indicated that they used the computer to create fliers, signs, brochures or greeting cards daily whereas 90% indicated such use once per week or less with the majority (55%) indicating that they had never used the computer for such use.
10. Thirty-eight point nine percent of respondents indicated the use of a school computer for other purposes at least once per week whereas 61.1% indicated such use once per month or less.

11. When asked how many hours they used a computer at school during the last week, 10% of the respondents indicated 4 hours or more while 15% of the respondents indicated 1 to 3 hours of use. Thirty percent of the respondents indicated 0-1 hours and 45% of the respondents indicated that they had not used a computer at school during the last week.

Section 4 - General Information

This section of the survey (see Figure C4 in the Appendix) was designed to obtain general information about the respondents including perceived computer abilities, gender, grade level, race/ethnicity and participation in Michigan's Free Lap Top Program. This section also was designed to obtain information on respondent perceptions of their confidence level when taking pencil and paper tests and tests given via computer. This section also collected narrative information in the respondents own words describing why they felt more or less confident or more or less worried when taking pencil and paper tests or tests given via computer.

1. Fifty percent of respondents rated their computer abilities as average while 50 % rated their computer abilities as above average or extremely good.
2. Thirty-six point eight percent of the respondents were male while 63.2% were female.
3. Seventy-five percent of the respondents were African American, 5% of the respondents were Native American, 5% of respondents were Hispanic American, 5% of respondents were European American and 10% of respondents indicated other when asked to describe their race/ethnicity.

4. Seventy-five percent of the respondents indicated that their school did participate in Michigan's Free Laptop program whereas 25% indicated that their school did not participate in Michigan's Free Laptop program or that they did not know if their school participated.
5. When students who indicated that their school did participate in Michigan's Free Laptop program were asked if they received a free laptop in 6^{th} grade, 33.3% indicated that they did receive a computer whereas 66.7% indicated that they had not received a computer.
6. When asked how they feel when they take pencil and paper tests, 85% of the respondents indicated that they felt very or somewhat confident while the remaining 15% indicated that they felt somewhat or very worried.
7. When asked how they feel when they take tests on a computer, 68.5% of the respondents indicated that they felt very or somewhat confident while the remaining 31.6% indicated that they felt somewhat or very worried.
8. When asked to give narrative responses as to why they felt very confident, somewhat confident, somewhat worried, or very worried when taking either pencil and paper test or computer tests, the vast majority of the answers were grounded in the respondent's perceived self-efficacy or the lack thereof.

In addition to gathering general data about how respondents rate their computer abilities, it was also important to understand the extent to which, if at all, respondents' self-assessments of their computer abilities influenced their proficiency on computerized tests. Table 32 indicates the suburban Grade 6 respondents' proficiency in math and reading based on their self-assessed computer ability.

Table 32

Grade 6 proficiency in math and reading based on self-assessed computer ability

URBAN	Grade 6	Grade 6
	% Proficient Math	% Proficient Rdg
Average or Less	70% (7/10)	70% (7/10)
Above Avg. or Greater	20% (2/10)	40% (4/10)

To address the possible influence of gender and socioeconomic status on computerized test-taking anxiety, it was also necessary to analyze respondent confidence levels by gender and socioeconomic status. With regard to confidence differences by gender as indicated in Table 33), when male respondents were asked how they felt when they took pencil and paper tests, 100% indicated that they felt very or somewhat confident. When asked the same question, 77% of female respondents indicated that they felt very or somewhat confident while the remaining 23% indicated that they felt somewhat or very worried. When male respondents were asked how they feel when they take tests on a computer, 83% indicated that they felt very or somewhat confident while the remaining 17% indicated that they felt somewhat or very worried. When asked the same question, 62% of female respondents indicated that they felt very or somewhat confident while the remaining 38% indicated that they felt somewhat or very worried.

Table 33

Urban Grade 6 respondents' confidence responses on pencil & paper tests vs. computerized test by gender

Boys (7)	Pencil & Paper	Computer
Worried	0 (0%)	1 (17%)
Confident	7 (100%)	5 (83%)

Girls (13)	Pencil & Paper	Computer
Worried	3 (23%)	5 (38%)
Confident	10 (77%)	8 (62%)

With regard to confidence differences by SES status, due to the urban school's unwillingness to provide free/reduced lunch information for the study participants, this researcher was unable address this aspect of the study for the urban school. As a result, this fact will be considered a limitation to this study.

To address the possible influence of the type of computer access on self-ratings of computer ability and computerized testing confidence, it was also necessary to analyze differences in shared use and sole use respondent's computer ability self-ratings and computerized testing confidence. As indicated in Table 34, there were 16 urban Grade 6 students with shared use only and none with sole use only. Of the shared use respondents, 56% rated their computer abilities as above average or greater while 80% were confident when taking computerized tests.

Table 34

The influence of type of computer access on self-rated computer ability and computerized testing confidence

URBAN (Shared Only)	Grade 6	% URBAN 6th
Average or Less	7/16	44%
Above Avg. or Greater	9/16	56%
Worried	3/15	20%
Confident	12/15	80%

URBAN (Sole Only)	Grade 6	% URBAN 6th
Average or Less	N/A	N/A
Above Avg. or Greater	N/A	N/A
Worried	N/A	N/A
Confident	N/A	N/A

Survey Data for Urban School Grade 7

Section 1 – Computer Access

This section of the survey (see Figure C5 in the Appendix) was designed to assess the respondent's level of computer access. Seventy-six point nine percent of the respondents indicated that they had a computer at home while 23.1% indicated that they did not. With regard to respondents that indicated that they did not currently have a computer at home, 33.3% indicated that they had access to a computer at the home of a nearby friend or relative while 66.7% indicated such access at school. Twenty percent of the respondents indicated that the computer in their home was their personal computer. 10% shared their computer with siblings and 70% shared their computer with the entire family. Based upon this data, it seems clear that the respondents have a high level of computer access overall.

Section 2 - Home & Community Computer Use

This section of the survey (see Figure C6 in the Appendix) was designed to determine how students with computer access at home or in their community actually utilized the computers. The questions were split between educational use and leisure use.

1. Thirty-eight point five percent of the respondents indicated that they used the computer to play games daily whereas 61.5% indicated such use once per week or less.
2. None of the respondents indicated that they used the computer for word processing daily whereas 100% indicated such use once per week or less. The majority, 69.2%, indicated that they never used their home or community computer for word processing.
3. Fifty-three point nine percent of the respondents indicated that they used the computer to send or read email messages daily whereas 46.1% indicated such use once per week or less.
4. Forty-six point two percent of the respondents indicated that they used the computer to create web pages (including MySpace and Face book) daily whereas 53.8% indicated such use once per week or less.
5. Fifty-three point nine percent of the respondents indicated that they used their home or community computer to listen to or download music files daily whereas 46.1% indicated such use once per week or less.
6. None of the respondents indicated that they used the computer to create graphs or charts daily whereas 100% indicated such use once per semester or less. The

majority, 76.9% indicated that they never use their home or community computer to create graphs or charts.

7. None of the respondents indicated that they used the computer to send instant messages daily whereas 100% indicated such use once per week or less. The majority, 69.2%, indicated that they never use their home or community computer to send IM's.
8. None of respondents indicated that they used the computer to create spreadsheets daily whereas 100% indicated such use once per month or less.
9. None of the respondents indicated that they used their home or community computer to create fliers, signs, brochures or greeting cards daily whereas 100% indicated such use once per month or less with the majority (58.3%) indicating that they had never used their home or community computer for such use.
10. Forty-five point five percent of respondents indicated the use of a home computer for other purposes daily whereas 54.5% indicated such use once per month or less.
11. When asked how many hours they used a computer at home or in the community during the last week, 15.4% of the respondents indicated 4 hours or more whereas 30.8% of the respondents indicated 1 to 3 hours. 53.8% of the respondents indicated that they had not used a computer at home or in the community during the last week.

In addition to simply knowing the number of hours that respondents used a computer in the previous week, it was also important to know the influence of both the amount of access and type of use on proficiency. Table 35 and Table 36 show the influence of the type of use and the amount of access on the achievement of Grade 7 urban respondents in mathematics and reading.

Table 35

Grade7 proficiency in math and reading based on type of computer use

Type of Use	% Grade 7 Proficient on Scantron Math - Urban	% Grade 7 Proficient on Scantron Rdg. - Urban
Sole Use	50%	100%
Shared Use	25%	50%
Community Only	0%	100%
School Only	50%	50%

Table 36

Grade 7 proficiency in math and reading based on type of use and amout of access

URBAN (Sole & Shared)	Grade 7 % Proficient Math	Grade 7 % Proficient Rdg
3 or Less	12% (1/8)	50% (4/8)
4 or More	100% (2/2)	100% (2/2)
URBAN (Shared Only)	Grade 7	Grade 7

	% Proficient Math	% Proficient Rdg
3 or Less	14% (1/7)	43% (3/7)
4 or More	100% (1/1)	100% (1/1)

URBAN (Sole Only)	Grade 7 % Proficient Math	Grade 7 % Proficient Rdg
3 or Less	0% (0/1)	100% (1/1)
4 or More	100% (1/1)	100% (1/1)

Section 3 - School Computer Use

This section of the survey (see Figure C7 in the Appendix) was designed to determine how students with computer access at school actually utilized the computers. The questions were split between educational use and leisure use.

1. Thirty-eight point five percent of the respondents indicated that they used their school computer to play games daily whereas 61.5% indicated such use once per week or less.
2. Seven point seven percent of the respondents indicated that they used the computer for word processing daily whereas 92.3% indicated such use once per week or less.
3. Seven point seven percent of the respondents indicated that they used the computer to send or read email messages daily whereas 92.3% indicated such use once per week or less.
4. The majority, 53.8%, indicated that they never used the school computer to send or read email messages.

5. Seven point seven percent of the respondents indicated that they used the computer to create web pages (including MySpace and Face book) daily whereas 92.3% indicated such use once per week or less. Fifty-three point eight percent indicated that they never used the school computer to create web pages.
6. Fifteen point four percent of the respondents indicated that they used the computer to listen to or download music files daily whereas 84.6% indicated that they used the school computer for such use once per semester or less. The majority, 69.2% indicated that they never used the school computer for such use.
7. None of the respondents indicated that they used the computer to create graphs or charts daily whereas 100% indicated such use once per month or less. The majority, 61.5%, indicated they never used the school computer for such use.
8. Eight point three percent of the respondents indicated that they used the computer to send instant messages daily whereas 91.7% indicated such use once per week or less. The majority, 66.7%, indicated that they never used the school computer for such use.
9. Seven point seven percent of respondents indicated that they used the computer to create spreadsheets daily whereas 92.3% indicated such use once per month or less. The majority, 53.8%, indicated that they never used the school computer for such use.
10. Seven point seven percent of respondents indicated that they used the computer to create fliers, signs, brochures or greeting cards daily whereas 92.3% indicated

such use once per month or less with the majority (76.9%) indicating that they had never used the school computer for such use.

11. Twenty-five percent of respondents indicated the use of a school computer for other purposes daily while 75% indicated such use once per month or less.
12. When asked how many hours they used a computer at school during the last week, 7.7% of the respondents indicated 4 hours or more while 7.7% of the respondents indicated 1 to 3 hours of use. Eighty-four point six percent of the respondents indicated that they had not used a computer at school during the last week.

Section 4 - General Information

This section of the survey (see Figure C8 in the Appendix) was designed to obtain general information about the respondents including perceived computer abilities, gender, grade level, race/ethnicity and participation in Michigan's Free Lap Top Program. This section also was designed to obtain information on respondent perceptions of their confidence level when taking pencil and paper tests and tests given via computer. This section also collected narrative information in the respondents own words describing why they felt more or less confident or more or less worried when taking pencil and paper tests or tests given via computer.

1. Forty-six point two percent of respondents rated their computer abilities as average while 46.2 % rated their computer abilities as above average or extremely

good. Seven point seven percent of respondents rated their computer abilities as below average.

2. Seven point seven percent of the respondents were male while 92.3% were female.
3. Ninety-two point three percent of the respondents were African American while 7.7% identified themselves as other.
4. Seventy-six point nine percent of the respondents indicated that their school did not participate in Michigan's Free Laptop program or that they did not know if their school participated. Twenty-three point one percent indicated that their school did participate in Michigan's Free Laptop program.
5. With regard to the respondents that indicated their school participated in Michigan's Free Laptop program, 75% indicated that they received a computer and 25% indicated that they had not.
6. When asked how they feel when they take pencil and paper tests, 69.2% of the respondents indicated that they felt very or somewhat confident while the remaining 30.8% indicated that they felt somewhat worried.
7. When asked how they feel when they take tests on a computer, 53.9% of the respondents indicated that they felt very or somewhat confident while the remaining 46.1% indicated that they felt somewhat or very worried.
8. When asked to give narrative responses as to why they felt very confident, somewhat confident, somewhat worried, or very worried when taking either

pencil and paper test or computer tests, the vast majority of the answers were grounded in the respondent's perceived self-efficacy or the lack thereof.

In addition to gathering general data about how respondents rate their computer abilities, it was also important to understand the extent to which, if at all, respondents' self-assessments of their computer abilities influenced their proficiency on computerized tests. Table 37 indicates the urban Grade 7 respondents' proficiency in math and reading based on their self-assessed computer ability.

Table 37

Grade 7 proficiency in math and reading based on self-assessed computer ability

URBAN	Grade 7	Grade 7
	% Proficient Math	% Proficient Rdg
Average or Less	29% (2/7)	57% (4/7)
Above Avg. or Greater	34% (2/6)	67% (4/6)

To address the possible influence of gender and socioeconomic status on computerized test-taking anxiety, it was also necessary to analyze respondent confidence levels by gender and socioeconomic status. With regard to confidence differences by gender as indicated in Table 38, when male respondents were asked how they felt when they took pencil and paper tests, 100% indicated that they felt very or somewhat confident. When asked the same question, 67% of female respondents indicated that they felt very or somewhat confident while the remaining 33% indicated that they felt somewhat or very worried. When male respondents were asked how they feel when they take tests on a computer, 100% indicated that they felt very or somewhat confident.

When asked the same question, 50% of female respondents indicated that they felt very or somewhat confident while the remaining 50% indicated that they felt somewhat or very worried.

Table 38

Urban Grade 7 respondents' confidence responses on pencil & paper tests vs. computerized test by gender

Boys (1)	Pencil & Paper	Computer
Worried	0 (0%)	0 (0%)
Confident	1 (100%)	1 (100%)

Girls (12)	Pencil & Paper	Computer
Worried	4 (33%)	6 (50%)
Confident	8 (67%)	6 (50%)

With regard to confidence differences by SES status, due to the urban school's unwillingness to provide free/reduced lunch information for the study participants, this researcher was unable address this aspect of the study for the urban school. As a result, this fact will be considered a limitation to this study.

To address the possible influence of the type of computer access on self-ratings of computer ability and computerized testing confidence, it was also necessary to analyze differences in shared use and sole use respondent's computer ability self-ratings and computerized testing confidence. As indicated in Table39, there are 8 urban Grade 7 students with shared use only and 2 with sole use only. Of the shared use respondents, 62.5% % rated their computer abilities as average or less while 62.5% were confident when taking computerized tests. Of the sole use respondents, 100% rated their computer abilities as above average or greater while 0% were confident when taking computerized tests.

Table 39

The influence of type of computer access on self-rated computer ability and computerized testing confidence

URBAN (Shared Only)	Grade 7	% URBAN 7th
Average or Less	5/8	62.5%
Above Avg. or Greater	3/8	37.5%
Worried	3/8	37.5%
Confident	5/8	62.5%

URBAN (Sole Only)	Grade 7	% URBAN 7th
Average or Less	0/2	0%
Above Avg. or Greater	2/2	100%
Worried	2/2	100%
Confident	0/2	0%

Survey Data for Urban School Grade 8

Section 1 – Computer Access

This section of the survey (see Figure C9 in the Appendix) was designed to assess the respondent's level of computer access. Ninety-five point two percent of the respondents indicated that they had a computer at home while 4.8% indicated that they did not have a computer at home. With regard to respondents that indicated that they did not have a computer at home, 50% indicated that they had access at the neighborhood library, and 50% indicated that they had access at the home of a nearby friend or relative. Ten percent of the respondents indicated that the computer in their home was their personal computer. Ten percent shared their computer with siblings and 80% shared their computer with the entire family. Based upon this data, it seems clear that the respondents have a high level of computer access overall.

Section 2 - Home & Community Computer Use

This section of the survey (see Figure C10 in the Appendix) was designed to determine how students with computer access at home or in their community actually utilized the computers. The questions were split between educational use and leisure use.

1. Twenty-five percent of the respondents indicated that they used the computer to play games daily whereas 75% indicated such use once per week or less.
2. Fifteen percent of the respondents indicated that they used the computer for word processing daily whereas 85% indicated such use once per week or less.
3. Sixty-three point two percent of the respondents indicated that they used the computer to send or read email messages daily whereas 36.8% indicated such use once per week or less.
4. Thirty-six point eight percent of the respondents indicated that they used the computer to create web pages (including MySpace and Face book) daily whereas 63.2% indicated such use once per week or less.

5. Sixty percent of the respondents indicated that they used the computer to listen to or download music files daily whereas 40% indicated such use once per month or less.
6. Five percent of the respondents indicated that they used the computer to create graphs or charts daily whereas 95% indicated such use once per month or less.
7. Thirty-eight point nine percent of the respondents indicated that they used the computer to send instant messages daily whereas 61.1% indicated such use once per week or less.
8. Ten percent of respondents indicated that they used the computer to create spreadsheets daily whereas 90% indicated such use once per week or less.
9. Fifteen point eight percent of the respondents indicated that they used the computer to create fliers, signs, brochures or greeting cards daily whereas 84.2% indicated such use once per week or less.
10. Thirty-one point six percent of respondents indicated the use of a home computer for other purposes daily whereas 68.4% indicated such use once per week or less.
11. When asked how many hours they used a computer at home during the last week, 47.7% of the respondents indicated 4 hours or more whereas 23.8% of the respondents indicated 1 to 3 hours. Fourteen point three percent of the respondents indicated 0-1 hours and 14.3% of the respondents indicated that they had not used a computer at home during the last week.

In addition to simply knowing the number of hours that respondents used a computer in the previous week, it was also important to know the influence of both the amount of access and type of use on proficiency. Table 40 and Table 41 show the influence of the type of use and the amount of access on the achievement of Grade 8 urban respondents in mathematics and reading.

Table 40

Grade 8 proficiency in math and reading based on type of computer use

Type of Use	% Grade 8 Proficient on Scantron Math - Urban	% Grade 8 Proficient on Scantron Rdg. - Urban
Sole Use	N/A	N/A
Shared Use	20%	50%
Community Only	100%	100%
School Only	N/A	N/A

Table 41

Grade 8 proficiency in math and reading based on type of use and amout of access

URBAN (Sole & Shared)	Grade 8 % Proficient Math	Grade 8 % Proficient Rdg
3 or Less	25% (1/4)	75% (3/4)
4 or More	17% (1/6)	33% (2/6)
URBAN (Shared Only)	**Grade 8 % Proficient Math**	**Grade 8 % Proficient Rdg**
3 or Less	25% (1/4)	75% (3/4)

4 or More	17% (1/6)	33% (2/6)

URBAN (Sole Only)	Grade 8 % Proficient Math	Grade 8 % Proficient Rdg
3 or Less	N/A	N/A
4 or More	N/A	N/A

Section 3 - School Computer Use

This section of the survey (see Figure C11 in the Appendix) was designed to determine how students with computer access at school actually utilized the computers. The questions were split between educational use and leisure use.

1. Twenty-five percent of the respondents indicated that they used the school computer to play games daily whereas 75% indicated such use once per week or less.
2. Nineteen point one percent of the respondents indicated that they used the computer for word processing daily whereas 80.9% indicated such use once per week or less.
3. Sixteen point seven percent of the respondents indicated that they used the computer to send or read email messages daily whereas 83.3% indicated such use once per week or less.
4. Five point six percent of the respondents indicated that they used the computer to create web pages (including MySpace and Face book) daily whereas 94.4% indicated such use once per week or less. Seventy-seven point eight percent indicated that they never used the school computer to create web pages.

5. Ten percent of the respondents indicated that they used the computer to listen to or download music files daily whereas 90% indicated such use once per week or less. The majority, 70%, indicated that they never used the school computer for such use.
6. Ten percent of the respondents indicated that they used the computer to create graphs or charts daily whereas 90% indicated such use once per week or less.
7. Ten point six percent of the respondents indicated that they used the computer to send instant messages daily whereas 89.4% indicated such use once per week or less. The majority, 63.2%, indicated that they never used the computer for such use.
8. Ten percent of respondents indicated that they used the computer to create spreadsheets daily whereas 90% indicated such use once per week or less.
9. Five point three percent of respondents indicated that they used the computer to create fliers, signs, brochures or greeting cards daily whereas 94.7% indicated such use once per month or less.
10. Seventeen point seven percent of respondents indicated the use of a school computer for other purposes daily. Eighty-two point three percent of respondents indicated the use of a school computer for other purposes once per week or less.
11. When asked how many hours they used a computer at school during the last week, 4.8% of the respondents indicated 4 hours or more while 14.3% of the respondents indicated 1 to 3 hours of use. Fifty-seven point one percent of the

respondents indicated 0-1 hours and the majority, 23.8% of the respondents indicated that they had not used a computer at school during the last week.

Section 4 - General Information

This section of the survey (see Figure C12 in the Appendix) was designed to obtain general information about the respondents including perceived computer abilities, gender, grade level, race/ethnicity and participation in Michigan's Free Lap Top Program. This section also was designed to obtain information on respondent perceptions of their confidence level when taking pencil and paper tests and tests given via computer. This section also collected narrative information in the respondents' own words describing why they felt more or less confident or more or less worried when taking pencil and paper tests or tests given via computer.

1. Forty-seven point six percent of respondents rated their computer abilities as average while 52.4% rated their computer abilities as above average or extremely good.
2. Sixty-one point nine percent of the respondents were male while 38.1% were female.
3. Ninety point five percent of the respondents were African American while 9.5% referred to themselves as other.
4. Eighty point nine percent of the respondents indicated that their school did not participate in Michigan's Free Laptop program or that they did not know if their school participated. Nineteen percent indicated that their school did participate in Michigan's Free Laptop program.

5. With regard to the respondents that indicated that their school did participate in Michigan's Free Laptop program, none indicated that they had actually received a free computer.
6. When asked how they feel when they take pencil and paper tests, 85.7% of the respondents indicated that they felt very or somewhat confident while the remaining 14.3% indicated that they felt somewhat worried.
7. When asked how they feel when they take tests on a computer, 72.2% of the respondents indicated that they felt very or somewhat confident while the remaining 27.8% indicated that they felt somewhat or very worried.
8. When asked to give narrative responses as to why they felt very confident, somewhat confident, somewhat worried, or very worried when taking either pencil and paper test or computer tests, the vast majority of the answers were grounded in the respondent's perceived self-efficacy or the lack thereof.

In addition to gathering general data about how respondents rate their computer abilities, it was also important to understand the extent to which, if at all, respondent's self-assessments of their computer abilities influenced their proficiency on computerized tests. Table 42 indicates the urban Grade 8 respondents' proficiency in math and reading based on their self-assessed computer ability.

Table 42

Grade 8 proficiency in math and reading based on self-assessed computer ability

URBAN	Grade 8 % Proficient Math	Grade 8 % Proficient Rdg

Average or Less	17% (1/6)	34% (2/6)
Above Avg. or Greater	40% (2/5)	80% (4/5)

To address the possible influence of gender and socioeconomic status on computerized test-taking anxiety, it was also necessary to analyze respondent confidence levels by gender and socioeconomic status. With regard to confidence differences by gender as indicated in Table 43, when male respondents were asked how they felt when they took pencil and paper tests, 85% indicated that they felt very or somewhat confident while the remaining 15% indicated that they felt somewhat or very worried. When asked the same question, 87.5% of female respondents indicated that they felt very or somewhat confident while the remaining 12.5% indicated that they felt somewhat or very worried. When male respondents were asked how they feel when they take tests on a computer, 82% indicated that they felt very or somewhat confident while the remaining 18% indicated that they felt somewhat or very worried. When asked the same question, 57% of female respondents indicated that they felt very or somewhat confident while the remaining 43% indicated that they felt somewhat or very worried.

Table 43

Urban Grade 8 respondents' confidence responses on pencil & paper tests vs. computerized test by gender

Boys (13)	Pencil & Paper	Computer
Worried	2 (15%)	2 (18%)
Confident	11 (85%)	9 (82%)
Girls (8)	Pencil & Paper	Computer

Worried	1 (12.5%)	3 (43%)
Confident	7 (87.5%)	4 (57%)

With regard to confidence differences by SES status, due to the urban school's unwillingness to provide free/reduced lunch information for the study participants, this researcher was unable address this aspect of the study for the urban school. As a result, this fact will be considered a limitation to this study.

To address the possible influence of the type of computer access on self-ratings of computer ability and computerized testing confidence, it was also necessary to analyze differences in shared use and sole use respondent's computer ability self-ratings and computerized testing confidence. As indicated in Table 44, there were 10 urban Grade 8 students with shared use only and none with sole use only. Of the shared use respondents, the percentage who rated their computer abilities as average or less and above average or greater was evenly split, 50% each while 78% were confident when taking computerized tests.

Table 44

The influence of type of computer access on self-rated computer ability and computerized testing confidence

URBAN (Shared Only)	Grade 8	% URBAN 8th
Average or Less	5/10	50%
Above Avg. or Greater	5/10	50%
Worried	2/9	22%

Confident	7/9	78%

URBAN (Sole Only)	Grade 8	% URBAN 8th
Average or Less	N/A	N/A
Above Avg. or Greater	N/A	N/A
Worried	N/A	N/A
Confident	N/A	N/A

Document Data

The documents that were analyzed or "mined for data" as Merriam (1998) states included reading and mathematics scores from both the Scantron Performance Series test and MEAP tests, and free and reduced lunch records. These documents relate to the central research questions and related questions of the current study in that they provide information regarding socioeconomic status as well as student achievement levels on both computerized and pen and paper tests. The analysis of these documents is important to the current study because they shed light on the relationship between socioeconomic status and lack of access to and infrequent use of computers and the impact that this relationship has on attitudes toward computers and resulting test scores.

The free and reduced lunch reports serve as an indicator of low socioeconomic status. The two sets of test scores were used to determine if student performance levels on computerized versus pen and paper tests differ and if so, the extent of the difference.

As indicated in Tables 45, 46, 47, 48, 49 and 50, over 50% of all Grade 6 and 7 students at the urban school met or exceeded standards on the MEAP test. Only Grade 8 students were below 50% in both reading and math on the MEAP test. As a result of the urban school's unwillingness to provide MEAP data for individual participants in this study, these scores are group scores. This fact will be duly noted as a limitation to this study.

However, the similarities and differences between the school-wide MEAP scores and the scores of the actual respondents on the Scantron test are noteworthy. Specifically, while 50% of Grade 6 and 7 respondents met or exceeded the standards on the Scantron reading test, similar to the school-wide performance on MEAP, the same was not true for math scores. Only 5% of Grade 6 respondents, 31% of Grade 7 respondents and 20% of Grade 8 respondents met or exceeded standards on the Scantron math test, in stark contrast to the school-wide performance on MEAP. Moreover, with regard to Grade 8 respondents, while 20% met or exceeded standards on the Scantron Math test, 34.5% of students met or exceeded standards on a school-wide basis on the MEAP math test. Finally, it is interesting to note that with regard to urban students with home computer ownership, only Grade 6 students with computer ownership surpassed their urban peers without computer ownership.

With regard to score differences with regard to socioeconomic status, similar to the situation with the MEAP scores, the urban school was unwilling to provide SES status data for individual participants. As a result, no analysis can be performed with regard to SES data. The school's unwillingness to provide this individual student data will be noted as a limitation to this study.

School-Wide Document Data for the Urban School

Table 45

Michigan Educational Assessment Program Scores - Urban

	Fall MEAP 2007 Grade 6		Fall MEAP 2007 Grade 7		Fall MEAP 2007 Grade 8	
	Math	Reading	Math	Reading	Math	Reading
Level 1: Advanced	19%	6.40%	18.30%	7.60%	3.60%	4.80%
Level 2: Proficient	36.70%	59%	33.30%	45.70%	31%	39.30%
Level 3: Partially Proficient	35.40%	28.20%	40.90%	26.10%	48.80%	38.10%
Level 4: Not Proficient	8.90%	6.40%	7.50%	20.70%	16.70%	17.90%
Met or Exceeded	55.70%	65.40%	51.60%	53.30%	34.50%	44%
Not Met	44.30%	34.60%	48.40%	46.70%	65.50%	56%

Table 46

Free Lunch Percentages - Urban

Number of Students Enrolled	Number of Free Lunch Students	% Free Lunch
548	456	83%

<u>Individual Participant Document Data for the Urban School</u>

Table 47

Scantron Performance Series Math Assessment Scores – Urban

Grade	% At Risk Range	% Interquartile Range	% Advanced Range

6	95%	5%	0%
7	69%	31%	0%
8	80%	20%	0%

Table 48

Scantron Performance Series Reading Assessment Scores - Urban

Grade	% At Risk Range	% Interquartile Range	% Advanced Range
6	40%	60%	0%
7	46%	54%	0%
8	50%	50%	0%

Table 49

Scantron Performance Series Math Assessment Scores (Computer Ownership) - Urban

Grade	% At Risk Range Urban w/o Computer	% At Risk Range Urban w/ Computer	% Interquartile Range Urban w/o Computer	% Interquartile Range Urban w/ Computer	% Advanced Range Urban w/o Computer	% Advanced Range Urban w/ Computer
6	75%	50%	25%	50%	0%	0%
7	66.67%	70%	33.33%	30%	0%	0%
8	0%	80%	100%	20%	0%	0%

Table 50

Scantron Performance Series Reading Assessment Scores (Computer Ownership)- Urban

Grade	% At Risk Range Urban w/o Computer	% At Risk Range Urban w/ Computer	% Interquartile Range Urban w/o Computer	% Interquartile Range Urban w/ Computer	% Advanced Range Urban w/o Computer	% Advanced Range Urban w/ Computer
6	50%	43.75%	50%	56.25%	0%	0%
7	33.33%	40%	66.67%	60%	0%	0%
8	0%	50%	100%	50%	0%	0%

Unlike the urban school, the suburban school was willing to provide both MEAP and socioeconomic data for individual participants in this study. As a result, this researcher was able to analyze the score differences of the suburban school respondents on the pen and paper test (MEAP) vs. the computerized test (Scantron). Moreover, this researcher was able to analyze score differences of suburban school respondents on the two tests with regard to socioeconomic status. Finally, this researcher was able to analyze differences in the number of respondents who scored below standards on the two tests.

As indicated in Tables 51, 52, 53, 54, and 55, the similarities and differences between the school-wide MEAP scores and the scores of the actual respondents on the Scantron test are noteworthy. Specifically, 80% of all Grade 6 students at the suburban school met or exceeded standards on the MEAP test in both math and reading. Moreover, 86.7% and 69% of Grade 7 students, in math and reading, respectively, met or exceeded standards on the MEAP test as did 66.7% and 69.2% of Grade 8 students in math and reading, respectively.

While the percentage of Grade 6 respondents who met or exceeded standards on the Scantron test was lower than the school-wide percentage on MEAP, with the exception of Grade 7 math, the exact opposite was true for Grade 7 and Grade 8 respondents. A greater number of Grade 7 respondents met or exceeded standards on the Scantron reading test (computerized) than the school as a whole on MEAP (pen & paper). Also, a greater number of Grade 8 respondents met or exceeded standards on the Scantron test (computerized) in both math and reading than the school as a whole on MEAP (pen & paper). However, a different story emerges when the MEAP scores of the individual respondents are examined in comparison to their Scantron scores. In this case, both Grade 6 and Grade 7 respondents scored higher on the MEAP (pen & paper) test than on the Scantron (computerized) test in both math and reading. Grade 8 scores were virtually the same on both tests with a four percentage point and one percentage point difference, in math and reading respectively, between the two tests.

<u>School-Wide Document Data for the Suburban School</u>

Table 51

Michigan Educational Assessment Program Scores - Suburban

Level	Fall MEAP 2007 Grade 6		Fall MEAP 2007 Grade 7		Fall MEAP 2007 Grade 8	
	Math	Reading	Math	Reading	Math	Reading
Level 1: Advanced	33.30%	26.70%	46.70%	37.90%	33.30%	19.20%
Level 2: Proficient	46.70%	53.30%	40%	31%	33.30%	50%
Level 3: Partially Proficient	16.70%	16.70%	13.30%	24.10%	25.90%	19.20%
Level 4: Not Proficient	3.30%	3.30%	0%	6.90%	7.40%	11.50%
Met or Exceeded	80%	80%	86.70%	69%	66.70%	69.20%
Not Met	20%	20%	13.30%	31%	33.30%	30.80%

Table 52

Free Lunch Percentage - Suburban

Number of Students Enrolled	Number of Free Lunch Students	% Free Lunch
338	80	24%

<u>Participant Document Data for the Suburban School</u>

Table 53

Participant MEAP Scores – Suburban

Level	Fall MEAP 2007 Grade 6		Fall MEAP 2007 Grade 7		Fall MEAP 2007 Grade 8	
	Math	Reading	Math	Reading	Math	Reading
Met or Exceeded	82%	77%	87%	73%	72%	75%
Not Met	18%	23%	13%	27%	28%	25%

Table 54

Participant Scantron Performance Series Math Scores - Suburban

Math	% At Risk Range	% Interquartile Range	% Advanced Range
6	27%	73%	0%
7	28.5%	71%	.5%
8	20%	76%	4%

Table 55

Participant Scantron Performance Series Reading Scores - Suburban

Rdg	% At Risk Range	% Interquartile Range	% Advanced Range
6	23%	73%	4%
7	19%	71.5%	9.5%
8	24%	76%	0%

As previously mentioned, this researcher was also able to analyze differences in the number of respondents who scored below standards on the two tests. As indicated in Table 56, six Grade 6 participants, six Grade 7 participants and five Grade 8 participants scored below standards (at risk range) on the Scantron (SPS) math test. Of these 17 participants, 10 students or 59% met or exceeded standards on the MEAP math test. On an individual grade level basis, only Grade 8 participants showed similar performance levels on both tests. As indicated in Table 57, five Grade 6 participants, four Grade 7 participants and six Grade 8 participants scored below standards (at risk range) on the

Scantron (SPS) reading test. Of these 15 participants, 6 students or 40% met or exceeded standards on the MEAP math test. On an individual grade level basis, Grade 7 and Grade 8 participants showed similar performance levels on both tests. In total, 16 of 32 students (50%) scored better on either the math or reading MEAP (pen & paper) test than on the math or reading Scantron (computerized) test.

Table 56

Comparison of At-Risk Students Scantron vs. MEAP Scores for Math - Suburban

Grade	# At Risk on SPS	# Number of Same Students Proficient or Higher on MEAP	%	# Number of Same Students Below Proficient on MEAP	%
6	6	4	67%	2	33%
7	6	5	83%	1	17%
8	5	1	20%	4	80%
Totals	17	10	59%	7	41%

Table 57

Comparison of At-Risk Students Scantron vs. MEAP Scores for Reading - Suburban

Grade	# At Risk on SPS	# Number of Same Students Proficient or Higher on MEAP	%	# Number of Same Students Below Proficient on MEAP	%
6	5	3	60%	2	40%
7	4	1	25%	3	75%
8	6	2	33%	4	67%
Totals	15	6	40%	9	60%

The previous section constituted the first level of analysis and began with specific units of analysis. Additionally, category construction was used for each single case in relation to the source of evidence. The section that follows is the second level of analysis or theory development and includes a cross-case analysis.

Cross Case Analysis: Level Two Theory Development

The cross-case analysis that follows was conducted using what Yin (1994) refers to as the idea of a theoretical proposition or as Merriam (1998) identifies as "developing theory". This researcher conducted this second level of analysis by examining the coded data from the observations, surveys and documents across both cases in order to find themes, patterns, and relationships that could form one or more unifying ideas or a theory regarding the factors that influence attitudes and achievement when students take computerized tests. The research questions were used as a guide in this search for themes, patterns, and relationships in the data. From this cross-case analysis, a theoretical proposition was developed. This cross-case analysis was based on the theoretical proposition that socioeconomic status limits computer access/use, creating negative attitudes towards computers and leading to low student achievement levels on computerized tests. An alternative proposition that the type of computer access (sole home, shared home, community only, school only) can positively or negatively influence the relationship between computer access/use, attitudes towards toward computers and student achievement levels on computerized tests was also considered.

Cross-Case Analysis - Tables

The table in *Appendix D* represents a side-by-side presentation of this researcher's categorized field notes as written during the observation of students from both the suburban and urban schools during Scantron testing. The aforementioned table presents observation data for Grade 6 and Grade 7 for the suburban and urban schools. Because IRB approval was received after the testing cycle started at the suburban school, this researcher was unable to obtain observation data for the Grade 8 students. Observation data for the urban school, however, was collected. The lack of observation data for Grade 8 for the suburban school is a limitation to this study and will be discussed further in chapter 5. Finally, the table in *Appendix E* is to presents the similarities and differences in the survey data between the urban and suburban schools for grades 6, 7 and 8.

While this researcher was unable to obtain MEAP scores and free lunch data for the individual respondents at the urban school, the school-wide MEAP scores and free lunch percentages were available as group data in the public domain. As such, Tables 58, 59, and 60 present the reading and math score differentials of the two schools that participated in the current study. This difference is typically known as the "achievement gap". Because this researcher was able to obtain the Scantron Performance Series scores for all respondents, the MEAP score achievement gap was utilized to analyze similarities and differences in the achievement gap differential of actual respondents on the computerized Scantron Performance Series and the school-wide pencil and paper MEAP school-wide test results. Table 61, which describes the school-wide free lunch percentages for both participating schools, was utilized to compare the school-wide percentage of free lunch students to the percentage of participants who qualify at the suburban school.

Table 58

Fall 2007 Michigan Educational Assessment Program Scores
Grade 6 (Reading and Mathematics) – Cross Case

	Urban School Math	Suburban School Math	Urban School Reading	Suburban School Reading
Met or Exceeded	55.70%	80%	65.40%	80%
Not Met	44.30%	20%	34.60%	20%

Table 59

Fall 2007Michigan Educational Assessment Program Scores
Grade 7 (Reading and Mathematics) – Cross Case

	Urban School Math	Suburban School Math	Urban School Reading	Suburban School Reading
Met or Exceeded	51.60%	86.70%	53.30%	69%
Not Met	48.40%	13.30%	46.70%	31%

Table 60

Fall 2007 Michigan Educational Assessment Program Scores
Grade 8 (Reading and Mathematics) - Cross Case

	Urban School Math	Suburban School Math	Urban School Reading	Suburban School Reading
Met or Exceeded	34.50%	66.70%	44%	69.20%
Not Met	65.50%	33.30%	56%	30.80%

Table 61

Free Lunch School-wide Percentages (Urban & Suburban)

School	Number of Students Enrolled	Number of Free Lunch Students	% Free Lunch
Urban School	548	456	83%
Suburban School	338	80	24%

Tables 62 and 63 present the reading and math score differentials of the respondents that participated in this study. This difference is typically known as the "achievement gap".

Table 62

Cross-Case Scantron Math Scores

Grade	% At Risk Range Urban	% At Risk Range Suburban	% Interquartile Range Urban	% Interquartile Range Suburban	% Advanced Range Urban	% Advanced Range Suburban
6	95%	27%	5%	73%	0%	0%
7	69%	28.5%	31%	71%	0%	.5%
8	80%	20%	20%	76%	0%	4%

Table 63

Cross-Case Scantron Reading Scores

Grade	% At Risk Range Urban	% At Risk Range Suburban	% Interquartile Range Urban	% Interquartile Range Suburban	% Advanced Range Urban	% Advanced Range Suburban
6	40%	23%	60%	73%	0%	4%
7	46%	19%	54%	71.5%	0%	9.5%
8	50%	24%	50%	76%	0%	0%

Tables 64 and 65 present the reading and math score differentials of the respondents who indicated ownership of a computer. This difference is typically known as the "achievement gap".

Table 64

Cross Case Scantron Math Assessment Scores (Computer Ownership)

Grade	% At Risk Range Urban w/ Computer	% At Risk Range Suburban w/ Computer	% Interquartile Range Urban w/ Computer	% Interquartile Range Suburban w/ Computer	% Advanced Range Urban w/ Computer	% Advanced Range Suburban/ w/ Computer
6	50%	27%	50%	73%	0%	0%
7	70%	28.5%	30%	71%	0%	.5%
8	80%	20%	20%	76%	0%	4%

Table 65

Cross Case Scantron Reading Assessment Scores (Computer Ownership)

Grade	% At Risk Range Urban w/ Computer	% At Risk Range Suburban w/ Computer	% Interquartile Range Urban w/ Computer	% Interquartile Range Suburban w/ Computer	% Advanced Range Urban w/ Computer	% Advanced Range Suburban/ w/ Computer
6	43.75%	23%	56.25%	73%	0%	4%
7	40%	19%	60%	71.5%	0%	9.5%
8	50%	24%	50%	76%	0%	0%

Table 66, Table 67 and Table 68 show the influence of the type of use and the amount of access on the achievement of Grade 6, 7 and 8 respondents in mathematics and reading.

Table 66

Grades 6,7 and 8 proficiency in mathematics based on type of computer use – Cross Case

Type of Use	% Grade 6 Proficient on Scantron Urban	% Grade 6 Proficient on Scantron Suburban	% Grade 7 Proficient on Scantron Urban	% Grade 7 Proficient on Scantron Suburban	% Grade 8 Proficient on Scantron Urban	% Grade 8 Proficient on Scantron Suburban
Sole Use	N/A	N/A	50%	100%	N/A	83.33%
Shared Use	50%	73%	25%	64.70%	20%	78.95%
Community Only	0%	N/A	0%	N/A	100%	N/A
School Only	50%	N/A	50%	N/A	N/A	N/A

Table 67

Grades 6,7 and 8 proficiency in reading based on type of computer use – Cross Case

Type of Use	% Grade 6 Proficient on Scantron Urban	% Grade 6 Proficient on Scantron Suburban	% Grade 7 Proficient on Scantron Urban	% Grade 7 Proficient on Scantron Suburban	% Grade 8 Proficient on Scantron Urban	% Grade 8 Proficient on Scantron Suburban
Sole Use	N/A	N/A	100%	100%	N/A	83.33%
Shared Use	56.25%	77%	50%	76.47%	50%	73.68%

Community Only	50%	N/A	100%	N/A	100%	N/A
School Only	50%	N/A	50%	N/A	N/A	N/A

Table 68

Grade 6,7 and 8 proficiency in math and reading based on amout of access – Cross Case

URBAN (All Grades)	All URBAN % Proficient Math	All URBAN % Proficient Rdg
3 or Less	33% (8/24)	58% (14/24)
4 or More	42% (5/12)	50% (6/12)
SUBURBAN (All Grades)	All SUBURBAN % Proficient Math	All SUBURBAN % Proficient Rdg
3 or Less	67% (26/39)	74% (29/39)
4 or More	83% (24/29)	83% (24/29)
Cross Case	Cross Case % Proficient Math	Cross Case % Proficient Rdg
3 or Less	54% (34/63)	68% (43/63)
4 or More	71% (29/41)	73% (30/41)

Table 69 shows the influence of the type of computer access on students self-rated computer abilities.

Table 69

The influence of type of computer access on self-rated computer ability

All Combined - Shared	Totals URBAN	Totals SUBURBAN	Grand Totals

Average or Less	50% (17/34)	47% (27/58)	48% (44/92)
Above Avg. or Greater	50% (17/34)	53% (31/58)	52% (48/92)

All Combined - Sole	Totals URBAN	Totals SUBURBAN	Grand Totals
Average or Less	0% (0/2)	50% (5/10)	42% (5/12)
Above Avg. or Greater	100% (2/2)	50% (5/10)	58% (7/12)

Cross Case Analysis Using the Research Questions as the Framework

Central Questions

1. *What is the influence of computer access/use and attitudes towards computers on student achievement using computerized tests?*

In attempting to answer the first central question number of the study, this researcher found Section 1 and Section 4 of the surveys, focusing on computer access and computer abilities/attitudes (Table 61) to be particularly useful. As described in section 1 of Table 61, 100% of all suburban respondents (grades 6, 7 and 8) indicated that they had a computer at home. In comparison, 78.9% of Grade 6 urban respondents, 76.9% of Grade 7 urban respondents and 95.2% of Grade 8 urban respondents indicated that they had a computer at home. Moreover, while none of the suburban or urban Grade 6 respondents indicated that the computer in their home was their personal computer, 19% and 20% of suburban and urban Grade 7 respondents, respectively, and 24% and 10% of suburban and urban Grade 8 respondents, respectively, indicated that the computer in their home was their personal computer.

The number of respondents who indicated that they shared a computer with siblings or with the entire family was similar for both suburban and urban respondents in

Grade 6 and Grade 7. However, significant differences in the level of sharing existed between suburban and urban Grade 8 respondents. Specifically, 33.4% and 26.7% of suburban and urban Grade 6 respondents, 9.5% and 10% of suburban and urban Grade 7 respondents, and 20% and 10% of suburban and urban Grade 8 respondents shared their computer with siblings. Additionally, 63.6% and 73.3% of suburban and urban Grade 6 respondents, 71.4% and 70% of suburban and urban Grade 7 respondents, and 56% and 80% of suburban and urban Grade 8 respondents shared their computer with the entire family.

When the respondents who indicated they did not have computer access at home were asked if they were able to access a computer at an alternate site, 25% of Grade 6 urban respondents and 50% of Grade 8 urban respondents indicated that they had access at the neighborhood library; 25% of Grade 6 urban respondents, 33% of Grade 7 urban respondents, and 50% of Grade 8 urban respondents indicated that they had access at the home of a nearby friend or relative, and 50% of Grade 6 urban respondents and 66.7% of Grade 7 urban respondents indicated that they had access at school.

Whereas section 1 focused on computer access, section 4 focused on self-reported computer abilities/attitudes. Specifically, 63.7% and 50% of Grade 6 suburban and urban respondents, 57.1 % and 46.2% of Grade 7 suburban and urban respondents, and 56 % and 52.4% of Grade 8 suburban and urban respondents rated their computer abilities as above average or extremely good.

Based upon this data, it seems clear that the respondents have a somewhat high level of computer access overall. However, the suburban respondents outpaced their urban counterparts in both the percentage of home computer ownership and the percentage with a better than average self-rating of computer ability. Moreover, as is the case with the percentage of home computer ownership and the percentage with a better than average self-rating of computer ability, suburban students also outpaced their urban peers at every grade level and by each academic measure. Specifically, as indicated in Tables 62, 63, 64, and 65, the cross-case analysis indicates the following major findings:

1. Suburban Grade 6 students outperformed urban Grade 6 students on the MEAP test in math by 24.3% and in reading by 16.4%.
2. Suburban Grade 7 students outperformed urban Grade 7 students on the MEAP test in math by 35.1% and in reading by 15.7%.
3. Suburban grade students 8 outperformed urban Grade 8 students on the MEAP test in math by 32.2% and in reading by 25.2%.
4. 83% of students at the urban school qualify for free lunch whereas 24% qualify at the suburban school.

Additionally, as presented in Tables 62 and 63, the cross-case analysis indicates the following findings:

1. The number of suburban Grade 6 respondents who scored in the inter-quartile or advanced range outpaced the urban Grade 6 respondents on the Scantron Performance Series test in math by 68% and in reading by 17%.

2. The number of suburban Grade 7 respondents who scored in the inter-quartile or advanced range outpaced the urban Grade 7 respondents on the Scantron Performance Series test in math by 40% and in reading by 27%.
3. The number of suburban Grade 8 respondents who scored in the inter-quartile or advanced range outpaced the urban Grade 8 respondents on the Scantron Performance Series test in math by 56% and in reading by 26%.

Also, as presented in Tables 62, 63, 64 and 65, the cross-case analysis indicates the following findings:

1. Suburban Grade 6 respondents outpace urban Grade 6 respondents overall as well as when non-computer owners are removed from the analysis. However, in spite of the score differential, the achievement gap between suburban and urban Grade 6 respondents decreased by 45% in math (23% as opposed to 68%). However, when only suburban and urban respondents who own computers were analyzed, the achievement gap in Grade 6 reading actually increased slightly by 3.75% (20.75% as opposed to 17%).
2. While suburban Grade 7 respondents outpaced the urban Grade 7 respondents overall as well as when non-computer owners were removed from the analysis, the achievement gap increased slightly by 1% in math (41.5% as opposed to 40.5%) when only suburban and urban respondents who own computers were analyzed while the gap in reading decreased by 6% (21% as opposed to 27%).

3. While suburban Grade 8 respondents outpaced the urban Grade 8 respondents overall as well as when non-computer owners were removed from the analysis, the achievement gap remained unchanged in both math (60%) and reading (26%) when only suburban and urban respondents who own computers were analyzed.

2. What is the influence of the type of computer access (sole home, shared home, community only, school only) on computer access/use, attitudes towards toward computers and student achievement levels on computerized tests?

In attempting to answer the second central question of the study, this researcher found Tables 66, 67, 68 and 69 to be particularly useful. The cross-case analysis of the aforementioned tables indicated the following findings:

1. 67% of sole use respondents indicated use of a computer 4 or more hours during the week prior to taking the survey while 32% of shared use respondents indicated the same level of use.
2. Respondents who indicated the use of a computer 4 or more hours during the week prior to taking the survey exhibited higher levels of proficiency in both reading and math on the Scantron test than respondents who indicated 3 hours or less of use.
3. Suburban respondents who indicated the use of a computer 4 or more hours during the week prior to taking the survey exhibited higher levels of

proficiency in both reading and math on the Scantron test than their urban counterparts.

4. When asked to rate their computer attitudes/abilities, 58% of sole use respondents and 52% of shared used respondents rated themselves as above average or greater.
5. Respondents with sole use of a computer, both urban and suburban, exhibited higher levels of proficiency in both reading and math on the Scantron test than their shared use counterparts.
6. Suburban respondents with sole use of a computer exhibited higher levels of proficiency in both reading and math on the Scantron test than their urban counterparts.

Related Question 1

What is the influence of socioeconomic status and computer access/use on student attitudes toward computers?

It is important to remember that only suburban school SES data was made available. While high percentages of both low SES and high SES respondents with sole use of a computer rated their computer abilities as above average or greater, 100% and 87.5%, respectively, the percentage of low SES respondents with shared use of a computer who rated themselves as average or lower (64%) was higher than their high SES counterparts (41%).

Related Question 2

What is the influence of student attitudes towards computers on student achievement levels on computerized tests?

In addition to gathering general data about how respondents rate their computer abilities, it was also important to understand the extent to which, if at all, respondent's self-assessments of their computer abilities influenced their proficiency on computerized tests. Table 70 indicated the urban and suburban respondents' proficiency in math and reading based on their self-assessed computer ability.

Table 70

Suburban and urban respondetns proficiency in math and reading based on self-assessed computer ability

SUBURBAN (All Grades)	All SUBURBAN % Proficient Math	All SUBURBAN % Proficient Rdg
Average or Less	71% (20/28)	79% (22/28)
Above Avg. or Greater	75% (30/40)	78% (31/40)
URBAN (All Grades)	All URBAN % Proficient Math	All URBAN % Proficient Rdg
Average or Less	43% (10/23)	57% (13/23)
Above Avg. or Greater	29% (6/21)	57% (12/21)
Cross Case	Cross Case % Proficient Math	Cross Case % Proficient Rdg
Average or Less	59% (30/51)	67% (35/51)
Above Avg. or Greater	59% (36/61)	70% (43/61)

Related Question 3

What is the influence of socioeconomic status and gender on computerized test-taking anxiety?

To address the possible influence of the gender and SES status on confidence levels when taking computerized tests, it was necessary to analyze confidence levels of all respondents, urban and suburban, with regard to gender and SES status. As indicated in Table 71, with regard to confidence when taking computerized tests, 83% of all male respondents expressed confidence as opposed to 61% of female respondents. Moreover, 63% of low SES respondents expressed confidence as opposed to 56% of high SES respondents.

Table 71

Suburban and urban respondents' confidence responses on pencil & paper tests vs. computerized test by gender and SES status

All - Confidence Responses by Gender		
Boys (50)	Pencil & Paper	Computer
Worried	10 (20%)	8 (17%)
Confident	40 (80%)	38 (83%)
Girls (72)	Pencil & Paper	Computer
Worried	22 (31%)	27 (39%)
Confident	50 (69%)	43 (61%)
Suburban All - Confidence Responses by SES Status		
Low SES (16)	Pencil & Paper	Computer
Worried	6 (37%)	6 (37%)
Confident	10 (63%)	10 (63%)
High SES (52)	Pencil & Paper	Computer
Worried	16 (31%)	12 (24%)
Confident	36 (69%)	38 (56%)

Related Question 4

What is the impact of the type of computer access (sole home, shared home, community only, school only) on students' computerized test-taking anxiety?

To address the possible influence of the type of computer access on computerized testing confidence, it was also necessary to analyze differences in shared use and sole use respondent's computerized testing confidence. As indicated in Table 72, there were 34 urban students with shared use and 92 suburban students with shared use. Additionally, there were 2 urban students with sole only use and 12 suburban students with sole only use. 73% of shared use respondents were confident when taking computerized tests while 67% of sole use respondents were confident when taking computerized tests.

Table 72

The influence of type of computer access on computerized testing confidence

All Combined - Shared	Totals URBAN	Totals SUBURBAN	Grand Totals
Worried	25% (8/32)	29% (16/56)	27% (24/88)
Confident	75% (24/32)	71% (40/56)	73% (64/88)

All Combined - Sole	Totals URBAN	Totals SUBURBAN	Grand Totals
Worried	100% (2/2)	20% (2/10)	33% (4/12)
Confident	0% (0/2)	80% (8/10)	67% (8/12)

Using the research questions as a guide, this second level of analysis involved coding data from the surveys and the interviews across both cases in an effort to form one or more unifying ideas or a theory. Moreover, the cross case analysis was based on two theoretical propositions, one involving the influence of socioeconomic status on computer access/use and attitude towards computers and the other involving the influence of the type of computer access on computer access/use, attitudes towards computers and student achievement levels when taking computerized tests. However, as is of the case with studies, it is sometimes that case that data is uncovered that is outside the expectations of the researcher. As such, the section that follows will detail the nonconforming and discrepant data in this study.

Nonconforming/Discrepant Data

Even though this researcher did not find any significant nonconforming data, there were several data items that were somewhat surprising to this researcher. In relation to the survey data, participants responded to the following question: “When I take tests on a computer I feel: Very Confident, Somewhat Confident, Somewhat Worried, or Very Worried.” The confidence levels for Grade 6 and Grade 8 students in response to this question were very similar. Specifically, 68.42% of Grade 6 urban students and 70.00% of Grade 6 suburban students indicated that they were very or somewhat confident when taking computerized tests. Likewise, 72.22% of Grade 8 urban students and 76% of Grade 8 suburban students indicated that they were very or somewhat confident when taking computerized tests. Surprisingly, only Grade 7 suburban respondents (75.00% confident) expressed more confidence on computer tests when compared to the urban respondents (53.84% confident). However, the achievement gap on the computerized tests was lowest in Grade 7 math. The Grade 6 gap was 68%, the Grade 7 gap was 40% and the Grade 8 gap was 56%. Additionally, while 100% of sole use urban respondents rated their computer abilities as above average or greater, the same respondents expressed worry when taking computerized tests. In all other instances, the majority of sole use respondents who expressed high self-ratings of computer ability also expressed high levels of confidence when taking computerized tests. While the difference in both of these cases may simply be an anomaly, further research would be required to determine if this nonconforming data was evidence of something more significant.

Evidence of Data Quality

Throughout the data collection process, numerous strategies were utilized to protect the quality of the data. First, participants from both schools reviewed this researcher's observation notes for accuracy of transcription. Additionally, two other colleagues who are also Ph.D. candidates provided feedback on this researcher's data collection and data analysis protocols as well as the findings for the study. Also, strict data collection protocols for this study were followed in order to ensure high quality data. Moreover, the construct validity for this study was increased through the use of multiple sources of evidence that included surveys, interviews, and documents. By using these multiple sources of data to confirm the findings, triangulation was used as another way to establish validity (Merriam, 1998). Finally, data quality was protected through the establishment of a case study database which included case study notes, case study documents, and related materials (Yin, 1994). For this study, the case study database specifically included the survey instrument, the observation data collection sheet, Scantron Performance Series test results, MEAP test results, free/reduced lunch data (specific for the suburban school and school-wide for both schools), survey letter, survey parent consent form, survey student assent form, invitation to participate, letter of cooperation, observation letter, observation parent consent form, observation student consent form, and the data use agreement form.

Summary

The main purpose of this exploratory multiple case study was to explore the influence of lack of access to and infrequent use of computers on attitudes toward computers and on resulting test scores of middle school students at two charter school districts in Michigan using computerized tests. In addition, this study also sought to explore how socioeconomic status, gender, computerized test-taking anxiety and the type of computer access (sole home, shared home, community only, school only) influences the amount and type of computer usage, attitudes towards computers, and student test scores. To this end, several major findings were uncovered in both the level one and level two analyses as summarized below.

The major findings of the level one analysis are summarized as follows*:*

1. The use of a computer 4 hours or more per week (as opposed to 3 hours or less) by suburban respondants translated into a higher rate of proficiency on the Scantron reading test (83% for 4+ hours and 67% for 3 hours or less) and math tests (83% for 4+ hours and 74% for 3 hours or less).
2. The use of a computer 4 hours or more per week by urban respondents (as opposed to 3 hours or less) translated into a higher rate of proficienty on the Scantron math test (42% for 4+ hours and 33% for 3 hours or less) but did not translate into a higher rate of proficiency on the scantron reading test (50% for 4+ hours and 58% for 3 hours or less).
3. Self-ratings regarding computer proficiency had little effect on levels of proficiency on the math and reading scantron tests for suburban

respondents as evidenced by the similarity in the percentage of respondents who rated themselves average or less and above average or greater and also scored in the proficient range. Specifically, with regard to math proficienty, 71% of respondents who rated themselves average or less scored proficent and 75% who rated themselves above average or greater scored proficeint. Likewise, with regard to reading, 79% of respondents who rated themselves average or less scored proficent and 78% who rated themselves above average or greater scored proficent.

4. With regard to urban respondents, self-ratings regarding computer proficiency had little effect on levels of proficiency on reading scantron tests (57% proficient for both ratings). However, a higher percentage of urban respondents who rated themselves average or less scored proficient in math, 43%, compared to 29% for respondents who rated themselves above average or greater. However, this is likely due to the huge difference with Grade 6 respondents where 70% of respondents who rataed themselves average or less in both reading and math scored proficent.
5. With regard to confidence when taking computerized tests, 82% of suburban male respondents expressed confidence as opposed to 66% of female respondents. 83% of urban male respondents expressed confidence as opposed to 56% of urban female respondents.

6. With regard to confidence when taking computerized tests in relation to SES status (suburban school only), low SES respondetns expressed a higher level of confidence (63%) than their high SES counterparts (56%).
7. With regard to effect of the type of computer use (sole or shared) on suburban respondents computer proficiency self-ratings and confidence when taking computerized tests, 53% of shared use respondents rated themselves above avearge or greater and 71% expressed confidence when taking computerized tests. Moreover, 50% of sole use respondents rated themselves above average or greater and 80% expressed confidence when taking computerized tests.
8. With regard to effect of the type of computer use (sole or shared) on urban respondents computer proficiency self-ratings and confidence when taking computerized tests, 50% of shared use respondents rated themselves above avearge or greater and 75% expressed confidence when taking computerized tests. However, 100% of sole use respondetns rated themselves above average or greater and 0% expressed confidence when taking computerized tests.

The major findings of the level two analyses are summarized as follows:

1. The use of a computer 4 hours or more per week (as opposed to 3 hours or less) by all respondants translated into a higher rate of proficiency on the Scantron reading test (73% for 4+ hours and 68% for 3 hours or less) and math tests (71% for 4+ hours and 54% for 3 hours or less).

2. Self-ratings regarding computer proficiency had little effect on levels of proficiency on the math and reading scantron tests for all respondents as evidenced by the similarity in the percentage of respondents who rated themselves average or less and above average or greater and also scored in the proficient range. Specifically, with regard to math proficienty, 59% of respondents who rated themselves average or less scored proficent and 59% who rated themselves above average or greater scored proficeint. Likewise, with regard to reading, 67% of respondents who rated themselves average or less scored proficent and 70% who rated themselves above average or greater scored proficent.
3. With regard to confidence when taking computerized tests, 83% of all male respondents expressed confidence as opposed to 61% of female respondents.
4. With regard to confidence when taking computerized tests in relation to SES status (suburban school only), low SES respondetns expressed a higher level of confidence (63%) than their high SES counterparts (56%).
5. With regard to effect of the type of computer use (sole or shared) on all respondents computer proficiency self-ratings and confidence when taking computerized tests, 52% of shared use respondents rated themselves above avearge or greater and 73% expressed confidence when taking computerized tests. Moreover, 58% of sole use respondents rated

themselves above average or greater and 67% expressed confidence when taking computerized tests.

Thus, utilizing well defined data collection and data analysis protocols, chapter 4 presented the results and findings. Chapter 5 will present an interpretation of the findings using the research questions as the framework, a description of the theoretical proposition that was developed from the data analysis, recommendations for action and future research, implications for social change, and reflections of the researcher.

CHAPTER 5: SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Introduction

Prior to engaging in this study, this researcher was concerned with the increased use of computerized assessments of student learning at the national level as well as in the State of Michigan. Specifically, the Scantron Performance Series test was used with increasing frequency by schools across the state of Michigan and specifically by charter school districts. As this researcher witnessed the implementation of this computerized test in his district, the following questions came to mind: Can the lack of access and/or infrequent use of computers negatively impact student scores? Can lack of access and infrequent use of computers lead to a negative reaction to a computerized test? What role does gender, SES status or ethnicity play with regard to access and attitudes towards computers? These unanswered questions led to the purpose of this study which was to explore the factors that influence attitudes and achievement when students take computerized tests.

Chapter 5 is the culmination of the study and includes the following sections: the chapter introduction, study summary, a summary and interpretation of the findings using the research questions as the framework, a description of a theoretical proposition that was developed from the analysis of data, recommendations for action and future research, implications for social change, reflections of the researcher, and a conclusion.

The findings of this study were as follows: a) computer access alone does not significantly influence achievement on computerized tests, b) home computer access, as opposed to community access, does not significantly influence achievement on computerized tests, c) while home computer access coupled with adequate usage may positively influence achievement on computerized tests, the positive impact seems to the benefit of the suburban students to a greater degree, d) student attitudes toward computers, in general, do not significantly influence achievement on computerized tests, e) home computer access, coupled with "sole use", has a positive influence on student achievement on computerized tests, f) sole access of a computer at home seems to significantly influence the amount of computer usage, g) home computer use with sole access has a slight positive influence on self-perceptions of computer ability, h) low SES status coupled with shared use of a computer seems to negatively influence self-perceptions of computer ability, i) male students in this study appear to be more confident when taking computerized tests than female students, and urban female students seem to be less confident than their suburban counterparts when taking computerized tests, and j) the data is inconclusive as to the question of whether the type of computer access influences on students' computerized test-taking anxiety.

Interpretation of Findings

Central Question One

What is the influence of computer access/use and attitudes towards computers on student achievement using computerized tests?

The data in relation to this question revealed that on average, 83.7% of urban respondents and 100% of suburban respondents indicated that a computer was present in their home. However, in spite of high levels of computer access by both urban and suburban respondents, the number of suburban respondents who scored in the interquartile or advanced range on the Scantron Performance Series reading and mathematics tests outpaced urban respondents in all grades (6, 7 and 8) resulting in significant achievement gaps.

This finding suggests that computer access alone does not significantly influence achievement on computerized tests. Moreover, this finding is consistent with Attewell's conclusion that the mere access to computers may do little to close achievement gaps and in fact may "at least initially, exacerbate existing educational differences between social classes" (Attewell, 2001, p. 257).

Another significant finding in relation to this central research question is that when access levels of only urban and suburban respondents with home computers are analyzed (respondents without home computers are excluded), the only significant shrinking of the achievement gap on the Scantron Performance Series Test achievement occurred in Grade 6 math. The Grade 6 math gap decreased by 45%, the Grade 7 math gap increased by 1%, and the Grade 8 math gap remained unchanged. The Grade 6 reading gap increased by 3.75%, the Grade 7 reading gap decreased by 6% and Grade 8 reading gap remained unchanged.

This finding suggests that home computer access, as opposed to community access, does not significantly influence achievement on computerized tests. Moreover, because the Grade 6 urban students also participated in Michigan's free laptop program, the decreasing gap in Grade 6 math could possibly be explained. However, because similar results were not evident in Grade 6 reading scores, the decreasing gap in Grade 6 math could be the result of some other intervention such as the use of a math specialist, curriculum adjustments, or improved instruction.

The percentage of respondents who used a home computer 4 hours or more and scored in the proficient (interquartile or advanced) range of the Scantron Performance Series Tests in reading and mathematics, 73% and 71% respectively, outpaced the percentage of respondents who used a home computer 3 hours or less and scored in the proficient (interquartile or advanced) range of the Scantron Performance Series Tests in reading and mathematics, 54% and 68%, respectively. However, the percentage of suburban students who indicated the use of a home computer 4 hours or more and scored in the proficient (interquartile or advanced) range of the Scantron Performance Series Tests in reading and mathematics 83% and 84%, respectively, significantly outpaced their urban counterparts who indicated the use of a home computer 4 hours or more and scored in the proficient (interquartile or advanced) range of the Scantron Performance Series Tests in reading and mathematics 50% and 42%, respectively.

Thus, while home computer access coupled with adequate usage may positively influence achievement on computerized tests, the positive impact seems to the benefit of the suburban students to a greater degree. Attewell (2001) noted that the key to ensuring adequate educational use of computers is dependent upon the “social envelope around computing and attitudes, competencies, and involvement of parents and siblings” (p. 257). He further noted that because the strength of the “social envelope” is directly related to the socioeconomic status and education levels of the parents, then “by implication, children of poor families would be disadvantaged when using home computers for education" (Attewell, 2001, p. 257). Based upon the drastic difference in the percentage of low SES students at the participating schools (i.e., 83% at the urban school and 24% at the suburban school), the "social envelope" is likely a contributing, if not major factor, in the differing levels of positive influence on achievement on computerized tests realized from the combination of computer access and adequate usage.

Another significant finding is that when student attitudes towards computers were analyzed based upon self-reported ratings (i.e., extremely poor, below average, average, above average, extremely good), the percentage of respondents who scored in the proficient (interquartile or advanced) range of the Scantron Performance Series Tests in reading and mathematics was similar for respondents who rated their computer abilities as average or less (59% in math, 67% in reading) as well as for those who rated themselves above average or greater (59% in math, and 70% in reading). However, while scores were similar regardless of rating in the cross-case analysis, as well as in reading for both schools, and math for the suburban school, the similarity was not true for math at the urban school. In this instance, the percentage of respondents who rated their abilities as average or less and scored in the proficient (interquartile or advanced) range of the Scantron Performance Series Math Test (43%) was greater than the percentage of respondents who rated their abilities as above average or greater and scored in the proficient (interquartile or advanced) range of the Scantron Performance Series Math Test (29%).

This finding suggests that student attitudes toward computers, in general, do not significantly influence achievement on computerized tests. Moreover, while an outlier exists with regard to mathematics at the urban school, the difference is a result of a 50% difference in the Grade 6 math scores. Because the Grade 6 urban students also participated in Michigan's free laptop program, the high percentage of students who rated themselves as average or less but nonetheless scored in the proficient range of the Scantron Performance Series Math Test could possibly be explained.

Central Question 2

What is the influence of the type of computer access (sole home, shared home, community only, school only) on computer access/use, attitudes towards toward computers and student achievement levels on computerized tests?

In the case of respondents with home computer access, the percentage of "sole use" respondents, both urban and suburban, who scored in the proficient (interquartile or advanced) range of the Scantron Performance Series Tests in both reading and mathematics outpaced their "shared use" counterparts.   Therefore, home computer access, coupled with "sole use", has a positive influence on student achievement on computerized tests.

When asked how many hours they used a computer in the previous week, 67% of "sole use" respondents indicated 4 hours or more while 36% of "shared use" respondents indicated the same level of computer usage. Therefore, sole access of a computer at home seems to significantly influence the amount of computer usage.

When asked to rate their computer abilities, 58% of "sole use" respondents and 52% of "shared use" respondents indicated above average or greater. This finding suggests that home computer use with sole access has a slight positive influence on self-perceptions of computer ability. McInerney et al., (1994) suggested that computer experience by its very nature may not lead to improved performance. However, additional experience, like the experience gained by respondents with sole use of a computer at home, will "improve subsequent computer performance if the experience leads to increased levels of self-efficacy (McInerney et. al., 1994). Stated simply, "anxiety and experience predict levels of self-efficacy, which in turn predict performance" (Brosnan, 1998, p. 225).

Related Question 1

What is the influence of socioeconomic status and computer access/use on student attitudes toward computers?

It is important to remember that this finding only applies to the suburban school as SES data was not made available from the urban school. While high percentages of both low SES and high SES respondents with sole use of a computer rated their computer abilities as above average or greater, 100% and 87.5%, respectively, the percentage of low SES respondents with shared use of a computer who rated themselves as average or lower (64%) was higher than their high SES counterparts (41%). Therefore, low SES status coupled with shared use of a computer seems to negatively influence self-efficacy with regard to computer ability.

Related Question 2

What is the influence of student attitudes towards computers on student achievement levels on computerized tests?

After analysis of the data began, this researcher realized that related question two was actually answered as part of central question one. In hind sight, this researcher realized that related question two was actually repetitive. Therefore, as outlined in the answer to central question one, which in incorporated in this response by reference, the data analysis seems to suggest that student attitudes toward computers, in general, do not significantly influence achievement on computerized tests. Therefore, in this study, student attitudes towards computers had virtually no influence on student achievement levels on computerized tests.

Related Question 3

What is the influence of socioeconomic status and gender on computerized test-taking anxiety?

While high percentages of both suburban and urban male respondents indicated that they felt confident when taking tests via computer, 82% and 83%, respectively, the percentage of suburban female respondents who indicated they felt confident when taking tests via computer (66%) was higher than their urban female counterparts (56%). Moreover, while the number of requests for assistance for technical assistance by females and males were equal at the primarily high SES suburban school, the number of requests by females was significantly higher than males at the primarily low SES urban school.

Moreover, whereas the male student's questions were generated at the start of the test and were based primarily on program startup, the female student questions occurred throughout the test period and included items such as use of the highlighter tool and procedure for switching between the math and reading tests.

Therefore, male students in this study appear to be more confident when taking computerized tests than female students, and urban female students seem to be less confident than their suburban counterparts when taking computerized tests. The lack of confidence among urban female students may be influenced by their lack of knowledge related to computer functionality as evidenced by the frequency and type of computer functionality questions asked during the test period. This conclusion is consistent with The National Center for Fair & Open Testing's assertion that "girls may be adversely affected by computerized tests" (fairtest.org) as outlined in the conceptual framework. Additionally, the performance of the female respondents could be linked to the "social context of computer learning that relies on mixed-gender group learning" (Cooper, 2006, p. 331). Specifically, the research seems to suggest that for girls, "having boys present has the effect of increasing computer anxiety and decreasing [both] learning" (Cooper, 2006, p. 324) and computer self-efficacy.

This last finding only applies to the suburban school as SES data was not made available by the urban school. The percentage of low SES respondents who indicated they felt confident when taking tests via computer (63%) surpassed high SES respondents (56%). Thus, SES status, alone, seems to have minimal influence on students' computerized test-taking anxiety.

Related Question 4

What is the impact of the type of computer access (sole home, shared home, community only, school only) on students' computerized test-taking anxiety?

Shared use respondents expressed higher confidence levels when taking computerized tests than their sole use counterparts, 73% and 67%. However, the lower confidence level among sole use respondents is negatively impacted by nonconforming data. Specifically, while 100% of sole use urban respondents rated their computer abilities as above average or greater, the same respondents expressed worry when taking computerized tests. In all other instances, the majority of sole use respondents who expressed high self-ratings of computer ability also expressed high levels of confidence when taking computerized tests. Therefore, the data is inconclusive as to the question of whether the type of computer access influences on students' computerized test-taking anxiety.

Development of a Theoretical Proposition

As a part of the case study research design, this researcher conducted a cross-case analysis using what Yin refers to as the idea of a theoretical proposition or what Merriam identifies as "developing theory." This second level of analysis was conducted by examining the coded data from the surveys and the interviews across both cases as well as the document data in order to find themes, patterns, and relationships that could form one or more unifying ideas or a theory. The research questions were also used as a guide in this search for themes, patterns, and relationships in the data. The cross-case analysis was based on the theoretical proposition that socioeconomic status limits computer access/use, creating negative attitudes towards computers and leading to low student achievement levels on computerized tests. An alternative proposition was also considered, namely, that the type of computer access (sole home, shared home, community only, school only) can positively or negatively influence the relationship between computer access/use, attitudes towards toward computers and student achievement levels on computerized tests.

With regard to the first a theoretical proposition, that socioeconomic status limits computer access/use, creating negative attitudes towards computers and leading to low student achievement levels on computerized tests, this researcher was only able to conduct analysis related to the suburban school. This was due to this researcher's inability to obtain free and reduced lunch status information from the urban school. Nonetheless, with regard to the suburban school, the theoretical proposition held true only in relation to the creation of negative attitudes towards computers. More specifically, based only on data from the suburban school, low SES status, coupled with shared use of a computer (as opposed to sole use), and seems to negatively influence self-perceptions of computer ability.

With regard to the alternative proposition, that the type of computer access (sole home, shared home, community only, school only) can positively or negatively influence the relationship between computer access/use, attitudes toward computers and student achievement levels on computerized tests, this researcher found that sole home computer access seems to significantly influence the amount of computer usage, positively influences self-perceptions of computer ability, and has a positive influence on student achievement on computerized tests. Therefore, the alternative proposition held true in all aspects.

Recommendations for Action

Based upon the findings of this study, this researcher recommends that the following actions to be taken by educational practitioners such as superintendents, charter school authorizers, technology directors, and legislators at both the state and federal levels. First, in spite of numerous computer and technology infrastructure initiatives at both state and federal levels that have resulted in significant upgrades to computer and Internet access in urban schools, neither computer access alone or home computer access (as opposed to community access) appears to significantly influence achievement on computerized tests. Sole use of a home computer, however, as outlined in the current study, seems to have a positive influence on student achievement of computerized tests, on the amount of computer usage, and on self-perceptions of computer ability. As such, while programs such as Michigan's free laptop program for Grade 6 students has been dismissed by many educators as too expensive to continue due to computer maintenance costs, such programs could have a positive influence on student achievement on computerized tests. To this end, legislators and practitioners should focus on increasing the opportunity for sole computer ownership, especially among low SES and female students. One way to accomplish this would be to provide funding to low SES districts in order to purchase thin client computers for all students and to serve as the Internet service provider (ISP).

The phrase *thin client/server based computing* describes a shift back toward centralized computing while maintaining the benefits offered by the personal computer (PC) revolution. Whereas each PC requires a dedicated hard drive, display, and, its own set of software applications, a thin client is a display-only terminal. A thin client does not have a hard drive, it does not need software loaded on it locally, and, it stores no data. Instead, applications are executed on powerful servers while the thin client presents the screen display and provides a way to operate the keyboard and mouse. Thin clients are very simple devices which individuals simply plug in, log on to a server, and start using. A thin client needs only to have sufficient power to render the display of a user session; therefore, it does not need to be replaced or upgraded as new software and hardware versions are released (www.thinclient.net).

The use of thin client computers is recommended for several reasons. First, thin client computers do not have hard drives and must be connected to a server via the Internet to operate. As such, all programs are run from the server allowing districts to control the types of programs that students use. Additionally, because the computers are connected to the schools server, all Internet traffic will be regulated by the schools filtering software. Because schools today have almost the same level of control over how students use computers at home as at school, the ability to steer usage towards educational use is enhanced. Also, because virtually any old computer can be converted to a thin client, districts and business could collaborate to provide thin client computers to students, leaving only the cost of a conversion kit. Moreover, because thin client systems can be used in conjunction with a Linux server, the software cost for schools would be significantly reduced as Linux servers utilize “open source” software which is free of charge. Additional benefits include “lower cost of ownership and maintenance. Better reliability…better security…remote access to all applications and data with high performance and simplified end user experience” (www.thinclient.net).

In addition to the use of thin clients, this researcher also recommends that low SES districts receive additional funding that would allow them to serve as an Internet service provider (ISP). In addition to ensuring that all students have Internet access, because the computers could be configured to only go to the district server and/or sites approved by the district, allowing districts to serve as ISP’s would also ensure that students are using the computers for educational endeavors. While start up costs for such a program could be significant, this researcher recommends that the United States Department of Education and the Federal Communication Commission work together to change the regulations surrounding the E-rate program to allow districts to use funds for hardware purchases necessary to become an ISP.

Currently, e-rate funding can be “requested under four categories of service: telecommunications services, Internet access, internal connections, and basic maintenance of internal connections. Discounts for support depend on the level of poverty and the urban/rural status of the population served and range from 20% to 90% of the costs of eligible services” (E-rate, ¶ 2). However, applicant schools “must provide additional resources including end-user equipment (e.g., computers, telephones, etc.), software, professional development, and the other elements that are necessary to utilize the connectivity funded by the Schools and Libraries Program” (E-rate, ¶ 3). By allowing districts to utilize e-rate funds for the purchase of broadband modems and ISP infrastructure, this researcher's recommendation could indeed become a reality.

In addition to endeavoring to supply students in low SES districts with thin client computers for their sole use, this study suggests that female students may also be negatively impacted by the shift to computerized testing. Specifically, urban female students have less confidence when taking computerized tests than both male students and suburban female students. The number of requests by females was also significantly higher than males at the low SES urban school. These two factors make urban females of low SES status more susceptible to computerized test taking anxiety.

Because some research suggests that mixed-gender group learning negatively impacts the computer experience of girls (Cooper, 2006), this researcher recommends that, if districts must utilize computerized testing, boys and girls should be tested separately. This change in the "social context" of computer learning will likely mitigate the increased computer anxiety and decreased learning that girls experience when boys are present (Cooper, 2006, p. 324).

Finally, in an effort to improve the self-efficacy and decrease the anxiety of female students with computers, this researcher recommends that software developers make a concerted effort to develop high quality computer aided instruction games geared towards girls. Currently, many of the computer aided instruction games such as *TimezAttack* and *ArithmAttack* are interesting for male use, but "for girls, the result [is] lowered interest, negative attitudes, lowered performance, and computer anxiety" (Cooper, 2006, p. 323). More specifically, the games for girls should be, as some studies suggest, less aggressive and less male focused. When this is the case, girls are more than capable of matching the achievement of their male counterparts (Cooper, 2006).

Recommendations for Future Research

Recommendation 1: Additional research regarding computerized standardized testing is necessary. However, this additional research should have a specific focus of providing guidance for states and districts considering the implementation of computerized standardized tests on how best to address the unique testing needs of urban, low SES and female students. Research could include quantitative studies on the difference between achievement levels of females who take computerized tests in same gender groups compared to those who take computerized tests in mixed gender groupings and qualitative studies on student perceptions of how the inability to check previous answers and the pattern of responses (two best practices for testing taught in urban schools as well as others) impacts computer testing anxiety levels.

Recommendation 2: This study found a possible connection between sole computer ownership, the amount of computer usage, and academic achievement on computerized tests. Utilizing the lessons learned from the cases included in the current study, a mixed-methods study focusing on the connection between sole computer ownership, the amount of computer usage and academic achievement could be conducted in an attempt to build a theoretical model. This researcher would recommend the inclusion of all charter districts and traditional districts in Michigan that utilize the Scantron Performance Series in such a study.

Recommendation 3: Due to this researcher's inability to obtain information regarding the free and reduced lunch status of all respondents, the influence of socioeconomic status in relation to the current study was only partially explored. Because the current study indicates that low SES status coupled with shared use of a computer seems to negatively influence self-perceptions of computer ability, additional research is necessary to confirm or deny this influence. More specifically, because SES data is often difficult to obtain at the district level, State Departments of Education, utilizing free/reduced lunch data that is in their possession, could engage in mixed-methods or quantitative studies to arrive at statistically reliable answers to this very important question regarding computerized testing.

Recommendation 4: Because related question four of this study was inconclusive due to the impact of non-conforming data, additional research is necessary to answer the question: What is the impact of the type of computer access (sole home, shared home, community only, school only) on students' computerized test-taking anxiety?**.** As current research already suggests that computer anxiety is higher for females than males, with African American females reporting the greatest levels of anxiety, determining if the type of computer access is a contributing factor could be of great value to practitioners. A qualitative or mixed-methods study would be appropriate. However, if another multiple exploratory case study is conducted that includes an urban and suburban school, the researcher would be wise to make certain that the urban school has an adequate amount of students with sole computer use in comparison to the suburban school.

Implications for Social Change

As outlined in chapter one, NCLB and the ever increasing gap between the performance of European American students and other racial groups has forced states and school districts to implement high-stakes testing programs to gather data about student achievement over time and to hold schools and students more accountable for learning (www.aera.net). These tests are called high stakes because of the severe consequences for schools and students in their failure to perform. “Schools may be judged according to the school-wide average scores of their students. High school-wide scores may bring public praise or financial rewards; low scores may bring public embarrassment or heavy sanctions. For individual students, high scores may bring a special diploma attesting to exceptional academic accomplishment; low scores may result in students being held back in grade or denied a high school diploma” (www.aera.net).

Because the administration of high stakes tests via computer is only now increasing in districts across the nation, the results of this study should cause practitioners to become aware of the possible negative implications of the practice. Specifically, it is this researcher’s hope that practitioners, prior to implementing computerized testing in their schools or districts on a wholesale basis, and legislators, prior to demanding such, will pay close attention to the positive impact of “sole” or individual computer use. As described in the findings from this case study, “sole” use of a computer at home 1) has a positive influence on student achievement on computerized tests; 2) significantly influences the amount of computer usage and 3) positively influences self-perception of computer ability. While the “sole” use phenomenon has positive outcomes for both urban and suburban students, due to ongoing issues of the “achievement gap”, initial efforts should be geared toward districts whose population is primarily urban, minority, and low SES.

Moreover, it is also important for practitioners and legislators to pay close attention to the issue of gender in relation to computerized testing. Specifically, as described in this case study, urban female students have less confidence when taking computerized tests than both male students and suburban female students. Moreover, while the number of requests for assistance by females and males were equal at the high SES suburban school, the number of requests by females was significantly higher than males at the low SES urban school. These two factors, less confidence when taking computerized tests and more requests for assistance when taking computerized tests, make urban females of low SES status more susceptible to computerized test taking anxiety.

As noted in this study, many unresolved issues regarding computerized testing and the impact of this type of testing on socioculturally marginalized learners still exist. Specifically, “despite many unresolved technical and equity-related problems, test-makers are plunging headlong into new computerized methods of administering multiple-choice exams” (fairtest.org). Unfortunately, only a limited few are demanding that the trend toward wide-scale use of computerized testing be slowed so that more research can be completed to measure the possible negative impact on those students without a voice. As Martin Luther King, Jr. once said, “our lives begin to end the day we become silent about things that matter" (www.quotedb.com/quotes/3081). All children matter and the time has come for practitioners to take their place at the forefront of educational reform.

Reflections of the Researcher

At the start of this study, while this researcher had no personal biases, he did have several preconceived ideas. Specifically, this researcher felt that the discrepancy in the percentage between the level of home computer ownership of urban and suburban students would be significant. As such, the difference of only 16.7% was rather surprising. This researcher also felt that the confidence level among suburban students when taking tests on computers would be significantly higher than their urban counterparts. While this was true for female students, the confidence level of urban and suburban males was similar, 83% and 82%, respectively. While this almost equal level of confidence did not translate into similar achievement levels, it did support Cooper's (2006) assertion that the male focus on video games and computer aided instruction games tends to make males more confident with computers overall.

In terms of the possible effects of the researcher on the participants or the situation, this researcher noticed very little effect. At both schools, the students were obviously curious about this researcher's presence in their computer labs. However, after a quick introduction by staff and a brief description of why this researcher was present, the students conducted themselves as typical adolescents would. While the researcher was more visible at the urban school (sat at a desk in the middle of the room) as opposed to the suburban school (sat at a desk in back corner of room), the increased visibility seemed to have no impact.

With regard to changes in this researcher's thinking as a result of this study, there is no doubt that change has indeed occurred. Specifically, prior to engaging in this study, this researcher had a propensity to look first at SES status as a possible cause when attempting to answer questions related to low student achievement. However, the fact that this researcher's belief that SES would be a significant factor in the results of the current study did not hold true is certain to lessen this propensity. Moreover, prior to this study, this researcher did not give significant attention to issues of gender and academic achievement. In fact, this study has caused this researcher to come to the realization that male educators who are very computer literate must make a concerted effort to understand the social and academic issues that exist for female students with regard to computer usage. Finally, issues such as the male focus on computer games and the impact of mixed-gender learning on the level of computer anxiety in girls that this researcher had never considered will now be strong factors in how this researcher addresses the issue of computerized testing in practice.

Conclusion

The main purpose of this exploratory multiple case study was to explore the influence of lack of access to and infrequent use of computers on attitudes toward computers and on resulting test scores of middle school students at two charter school districts in Michigan using computerized tests. In addition, this study explored how socioeconomic status, gender, computerized test-taking anxiety and the type of computer access (sole home, shared home, community only, school only) influenced the amount and type of computer usage, attitudes towards computers, and student test scores. The results of this study suggest that prior to developing and implementing computer-based testing programs to assess student learning, state departments of education, school districts and leaders at the federal level must consider issues of gender and usage, especially with regard to low SES students.

Because significant achievement gaps already exist and are widening, to implement wholesale computerized testing without fully considering the extent to which such a move would further widen the gap is simply unconscionable. Also, with low cost options such as thin client technology, there is simply no reason why educators cannot ensure that all public schools students have adequate computer access. Finally, there is no reason why districts cannot make accommodations for female students during the administration of computerized tests to lessen their computer testing anxiety.

The factors that influence attitudes and achievement when students take computerized tests and the associated consequences are real. Until such time that adequate resources can be allocated to increase the level of sole computer ownership by students and changes are made in how tests are administered to female students, this researcher believes that those who choose to administer computerized tests must proceed with caution.

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APPENDIX A: TEN SUGGESTIONS FOR ANALYZING DATA AS OUTLINED BY MERRIAM

Ten suggestions for analyzing data as outlined by Merriam

Suggestion #	Data Analysis Suggestions
1	Force yourself to make decisions that narrow the study "You must discipline yourself not to pursue everything… or else you are likely to wind up with data to diffuse and inappropriate for what you decide to do. The more data you have on a given topic setting, or subjects, the easier it will be to think deeply about it and the more productive you are likely to be when you attempt the final analysis" (p. 155).
2	Force yourself to make decisions concerning the type of study you want to conduct. "You should try to make clear in your own mind, for example, whether you want to do a full description of a setting or whether you are interested in generating theory about a particular aspect of it" (p. 155).
3	Develop analytic questions. "Some researchers bring general questions to a study. These are important because they give focus to data collection and help organize it as you proceed… We suggest that shortly after you enter the field, you assess which questions, you brought with you are relevant and which ones should be reformulated

	to direct your work" (p. 155).
4	Plan data collection sessions according to what you find in previous observations. "In light of what you find when you periodically review your field notes, plan to pursue specific leads in your next data collection session" (p. 157).
5	Write many "observer's comments" as you go. "The idea is to stimulate critical thinking about what you see and to become more than recording machine" (p. 158).
6	Write memos to yourself about what you are learning. "These memos can provide a time to reflect on issues raised in the setting and how they relate to larger theoretical, methodological, and substantive issues" (p. 159).
7	Try out ideas and themes on subjects. "While not everyone should be asked, and while not all you hear may be helpful, key informants, under the appropriate circumstances, can help advance your analysis, especially to fill in the holes of description" (p. 161).
8	Begin exploring literature while you are in the field. "After you have been in the field for a while, going through the substantive literature in the area you are studying will enhance analysis" (p. 161). This reading "should provide you with stimulation rather than be a substitute for thinking. (p. 162).

9	Play with metaphors, analogies, and concepts. "Nearsightedness plagues most research… Ask the questions, "What does this remind me of?" (p.162). "Another way to expand analytic horizons is to try to raise concrete relations and happenings observed in a particular setting to a higher level of abstraction" (p. 163).
10	Use visual devices. Trying to visualize what you are leaning about the phenomenon can bring clarity to your analysis. Such representations include "primitive doodling" and sophisticated computer-generated models (p. 164).

(Merriam, 1998, pp. 162-163)

APPENDIX B: SUBURBAN SCHOOL GRADES 6, 7 & 8 SURVEY REPORT

Section 1: Computer Access

Do you currently have a computer at home?	Response percent	Response total
Yes	100%	22
No	0%	0

Total # of respondents **22**. Statistics based on **22** respondents **0** filtered; **0** skipped.

If you answered "YES" to question 1, is the computer...	Response percent	Response total
Your personal computer?	0%	0
Shared with siblings?	36.4%	8
Shared with the entire family?	63.6%	14

Total # of respondents **22**. Statistics based on **22** respondents **0** filtered; **0** skipped.

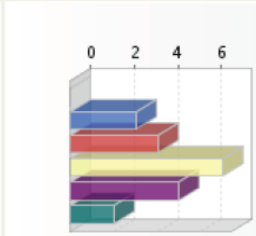
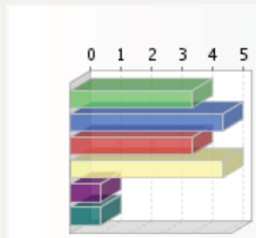
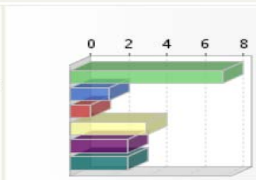
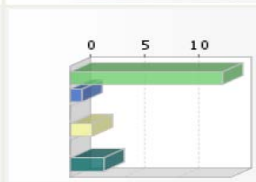
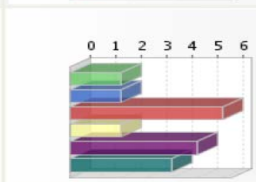
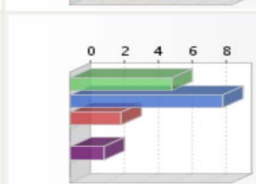
IF YOU ANSWERED "YES" TO QUESTION 1, LEAVE THIS QUESTION BLANK. Can you access a computer...	Response percent	Response total
At the neighborhood library?	0%	0
At church?	0%	0
At the home of a nearby friend or relative?	80%	4
At school?	0%	0
View Other	20%	1

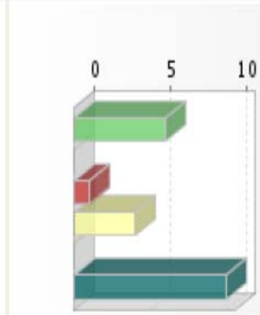
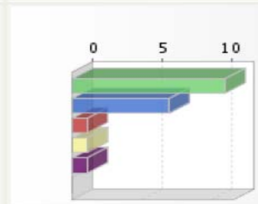
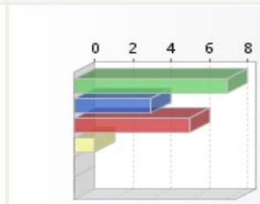
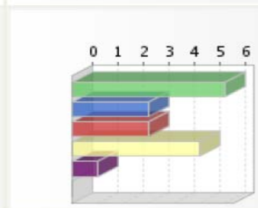
Total # of respondents **22**. Statistics based on **5** respondents **0** filtered; **17** skipped.

Figure B1. Suburban school Grade 6 survey report: Section 1.

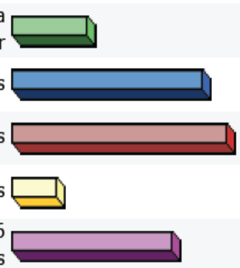
Section 2: Home & Community Computer Use

How often do you use computers at home, in your community, at a friend's or at a relative's...

View	Never	At least onece per semester	At least once per month	At least once per week	At least once per day	More than once per day	Never At least onece per semester At least once per month At least once per week At least once per day More than once per day	Response total
to play games	0% (0)	14.3% (3)	19% (4)	33.3% (7)	23.8% (5)	9.5% (2)		21
to use a word processing program (i.e., MS Word)	20% (4)	25% (5)	20% (4)	25% (5)	5% (1)	5% (1)		20
to send or read email messages	38.1% (8)	9.5% (2)	4.8% (1)	19% (4)	14.3% (3)	14.3% (3)		21
to create webpages (includes MySpace and Facebook)	70% (14)	5% (1)	0% (0)	10% (2)	0% (0)	15% (3)		20
to listen to or download music files	9.5% (2)	9.5% (2)	28.6% (6)	9.5% (2)	23.8% (5)	19% (4)		21
to create graphs or charts	30% (6)	45% (9)	15% (3)	0% (0)	10% (2)	0% (0)		20

to send IM's (instant messages)	28.6% (6)	0% (0)	4.8% (1)	19% (4)	0% (0)	47.6% (10)		21
to use a spreadsheet program (i.e., MS Excel)	52.4% (11)	33.3% (7)	4.8% (1)	4.8% (1)	4.8% (1)	0% (0)		21
to use a software program to create fliers, signs, borchures, greeting cards, etc. (e.g., Printshop, Pagemaker)	42.1% (8)	21.1% (4)	31.6% (6)	5.3% (1)	0% (0)	0% (0)		19
for other purposes	33.3% (6)	16.7% (3)	16.7% (3)	27.8% (5)	5.6% (1)	0% (0)		18

Total # of respondents **22**. Statistics based on **22** respondents **0** filtered; **0** skipped.



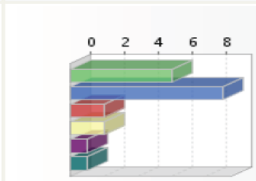
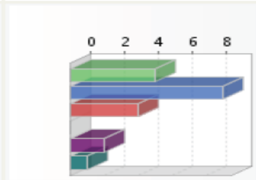
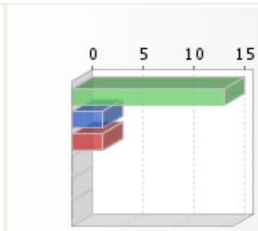
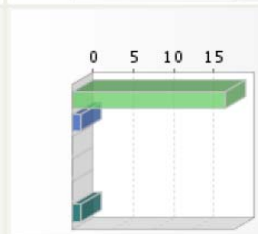
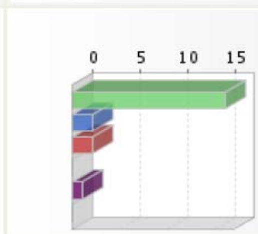
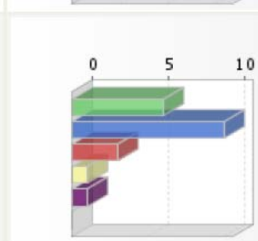
Last week, how many hours did you use a computer at home, in your community, at a friend's or at a relative's?	Response percent	Response total
I didn't use a computer	**9.5%**	2
0-1 hours	**28.6%**	6
1-3 hours	**33.3%**	7
4-6 hours	**4.8%**	1
More than 6 hours	**23.8%**	5

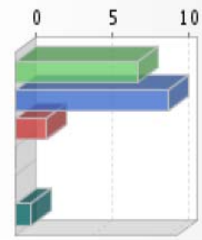
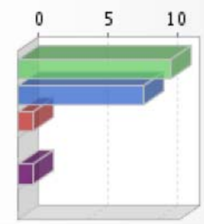
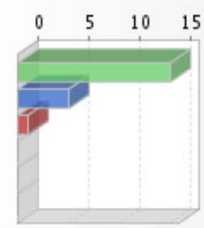
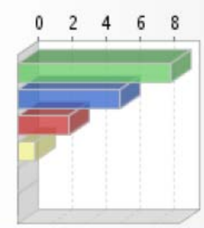
Total # of respondents **22**. Statistics based on **21** respondents **0** filtered; **1** skipped.

Figure B2. Suburban School Grade 6 Survey Report: Section 2

Section 3: School Computer Use

How often do you use computers at school...

View	Never	At least onece per semester	At least once per month	At least once per week	At least once per day	More than once per day	Never At least onece per semester At least once per month At least once per week At least once per day More than once per day	Response total
to play games	28.6% (6)	42.9% (9)	9.5% (2)	9.5% (2)	4.8% (1)	4.8% (1)		21
to use a word processing program (i.e., MS Word)	23.8% (5)	42.9% (9)	19% (4)	0% (0)	9.5% (2)	4.8% (1)		21
to send or read email messages	71.4% (15)	14.3% (3)	14.3% (3)	0% (0)	0% (0)	0% (0)		21
to create webpages (includes MySpace and Facebook)	90.5% (19)	4.8% (1)	0% (0)	0% (0)	0% (0)	4.8% (1)		21
to listen to or download music files	76.2% (16)	9.5% (2)	9.5% (2)	0% (0)	4.8% (1)	0% (0)		21
to create graphs or charts	28.6% (6)	47.6% (10)	14.3% (3)	4.8% (1)	4.8% (1)	0% (0)		21

to send IM's (instant messages)	38.1% (8)	47.6% (10)	9.5% (2)	0% (0)	0% (0)	4.8% (1)		21
to use a spreadsheet program (i.e., MS Excel)	50% (11)	40.9% (9)	4.5% (1)	0% (0)	4.5% (1)	0% (0)		22
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Printshop, Pagemaker)	71.4% (15)	23.8% (5)	4.8% (1)	0% (0)	0% (0)	0% (0)		21
for other purposes	47.4% (9)	31.6% (6)	15.8% (3)	5.3% (1)	0% (0)	0% (0)		19
	Total # of respondents **22**.		Statistics based on **22** respondents				**0** filtered;	**0** skipped.

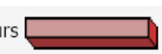
Last week, how many hours did you use a computer at school?		Response percent	Response total
I didn't use a computer		**72.7%**	**16**
0-1 hours		**9.1%**	**2**
1-3 hours		**18.2%**	**4**
4-6 hours		**0%**	**0**
More than 6 hours		**0%**	**0**
Total # of respondents **22**.	Statistics based on **22** respondents	**0** filtered;	**0** skipped.

Figure B3. Suburban School Grade 6 Survey Report: Section 3

Section 4: General Information

How would you rate your computer abilities?	Response percent	Response total
Extremely Poor	0%	0
Below Average	0%	0
Average	36.4%	8
Above Average	36.4%	8
Extremely Good	27.3%	6

Total # of respondents **22**. Statistics based on **22** respondents **0** filtered; **0** skipped.

What is your Gender?	Response percent	Response total
Male	45.5%	10
Female	54.5%	12

Total # of respondents **22**. Statistics based on **22** respondents **0** filtered; **0** skipped.

What is your grade level?	Response percent	Response total
6th Grade	100%	22
7th Grade	0%	0
8th Grade	0%	0

Total # of respondents **22**. Statistics based on **22** respondents **0** filtered; **0** skipped.

What is your Race/Ethnicity?	Response percent	Response total
African American	0%	0
Native American	0%	0
Hispanic	0%	0
Asian	0%	0
White, Non-Hispanic	100%	22
View Other	0%	0

Total # of respondents **22**. Statistics based on **22** respondents **0** filtered; **0** skipped.

Does your school participate in Michigan's free laptop program for 6th grade students?	Response percent	Response total
Yes	0%	0
No	28.6%	6
I don't know	71.4%	15
Total # of respondents 22. Statistics based on 21 respondents	0 filtered;	1 skipped.

ONLY ANSWER THIS QUESTION IF YOU ANSWERED "YES" TO QUESTION #12; Did you receive a free laptop from your school in 6th grade?	Response percent	Response total
Yes	0%	0
No	100%	2
Total # of respondents 22. Statistics based on 2 respondents	0 filtered;	20 skipped.

When I take pencil and paper tests, I feel...	Response percent	Response total
Very confident	18.2%	4
Somewhat confident	50%	11
Somewhat worried	22.7%	5
Very worried	9.1%	2
Total # of respondents 22. Statistics based on 22 respondents	0 filtered;	0 skipped.

Answer question #15 or question #16, NOT BOTH

If you answered "very confident" or "somewhat confident" to question #14, why do you feel this way?	Response total
View	16
Total # of respondents 22. Statistics based on 16 respondents 0 filtered;	6 skipped.

If you answered "very confident" or "somewhat confident" to question #14, why do you feel this way?

#	Responses
	(16 total)
1	I feel that I can go back and erase very easily
2	I feel very confident because I've studied and I know what I have to.
3	Because I want to do good and I get this way because I get nervious because I think I am going to do bad.
4	I feel like I know most of the answers
5	I feel that way because if I were to make a mistake I could go back and fix it.
6	I feel that way because I know I can do it, I know I studied for the test.
7	I feel this way because I have studied and I know this stuff on the test.
8	I feel that way because I always study for my tests and quizzes.
10	I feel somewhat confident because I studed and maybe I know it very well to answer
12	Well sometimes I might not know what to write and hope to get a good grade.
13	I feel this way because I'm confident and study and listen to the teacher.
15	I feel this way because I know I am going to do good on it and I study for it.
16	I feel this way because most of the time I get good grades
17	I feel this way because I think I'm a very good writer when I put my mind to it and others have told me I'm a good writer.
18	When I feel confident because I studied well.
21	I feel this way because I feel like I'm going to mess up or fail.
	(16 total)

If you answered "somewhat worried" or "very worried" to question #14, why do you feel this way?	Response total
View	6
Total # of respondents **22**. Statistics based on **6** respondents **0** filtered; **16** skipped.	

If you answered "somewhat worried" or "very worried" to question #14, why do you feel this way?

#	Responses
	(6 total)
9	I would be somewhat worried because I get scared if I am going to get them all wrong.
11	That I would not know the answer and get something for it bad.
14	Some how I don't feel comfortable with handwriting
19	Because sometimes I'm not good at tests.
20	I do not like to take tests on the computer.
22	Because I am worried about my grade, and scared.

(6 total)

When I take tests on a computer I feel:	Response percent	Response total
Very confident	**35%**	7
Somewhat confident	**35%**	7
Somewhat worried	**20%**	4
Very worried	**10%**	2
Total # of respondents **22**. Statistics based on **20** respondents **0** filtered; **2** skipped.		

Answer question #18 or question #19, NOT BOTH

If you answered "very confident" or "somewhat confident" to question #17, why do you feel this way?	Response total
View	16
Total # of respondents **22**. Statistics based on **16** respondents **0** filtered; **6** skipped.	

If you answered "very confident" or "somewhat confident" to question #17, why do you feel this way?

#	Responses
	(16 total)
2	I feel somewhat confident because on a computer you cant go back, so once you put the answer thats it.
3	Because I do not know what kind of questions there is going to be.
4	I use my process of elimination skills because some of the answers are ridiculas.
5	I feel this way cause I can click the wrong answer. Also I very rarely take computer tests.
6	I feel that way because I like taking survey's and test on computers.
7	I feel very confident because I learned everything and I shouldknow the answers.
8	I feel that way because I don't know what is going to be on it so I can't study as much as I study for paper tests.
10	I feel very confident because I got all the time I need to answer it.
11	Because I am feeling confident is that nothing is going to happen but only get help.
12	I feel this way because I can answer some of these questions or not but I can do it.
14	Because I don't have to worry about handwriting and the computer feels more natural.
15	I feel this way because I know it won't be very hard.
16	Because I get good grades on the computer.
17	I feel this way because I think I can be very smart when I put my mind to it.
18	Because you have a 25% chance of getting it right. If I know the question I get it right.
19	Because, I think that computer tests are somewhat easy.
	(16 total)

If you answered "somewhat worried" or "very worried" to question #17, why do you feel this way?

#	Responses
	(5 total)
1	I feel like I can't go back if I have made a mistake
9	I would geel womewhat worried because of the same problem.
20	I don't like to take tests on computers.
21	I feel this way because I always feel like I'm going to mess up and get a low score.
22	I feel worried because what level I am going to be, and my grade.
	(5 total)

Figure B4. Suburban School Grade 6 Survey Report: Section 4

Section 1: Computer Access

Do you currently have a computer at home?	Response percent	Response total
Yes	100%	21
No	0%	0
Total # of respondents **21**. Statistics based on **21** respondents	**0** filtered;	**0** skipped.

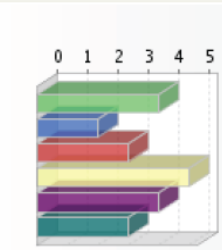
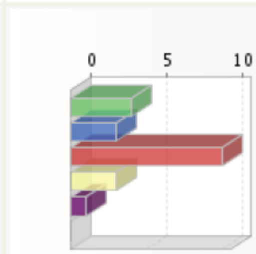
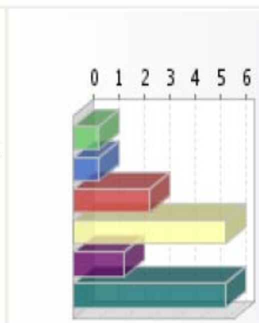
If you answered "YES" to question 1, is the computer...	Response percent	Response total
Your personal computer?	19%	4
Shared with siblings?	9.5%	2
Shared with the entire family?	71.4%	15
Total # of respondents **21**. Statistics based on **21** respondents	**0** filtered;	**0** skipped.

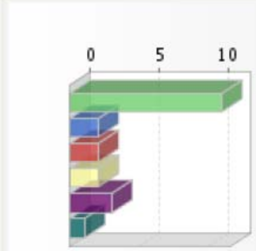
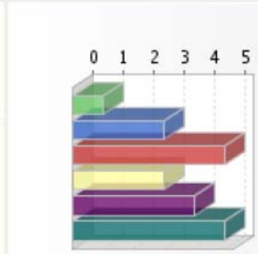
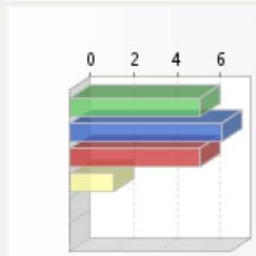
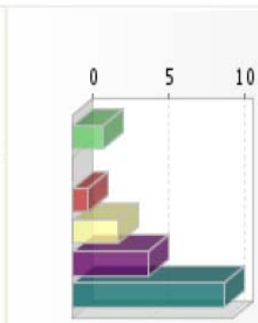
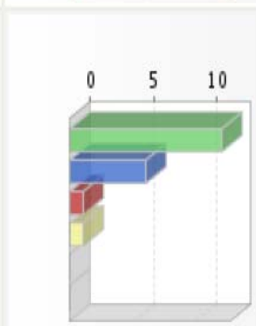
IF YOU ANSWERED "YES" TO QUESTION 1, LEAVE THIS QUESTION BLANK. Can you access a computer...	Response percent	Response total
At the neighborhood library?	0%	0
At church?	0%	0
At the home of a nearby friend or relative?	100%	1
At school?	0%	0
View Other	0%	0
Total # of respondents **21**. Statistics based on **1** respondents	**0** filtered;	**20** skipped.

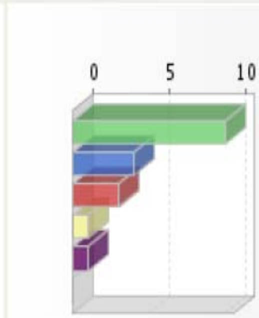
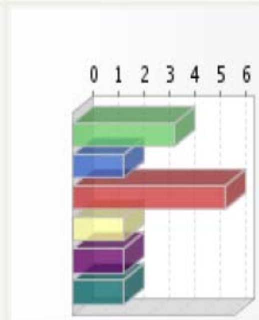
Figure B5. Suburban School Grade 7 Survey Report: Section 1

Section 2: Home & Community Computer Use

How often do you use computers at home, in your community, at a friend's or at a relative's...

View	Never	At least onece per semester	At least once per month	At least once per week	At least once per day	More than once per day	Never / At least onece per semester / At least once per month / At least once per week / At least once per day / More than once per day	Response total
to play games	19% (4)	9.5% (2)	14.3% (3)	23.8% (5)	19% (4)	14.3% (3)		21
to use a word processing program (i.e., MS Word)	19% (4)	14.3% (3)	47.6% (10)	14.3% (3)	4.8% (1)	0% (0)		21
to send or read email messages	5.3% (1)	5.3% (1)	15.8% (3)	31.6% (6)	10.5% (2)	31.6% (6)		19

to create webpages (includes MySpace and Facebook)	52.4% (11)	9.5% (2)	9.5% (2)	9.5% (2)	14.3% (3)	4.8% (1)		21
to listen to or download music files	4.8% (1)	14.3% (3)	23.8% (5)	14.3% (3)	19% (4)	23.8% (5)		21
to create graphs or charts	28.6% (6)	33.3% (7)	28.6% (6)	9.5% (2)	0% (0)	0% (0)		21
to send IM's (instant messages)	9.5% (2)	0% (0)	4.8% (1)	14.3% (3)	23.8% (5)	47.6% (10)		21
to use a spreadsheet program (i.e., MS Excel)	60% (12)	30% (6)	5% (1)	5% (1)	0% (0)	0% (0)		20

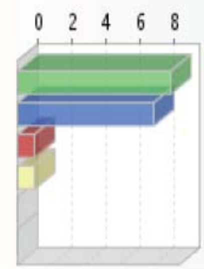
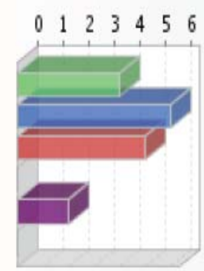
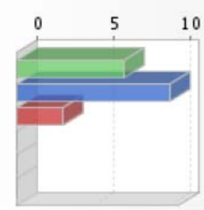
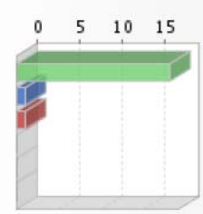
to use a software program to create fliers, signs, borchures, greeting cards, etc. (e.g., Printshop, Pagemaker)	52.6% (10)	21.1% (4)	15.8% (3)	5.3% (1)	5.3% (1)	0% (0)		19
for other purposes	22.2% (4)	11.1% (2)	33.3% (6)	11.1% (2)	11.1% (2)	11.1% (2)		18
	Total # of respondents **21**.		Statistics based on **21** respondents				**0** filtered;	**0** skipped.

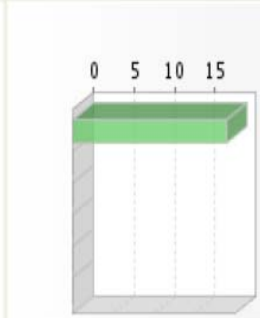
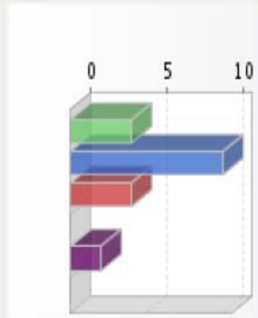
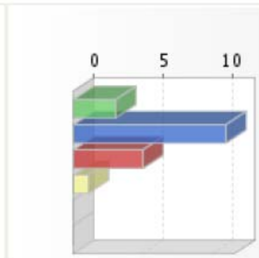
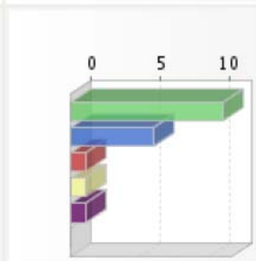
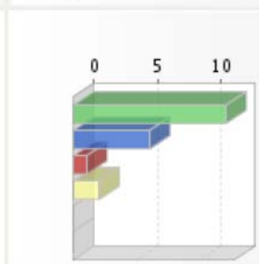
Last week, how many hours did you use a computer at home, in your community, at a friend's or at a relative's?	Response percent	Response total
I didn't use a computer	**0%**	**0**
0-1 hours	**9.5%**	**2**
1-3 hours	**42.9%**	**9**
4-6 hours	**38.1%**	**8**
More than 6 hours	**9.5%**	**2**
Total # of respondents **21**. Statistics based on **21** respondents	**0** filtered;	**0** skipped.

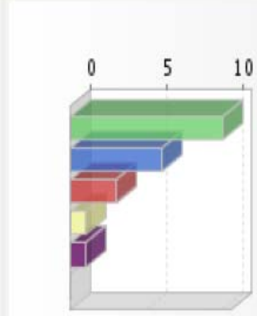
Figure B6. Suburban School Grade 7 Survey Report: Section 2

Section 3: School Computer Use

How often do you use computers at school...

View	Never	At least onece per semester	At least once per month	At least once per week	At least once per day	More than once per day	Never At least onece per semester At least once per month At least once per week At least once per day More than once per day	Response total
to play games	47.4% (9)	42.1% (8)	5.3% (1)	5.3% (1)	0% (0)	0% (0)		19
to use a word processing program (i.e., MS Word)	23.5% (4)	35.3% (6)	29.4% (5)	0% (0)	11.8% (2)	0% (0)		17
to send or read email messages	35% (7)	50% (10)	15% (3)	0% (0)	0% (0)	0% (0)		20
to create webpages (includes MySpace and Facebook)	90% (18)	5% (1)	5% (1)	0% (0)	0% (0)	0% (0)		20

to listen to or download music files	100% (19)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)		19
to create graphs or charts	20% (4)	50% (10)	20% (4)	0% (0)	10% (2)	0% (0)		20
to send IM's (instant messages)	15% (3)	55% (11)	25% (5)	5% (1)	0% (0)	0% (0)		20
to use a spreadsheet program (i.e., MS Excel)	55% (11)	30% (6)	5% (1)	5% (1)	5% (1)	0% (0)		20
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Printshop, Pagemaker)	57.1% (12)	28.6% (6)	4.8% (1)	9.5% (2)	0% (0)	0% (0)		21

for other purposes	47.6% (10)	28.6% (6)	14.3% (3)	4.8% (1)	4.8% (1)	0% (0)		21
Total # of respondents **21**. Statistics based on **21** respondents **0** filtered; **0** skipped.								

Last week, how many hours did you use a computer at school?	**Response percent**	**Response total**
I didn't use a computer	**76.2%**	**16**
0-1 hours	**14.3%**	**3**
1-3 hours	**4.8%**	**1**
4-6 hours	**4.8%**	**1**
More than 6 hours	**0%**	**0**
Total # of respondents **21**. Statistics based on **21** respondents	**0** filtered;	**0** skipped.

Figure B7. Suburban School Grade 7 Survey Report: Section 3

Section 4: General Information

How would you rate your computer abilities?	Response percent	Response total
Extremely Poor	0%	0
Below Average	4.8%	1
Average	38.1%	8
Above Average	38.1%	8
Extremely Good	19%	4
Total # of respondents **21**. Statistics based on **21** respondents	**0** filtered;	**0** skipped.

What is your Gender?	Response percent	Response total
Male	30%	6
Female	70%	14
Total # of respondents **21**. Statistics based on **20** respondents	**0** filtered;	**1** skipped.

What is your grade level?	Response percent	Response total
6th Grade	0%	0
7th Grade	100%	21
8th Grade	0%	0
Total # of respondents **21**. Statistics based on **21** respondents	**0** filtered;	**0** skipped.

What is your Race/Ethnicity?	Response percent	Response total
African American	4.8%	1
Native American	0%	0
Hispanic	0%	0
Asian	0%	0
White, Non-Hispanic	95.2%	20
View Other	0%	0
Total # of respondents **21**. Statistics based on **21** respondents	**0** filtered;	**0** skipped.

Does your school participate in Michigan's free laptop program for 6th grade students?	Response percent	Response total
Yes	0%	0
No	19%	4
I don't know	81%	17
Total # of respondents **21**. Statistics based on **21** respondents	**0** filtered;	**0** skipped.

ONLY ANSWER THIS QUESTION IF YOU ANSWERED "YES" TO QUESTION #12; Did you receive a free laptop from your school in 6th grade?	Response percent	Response total
Yes	0%	0
No	100%	4
Total # of respondents **21**. Statistics based on **4** respondents	**0** filtered;	**17** skipped.

When I take pencil and paper tests, I feel...	Response percent	Response total
Very confident	25%	5
Somewhat confident	40%	8
Somewhat worried	30%	6
Very worried	5%	1
Total # of respondents **21**. Statistics based on **20** respondents	**0** filtered;	**1** skipped.

Answer question #15 or question #16, NOT BOTH

If you answered "very confident" or "somewhat confident" to question #14, why do you feel this way?		Response total
View		14
Total # of respondents **21**. Statistics based on **14** respondents	**0** filtered;	**7** skipped.

#	Responses
	(14 total)
2	Because these tests are about things that we have learned and after the, teacher corrects our mistakes.
4	I feel this way because I study a lot and take every chance I get to study more.
5	Because I study very hard, do what I am told and things in school usually come very naturally to me.
6	Because I get scared if it's going to be hard and fail it
7	I feel that I may not have studied the right material.
8	I feel that way because I study very well for tests. I take up most of my day just studying for my tests because education is important to me.
9	I study for like 20 minutes not that long
10	Because the night before I would of alrady studied for the test. (reviewed)
13	I feel somewhat confident because you can't really be sure you'll do well on a test, even if you studied the night before.
14	I answered "somewhat" confident to # 14, because I know that I studed well for the test.
15	I feel this way, because I know that I can always look back to review and to check my mistakes.
16	I feel confident because I study for every test. I take time and study for 20-60 minutes.
20	Because I studied for that test, but I forget or don't know the answer for 2 or more questions.
21	Because I'm used to pencil and paper and I very rarley use computers to take a test.
	(14 total)

If you answered "somewhat worried" or "very worried" to question #14, why do you feel this way?	Response total
View	7
Total # of respondents **21**. Statistics based on **7** respondents **0** filtered; **14** skipped.	

#	Responses
	(7 total)
1	I am afraid to spell a word wrong or break my pencil.
3	Because I don't know if I studied enough or what grade I'll get.
11	I feel this way because you have to study harder and you would need to write a lot unlike computer tests, which are easy to take.
12	I feel this way because pencil and paper test are hard.
17	I feel that way because I want to get a good grade.
18	I feel somewhat worried because I am nervous. Sometimes I think I could have studied more than how much i did.
19	Because I am not sure if I wrote and chose everything correctly.

(7 total)

When I take tests on a computer I feel:	Response percent	Response total
Very confident	20%	4
Somewhat confident	55%	11
Somewhat worried	25%	5
Very worried	0%	0
Total # of respondents **21**. Statistics based on **20** respondents **0** filtered; **1** skipped.		

Answer question #18 or question #19, NOT BOTH

If you answered "very confident" or "somewhat confident" to question #17, why do you feel this way?	Response total
View	15
Total # of respondents **21**. Statistics based on **15** respondents **0** filtered; **6** skipped.	

#	Responses
	(15 total)
1	I feel that it's just me taking the test. People don't have the same answers as me.
3	Because you don't really have to study and it just depends on what level you are at
4	I feel somewhat confident because I don't know what is on the test but I know the general things about it.
5	Because I know a lot about computers and when I take tests, either compter or paper I know what to do.
6	Because I get kinda scared if I am not going to do good.
7	The tests on the computers usually are multiple choice, so there is a 25% chance that you picked the correct answer.
8	I feel this way because the tests on the computers relate to everything we've been learning and what we've been doing. There is no way I can study for it because I don't know what kind of questions would be on it.
10	I have learned what I needed to learn to take the test.
12	I feel this way because computer tests are easier than the other test.
14	I feel very confident, because I know that it dosen't go toward my report card, I just have to do what I've learned with paper and pencil the whole year.
16	I feel that tests given on a computer are easier than ones on paper. Recently, I scored a 9.9 on my math ed performance.
17	I feel that way because I know that the teacher can read it.
18	I feel somewhat confident because it is multiple chose and I am used to the computer.
20	Because I feel like the computers test are a lot easier.
21	Test are easy either way because I always pass.

(15 total)

If you answered "somewhat worried" or "very worried" to question #17, why do you feel this way?	Response total
View	5
Total # of respondents **21**. Statistics based on **5** respondents **0** filtered; **16** skipped.	

#	Responses
	(5 total)
2	Because the computer doesn't correct the test. It shows results and we don't know all of the questions on the computerized test.
9	Because I think I've never had it so it scares me.
13	I feel somewhat worried because usually on the computer tests that we had so far, you can't change your answer once you put it.
15	I feel worried, because I can never go back and check for my mistakes, when the test is over.
19	Because its not easy, and I messed up, and I don't know what to do.
	(5 total)

Figure B8. Suburban School Grade 7 Survey Report: Section 4

Section 1: Computer Access

Do you currently have a computer at home?	Response percent	Response total
Yes	100%	25
No	0%	0

Total # of respondents **25**. Statistics based on **25** respondents **0** filtered; **0** skipped.

If you answered "YES" to question 1, is the computer...	Response percent	Response total
Your personal computer?	24%	6
Shared with siblings?	20%	5
Shared with the entire family?	56%	14

Total # of respondents **25**. Statistics based on **25** respondents **0** filtered; **0** skipped.

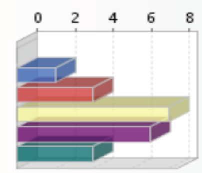
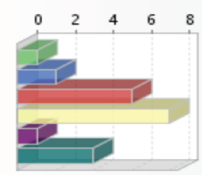
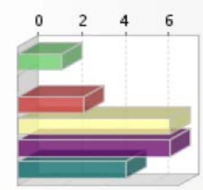
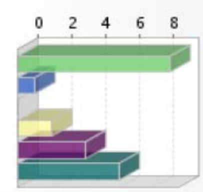
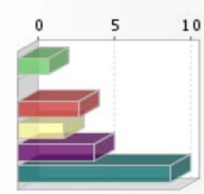
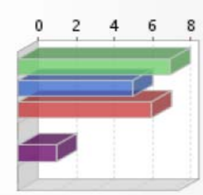
IF YOU ANSWERED "YES" TO QUESTION 1, LEAVE THIS QUESTION BLANK. Can you access a computer...	Response percent	Response total
At the neighborhood library?	0%	0
At church?	0%	0
At the home of a nearby friend or relative?	66.7%	2
At school?	33.3%	1
View Other	0%	0

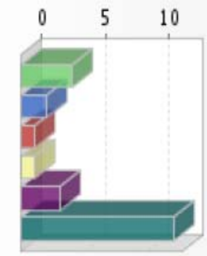
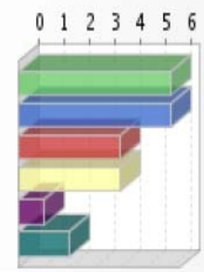
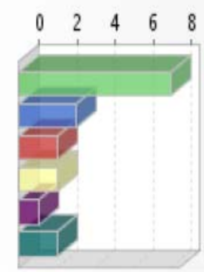
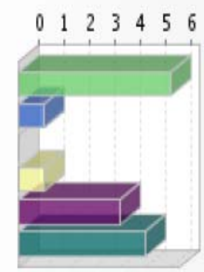
Total # of respondents **25**. Statistics based on **3** respondents **0** filtered; **22** skipped.

Figure B9. Suburban School Grade 8 Survey Report: Section 1

Section 2: Home & Community Computer Use

How often do you use computers at home, in your community, at a friend's or at a relative's...

View	Never	At least onece per semester	At least once per month	At least once per week	At least once per day	More than once per day	Never At least onece per semester At least once per month At least once per week At least once per day More than once per day	Response total
to play games	0% (0)	8% (2)	16% (4)	32% (8)	28% (7)	16% (4)		25
to use a word processing program (i.e., MS Word)	4.5% (1)	9.1% (2)	27.3% (6)	36.4% (8)	4.5% (1)	18.2% (4)		22
to send or read email messages	8.3% (2)	0% (0)	12.5% (3)	29.2% (7)	29.2% (7)	20.8% (5)		24
to create webpages (includes MySpace and Facebook)	40.9% (9)	4.5% (1)	0% (0)	9.1% (2)	18.2% (4)	27.3% (6)		22
to listen to or download music files	8.3% (2)	0% (0)	16.7% (4)	12.5% (3)	20.8% (5)	41.7% (10)		24
to create graphs or charts	34.8% (8)	26.1% (6)	30.4% (7)	0% (0)	8.7% (2)	0% (0)		23

to send IM's (instant messages)	17.4% (4)	8.7% (2)	4.3% (1)	4.3% (1)	13% (3)	52.2% (12)		23
to use a spreadsheet program (i.e., MS Excel)	26.1% (6)	26.1% (6)	17.4% (4)	17.4% (4)	4.3% (1)	8.7% (2)		23
to use a software program to create fliers, signs, borchures, greeting cards, etc. (e.g., Printshop, Pagemaker)	44.4% (8)	16.7% (3)	11.1% (2)	11.1% (2)	5.6% (1)	11.1% (2)		18
for other purposes	35.3% (6)	5.9% (1)	0% (0)	5.9% (1)	23.5% (4)	29.4% (5)		17

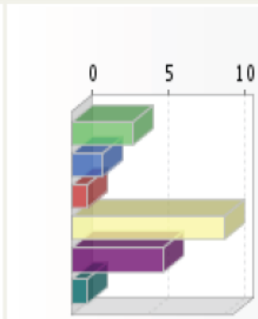
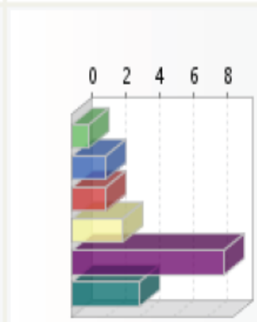
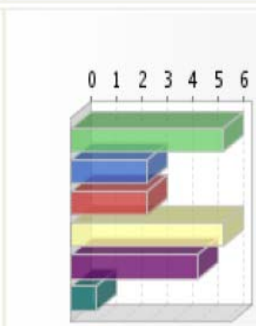
Total # of respondents **25**. Statistics based on **25** respondents **0** filtered; **0** skipped.

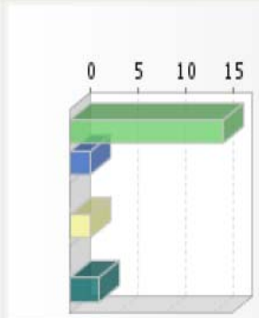
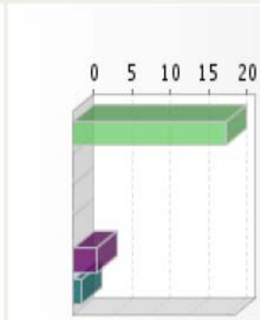
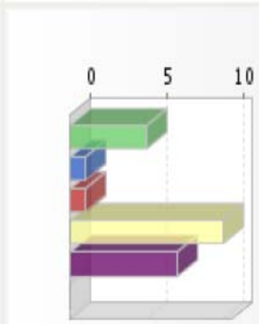
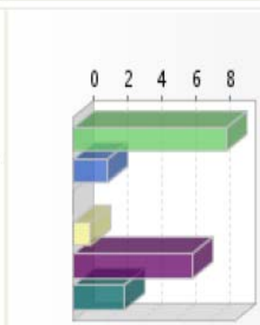
Last week, how many hours did you use a computer at home, in your community, at a friend's or at a relative's?	Response percent	Response total
I didn't use a computer	**0%**	**0**
0-1 hours	**24%**	6
1-3 hours	**24%**	6
4-6 hours	**24%**	6
More than 6 hours	**28%**	7
Total # of respondents **25**. Statistics based on **25** respondents	**0** filtered;	**0** skipped.

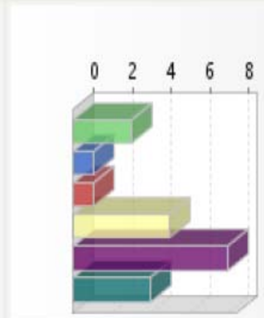
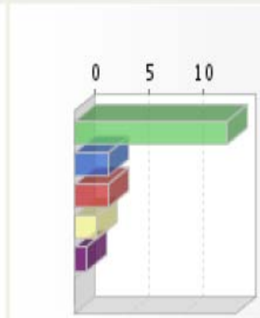
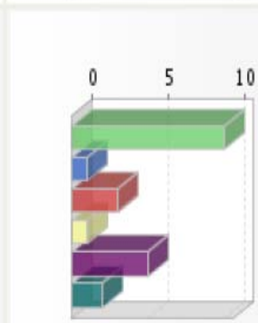
Figure B10. Suburban School Grade 8 Survey Report: Section 2

Section 3: School Computer Use

How often do you use computers at school...

View	Never	At least onece per semester	At least once per month	At least once per week	At least once per day	More than once per day	Never At least onece per semester At least once per month At least once per week At least once per day More than once per day	Response total
to play games	16.7% (4)	8.3% (2)	4.2% (1)	41.7% (10)	25% (6)	4.2% (1)		24
to use a word processing program (i.e., MS Word)	4.8% (1)	9.5% (2)	9.5% (2)	14.3% (3)	42.9% (9)	19% (4)		21
to send or read email messages	25% (6)	12.5% (3)	12.5% (3)	25% (6)	20.8% (5)	4.2% (1)		24

to create webpages (includes MySpace and Facebook)	69.6% (16)	8.7% (2)	0% (0)	8.7% (2)	0% (0)	13% (3)		23
to listen to or download music files	83.3% (20)	0% (0)	0% (0)	0% (0)	12.5% (3)	4.2% (1)		24
to create graphs or charts	20.8% (5)	4.2% (1)	4.2% (1)	41.7% (10)	29.2% (7)	0% (0)		24
to send IM's (instant messages)	40.9% (9)	9.1% (2)	0% (0)	4.5% (1)	31.8% (7)	13.6% (3)		22

to use a spreadsheet program (i.e., MS Excel)	13.6% (3)	4.5% (1)	4.5% (1)	22.7% (5)	36.4% (8)	18.2% (4)		22
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Printshop, Pagemaker)	60.9% (14)	13% (3)	13% (3)	8.7% (2)	4.3% (1)	0% (0)		23
for other purposes	45.5% (10)	4.5% (1)	13.6% (3)	4.5% (1)	22.7% (5)	9.1% (2)		22
	Total # of respondents **25**.		Statistics based on **25** respondents			**0** filtered;		**0** skipped.

Last week, how many hours did you use a computer at school?		Response percent	Response total
I didn't use a computer		**0%**	**0**
0-1 hours		**48%**	12
1-3 hours		**4%**	1
4-6 hours		**48%**	12
More than 6 hours		**0%**	**0**
Total # of respondents **25**.	Statistics based on **25** respondents	**0** filtered;	**0** skipped.

Figure B11. Suburban School Grade 8 Survey Report: Section 3

Section 4: General Information

How would you rate your computer abilities?	Response percent	Response total
Extremely Poor	0%	0
Below Average	4%	1
Average	40%	10
Above Average	36%	9
Extremely Good	20%	5
Total # of respondents **25**. Statistics based on **25** respondents	**0** filtered;	**0** skipped.

What is your Gender?	Response percent	Response total
Male	48%	12
Female	52%	13
Total # of respondents **25**. Statistics based on **25** respondents	**0** filtered;	**0** skipped.

What is your grade level?	Response percent	Response total
6th Grade	0%	0
7th Grade	0%	0
8th Grade	100%	25
Total # of respondents **25**. Statistics based on **25** respondents	**0** filtered;	**0** skipped.

What is your Race/Ethnicity?	Response percent	Response total
African American	4%	1
Native American	0%	0
Hispanic	0%	0
Asian	0%	0
White, Non-Hispanic	96%	24
View Other	0%	0
Total # of respondents **25**. Statistics based on **25** respondents	**0** filtered;	**0** skipped.

Does your school participate in Michigan's free laptop program for 6th grade students?	Response percent	Response total
Yes	0%	0
No	52%	13
I don't know	48%	12
Total # of respondents **25**. Statistics based on **25** respondents	**0** filtered;	**0** skipped.

ONLY ANSWER THIS QUESTION IF YOU ANSWERED "YES" TO QUESTION #12; Did you receive a free laptop from your school in 6th grade?	Response percent	Response total
Yes	0%	0
No	100%	4
Total # of respondents **25**. Statistics based on **4** respondents **0** filtered; **21** skipped.		

When I take pencil and paper tests, I feel...	Response percent	Response total
Very confident	32%	8
Somewhat confident	40%	10
Somewhat worried	24%	6
Very worried	4%	1
Total # of respondents **25**. Statistics based on **25** respondents **0** filtered; **0** skipped.		

Answer question #15 or question #16, NOT BOTH

If you answered "very confident" or "somewhat confident" to question #14, why do you feel this way?	Response total
View	18
Total # of respondents **25**. Statistics based on **18** respondents **0** filtered; **7** skipped.	

If you answered "very confident" or "somewhat confident" to question #14, why do you feel this way?

#	Responses
	(18 total)
1	Because I study most of the time, I can erase wrong answers.
2	For test, I study so I pretty much know what I'm looking at. But if it's surprised, I don't freak out, I'm confident I'll do good.
3	I feel this way because I don't know if I know all the answers to the questions It also depends on the subject.
5	I feel this way because it makes me feel ready for any test.
6	Because I think I am very smart and I do well on test.
8	Why because I feel I will forget what I learned.
9	Because with a pencil I control exactly what I'm writing, and I can't be accused of cheating.
13	I feel that way because I don't know if I studied enough to know the answers.
14	Because I feel confident on what I write. Since I know what I want to write on paper. I can get the info from my head down n paper.
15	Because I enjoy writing, and feel that I should continue to practice writing with pencil and paper, while not becoming accustomed to the computer.
16	I'm always prepared for it. I don't get scared about thests if I know that I'm ready for it.
17	Because if it was a test and I studied for it, I would know I would be receiving a good grade but I would also feel somewhat nervous.
18	I study very hard.
19	Because I tend to forget some of the material
20	Because I don't want to now test score.
21	I feel this way because sometimes I understand things better and I am more confident, but sometimes I am not 100% sure so I am not very confident.
23	Because I always study and I always get good grades.
25	I don't feel like I have to hide something.
	(18 total)

If you answered "somewhat worried" or "very worried" to question #14, why do you feel this way?	Response total
View	6
Total # of respondents **25**. Statistics based on **6** respondents **0** filtered; **19** skipped.	

If you answered "somewhat worried" or "very worried" to question #14, why do you feel this way?

#	Responses
	(6 total)
4	Because even if I have studied I'm not sure that I will geet everything right.
7	Because you don't know what grade I am going to get.
11	Becasue I am worried a bout my grade also I'm worried if I have everything right.
12	I feel this way because I always get worried on test, I get stressed fast.
22	I feel this way because I am always in doubt of what I'm going to get and what my parents are going to think.
24	Because I'm not sure if it is right.

(6 total)

When I take tests on a computer I feel:	Response percent	Response total
Very confident	44%	11
Somewhat confident	32%	8
Somewhat worried	20%	5
Very worried	4%	1

Total # of respondents **25**. Statistics based on **25** respondents **0** filtered; **0** skipped.

Answer question #18 or question #19, NOT BOTH

If you answered "very confident" or "somewhat confident" to question #17, why do you feel this way?	Response total
View	18

Total # of respondents **25**. Statistics based on **18** respondents **0** filtered; **7** skipped.

If you answered "very confident" or "somewhat confident" to question #17, why do you feel this way?

#	Responses
	(18 total)
2	I haven't taken to many computer test in my life, But still feel confident I'll do good.
3	I feel this way because I don't know it I know all the answers to the questions.
5	I feel this way because it is something I like to use.
6	Because I am very good at doing things on the computer.
7	Because computer test are easy.
8	Because there are things that I don't know the answer to.
12	I feel this way because it multiple choice.
13	I feel that way because I know enough about computers that I feel comfortable.
14	I know the information I have to know. I can think many, many, moves ahead to find the right answer.
15	I feel this way because most tests thaken on a computer are very simple, and don't worry me.
16	I tend to do much better on computers.
17	Because we have taken test on computers more and on the computer I feel more confident to get a good grade.
18	I study very hard.
19	I really don't know why exactly.
20	Because it's easier to take test in computer.
21	I feel this way because the tests on the computer aren't graded, so I am more relaxed and confident.
23	Because I always on a computer so I know that I know how to use it and its like a paper test so its the same.
25	Because no one knows who I am.
	(18 total)

If you answered "somewhat worried" or "very worried" to question #17, why do you feel this way?	Response total
View	6
Total # of respondents **25**. Statistics based on **6** respondents **0** filtered; **19** skipped.	

If you answered "somewhat worried" or "very worried" to question #17, why do you feel this way?

#	Responses
	(6 total)
1	I believe my computer skills arent as good as others.
4	Because I never know whats going to be on these test, and I feel uncomfortable.
9	Because the computer might turn off and the data might be lost.
11	Is like the same answer worried about my grade and how well I've done it.
22	Because I am better with a computer rather then with paper and pencil
24	Because I'm not sure if I did good on the test.
	(6 total)

Figure B12. Suburban School Grade 8 Survey Report: Section 4

APPENDIX C: URBAN SCHOOL GRADES 6, 7 & 8 SURVEY REPORT

Section 1: Computer Access

Do you currently have a computer at home?	Response percent	Response total
Yes	78.9%	15
No	21.1%	4
Total # of respondents **20**. Statistics based on **19** respondents	**0** filtered;	**1** skipped.

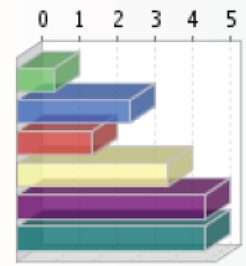
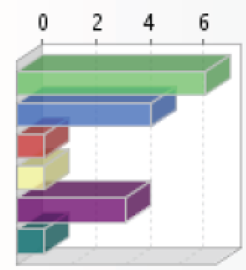
If you answered "YES" to question 1, is the computer...	Response percent	Response total
Your personal computer?	0%	0
Shared with siblings?	26.7%	4
Shared with the entire family?	73.3%	11
Total # of respondents **20**. Statistics based on **15** respondents	**0** filtered;	**5** skipped.

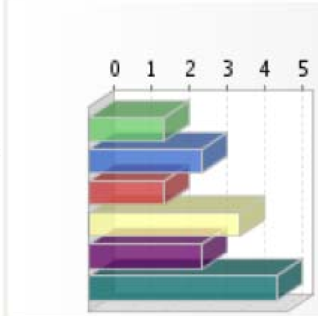
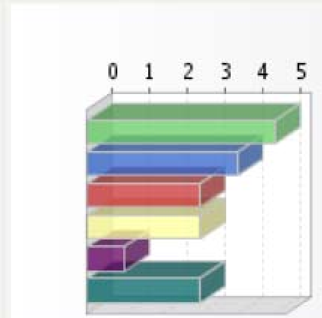
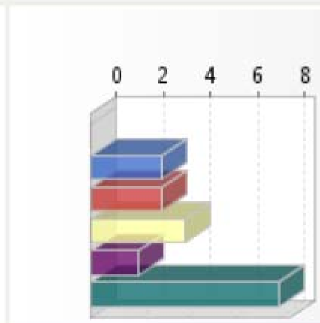
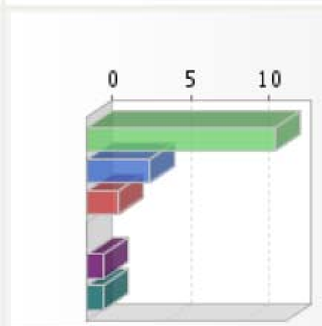
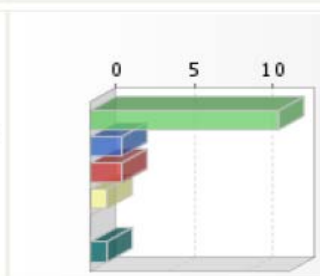
IF YOU ANSWERED "YES" TO QUESTION 1, LEAVE THIS QUESTION BLANK. Can you access a computer...	Response percent	Response total
At the neighborhood library?	25%	1
At church?	0%	0
At the home of a nearby friend or relative?	25%	1
At school?	50%	2
View Other	0%	0
Total # of respondents **20**. Statistics based on **4** respondents	**0** filtered;	**16** skipped.

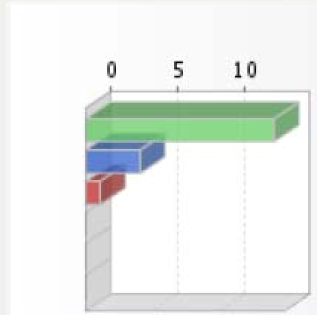
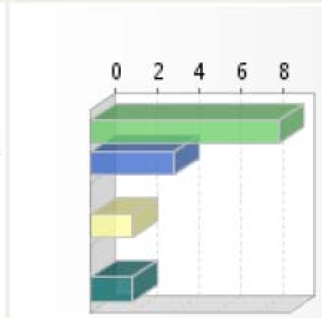
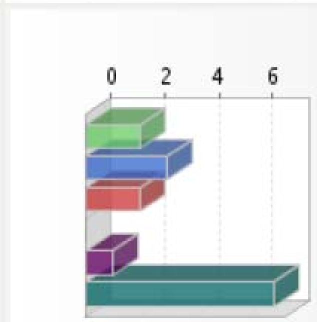
Figure C1. Urban School Grade 6 Survey Report: Section 1

Section 2: Home & Community Computer Use

How often do you use computers at home, in your community, at a friend's or at a relative's...

View	Never	At least onece per semester	At least once per month	At least once per week	At least once per day	More than once per day	Never At least onece per semester At least once per month At least once per week At least once per day More than once per day	Response total
to play games	5% (1)	15% (3)	10% (2)	20% (4)	25% (5)	25% (5)		20
to use a word processing program (i.e., MS Word)	36.8% (7)	26.3% (5)	5.3% (1)	5.3% (1)	21.1% (4)	5.3% (1)		19

to send or read email messages	10.5% (2)	15.8% (3)	10.5% (2)	21.1% (4)	15.8% (3)	26.3% (5)		19
to create webpages (includes MySpace and Facebook)	26.3% (5)	21.1% (4)	15.8% (3)	15.8% (3)	5.3% (1)	15.8% (3)		19
to listen to or download music files	0% (0)	15% (3)	15% (3)	20% (4)	10% (2)	40% (8)		20
to create graphs or charts	60% (12)	20% (4)	10% (2)	0% (0)	5% (1)	5% (1)		20
to send IM's (instant messages)	66.7% (12)	11.1% (2)	11.1% (2)	5.6% (1)	0% (0)	5.6% (1)		18

to use a spreadsheet program (i.e., MS Excel)	73.7% (14)	21.1% (4)	5.3% (1)	0% (0)	0% (0)	0% (0)		19
to use a software program to create fliers, signs, borchures, greeting cards, etc. (e.g., Printshop, Pagemaker)	52.9% (9)	23.5% (4)	0% (0)	11.8% (2)	0% (0)	11.8% (2)		17
for other purposes	13.3% (2)	20% (3)	13.3% (2)	0% (0)	6.7% (1)	46.7% (7)		15
Total # of respondents **20**.	Statistics based on **20** respondents						**0** filtered;	**0** skipped.

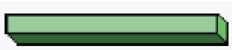
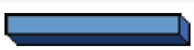
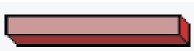
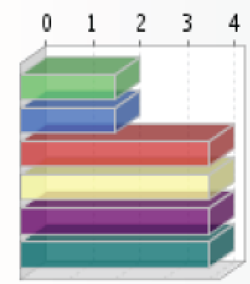
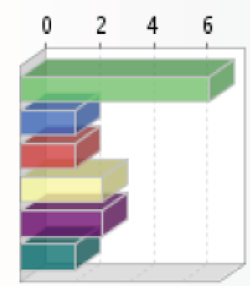
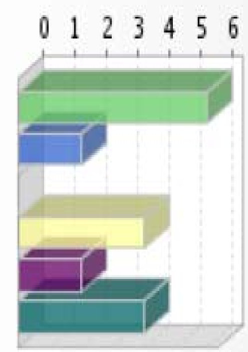
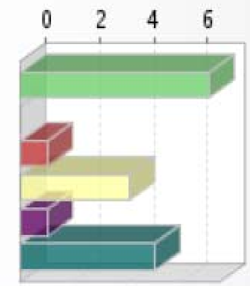
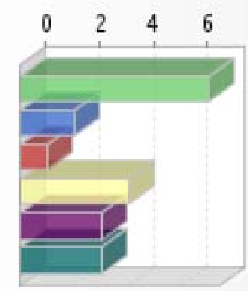
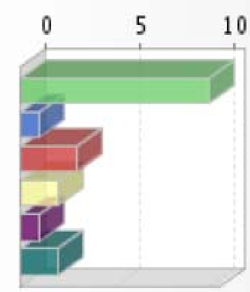
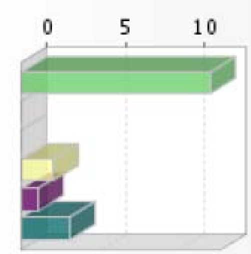
Last week, how many hours did you use a computer at home, in your community, at a friend's or at a relative's?		Response percent	Response total
I didn't use a computer		**26.3%**	5
0-1 hours		**21.1%**	4
1-3 hours		**21.1%**	4
4-6 hours		**15.8%**	3
More than 6 hours		**15.8%**	3
Total # of respondents **20**.	Statistics based on **19** respondents	**0** filtered;	**1** skipped.

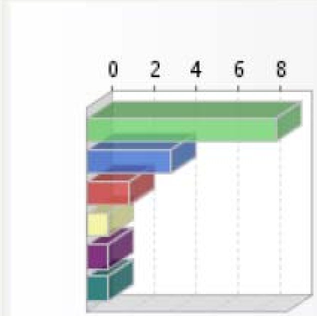
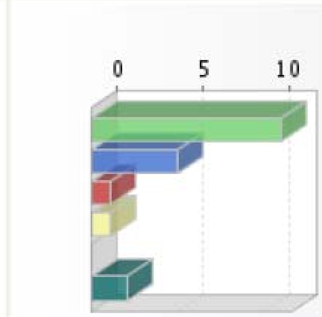
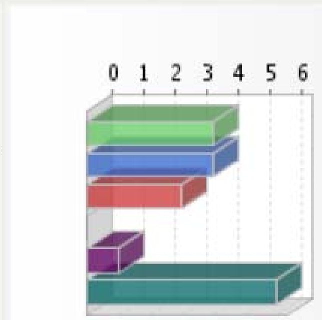
Figure C2. Urban School Grade 6 Survey Report: Section 2

Section 3: School Computer Use

How often do you use computers at school...

View	Never	At least onece per semester	At least once per month	At least once per week	At least once per day	More than once per day	Never At least onece per semester At least once per month At least once per week At least once per day More than once per day	Response total
to play games	10% (2)	10% (2)	20% (4)	20% (4)	20% (4)	20% (4)		20
to use a word processing program (i.e., MS Word)	36.8% (7)	10.5% (2)	10.5% (2)	15.8% (3)	15.8% (3)	10.5% (2)		19
to send or read email messages	33.3% (6)	11.1% (2)	0% (0)	22.2% (4)	11.1% (2)	22.2% (4)		18

to create webpages (includes MySpace and Facebook)	38.9% (7)	0% (0)	5.6% (1)	22.2% (4)	5.6% (1)	27.8% (5)		18
to listen to or download music files	35% (7)	10% (2)	5% (1)	20% (4)	15% (3)	15% (3)		20
to create graphs or charts	52.6% (10)	5.3% (1)	15.8% (3)	10.5% (2)	5.3% (1)	10.5% (2)		19
to send IM's (instant messages)	66.7% (12)	0% (0)	0% (0)	11.1% (2)	5.6% (1)	16.7% (3)		18

to use a spreadsheet program (i.e., MS Excel)	50% (9)	22.2% (4)	11.1% (2)	5.6% (1)	5.6% (1)	5.6% (1)		18
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Printshop, Pagemaker)	55% (11)	25% (5)	5% (1)	5% (1)	0% (0)	10% (2)		20
for other purposes	22.2% (4)	22.2% (4)	16.7% (3)	0% (0)	5.6% (1)	33.3% (6)		18
	Total # of respondents **20**.		Statistics based on **20** respondents				**0** filtered;	**0** skipped.

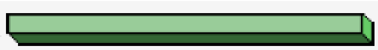
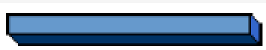
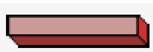
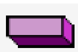
Last week, how many hours did you use a computer at school?		**Response percent**	**Response total**
I didn't use a computer		**45%**	**9**
0-1 hours		**30%**	**6**
1-3 hours		**15%**	**3**
4-6 hours		**5%**	**1**
More than 6 hours		**5%**	**1**
Total # of respondents **20**.	Statistics based on **20** respondents	**0** filtered;	**0** skipped.

Figure C3. Urban School Grade 6 Survey Report: Section 3

Section 4: General Information

How would you rate your computer abilities?	Response percent	Response total
Extremely Poor	0%	0
Below Average	0%	0
Average	50%	10
Above Average	20%	4
Extremely Good	30%	6
Total # of respondents **20**. Statistics based on **20** respondents	**0** filtered;	**0** skipped.

What is your Gender?	Response percent	Response total
Male	36.8%	7
Female	63.2%	12
Total # of respondents **20**. Statistics based on **19** respondents	**0** filtered;	**1** skipped.

What is your grade level?	Response percent	Response total
6th Grade	100%	20
7th Grade	0%	0
8th Grade	0%	0
Total # of respondents **20**. Statistics based on **20** respondents	**0** filtered;	**0** skipped.

What is your Race/Ethnicity?	Response percent	Response total
African American	75%	15
Native American	5%	1
Hispanic	5%	1
Asian	0%	0
White, Non-Hispanic	5%	1
View Other	10%	2
Total # of respondents **20**. Statistics based on **20** respondents	**0** filtered;	**0** skipped.

Does your school participate in Michigan's free laptop program for 6th grade students?	Response percent	Response total
Yes	75%	15
No	5%	1
I don't know	20%	4
Total # of respondents **20**. Statistics based on **20** respondents	**0** filtered;	**0** skipped.

ONLY ANSWER THIS QUESTION IF YOU ANSWERED "YES" TO QUESTION #12; Did you receive a free laptop from your school in 6th grade?	Response percent	Response total
Yes	33.3%	5
No	66.7%	10
Total # of respondents **20**. Statistics based on **15** respondents	**0** filtered;	**5** skipped.

When I take pencil and paper tests, I feel...	Response percent	Response total
Very confident	60%	12
Somewhat confident	25%	5
Somewhat worried	10%	2
Very worried	5%	1
Total # of respondents **20**. Statistics based on **20** respondents	**0** filtered;	**0** skipped.

Answer question #15 or question #16, NOT BOTH

If you answered "very confident" or "somewhat confident" to question #14, why do you feel this way?	Response total
View	16
Total # of respondents **20**. Statistics based on **16** respondents **0** filtered;	**4** skipped.

If you answered "very confident" or "somewhat confident" to question #14, why do you feel this way?

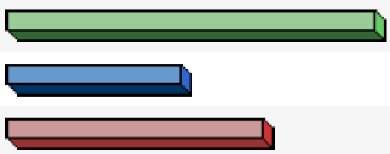
#	Responses
	(16 total)
1	Because I alwasy study for tests
2	Becasue I am not scared to take a test.
4	I feel this way because there is no stress.
5	Because when I study, some stuff pops out of my head.
7	Because I study.
8	I feel this way becasue if I think negative things, negative things might happen.
9	I feel a little worried sometime.
10	Because I study.
11	Because I study very good at all times.
13	Because I know I learned it.
14	Because it was so easy.
15	I feel very confident because I know I study and I know.
17	I feel very confident.
18	Becasue I know I am doing my best.
19	I feel this way because I am very smart and I don't have to worry about anything.
20	I want to feel confident that I will pass the test. I wouldn't want to be stressed when I take the test.
	(16 total)

If you answered "somewhat worried" or "very worried" to question #14, why do you feel this way?	Response total
View	3
Total # of respondents **20**. Statistics based on **3** respondents **0** filtered; **17** skipped.	

If you answered "somewhat worried" or "very worried" to question #14, why do you feel this way?

#	Responses
	(3 total)
3	Sometime I don't come to school. Sometime I don't study for it or don't get it.
6	I don't know.
12	I didn't study.

(3 total)



When I take tests on a computer I feel:	Response percent	Response total
Very confident	**47.4%**	9
Somewhat confident	**21.1%**	4
Somewhat worried	**31.6%**	6
Very worried	**0%**	**0**
Total # of respondents **20**. Statistics based on **19** respondents **0** filtered; **1** skipped.		

Answer question #18 or question #19, NOT BOTH

If you answered "very confident" or "somewhat confident" to question #17, why do you feel this way?	Response total
View	11
Total # of respondents **20**. Statistics based on **11** respondents **0** filtered; **9** skipped.	

If you answered "very confident" or "somewhat confident" to question #17, why do you feel this way?

#	Responses
	(11 total)
1	Because I know that I am confident in myself so I am very confident.
2	Because you just have to "click".
7	Because I study.
10	Because it's easy.
11	I have something to reflect on...something else.
13	Becasue I know I learned it.
14	Becasue it feels easy.
17	Again, I feel very confident
18	Becasue I know I am doing my best.
19	Be I'm smart that why I feel this way.
20	I want to feel confident that I will pass the test. I wouldn't want to be stressed when I take the test.

(11 total)

If you answered "somewhat worried" or "very worried" to question #17, why do you feel this way?	Response total
View	7
Total # of respondents **20**. Statistics based on **7** respondents **0** filtered; **13** skipped.	

If you answered "somewhat worried" or "very worried" to question #17, why do you feel this way?

#	Responses
	(7 total)
3	Cause it be different from our work. It be hard sometimes.
4	I feel this way because it like nothing in the room is not comfortable.
5	Because they come up with stuff I hav not heard of.
6	Becasue it's hard.
8	I feel this way because computers sometimes make mistakes.
9	I don't know what it is about.
12	Too many questions.

(7 total)

Figure C4. Urban School Grade 6 Survey Report: Section 4

Section 1: Computer Access

Do you currently have a computer at home?	Response percent	Response total
Yes	76.9%	10
No	23.1%	3

Total # of respondents **13**. Statistics based on **13** respondents **0** filtered; **0** skipped.

If you answered "YES" to question 1, is the computer...	Response percent	Response total
Your personal computer?	20%	2
Shared with siblings?	10%	1
Shared with the entire family?	70%	7

Total # of respondents **13**. Statistics based on **10** respondents **0** filtered; **3** skipped.

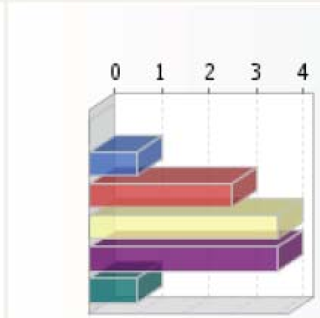
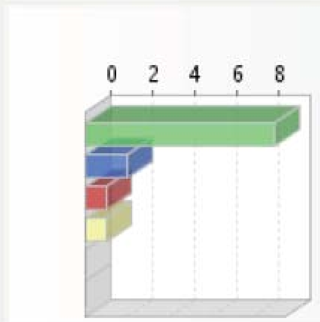
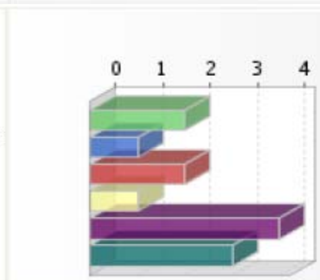
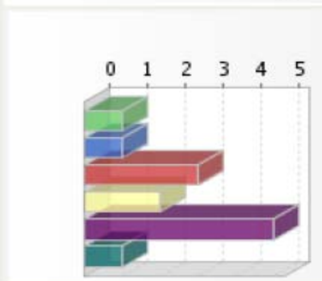
IF YOU ANSWERED "YES" TO QUESTION 1, LEAVE THIS QUESTION BLANK. Can you access a computer...	Response percent	Response total
At the neighborhood library?	0%	0
At church?	0%	0
At the home of a nearby friend or relative?	33.3%	1
At school?	66.7%	2
View Other	0%	0

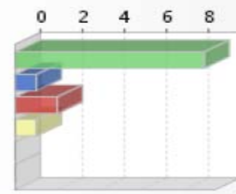
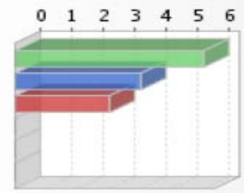
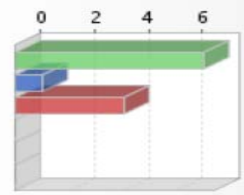
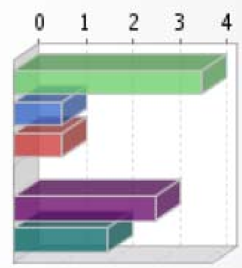
Total # of respondents **13**. Statistics based on **3** respondents **0** filtered; **10** skipped.

Figure C5. Urban School Grade 7 Survey Report: Section 1

Section 2: Home & Community Computer Use

How often do you use computers at home, in your community, at a friend's or at a relative's...

View	Never	At least onece per semester	At least once per month	At least once per week	At least once per day	More than once per day	Never At least onece per semester At least once per month At least once per week At least once per day More than once per day	Response total
to play games	0% (0)	7.7% (1)	23.1% (3)	30.8% (4)	30.8% (4)	7.7% (1)		13
to use a word processing program (i.e., MS Word)	69.2% (9)	15.4% (2)	7.7% (1)	7.7% (1)	0% (0)	0% (0)		13
to send or read email messages	15.4% (2)	7.7% (1)	15.4% (2)	7.7% (1)	30.8% (4)	23.1% (3)		13
to create webpages (includes MySpace and Facebook)	7.7% (1)	7.7% (1)	23.1% (3)	15.4% (2)	38.5% (5)	7.7% (1)		13

to send IM's (instant messages)	69.2% (9)	7.7% (1)	15.4% (2)	7.7% (1)	0% (0)	0% (0)		13
to use a spreadsheet program (i.e., MS Excel)	46.2% (6)	30.8% (4)	23.1% (3)	0% (0)	0% (0)	0% (0)		13
to use a software program to create fliers, signs, borchures, greeting cards, etc. (e.g., Printshop, Pagemaker)	58.3% (7)	8.3% (1)	33.3% (4)	0% (0)	0% (0)	0% (0)		12
for other purposes	36.4% (4)	9.1% (1)	9.1% (1)	0% (0)	27.3% (3)	18.2% (2)		11

Total # of respondents **13**. Statistics based on **13** respondents **0** filtered; **0** skipped.

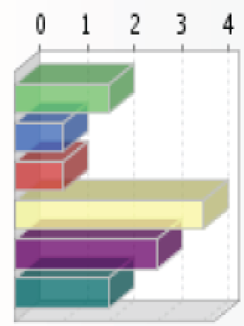
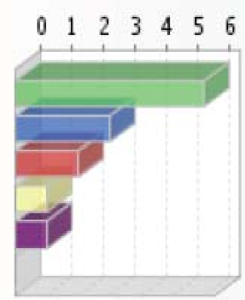
Last week, how many hours did you use a computer at home, in your community, at a friend's or at a relative's?		Response percent	Response total
I didn't use a computer		**53.8%**	**7**
0-1 hours		**0%**	**0**
1-3 hours		**30.8%**	**4**
4-6 hours		**7.7%**	**1**
More than 6 hours		**7.7%**	**1**

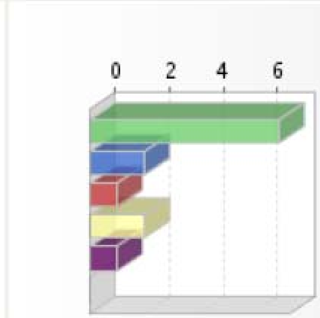
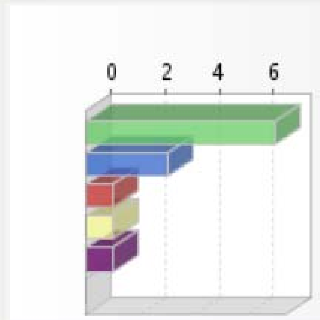
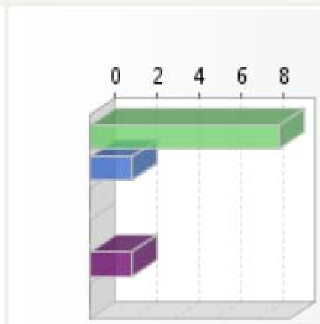
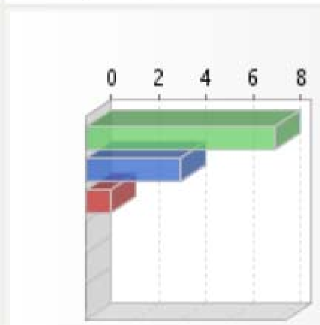
Total # of respondents **13**. Statistics based on **13** respondents **0** filtered; **0** skipped.

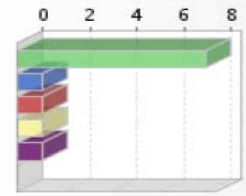
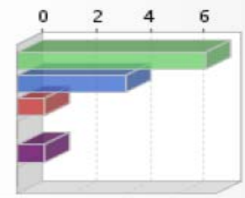
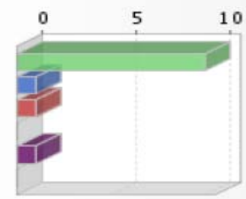
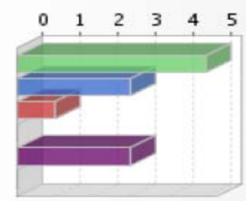
Figure C6. Urban School Grade 7 Survey Report: Section 2

Section 3: School Computer Use

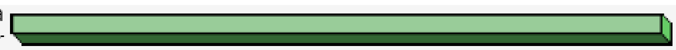
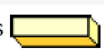
How often do you use computers at school...

View	Never	At least onece per semester	At least once per month	At least once per week	At least once per day	More than once per day	Never / At least onece per semester / At least once per month / At least once per week / At least once per day / More than once per day	Response total
to play games	15.4% (2)	7.7% (1)	7.7% (1)	30.8% (4)	23.1% (3)	15.4% (2)		13
to use a word processing program (i.e., MS Word)	46.2% (6)	23.1% (3)	15.4% (2)	7.7% (1)	7.7% (1)	0% (0)		13

to send or read email messages	53.8% (7)	15.4% (2)	7.7% (1)	15.4% (2)	7.7% (1)	0% (0)		13
to create webpages (includes MySpace and Facebook)	53.8% (7)	23.1% (3)	7.7% (1)	7.7% (1)	7.7% (1)	0% (0)		13
to listen to or download music files	69.2% (9)	15.4% (2)	0% (0)	0% (0)	15.4% (2)	0% (0)		13
to create graphs or charts	61.5% (8)	30.8% (4)	7.7% (1)	0% (0)	0% (0)	0% (0)		13

to send IM's (instant messages)	66.7% (8)	8.3% (1)	8.3% (1)	8.3% (1)	8.3% (1)	0% (0)		12
to use a spreadsheet program (i.e., MS Excel)	53.8% (7)	30.8% (4)	7.7% (1)	0% (0)	7.7% (1)	0% (0)		13
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Printshop, Pagemaker)	76.9% (10)	7.7% (1)	7.7% (1)	0% (0)	7.7% (1)	0% (0)		13
for other purposes	41.7% (5)	25% (3)	8.3% (1)	0% (0)	25% (3)	0% (0)		12

Total # of respondents **13**. Statistics based on **13** respondents **0** filtered; **0** skipped.

Last week, how many hours did you use a computer at school?		Response percent	Response total
I didn't use a computer		84.6%	11
0-1 hours		0%	0
1-3 hours		7.7%	1
4-6 hours		7.7%	1
More than 6 hours		0%	0

Total # of respondents **13**. Statistics based on **13** respondents **0** filtered; **0** skipped.

Figure C7. Urban School Grade 7 Survey Report: Section 3

Section 4: General Information

How would you rate your computer abilities?	Response percent	Response total
Extremely Poor	0%	0
Below Average	7.7%	1
Average	46.2%	6
Above Average	30.8%	4
Extremely Good	15.4%	2
Total # of respondents **13**. Statistics based on **13** respondents	**0** filtered;	**0** skipped.

What is your Gender?	Response percent	Response total
Male	7.7%	1
Female	92.3%	12
Total # of respondents **13**. Statistics based on **13** respondents	**0** filtered;	**0** skipped.

What is your grade level?	Response percent	Response total
6th Grade	0%	0
7th Grade	100%	13
8th Grade	0%	0
Total # of respondents **13**. Statistics based on **13** respondents	**0** filtered;	**0** skipped.

What is your Race/Ethnicity?	Response percent	Response total
African American	92.3%	12
Native American	0%	0
Hispanic	0%	0
Asian	0%	0
White, Non-Hispanic	0%	0
View Other	7.7%	1
Total # of respondents **13**. Statistics based on **13** respondents	**0** filtered;	**0** skipped.

Does your school participate in Michigan's free laptop program for 6th grade students?	Response percent	Response total
Yes	23.1%	3
No	0%	0
I don't know	76.9%	10
Total # of respondents 13. Statistics based on 13 respondents	0 filtered;	0 skipped.

ONLY ANSWER THIS QUESTION IF YOU ANSWERED "YES" TO QUESTION #12; Did you receive a free laptop from your school in 6th grade?	Response percent	Response total
Yes	75%	3
No	25%	1
Total # of respondents 13. Statistics based on 4 respondents	0 filtered;	9 skipped.

When I take pencil and paper tests, I feel...	Response percent	Response total
Very confident	53.8%	7
Somewhat confident	15.4%	2
Somewhat worried	30.8%	4
Very worried	0%	0
Total # of respondents 13. Statistics based on 13 respondents	0 filtered;	0 skipped.

Answer question #15 or question #16, NOT BOTH

If you answered "very confident" or "somewhat confident" to question #14, why do you feel this way?		Response total
View		9
Total # of respondents 13. Statistics based on 9 respondents	0 filtered;	4 skipped.

If you answered "very confident" or "somewhat confident" to question #14, why do you feel this way?

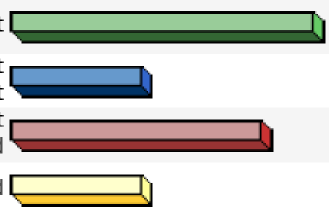
#	Responses
	(9 total)
1	Because I am. But even though I might not have a pencil and paper, I'm still very confident.
2	I feel this way because as long as I study, I should be alright. But the reason I'm somewhat is because I might forget some stuff.
5	Becasue I studied.
6	Becasue I study.
7	Because I just feel confident in what I do.
8	Because I use a pencil.
10	I feel this way becasue I score well on standardized tests.
12	Becasue I think I would know much more.
13	I feel this way because I study when I have tests.
	(9 total)

If you answered "somewhat worried" or "very worried" to question #14, why do you feel this way?	Response total
View	4
Total # of respondents **13**. Statistics based on **4** respondents **0** filtered; **9** skipped.	

If you answered "somewhat worried" or "very worried" to question #14, why do you feel this way?

#	Responses
	(4 total)
3	Because I be worried on if I will mess up.
4	Because you don't know what it's about or didn't study.
9	Because I always erase stuff and my answers get mixed up.
11	I feel this way because I might not get an A.

(4 total)



When I take tests on a computer I feel:	Response percent	Response total
Very confident	**38.5%**	5
Somewhat confident	**15.4%**	2
Somewhat worried	**30.8%**	4
Very worried	**15.4%**	2
Total # of respondents **13**. Statistics based on **13** respondents **0** filtered; **0** skipped.		

Answer question #18 or question #19, NOT BOTH

If you answered "very confident" or "somewhat confident" to question #17, why do you feel this way?	Response total
View	7
Total # of respondents **13**. Statistics based on **7** respondents **0** filtered; **6** skipped.	

If you answered "very confident" or "somewhat confident" to question #17, why do you feel this way?

#	Responses
	(7 total)
1	I'm very confident when I work on computer tests. I know that I am capable to do it.
2	I feel somewhat confident because I don't really know how the test will be.
3	The computer is better than pencil and paper.
5	Because I study.
6	Because I study.
7	Becasue the computer makes me feel confident.
11	Because I would know what I got wrong.

(7 total)

If you answered "somewhat worried" or "very worried" to question #17, why do you feel this way?	Response total
View	6
Total # of respondents **13**. Statistics based on **6** respondents **0** filtered; **7** skipped.	

If you answered "somewhat worried" or "very worried" to question #17, why do you feel this way?

#	Responses
	(6 total)
4	I worry about my score or how many questions there are.
8	Because I can't use electronics.
9	Becasue I don't know when the test is over!!
10	I feel this way because I analyze questions less when they're on a computer screen.
12	Because it is stressful and I feel nervous.
13	I feel very worried because I don't know what the test will be about.
	(6 total)

Figure C8. Urban School Grade 7 Survey Report: Section 4

Section 1: Computer Access

Do you currently have a computer at home?	Response percent	Response total
Yes	95.2%	20
No	4.8%	1
Total # of respondents **21**. Statistics based on **21** respondents	**0** filtered;	**0** skipped.

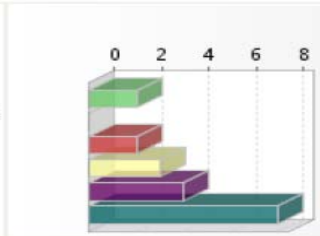
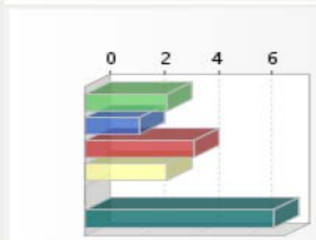
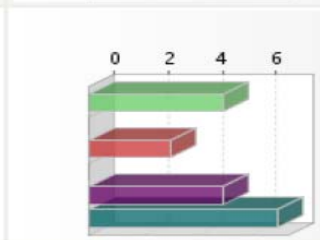
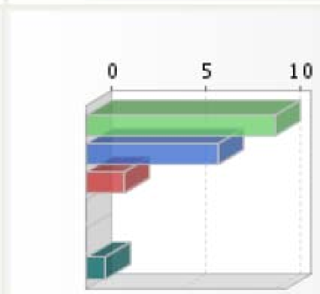
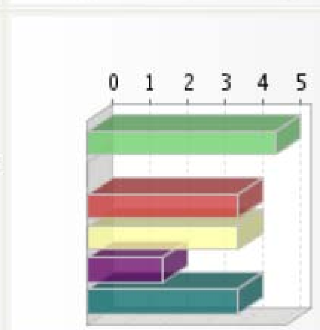
If you answered "YES" to question 1, is the computer...	Response percent	Response total
Your personal computer?	10%	2
Shared with siblings?	10%	2
Shared with the entire family?	80%	16
Total # of respondents **21**. Statistics based on **20** respondents	**0** filtered;	**1** skipped.

IF YOU ANSWERED "YES" TO QUESTION 1, LEAVE THIS QUESTION BLANK. Can you access a computer...	Response percent	Response total
At the neighborhood library?	50%	1
At church?	0%	0
At the home of a nearby friend or relative?	50%	1
At school?	0%	0
View Other	0%	0
Total # of respondents **21**. Statistics based on **2** respondents	**0** filtered;	**19** skipped.

Figure C9. Urban School Grade 8 Survey Report: Section 1

Section 2: Home & Community Computer Use

How often do you use computers at home, in your community, at a friend's or at a relative's...

View	Never	At least onece per semester	At least once per month	At least once per week	At least once per day	More than once per day	Never; At least onece per semester; At least once per month; At least once per week; At least once per day; More than once per day	Response total
to send or read email messages	10.5% (2)	0% (0)	10.5% (2)	15.8% (3)	21.1% (4)	42.1% (8)		19
to create webpages (includes MySpace and Facebook)	15.8% (3)	10.5% (2)	21.1% (4)	15.8% (3)	0% (0)	36.8% (7)		19
to listen to or download music files	25% (5)	0% (0)	15% (3)	0% (0)	25% (5)	35% (7)		20
to create graphs or charts	50% (10)	35% (7)	10% (2)	0% (0)	0% (0)	5% (1)		20
for other purposes	26.3% (5)	0% (0)	21.1% (4)	21.1% (4)	10.5% (2)	21.1% (4)		19

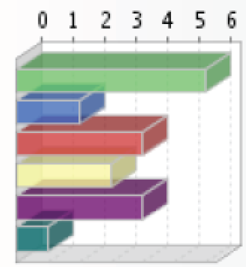
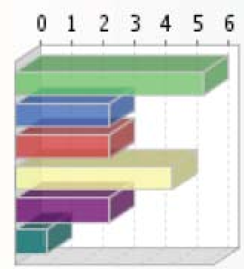
Total # of respondents **21**. Statistics based on **21** respondents **0** filtered; **0** skipped.

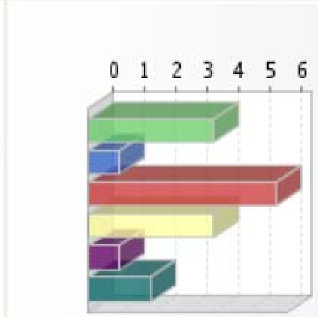
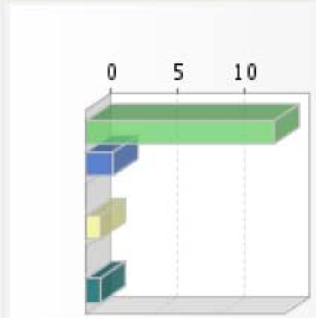
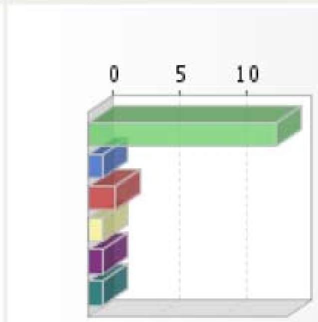
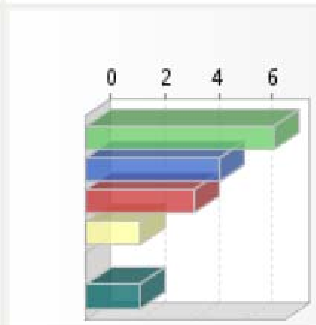
Last week, how many hours did you use a computer at home, in your community, at a friend's or at a relative's?	Response percent	Response total
I didn't use a computer	**14.3%**	3
0-1 hours	**14.3%**	3
1-3 hours	**23.8%**	5
4-6 hours	**4.8%**	1
More than 6 hours	**42.9%**	9
Total # of respondents **21**. Statistics based on **21** respondents	**0** filtered;	**0** skipped.

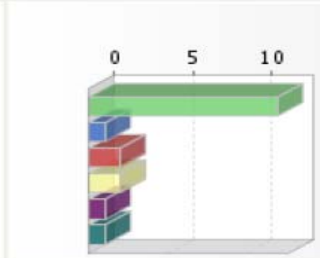
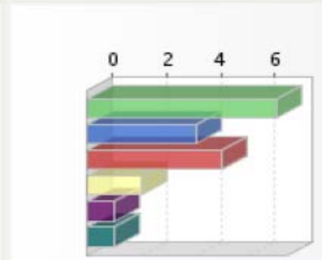
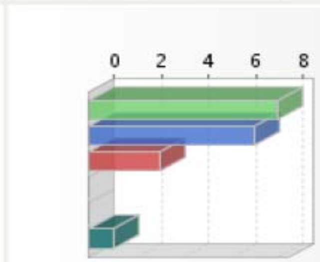
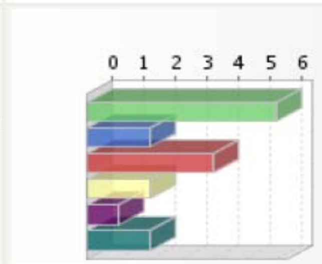
Figure C10. Urban School Grade 8 Survey Report: Section 2

Section 3: School Computer Use

How often do you use computers at school...

View	Never	At least onece per semester	At least once per month	At least once per week	At least once per day	More than once per day	Never At least onece per semester At least once per month At least once per week At least once per day More than once per day	Response total
to play games	30% (6)	10% (2)	20% (4)	15% (3)	20% (4)	5% (1)		20
to use a word processing program (i.e., MS Word)	28.6% (6)	14.3% (3)	14.3% (3)	23.8% (5)	14.3% (3)	4.8% (1)		21

to send or read email messages	22.2% (4)	5.6% (1)	33.3% (6)	22.2% (4)	5.6% (1)	11.1% (2)		18
to create webpages (includes MySpace and Facebook)	77.8% (14)	11.1% (2)	0% (0)	5.6% (1)	0% (0)	5.6% (1)		18
to listen to or download music files	70% (14)	5% (1)	10% (2)	5% (1)	5% (1)	5% (1)		20
to create graphs or charts	35% (7)	25% (5)	20% (4)	10% (2)	0% (0)	10% (2)		20

to send IM's (instant messages)	63.2% (12)	5.3% (1)	10.5% (2)	10.5% (2)	5.3% (1)	5.3% (1)		19
to use a spreadsheet program (i.e., MS Excel)	35% (7)	20% (4)	25% (5)	10% (2)	5% (1)	5% (1)		20
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Printshop, Pagemaker)	42.1% (8)	36.8% (7)	15.8% (3)	0% (0)	0% (0)	5.3% (1)		19
for other purposes	35.3% (6)	11.8% (2)	23.5% (4)	11.8% (2)	5.9% (1)	11.8% (2)		17

Total # of respondents **21**. Statistics based on **21** respondents **0** filtered; **0** skipped.

Last week, how many hours did you use a computer at school?		Response percent	Response total
I didn't use a computer		23.8%	5
0-1 hours		57.1%	12
1-3 hours		14.3%	3
4-6 hours		4.8%	1
More than 6 hours		0%	0

Total # of respondents **21**. Statistics based on **21** respondents **0** filtered; **0** skipped.

Figure C11. Urban School Grade 8 Survey Report: Section 3

Section 4: General Information

How would you rate your computer abilities?	Response percent	Response total
Extremely Poor	0%	0
Below Average	0%	0
Average	47.6%	10
Above Average	23.8%	5
Extremely Good	28.6%	6

Total # of respondents **21**. Statistics based on **21** respondents **0** filtered; **0** skipped.

What is your Gender?	Response percent	Response total
Male	61.9%	13
Female	38.1%	8

Total # of respondents **21**. Statistics based on **21** respondents **0** filtered; **0** skipped.

What is your grade level?	Response percent	Response total
6th Grade	0%	0
7th Grade	0%	0
8th Grade	100%	21

Total # of respondents **21**. Statistics based on **21** respondents **0** filtered; **0** skipped.

What is your Race/Ethnicity?	Response percent	Response total
African American	90.5%	19
Native American	0%	0
Hispanic	0%	0
Asian	0%	0
White, Non-Hispanic	0%	0
View Other	9.5%	2

Total # of respondents **21**. Statistics based on **21** respondents **0** filtered; **0** skipped.

Does your school participate in Michigan's free laptop program for 6th grade students?	Response percent	Response total
Yes	19%	4
No	19%	4
I don't know	61.9%	13

Total # of respondents **21**. Statistics based on **21** respondents **0** filtered; **0** skipped.

ONLY ANSWER THIS QUESTION IF YOU ANSWERED "YES" TO QUESTION #12; Did you receive a free laptop from your school in 6th grade?	Response percent	Response total
Yes	0%	0
No	100%	6

Total # of respondents **21**. Statistics based on **6** respondents **0** filtered; **15** skipped.

When I take pencil and paper tests, I feel...	Response percent	Response total
Very confident	23.8%	5
Somewhat confident	61.9%	13
Somewhat worried	14.3%	3
Very worried	0%	0

Total # of respondents **21**. Statistics based on **21** respondents **0** filtered; **0** skipped.

Answer question #15 or question #16, NOT BOTH

If you answered "very confident" or "somewhat confident" to question #14, why do you feel this way?	Response total
View	15

Total # of respondents **21**. Statistics based on **15** respondents **0** filtered; **6** skipped.

If you answered "very confident" or "somewhat confident" to question #14, why do you feel this way?

#	Responses
	(15 total)
1	I feel somewhat confident because I feel that my writing is not as good as it could be. Sometimes I get stressed while taking essays.
3	I know I'm going to pass.
4	Because I know I've learned alot and know alot, so I'm ready to use my knowledge.
5	I feel somewhat confident because pencil and paper tests make me a little nervous sometimes. I love to do tests verbally sometimes like spelling bees.
6	I feel this way because sometime I think I will sometimes pass or fail.
7	If you not confidetn you probably a low score grade.
9	Because if you going in for a test in you not confident you most likely to get a low grade.
10	I feel confident becuase I think I am going to do well.
11	I feel this way becasue I know that I'm going to pass the test or assignment.
13	Because I think I can do good.
14	Because I start to get nervous and everything I studied for just start scrambling up such as I write an answer down for the wrong question.
16	I feel this way because you can never be always confident while taking a test. You never no what material will be used.
17	Because I'm not sure of myself sometimes. They're sometimes easy though.
18	I feel very confident when taking pencil and paper tests because I can always goback and erase my mistakes and not so positive answers.
21	My answer was somewhat confident, I feel this way because I know I can do whatever I put my mind to do.

(15 total)

If you answered "somewhat worried" or "very worried" to question #14, why do you feel this way?	Response total
View	3
Total # of respondents **21**. Statistics based on **3** respondents **0** filtered; **18** skipped.	

If you answered "somewhat worried" or "very worried" to question #14, why do you feel this way?

#	Responses
	(3 total)
12	Because I don't always study.
15	I'm not very good on those test, a little to much writing.
20	Because I know that I can do the work if I put my mind to it but at the same time there's just a little doubt.

(3 total)

When I take tests on a computer I feel:	Response percent	Response total
Very confident	50%	9
Somewhat confident	22.2%	4
Somewhat worried	22.2%	4
Very worried	5.6%	1
Total # of respondents **21**. Statistics based on **18** respondents **0** filtered; **3** skipped.		

Answer question #18 or question #19, NOT BOTH

If you answered "very confident" or "somewhat confident" to question #17, why do you feel this way?	Response total
View	10
Total # of respondents **21**. Statistics based on **10** respondents **0** filtered; **11** skipped.	

If you answered "very confident" or "somewhat confident" to question #17, why do you feel this way?

#	Responses
	(10 total)
3	Because I will be able to focus more and I will have more time.
4	Because I'm better with using a computer than a pencil or pen.
5	I don't know why I feel this way.
7	I feel very confident because I know what I have to do to get a good score.
11	I feel confident because I know that the test is going to be easy or in the middle.
14	Because computer test all you really have to do is click the box which is really easy.
15	I feel that way because I love computers and I feel better using it.
16	I feel very confident because it seems more relaxing when I'm doing it with for fulfilling fun.
18	I feel this way because I'm not actually worried but I'm not very confident either.
21	As I mentioned earlier, I know what I put my mind to I can do.

(10 total)

If you answered "somewhat worried" or "very worried" to question #17, why do you feel this way?	Response total
View	5
Total # of respondents **21**. Statistics based on **5** respondents **0** filtered; **16** skipped.	

If you answered "somewhat worried" or "very worried" to question #17, why do you feel this way?

#	Responses
	(5 total)
1	I feel somewhat worried because on certain tests on the computer you are not able to go back and change your answer.
10	I feel this way becasue I didn't do good on my test on the computer.
13	Because it is a funny feeling in my body.
17	I'll never know how hard or challenging it is by technology.
19	Why I would feel somewhat worried because I don't know what I'm going to get on my test.

(5 total)

Figure C12. Urban School Grade 8 Survey Report: Section 4

APPENDIX D: OBSERVATION DATA-CROSS CASE: GRADES 6 & 7

Observation Data – Cross Case: Grades 6 & 7

The Physical Setting			
Age of Computers/Condition			
Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
The computers were 4 to 6 years in age. All computers were IBM Desktops with flat screen monitors.	Staff reported that computers were three months old. All computers were loaded with current XP operating system with flat screen monitors. Acer models.	The computers were 4 to 6 years in age. All computers were IBM Desktops with flat screen monitors.	Staff reported that computers were three months old. All computers were loaded with current XP operating system with flat screen monitors. Acer models.
Computer/Student Ratio			
Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
Computer to student ratio was 1 to 1. No computers were shared.	Computer ratio was 1:1	Computer to student ratio was 1 to 1. No computers were shared.	Computer ratio was 1:1
Physical Environment			
Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
Several of the computer carts in the middle of the room were in need of minor repairs. The room was separately climate controlled. Room seemed overly cool. However, the majority of students wore blue "hoodies" with the	Computer lab was larger than most computer labs. The room was fully carpeted with adequate artificial lighting. The lighting in the room is boosted by the large amount of natural light that emanates from the 8 large windows in the room. The	The room was separately climate controlled. Room seemed overly cool. However, the majority of students wore blue "hoodies" with the school logo. Room dimension was 26 x 26. Walls were beige, carpet was brown, computers were black and	Computer lab was larger than most computer labs. The room was fully carpeted with adequate artificial lighting. The lighting in the room is boosted by the large amount of natural light that emanates from the 8 large windows in the room. The

school logo. Room dimension was 26 x 26. Walls were beige, carpet was brown, computers were black and chairs were blue. Room included two teacher desks one in the SW corner and one in the SE corner. Lights were off in 1/3 of room.	tables used for the computers were not computer tables but rather fold down tables. Tables were too high for a few of the shorter 6th grade students. Room was hot and several large fans were going. Staff stated that fans were used to muffle hallway noise. Chairs were traditional hard plastic.	chairs were blue. Room included two teacher desks one in the SW corner and one in the SE corner. Lights were off in 1/3 of room.	tables used for the computers were not computer tables but rather fold down tables. Tables were too high for a few of the shorter 6th grade students. Room was hot and several large fans were going. Staff stated that fans were used to muffle hallway noise. Chairs were traditional hard plastic.

The Participants

Gender Differences/Majority

Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
28 total students participated in the testing, 15 female and 13 male.	32 students total. 19 female and 13 male. (large class was broken down into two sessions: 8 males and 8 females; 11 females and 5 males)	29 total students participated in the testing, 20 female and 9 male.	14 female and 8 male

Who Is In The Scene (How many? Roles?)

Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
In addition to the 28 students, two teachers were present – the 6th grade ELA teacher and the computer	3 Staff Members: 6th Grade Teacher, Tech. Director, Testing Coordinator.	In addition to the 29 students, two teachers were present – the 7th grade ELA teacher and the computer	3 Staff Members: 7th Grade Teacher, Tech. Director, Testing Coordinator.

lab teacher.	lab teacher.

Relevant Characteristics of the Participants			
Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
All 28 of the students were "European American".	12 African American males, 18 African American females, 1 Latino American female and 1 European American male)	28 of the 29 students were "European American" and 1 student was African American.	All students were African American. 14 female and 8 male.

Activities and Interactions

Keyboarding Ability			
Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
N/A as all entries were completed via mouse click.	Primarily point and click. Keyboarding was not an issue.	N/A as all entries were completed via mouse click.	Primarily point and click. Keyboarding was not an issue.

Number of Requests for Assistance (Race)			
Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
2 requests for assistance occurred during observation period. Both students were European American.	14 requests for assistance by African American Students. 1 request for assistance by European American student.	1 request for assistance occurred during observation period. Student was a European American male.	6 requests for assistance. All African American.

Number of Requests for Assistance (Gender)			
Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
2 requests for assistance occurred during observation period. One student was a European American male and the other was a European	15 total requests. 8 female request and 7 male requests.	1 request for assistance occurred during observation period. Student was a white male.	5 requests for assistance by female students and 1 by male students.

American female.

Interaction with Activity and Others			
Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
Majority of kids were sitting upright and seemed very focused. Some of the smaller six grade students were not at eye level with the computer and had to look up at an angle to view the screen.	2 students had severe sniffles. Several students physically pointed to and touched the screen as if it were paper – 11 instances. All students used scrap paper. Student used computer highlighter tool to re-read story problem. Students who completed early were given individual assignments so as not to disturb others. Several students scrolled the text with the mouse wheel. Reading speed of these students seemed slow based on cursor speed. When reading longer passages,	Prior to testing, the computer teacher provided extensive instructions regarding: 1) ways to spoil the test; 2) what to do when finished; 3) how to refresh screen (if necessary). Majority of kids were sitting upright and seemed very focused. Girls seemed more attentive than boys in general.	Several students physically pointed to and touched the screen as if it were paper – 11 instances. All students used scrap paper. Students who completed early were given individual assignments so as not to disturb others. When reading longer passages, students tended to move closer to the screen. Several students visibly tired (yawning, etc.)

	students tended to move closer to the screen. Several students visibly tired Several students had tendency to lay head on hand while reading.		

Conversations			
Content of Conversations			
Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
Unable to determine nature of student request.	Majority of conversations centered on password retrieval and functionality questions.	Student requested assistance because screen went black. Teacher quickly assisted student.	

Number of Computer Functionality Questions			
Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
Two students (one European American female and one European American male) had computer functionality questions.	14 computer functionality questions.	One student (European American male) had a computer functionality question when his screen went black.	3 computer functionality questions.

Subtle Factors			
Instances of Visible Frustration			
Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7

Three instances of frustration occurred. Two of the students were the same as those listed above with computer functionality questions.	8 instances of visible frustration. In one instance, student, out of frustration, skipped question and in another instance, student was distracted by hallway noise.	One instance of visible frustration when student's screen went black.	9 instances of visible frustration. 7 female and 2 male.

Instances of Daydreaming and Other Off-Task Behaviors			
Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
6 instances of daydreaming and other off-task behavior occurred, 5 girls and 1 boy.	29 instances of daydreaming and other off task behaviors.	5 instances of daydreaming and other off-task behavior occurred, 4 girls and 1 boy.	9 instances of daydreaming and other off-task behaviors.

Informal and Unplanned Activities (i.e., entrants, class passing, PA, other students)			
Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
The computer lab was adjacent to an ESL classroom. The class was involved in some sort of language activity that required verbal interaction. One phone call came into the room near the end of testing. However, when the phone rang,	During the course of the session, two staff persons entered the room, two students entered the room (one left and slammed the door though not on purpose), one phone call came in on classroom phone, middle school passed to lunch.	The computer lab was adjacent to an ESL classroom. As is the case with most language courses, a good amount of verbal activity took place. After completing the test, teacher had to inform students on three occasions that they could not leave	Computer tech. entered after testing was started. One student entered late. School-wide PA announcement during testing.

only two students remained.		until the bell sounded.	

Observer Behavior

Observer Affect on the Scene

Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
Observer was introduced at the start of class.	Observer was introduced at the start of class.	Observer was introduced at the start of class.	Observer was introduced at the start of class.

Observer Comments and Actions

Suburban School Grade 6	Urban School Grade 6	Suburban School Grade 7	Urban School Grade 7
Observer simply stated hello	Observer simply greeted the students and thanked them for participating in the study.	Observer simply stated hello and thank students for participating.	Observer simply greeted the students and thanked them for participating in the study.

APPENDIX E: *SURVEY DATA – CROSS CASE: GRADES 6, 7 AND 8*

Section 1: Computer Access

Q1	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Do you currently have a computer at home?	Response percent	Response percent	Response percent	Response percent	Response percent	Response percent
Yes	78.95%	100.00%	76.92%	100.00%	95.24%	100.00%
No	21.05%	0.00%	23.08%	0.00%	4.76%	0.00%

Q2	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
If you answered "YES" to question 1, is the computer...	Response percent	Response percent	Response percent	Response percent	Response percent	Response percent
Your personal computer?	0.00%	0.00%	20.00%	19.05%	10.00%	24.00%
Shared with siblings?	26.67%	36.36%	10.00%	9.52%	10.00%	

						20.00%
Shared with the entire family?	73.33%	63.64%	70.00%	71.43%	80.00%	56.00%

Q3	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
IF YOU ANSWERED "YES" TO QUESTION 1, LEAVE THIS QUESTION BLANK. Can you access a computer...	Response percent	Response percent	Response percent	Response percent	Response percent	Response percent
At the neighborhood library?	25.00%	0.00%	0.00%	0.00%	50.00%	0.00%
At church?	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
At the home of a nearby friend or relative?	25.00%	80.00%	33.33%	100.00%	50.00%	66.67%
At school?	50.00%	0.00%	66.67%	0.00%	0.00%	33.33%
Other	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%

Section 2: Home & Community Computer Use

Q5						
How often do you use computers at home, in your community, at a friend's or at a relative's...	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Response percent	1. Never	1. Never	1. Never	1. Never	1. Never	1. Never
to play games	5.00%	0.00%	0.00%	19.05%	5.00%	0.00%
to use a word processing program (i.e., MS Word)	36.84%	20.00%	69.23%	19.05%	20.00%	4.55%
to send or read email messages	10.53%	38.10%	15.38%	5.26%	10.53%	8.33%
to create WebPages (includes MySpace and Face book)	26.32%	70.00%	7.69%	52.38%	15.79%	40.91%
to listen to or download music files	0.00%	9.52%	15.38%	4.76%	25.00%	8.33%
to create graphs or charts	60.00%	30.00%	76.92%	28.57%	50.00%	34.78%
to send IM's (instant messages)	66.67%	28.57%	69.23%	9.52%	27.78%	17.39%
to use a spreadsheet program (i.e., MS Excel)	73.68%	52.38%	46.15%	60.00%	45.00%	26.09%

to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Print shop, PageMaker)	52.94%	42.11%	58.33%	52.63%	42.11%	44.44%
for other purposes	13.33%	33.33%	36.36%	22.22%	26.32%	35.29%
	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Response percent	2. At least once per semester	2. At least once per semester	2. At least once per semester	2. At least once per semester	2. At least once per semester	2. At least once per semester
to play games	15.00%	14.29%	7.69%	9.52%	0.00%	8.00%
to use a word processing program (i.e., MS Word)	26.32%	25.00%	15.38%	14.29%	25.00%	9.09%
to send or read email messages	15.79%	9.52%	7.69%	5.26%	0.00%	0.00%
to create WebPages (includes MySpace and Face book)	21.05%	5.00%	7.69%	9.52%	10.53%	4.55%
to listen to or download music files	15.00%	9.52%	23.08%	14.29%	0.00%	0.00%
to create graphs or charts	20.00%	45.00%	23.08%	33.33%	35.00%	26.09%
to send IM's (instant messages)	11.11%	0.00%	7.69%	0.00%	5.56%	8.70%
to use a spreadsheet program (i.e., MS Excel)	21.05%	33.33%	30.77%	30.00%	35.00%	26.09%
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Print shop, PageMaker)	23.53%	21.05%	8.33%	21.05%	15.79%	16.67%
for other purposes	20.00%	16.67%	9.09%	11.11%	0.00%	5.88%
	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Response percent	3. At least once per month	3. At least once per month	3. At least once per month	3. At least once per month	3. At least once per month	3. At least once per month
to play games	10.00%	19.05%	23.08%	14.29%	25.00%	16.00%
to use a word processing program (i.e., MS Word)	5.26%	20.00%	7.69%	47.62%	20.00%	27.27%
to send or read email messages	10.53%	4.76%	15.38%	15.79%	10.53%	12.50%
to create WebPages (includes MySpace and Face book)	15.79%	0.00%	23.08%	9.52%	21.05%	0.00%
to listen to or download music files	15.00%	28.57%	0.00%	23.81%	15.00%	16.67%
to create graphs or charts	10.00%	15.00%	0.00%	28.57%	10.00%	30.43%
to send IM's	11.11%	4.76%	15.38%	4.76%	16.67%	

(instant messages)						4.35%
to use a spreadsheet program (i.e., MS Excel)	5.26%	4.76%	23.08%	5.00%	0.00%	17.39%
to use a software program to create fliers, signs, brochures, greeting cards, etc.	0.00%	31.58%	33.33%	15.79%	21.05%	11.11%
for other purposes	13.33%	16.67%	9.09%	33.33%	21.05%	0.00%
	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Response percent	4. At least once per week	4. At least once per week	4. At least once per week	4. At least once per week	4. At least once per week	4. At least once per week
to play games	20.00%	33.33%	30.77%	23.81%	45.00%	32.00%
to use a word processing program (i.e., MS Word)	5.26%	25.00%	7.69%	14.29%	20.00%	36.36%
to send or read email messages	21.05%	19.05%	7.69%	31.58%	15.79%	29.17%
to create WebPages (includes MySpace and Face book)	15.79%	10.00%	15.38%	9.52%	15.79%	9.09%
to listen to or download music files	20.00%	9.52%	7.69%	14.29%	0.00%	12.50%
to create graphs or charts	0.00%	0.00%	0.00%	9.52%	0.00%	0.00%
to send IM's (instant messages)	5.56%	19.05%	7.69%	14.29%	11.11%	4.35%
to use a spreadsheet program (i.e., MS Excel)	0.00%	4.76%	0.00%	5.00%	10.00%	17.39%
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Print shop, PageMaker)	11.76%	5.26%	0.00%	5.26%	5.26%	11.11%
for other purposes	0.00%	27.78%	0.00%	11.11%	21.05%	5.88%
	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Response percent	5. At least once per day	5. At least once per day	5. At least once per day	5. At least once per day	5. At least once per day	5. At least once per day
to play games	25.00%	23.81%	30.77%	19.05%	20.00%	28.00%
to use a word processing program (i.e., MS Word)	21.05%	5.00%	0.00%	4.76%	10.00%	4.55%
to send or read email messages	15.79%	14.29%	30.77%	10.53%	21.05%	29.17%
to create WebPages (includes MySpace and Face book)	5.26%	0.00%	38.46%	14.29%	0.00%	18.18%
to listen to or	10.00%	23.81%	30.77%	19.05%	25.00%	20.83%

download music files						
to create graphs or charts	5.00%	10.00%	0.00%	0.00%	0.00%	8.70%
to send IM's (instant messages)	0.00%	0.00%	0.00%	23.81%	16.67%	13.04%
to use a spreadsheet program (i.e., MS Excel)	0.00%	4.76%	0.00%	0.00%	5.00%	4.35%
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Print shop, PageMaker)	0.00%	0.00%	0.00%	5.26%	15.79%	5.56%
for other purposes	6.67%	5.56%	27.27%	11.11%	10.53%	23.53%

	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Response percent	6. More than once per day	6. More than once per day	6. More than once per day	6. More than once per day	6. More than once per day	6. More than once per day
to play games	25.00%	9.52%	7.69%	14.29%	5.00%	16.00%
to use a word processing program (i.e., MS Word)	5.26%	5.00%	0.00%	0.00%	5.00%	18.18%
to send or read email messages	26.32%	14.29%	23.08%	31.58%	42.11%	20.83%
to create WebPages (includes MySpace and Face book)	15.79%	15.00%	7.69%	4.76%	36.84%	27.27%
to listen to or download music files	40.00%	19.05%	23.08%	23.81%	35.00%	41.67%
to create graphs or charts	5.00%	0.00%	0.00%	0.00%	5.00%	0.00%
to send IM's (instant messages)	5.56%	47.62%	0.00%	47.62%	22.22%	52.17%
to use a spreadsheet program (i.e., MS Excel)	0.00%	0.00%	0.00%	0.00%	5.00%	8.70%
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Print shop, PageMaker)	11.76%	0.00%	0.00%	0.00%	0.00%	11.11%
for other purposes	46.67%	0.00%	18.18%	11.11%	21.05%	29.41%

Q6	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Last week, how many hours did you use a computer at home, in your	Response percent	Response percent	Response percent	Response percent	Response percent	Response percent

community, at a friend's or at a relative's?						
I didn't use a computer	26.32%	9.52%	53.85%	0.00%	14.29%	0.00%
0-1 hours	21.05%	28.57%	0.00%	9.52%	14.29%	24.00%
1-3 hours	21.05%	33.33%	30.77%	42.86%	23.81%	24.00%
4-6 hours	15.79%	4.76%	7.69%	38.10%	4.76%	24.00%
More than 6 hours	15.79%	23.81%	7.69%	9.52%	42.86%	28.00%

Section 3: School Computer Use

Q7	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
How often do you use computers at school...wrong punctuation						
Response percent	1. Never	1. Never	1. Never	1. Never	1. Never	1. Never
to play games	10.00%	28.57%	15.38%	47.37%	30.00%	16.67%
to use a word processing program (i.e., MS Word)	36.84%	23.81%	46.15%	23.53%	28.57%	4.76%
to send or read email messages	33.33%	71.43%	53.85%	35.00%	22.22%	25.00%
to create WebPages (includes MySpace and Face book)	38.89%	90.48%	53.85%	90.00%	77.78%	69.57%
to listen to or download music files	35.00%	76.19%	69.23%	100.00%	70.00%	83.33%
to create graphs or charts	52.63%	28.57%	61.54%	20.00%	35.00%	20.83%
to send IM's (instant messages)	66.67%	38.10%	66.67%	15.00%	63.16%	40.91%
to use a spreadsheet program (i.e., MS Excel)	50.00%	50.00%	53.85%	55.00%	35.00%	13.64%
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Print shop, PageMaker)	55.00%	71.43%	76.92%	57.14%	42.11%	60.87%
for other purposes	22.22%	47.37%	41.67%	47.62%	35.29%	45.45%

	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Response percent	2. At least once per semester	2. At least once per semester	2. At least once per semester	2. At least once per semester	2. At least once per semester	2. At least once per semester
to play games	10.00%	42.86%	7.69%	42.11%	10.00%	8.33%
to use a word processing program (i.e., MS Word)	10.53%	42.86%	23.08%	35.29%	14.29%	9.52%
to send or read	11.11%	14.29%	15.38%	50.00%	5.56%	12.50%

email messages						
to create WebPages (includes MySpace and Face book)	0.00%	4.76%	23.08%	5.00%	11.11%	8.70%
to listen to or download music files	10.00%	9.52%	15.38%	0.00%	5.00%	0.00%
to create graphs or charts	5.26%	47.62%	30.77%	50.00%	25.00%	4.17%
to send IM's (instant messages)	0.00%	47.62%	8.33%	55.00%	5.26%	9.09%
to use a spreadsheet program (i.e., MS Excel)	22.22%	40.91%	30.77%	30.00%	20.00%	4.55%
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Print shop, PageMaker)	25.00%	23.81%	7.69%	28.57%	36.84%	13.04%
for other purposes	22.22%	31.58%	25.00%	28.57%	11.76%	4.55%
	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Response percent	3. At least once per month	3. At least once per month	3. At least once per month	3. At least once per month	3. At least once per month	3. At least once per month
to play games	20.00%	9.52%	7.69%	5.26%	20.00%	4.17%
to use a word processing program (i.e., MS Word)	10.53%	19.05%	15.38%	29.41%	14.29%	9.52%
to send or read email messages	0.00%	14.29%	7.69%	15.00%	33.33%	12.50%
to create WebPages (includes MySpace and Face book)	5.56%	0.00%	7.69%	5.00%	0.00%	0.00%
to listen to or download music files	5.00%	9.52%	0.00%	0.00%	10.00%	0.00%
to create graphs or charts	15.79%	14.29%	7.69%	20.00%	20.00%	4.17%
to send IM's (instant messages)	0.00%	9.52%	8.33%	25.00%	10.53%	0.00%
to use a spreadsheet program (i.e., MS Excel)	11.11%	4.55%	7.69%	5.00%	25.00%	4.55%
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Print shop, PageMaker)	5.00%	4.76%	7.69%	4.76%	15.79%	13.04%
for other purposes	16.67%	15.79%	8.33%	14.29%	23.53%	13.64%
	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Response percent	4. At least once per week	4. At least once per week	4. At least once per week	4. At least once per week	4. At least once per week	4. At least once per week
to play games	20.00%	9.52%	30.77%	5.26%	15.00%	41.67%

to use a word processing program (i.e., MS Word)	15.79%	0.00%	7.69%	0.00%	23.81%	14.29%
to send or read email messages	22.22%	0.00%	15.38%	0.00%	22.22%	25.00%
to create WebPages (includes MySpace and Face book)	22.22%	0.00%	7.69%	0.00%	5.56%	8.70%
to listen to or download music files	20.00%	0.00%	0.00%	0.00%	5.00%	0.00%
to create graphs or charts	10.53%	4.76%	0.00%	0.00%	10.00%	41.67%
to send IM's (instant messages)	11.11%	0.00%	8.33%	5.00%	10.53%	4.55%
to use a spreadsheet program (i.e., MS Excel)	5.56%	0.00%	0.00%	5.00%	10.00%	22.73%
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Print shop, PageMaker)	5.00%	0.00%	0.00%	9.52%	0.00%	8.70%
for other purposes	0.00%	5.26%	0.00%	4.76%	11.76%	4.55%
	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Response percent	5. At least once per day	5. At least once per day	5. At least once per day	5. At least once per day	5. At least once per day	5. At least once per day
to play games	20.00%	4.76%	23.08%	0.00%	20.00%	25.00%
to use a word processing program (i.e., MS Word)	15.79%	9.52%	7.69%	11.76%	14.29%	42.86%
to send or read email messages	11.11%	0.00%	7.69%	0.00%	5.56%	20.83%
to create WebPages (includes MySpace and Face book)	5.56%	0.00%	7.69%	0.00%	0.00%	0.00%
to listen to or download music files	15.00%	4.76%	15.38%	0.00%	5.00%	12.50%
to create graphs or charts	5.26%	4.76%	0.00%	10.00%	0.00%	29.17%
to send IM's (instant messages)	5.56%	0.00%	8.33%	0.00%	5.26%	31.82%
to use a spreadsheet program (i.e., MS Excel)	5.56%	4.55%	7.69%	5.00%	5.00%	36.36%
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Print shop, PageMaker)	0.00%	0.00%	7.69%	0.00%	0.00%	4.35%
for other purposes	5.56%	0.00%	25.00%	4.76%	5.88%	22.73%
	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8

Response percent	6. More than once per day	6. More than once per day	6. More than once per day	6. More than once per day	6. More than once per day	6. More than once per day
to play games	20.00%	4.76%	15.38%	0.00%	5.00%	4.17%
to use a word processing program (i.e., MS Word)	10.53%	4.76%	0.00%	0.00%	4.76%	19.05%
to send or read email messages	22.22%	0.00%	0.00%	0.00%	11.11%	4.17%
to create WebPages (includes MySpace and Face book)	27.78%	4.76%	0.00%	0.00%	5.56%	13.04%
to listen to or download music files	15.00%	0.00%	0.00%	0.00%	5.00%	4.17%
to create graphs or charts	10.53%	0.00%	0.00%	0.00%	10.00%	0.00%
to send IM's (instant messages)	16.67%	4.76%	0.00%	0.00%	5.26%	13.64%
to use a spreadsheet program (i.e., MS Excel)	5.56%	0.00%	0.00%	0.00%	5.00%	18.18%
to use a software program to create fliers, signs, brochures, greeting cards, etc. (e.g., Print shop, PageMaker)	10.00%	0.00%	0.00%	0.00%	5.26%	0.00%
for other purposes	33.33%	0.00%	0.00%	0.00%	11.76%	9.09%

Q8	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Last week, how many hours did you use a computer at school?	Response percent	Response percent	Response percent	Response percent	Response percent	Response percent
I didn't use a computer	45.00%	72.73%	84.62%	76.19%	23.81%	0.00%
0-1 hours	30.00%	9.09%	0.00%	14.29%	57.14%	48.00%
1-3 hours	15.00%	18.18%	7.69%	4.76%	14.29%	4.00%
4-6 hours	5.00%	0.00%	7.69%	4.76%	4.76%	48.00%
More than 6 hours	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Section 4: General Information

Q9	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
How would you rate your computer abilities?	Response percent	Response percent	Response percent	Response percent	Response percent	Response percent
Extremely Poor	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Below Average	0.00%	0.00%	7.69%	4.76%	0.00%	4.00%
Average	50.00%	36.36%	46.15%	38.10%	47.62%	40.00%
Above Average	20.00%	36.36%	30.77%	38.10%	23.81%	36.00%
Extremely Good	30.00%	27.27%	15.38%	19.05%	28.57%	20.00%

Q10	Urban	Suburban	Urban	Suburban	Urban	Suburban

	Grade 6	Grade 6	Grade 7	Grade 7	Grade 8	Grade 8
What is your Gender?	Response percent	Response percent	Response percent	Response percent	Response percent	Response percent
Male	36.84%	45.45%	7.69%	30.00%	61.90%	48.00%
Female	63.16%	54.55%	92.31%	70.00%	38.10%	52.00%

Q11	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
What is your Race/Ethnicity?	Response percent	Response percent	Response percent	Response percent	Response percent	Response percent
African American	75.00%	0.00%	92.31%	4.76%	90.48%	4.00%
Native American	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Latino American	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Asian American	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
European American, Non-Latino American	5.00%	100.00%	0.00%	95.24%	0.00%	96.00%
Other	10.00%	0.00%	7.69%	0.00%	9.52%	0.00%

Q12	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
Does your school participate in Michigan's free laptop program for 6th grade students?	Response percent	Response percent	Response percent	Response percent	Response percent	Response percent
Yes	75.00%	0.00%	23.08%	0.00%	19.05%	0.00%
No	5.00%	28.57%	0.00%	19.05%	19.05%	52.00%
I don't know	20.00%	71.43%	76.92%	80.95%	61.90%	48.00%

Q13	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
ONLY ANSWER THIS QUESTION IF YOU ANSWERED "YES" TO QUESTION #12; Did you receive a free laptop from your school in 6th grade?	Response percent	Response percent	Response percent	Response percent	Response percent	Response percent
Yes	33.33%	0.00%	75.00%	0.00%	0.00%	0.00%
No	66.67%	100.00%	25.00%	100.00%	100.00%	100.00%

Q14	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
When I take pencil and paper tests, I feel...	Response percent	Response percent	Response percent	Response percent	Response percent	Response percent
Very confident	60.00%	18.18%	53.85%	25.00%	23.81%	32.00%

Somewhat confident	25.00%	50.00%	15.38%	40.00%	61.90%	40.00%
Somewhat worried	10.00%	22.73%	30.77%	30.00%	14.29%	24.00%
Very worried	5.00%	9.09%	0.00%	5.00%	0.00%	4.00%

Answer question #15 or question #16, NOT BOTH

Q15	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
If you answered "very confident" or "somewhat confident" to question #14, why do you feel this way?	Because I always study for tests	I feel that I can go back and erase very easily	Because I am. But even though I might not have a pencil and paper, I'm still very confident.	Because these tests are about things that we have learned and after the, teacher corrects our mistakes.	I feel somewhat confident because I feel that my writing is not as good as it could be. Sometimes I get stressed while taking essays.	Because I study most of the time, I can erase wrong answers.
	Because I am not scared to take a test.	I feel very confident because I've studied and I know what I have to.	I feel this way because as long as I study, I should be alright. But the reason I'm somewhat is because I might forget some stuff.	I feel this way because I study a lot and take every chance I get to study more.	I know I'm going to pass.	For test, I study so I pretty much know what I'm looking at. But if it's surprised, I don't freak out, I'm confident I'll do good.
	I feel this way because there is no stress.	Because I want to do good and I get this way because I get nervous because I think I am going to do bad.	Because I studied.	Because I study very hard, do what I am told and things in school usually come very naturally to me.	Because I know I've learned a lot and know a lot, so I'm ready to use my knowledge.	I feel this way because I don't know if I know all the answers to the questions It also depends on the subject.
	Because when I study, some stuff pops out of my head.	I feel like I know most of the answers	Because I study.	Because I get scared if it's going to be hard and fail it	I feel somewhat confident because pencil and paper tests make me a little nervous sometimes. I love to do tests verbally sometimes like spelling bees.	I feel this way because it makes me feel ready for any test.

	Because I study.	I feel that way because if I were to make a mistake I could go back and fix it.	Because I just feel confident in what I do.	I feel that I may not have studied the right material.	I feel this way because sometime I think I will sometimes pass or fail.	Because I think I am very smart and I do well on test.
	I feel this way because if I think negative things, negative things might happen.	I feel that way because I know I can do it, I know I studied for the test.	Because I use a pencil.	I feel that way because I study very well for tests. I take up most of my day just studying for my tests because education is important to me.	If you not confident you probably a low score grade.	Why because I feel I will forget what I learned.
	I feel a little worried sometime.	I feel this way because I have studied and I know this stuff on the test.	I feel this way because I score well on standardized tests.	I study for like 20 minutes not that long	Because if you going in for a test in you not confident you most likely to get a low grade.	Because with a pencil I control exactly what I'm writing, and I can't be accused of cheating.
	Because I study.	I feel that way because I always study for my tests and quizzes.		Because the night before I would of already studied for the test. (reviewed)	I feel confident because I think I am going to do well.	I feel that way because I don't know if I studied enough to know the answers.
	Because I study very good at all times.		Because I think I would know much more.	I feel somewhat confident because you can't really be sure you'll do well on a test, even if you studied the night before.	I feel this way because I know that I'm going to pass the test or assignment.	Because I feel confident on what I write. Since I know what I want to write on paper. I can get the info from my head down n paper.
	Because I know I learned it.	I feel somewhat confident because I studied and maybe I know it very well to answer	I feel this way because I study when I have tests.	I answered "somewhat" confident to # 14, because I know that I studied well for the test.	Because I think I can do good.	Because I enjoy writing, and feel that I should continue to practice writing with pencil and paper, while not becoming accustomed to the computer.
	Because it was so easy.	Well sometimes I might not know what to write and hope to get a good grade.		I feel this way, because I know that I can always look back to	Because I start to get nervous and everything	I'm always prepared for it. I don't get scared about tests if I know

				review and to check my mistakes.	I studied for just start scrambling up such as I write an answer down for the wrong question.	that I'm ready for it.
	I feel very confident because I know I study and I know.	I feel this way because I'm confident and study and listen to the teacher.		I feel confident because I study for every test. I take time and study for 20-60 minutes.	I feel this way because you can never be always confident while taking a test. You never no what material will be used.	Because if it was a test and I studied for it, I would know I would be receiving a good grade but I would also feel somewhat nervous.
	I feel very confident.	I feel this way because I know I am going to do good on it and I study for it.		Because I studied for that test, but I forget or don't know the answer for 2 or more questions.	Because I'm not sure of myself sometimes. They're sometimes easy though.	I study very hard.
	Because I know I am doing my best.	I feel this way because most of the time I get good grades		Because I'm used to pencil and paper and I very rarely use computers to take a test.	I feel very confident when taking pencil and paper tests because I can always go back and erase my mistakes and not so positive answers.	Because I tend to forget some of the material
	I feel this way because I am very smart and I don't have to worry about anything.	I feel this way because I think I'm a very good writer when I put my mind to it and others have told me I'm a good writer.			My answer was somewhat confident, I feel this way because I know I can do whatever I put my mind to do.	Because I don't want to now test score.
	I want to feel confident that I will pass the test. I wouldn't want to be stressed when I take the test.	When I feel confident because I studied well.				I feel this way because sometimes I understand things better and I am more confident, but

						sometimes I am not 100% sure so I am not very confident.
		I feel this way because I feel like I'm going to mess up or fail.				Because I always study and I always get good grades.
						I don't feel like I have to hide something.

Q16	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
If you answered "somewhat worried" or "very worried" to question #14, why do you feel this way?			Because I be worried on if I will mess up.	I am afraid to spell a word wrong or break my pencil.	Because I don't always study.	Because even if I have studied I'm not sure that I will get everything right.
	Sometime I don't come to school. Sometime I don't study for it or don't get it.	That I would not know the answer and get something for it bad.	Because you don't know what it's about or didn't study.	Because I don't know if I studied enough or what grade I'll get.	I'm not very good on those test, a little to much writing.	Because you don't know what grade I am going to get.
	I don't know.	Some how I don't feel comfortable with handwriting	Because I always erase stuff and my answers get mixed up.	I feel this way because you have to study harder and you would need to write a lot unlike computer tests, which are easy to take.	Because I know that I can do the work if I put my mind to it but at the same time there's just a little doubt.	Because I am worried a bout my grade also I'm worried if I have everything right.
	I didn't study.	Because sometimes I'm not good at tests.	I feel this way because I might not get an A.	I feel this way because pencil and paper test are hard.		I feel this way because I always get worried on test, I get stressed fast
		I do not like to take tests on the computer.		I feel that way because I want to get a good grade. Because I am not sure if I wrote and chose everything correctly.		I feel this way because I am always in doubt of what I'm going to get and what my parents are going to think.
		Because I am worried about my grade, and scared.		I feel somewhat worried because I am nervous. Sometimes I think I could have studied		Because I'm not sure if it is right.

				more than how much I did.		

Q17	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
When I take tests on a computer I feel:	Response percent	Response percent	Response percent	Response percent	Response percent	Response percent
Very confident	47.37%	35.00%	38.46%	20.00%	50.00%	44.00%
Somewhat confident	21.05%	35.00%	15.38%	55.00%	22.22%	32.00%
Somewhat worried	31.58%	20.00%	30.77%	25.00%	22.22%	20.00%
Very worried	0.00%	10.00%	15.38%	0.00%	5.56%	4.00%

Answer question #18 or question #19, NOT BOTH

Q18	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
If you answered "very confident" or "somewhat confident" to question #17, why do you feel this way?	Because I know that I am confident in myself so I am very confident.	I feel somewhat confident because on a computer you cant go back, so once you put the answer that's it.	I'm very confident when I work on computer tests. I know that I am capable to do it.	I feel that it's just me taking the test. People don't have the same answers as me.	Because I will be able to focus more and I will have more time.	I haven't taken to many computer test in my life, But still feel confident I'll do good.
	Because you just have to "click".	Because I do not know what kind of questions there is going to be.	I feel somewhat confident because I don't really know how the test will be.	Because you don't really have to study and it just depends on what level you are at	Because I'm better with using a computer than a pencil or pen.	I feel this way because I don't know it I know all the answers to the questions.
	Because I study.	I use my process of elimination skills because some of the answers are ridicules'.	The computer is better than pencil and paper.	I feel somewhat confident because I don't know what is on the test but I know the general things about it.	I don't know why I feel this way.	I feel this way because it is something I like to use.
	Because it's easy.	I feel this way because I can click the wrong answer. Also I very rarely take computer tests.	Because I study.	Because I know a lot about computers and when I take tests, either computer or paper I know what to do.		Because I am very good at doing things on the computer.
	I have something to reflect on...something else.	I feel that way because I like taking surveys and test on computers.	Because I study.	Because I get kind of scared if I am not going to do good.	I feel very confident because I know what I have to do	Because computer test are easy.

					to get a good score.	
	Because I know I learned it.	I feel very confident because I learned everything and I should know the answers.	Because the computer makes me feel confident.	The tests on the computers usually are multiple choice, so there is a 25% chance that you picked the correct answer.	I feel confident because I know that the test is going to be easy or in the middle.	Because there are things that I don't know the answer to.
	Because it feels easy.	I feel that way because I don't know what is going to be on it so I can't study as much as I study for paper tests.	Because I would know what I got wrong.	I feel this way because the tests on the computers relate to everything we've been learning and what we've been doing. There is no way I can study for it because I don't know what kind of questions would be on it.	Because computer test all you really have to do is click the box which is really easy.	I feel this way because it multiple choice.
	Again, I feel very confident	I feel very confident because I got all the time I need to answer it.		I have learned what I needed to learn to take the test.	I feel that way because I love computers and I feel better using it.	I feel that way because I know enough about computers that I feel comfortable.
	Because I know I am doing my best.	Because I am feeling confident is that nothing is going to happen but only get help.		I feel this way because computer tests are easier than the other test.	I feel very confident because it seems more relaxing when I'm doing it with for fulfilling fun.	I know the information I have to know. I can think many, many, moves ahead to find the right answer.
	Be I'm smart that why I feel this way.	I feel this way because I can answer some of these questions or not but I can do it.		I feel very confident, because I know that it doesn't go toward my report card, I just have to do what I've learned with paper and pencil the whole year.	I feel this way because I'm not actually worried but I'm not very confident either.	I feel this way because most tests taken on a computer are very simple, and don't worry me.

	I want to feel confident that I will pass the test. I wouldn't want to be stressed when I take the test.	Because I don't have to worry about handwriting and the computer feels more natural.		I feel that tests given on a computer are easier than ones on paper. Recently, I scored a 9.9 on my math ed performance.	As I mentioned earlier, I know what I put my mind to I can do.	I tend to do much better on computers.
		I feel this way because I know it won't be very hard.		I feel that way because I know that the teacher can read it.		Because we have taken test on computers more and on the computer I feel more confident to get a good grade.
		Because I get good grades on the computer.		I feel somewhat confident because it is multiple chose and I am used to the computer.		I study very hard.
		I feel this way because I think I can be very smart when I put my mind to it.		Because I feel like the computers test are a lot easier.		I really don't know why exactly.
		Because you have a 25% chance of getting it right. If I know the question I get it right.		Test are easy either way because I always pass.		Because it's easier to take test in computer.
		Because, I think that computer tests are somewhat easy				I feel this way because the tests on the computer aren't graded, so I am more relaxed and confident.
						Because I always on a computer so I know that I know how to use it and it’s like a paper test so it’s the same.
						Because no one knows who I am.

Q19	Urban Grade 6	Suburban Grade 6	Urban Grade 7	Suburban Grade 7	Urban Grade 8	Suburban Grade 8
If you answered "somewhat worried" or "very worried" to question #17, why do			I worry about my score or how many questions	Because the computer doesn't correct the test. It	I feel somewhat worried because on	I believe my computer skills aren't as good as others.

you feel this way?			there are.	shows results and we don't know all of the questions on the computerized test.	certain tests on the computer you are not able to go back and change your answer.	
			Because I can't use electronics.	Because I think I've never had it so it scares me.	I feel this way because I didn't do good on my test on the computer.	Because I never know what's going to be on these test, and I feel uncomfortable.
	Cause it be different from our work. It be hard sometimes.	I feel like I can't go back if I have made a mistake	Because I don't know when the test is over!!	I feel somewhat worried because usually on the computer tests that we had so far, you can't change your answer once you put it.	Because it is a funny feeling in my body.	Because the computer might turn off and the data might be lost.
	I feel this way because it like nothing in the room is not comfortable.	I would feel somewhat worried because of the same problem.	I feel this way because I analyze questions less when they're on a computer screen.	I feel worried, because I can never go back and check for my mistakes, when the test is over.	I'll never know how hard or challenging it is by technology.	
	Because they come up with stuff I have not heard of.	I don't like to take tests on computers.	Because it is stressful and I feel nervous.	Because its not easy, and I messed up, and I don't know what to do.	Why I would feel somewhat worried because I don't know what I'm going to get on my test.	Is like the same answer worried about my grade and how well I've done it.
	Because it's hard.	I feel this way because I always feel like I'm going to mess up and get a low score.	I feel very worried because I don't know what the test will be about.			Because I am better with a computer rather then with paper and pencil
	I feel this way because computers sometimes make mistakes.	I feel worried because what level I am going to be, and my grade.				Because I'm not sure if I did good on the test.
	I don't know what it is about.					
	Too many questions.					

APPENDIX F: OBSERVATION DATA COLLECTION SHEET

Observation Data Collection Sheet		
The Physical Setting	**Raw Data/Field Notes**	**Researcher Reflections**
Age of Computers/Condition		
Computer/Student Ratio		
Physical Environment		
The Participants		
Gender Differences/Majority		
Who is in the scene (how many? roles?)		
Relevant characteristics of the participants		
Activities and Interactions		
Keyboarding ability		
#of requests for assistance (race)		
#of requests for assistance (gender)		
Interaction w/activity and others		
Conversations		
Content of conversations		
# of computer functionality questions		
Subtle Factors		
Instances of visible frustration		
Instances of daydreaming and other off-task behaviors		
Informal and unplanned activities (i.e., entrants, class passing, PA, other students)		
Observer Behavior		

Observer affect on the scene		
Observer comments and actions		
Observer thoughts		

APPENDIX G: INVITATION TO PARTICIPATE

Are you interested in taking a survey about how much you use computers?

We are in need of 25 girls and 25 boys from the 6th, 7th and 8th grades (total 150 students) to participate in a survey regarding computer use. The survey will take no longer than 20-25 minutes

Participation is strictly voluntary and is on a first come first serve basis.

Yes! I am interested in taking the computer use survey.

Name: ______________________________

Grade: ______________________________

Homeroom Teacher: ______________________

Gender: □ Male □ Female

Are you interested????? If so, please complete this form and return it to the main office.

As an added bonus...

When you complete the survey

YOU GET FREE PIZZA!!!!!

&

You will be entered into a drawing to receive a new IPod Nano!

APPENDIX H: STUDENT ASSENT FORM

STUDENT ASSENT FORM
Study on relationship between socioeconomic status, computer access, and attitudes towards computerized testing and scores

I, ____, understand that my parents have said it is O.K. for me to take part in this project that looks at what influences student attitudes and student achievement using computerized testing under the direction of Mr. Jessie Kilgore, Jr. The purpose of the project is to answer the following questions: 1) What is the influence of socioeconomic status, computer access/use, and attitudes towards computers on student achievement using computerized tests?; 2) How does the type of computer access (sole home, shared home, community only, school only) influence computer access/use, attitudes towards toward computers and student achievement levels on computerized tests?

My understandings about this study are as follows:

- I understand that I have been selected for this study because I am middle school student at a Michigan charter school.
- I understand that I am only being asked to take a short survey (max. 30 minutes) and to be observed during Scantron testing (max. 30 minutes).

- I understand that nothing bad will happen to me by participating in this study.
- I understand that future students may be able to use computers more because of my participation in this study.
- I understand that all records of this study will be secret and that any reports that are written will not print my name.
- I understand that all records will be kept in a locked file, and only the researcher will have the key.
- I understand that I will receive a copy of this form from the researcher.
- I understand that I will not be paid for participating in this study. However, I understand that I will be invited to a pizza party after completing the survey and that my name will be entered into a drawing to receive a new IPod Nano.

I am taking part in this project because I want to and I understand that I may stop at any time if I decide I want to and nothing bad will happen to me.

Note: If you'd like to talk to someone at my university who will keep your name private, you may contact Dr. Leilani Endicott, Research Participant Advocate, at 1-800-925-3368, extension 1210.

Statement of Consent:

☐ The study on what influences student attitudes and student achievement using computerized testing has been explained to me and any questions I had have been answered. I would like to take part in the study.

Printed Name of Student ____________________________________

Student Signature ____________________________________

Signature of Researcher

APPENDIX I: PARENTAL CONSENT FORM

PARENTAL CONSENT FORM

Study on relationship between socioeconomic status, computer access, and attitudes towards computerized testing and scores

Your child has been invited to participate in a research study that that explores the relationship between socioeconomic status, computer access, and attitudes towards computerized testing and scores. Your child was selected to participate because he/she is a middle school student at a charter school. Please read this form and ask any questions you may have before agreeing to allow your child to take part in this study.

This study is being conducted by Jessie E. Kilgore, Jr., a doctoral candidate at Walden University.

Background Information:
The purpose of the project is to answer the following questions: 1) What is the influence of socioeconomic status, computer access/use, and attitudes towards computers on student achievement using computerized tests?; 2) How does the type of computer access (sole home, shared home, community only, school only) influence computer access/use, attitudes towards toward computers and student achievement levels on computerized tests?

Procedures:
If you agree to allow your child to participate in this study, they will be asked to complete a survey (15 min) and will be observed during administration of the Scantron Performance Series Test. The survey will take place before or after the normal school day.

Voluntary Nature of the Study:
Your child's participation in this study is strictly voluntary. Your decision whether or not to allow him/her to participate will not affect you or your child's current or future relations with Plymouth Educational Center. If you initially decide to allow your child to participate, you are still free to withdraw his/her participation at any time later without affecting those relationships.

Risks and Benefits of Being in the Study:
There are no risks associated with participating in this study. However, the results of this study may lead to improved computer access for future students.

In the event your child experiences stress or anxiety during their participation in the study, they may terminate their participation at any time. They may refuse to answer any questions that they or you consider inappropriate or stressful.

Compensation:
There will be no compensation provided for your child's participation in this study. However, students who participate will be invited to a pizza party after completing the survey. Participants will also be entered into a drawing to receive a new IPod Nano.

Confidentiality:
The records of this study will be kept private. In any report of this study that might be published, the researcher will not include any information that will make it possible to identify your child. Research records will be kept in a locked file, and only the researcher will have access to the records.

Contacts and Questions:
The researcher conducting this study is Jessie E. Kilgore, Jr. The researcher's faculty advisor is Deanna Boddie, Ph.D. (dboddie@waldenu.edu). You may ask any questions you have now. If you have questions later, you may contact them via phone at (313) 999-1793. If you'd like to talk to someone at the university who will keep your name private, you may contact Dr. Leilani Endicott, Research Participant Advocate, at 1-800-925-3368, extension 1210. You will receive a copy of this form from the researcher.

Statement of Consent:

☐ I have read the above information. I have asked questions and received answers. I consent to my child's participation in the study.

Printed Name of Participant ______________________________

Participant Signature ______________________________

Signature of Researcher ______________________________

APPENDIX J: LETTER OF COOPERATION

Date

Dear Mr. Kilgore,

Based on my review of your research proposal, I give permission for you to conduct the study titled " Exploring the relationship between socioeconomic status, computer access, and attitudes towards computerized testing and scores: A Case Study of Two Charter Schools" at the ___________________________. As part of this study, I authorize you to invite members of my organization, whose names and contact information I will provide, to participate in the study as interview subjects. Their participation will be voluntary and at their own discretion. We reserve the right to withdraw from the study at any time if our circumstances change.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the research team without permission from the Walden University IRB.

Sincerely, Sincerely,

Board President Principal

APPENDIX K: DATA USE AGREEMENT - SUBURBAN

DATA USE AGREEMENT

This Data Use Agreement ("Agreement"), effective as of February 15, 2008 ("Effective Date"), is entered into by and between Jessie E. Kilgore, Jr. ("Data Recipient") and _______________ School. ("Data Provider"). The purpose of this Agreement is to provide Data Recipient with access to a Limited Data Set ("LDS") for use in research in accord with the HIPAA and FERPA Regulations.

1. Definitions. Unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the "HIPAA Regulations" codified at Title 45 parts 160 through 164 of the United States Code of Federal Regulations, as amended from time to time.

2. Preparation of the LDS. Data Provider shall prepare and furnish to Data Recipient a LDS in accord with any applicable HIPAA or FERPA Regulations

3. Data Fields in the LDS. No direct identifiers such as names may be included in the Limited Data Set (LDS). In preparing the LDS, Data Provider shall include the **data fields specified as follows**, which are the minimum necessary to accomplish the research: MEAP language arts scores (scaled score, GLE score), MEAP math scores (scaled score, GLE score), Performance Series reading scores (scaled score, GLE score), Performance Series math scores (scaled score, GLE score), free/reduced lunch status from SRSD (student name field, free/reduced lunch status field) or student name, free/reduced lunch status from other source.

4. Responsibilities of Data Recipient. Data Recipient agrees to:

   a. Use or disclose the LDS only as permitted by this Agreement or as required by law;

   b. Use appropriate safeguards to prevent use or disclosure of the LDS other than as permitted by this Agreement or required by law;

   c. Report to Data Provider any use or disclosure of the LDS of which it becomes aware that is not permitted by this Agreement or required by law;

   d. Require any of its subcontractors or agents that receive or have access to the LDS to agree to the same restrictions and conditions on the use and/or disclosure of the LDS that apply to Data Recipient under this Agreement; and

e. Not use the information in the LDS to identify or contact the individuals who are data subjects.

5. Permitted Uses and Disclosures of the LDS. Data Recipient may use and/or disclose the LDS for its Research activities only.

6. Term and Termination.

a. Term. The term of this Agreement shall commence as of the Effective Date and shall continue for so long as Data Recipient retains the LDS, unless sooner terminated as set forth in this Agreement.

b. Termination by Data Recipient. Data Recipient may terminate this agreement at any time by notifying the Data Provider and returning or destroying the LDS.

c. Termination by Data Provider. Data Provider may terminate this agreement at any time by providing thirty (30) days prior written notice to Data Recipient.

d. For Breach. Data Provider shall provide written notice to Data Recipient within ten (10) days of any determination that Data Recipient has breached a material term of this Agreement. Data Provider shall afford Data Recipient an opportunity to cure said alleged material breach upon mutually agreeable terms. Failure to agree on mutually agreeable terms for cure within thirty (30) days shall be grounds for the immediate termination of this Agreement by Data Provider.

e. Effect of Termination. Sections 1, 4, 5, 6(e) and 7 of this Agreement shall survive any termination of this Agreement under subsections c or d.

7. Miscellaneous.

a. Change in Law. The parties agree to negotiate in good faith to amend this Agreement to comport with changes in federal law that materially alter either or both parties' obligations under this Agreement. Provided however, that if the parties are unable to agree to mutually acceptable amendment(s) by the compliance date of the change in applicable law or regulations, either Party may terminate this Agreement as provided in section 6.

b. Construction of Terms. The terms of this Agreement shall be construed to give effect to applicable federal interpretative guidance regarding the HIPAA Regulations.

c. No Third Party Beneficiaries. Nothing in this Agreement shall confer upon any person other than the parties and their respective successors or assigns, any rights, remedies, obligations, or liabilities whatsoever.

d. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

e. Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and on its behalf.

DATA PROVIDER	**DATA RECIPIENT**
Signed: ______________________	Signed: ______________________
Print Name: ___________________	Print Name: ___________________
Print Title: ____________________	Print Title: ____________________

APPENDIX L: DATA USE AGREEMENT - URBAN

DATA USE AGREEMENT

This Data Use Agreement ("Agreement"), effective as of February 15, 2008 ("Effective Date"), is entered into by and between Jessie E. Kilgore, Jr. ("Data Recipient") and _________________ School ("Data Provider"). The purpose of this Agreement is to provide Data Recipient with access to a Limited Data Set ("LDS") for use in research in accord with the HIPAA and FERPA Regulations.

8. Definitions. Unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the "HIPAA Regulations" codified at Title 45 parts 160 through 164 of the United States Code of Federal Regulations, as amended from time to time.

9. Preparation of the LDS. Data Provider shall prepare and furnish to Data Recipient a LDS in accord with any applicable HIPAA or FERPA Regulations

10. Data Fields in the LDS. No direct identifiers such as names may be included in the Limited Data Set (LDS). In preparing the LDS, Data Provider shall include the **data fields specified as follows**, which are the minimum necessary to accomplish the research: MEAP language arts scores (scaled score, GLE score), MEAP math scores (scaled score, GLE score), Performance Series reading scores (scaled score, GLE score), Performance Series math scores (scaled score, GLE score), free/reduced lunch status from SRSD (student name field, free/reduced lunch status field) or student name, free/reduced lunch status from other source.

11. Responsibilities of Data Recipient. Data Recipient agrees to:

    a. Use or disclose the LDS only as permitted by this Agreement or as required by law;

    b. Use appropriate safeguards to prevent use or disclosure of the LDS other than as permitted by this Agreement or required by law;

    c. Report to Data Provider any use or disclosure of the LDS of which it becomes aware that is not permitted by this Agreement or required by law;

    d. Require any of its subcontractors or agents that receive or have access to the LDS to agree to the same restrictions and conditions on the use and/or disclosure of the LDS that apply to Data Recipient under this Agreement; and

e. Not use the information in the LDS to identify or contact the individuals who are data subjects.

12. Permitted Uses and Disclosures of the LDS. Data Recipient may use and/or disclose the LDS for its Research activities only.

13. Term and Termination.

a. Term. The term of this Agreement shall commence as of the Effective Date and shall continue for so long as Data Recipient retains the LDS, unless sooner terminated as set forth in this Agreement.

b. Termination by Data Recipient. Data Recipient may terminate this agreement at any time by notifying the Data Provider and returning or destroying the LDS.

c. Termination by Data Provider. Data Provider may terminate this agreement at any time by providing thirty (30) days prior written notice to Data Recipient.

d. For Breach. Data Provider shall provide written notice to Data Recipient within ten (10) days of any determination that Data Recipient has breached a material term of this Agreement. Data Provider shall afford Data Recipient an opportunity to cure said alleged material breach upon mutually agreeable terms. Failure to agree on mutually agreeable terms for cure within thirty (30) days shall be grounds for the immediate termination of this Agreement by Data Provider.

e. Effect of Termination. Sections 1, 4, 5, 6(e) and 7 of this Agreement shall survive any termination of this Agreement under subsections c or d.

14. Miscellaneous.

a. Change in Law. The parties agree to negotiate in good faith to amend this Agreement to comport with changes in federal law that materially alter either or both parties' obligations under this Agreement. Provided however, that if the parties are unable to agree to mutually acceptable amendment(s) by the compliance date of the change in applicable law or regulations, either Party may terminate this Agreement as provided in section 6.

b. Construction of Terms. The terms of this Agreement shall be construed to give effect to applicable federal interpretative guidance regarding the HIPAA Regulations.

c. No Third Party Beneficiaries. Nothing in this Agreement shall confer upon any person other than the parties and their respective successors or assigns, any rights, remedies, obligations, or liabilities whatsoever.

d. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

e. Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and on its behalf.

DATA PROVIDER	**DATA RECIPIENT**
Signed: ________________________	Signed: ________________________
Print Name: ____________________	Print Name: ____________________
Print Title: _____________________	Print Title: _____________________

APPENDIX M: PILOT SURVEY RATER SHEETS

To Whom It May Concern:

Jessie E. Kilgore, Jr., a Ph.D. candidate at Walden University, requested that I review th changes made to a survey he created for his pilot study. This letter is to confirm that I have reviewed the changes and to indicate my level of agreement. Of the 13 changes to the survey, I agree with all 13 changes for an agreement percentage of 100%.

Overall, I feel the changes provided clarity (i.e. changes to questions 3, 14, 15, 18, and 19) and depth (i.e. questions 4, 6. 12, 16). Additionally, the questions and directions added in the revised plan are significant changes that appear to add strength to the instrument.

Sincerely,

Christopher Plum

Christopher Plum
Ph.D. Candidate
Walden University
(313) 282-7618

Dear Committee Members,

I am writing this statement on behalf Jessie E. Kilgore, Jr., a Ph.D. candidate at Walden University. Mr. Kilgore requested that I review the changes made to a survey he created for his pilot study. This letter is to confirm that I have reviewed the changes and to indicate my level of agreement. Of the changes to the survey, I agree with 12 of the 13 of changes for an agreement percentage of 92.3%. Overall, I feel the changes improved the survey's clarity and readability.

Sincerely,

James E. Spruill

James E. Spruill, Ed.S.

Ph.D. Candidate

Nova Southeastern University

313-999-1797

CURRICULUM VITAE

Jessie E. Kilgore, Jr.

JEKJ@aol.com [email]

PROFESSIONAL EXPERIENCE

Plymouth Educational Center, Detroit, Michigan **1998 - Present**

Chief Administrative Officer **(2002 - Present)**

Provide leadership in implementing an educational program within available funding and Board policies. Responsible for planning, financial administration, personnel administration, implementation of educational programs, representation of the School Board, facilities, and communications with staff members and the public regarding educational issues and services.

- Assist the Board in the identification of student achievement goals and provide leadership to achieve and evaluate progress toward meeting those goals.
- Provide for overall management of financial activities and take appropriate action to insure that expenses are kept within approved budgetary limits.
- Supervise the development of systems for budget development, purchase of goods and services, accountability for expenditure of district funds, and for timely analyses and reporting of the district's financial position to the Board and the general public.
- Supervise the acquisition, construction, maintenance, renovation, and disposal of all school district facilities and properties with approval of the Board of Directors.
- Assist the Board of Directors with the development of school Board policy.
- Serve as Executive Director of the Plymouth Education Foundation.
- Seek additional resources from foundations, corporations and other funding entities
- Maintain active contact and familiarization with all local, state, federal and philanthropic programs which provide or could provide financial assistance to the district
- Maintain communication between and among the Board, staff, the media, the general public, and other business, governmental, and educational organizations of the community, region, and state.
- Recommend salary increases, salary adjustments and benefits for all personnel; develop and recommend to the Board job classifications/reclassifications for all positions and supervise the development of systems for the recruitment, employment, evaluation, in-service and development, and compensation and benefits for all school district staff.
- Represent the Board in its dealings with city, county, state and federal governmental agencies and Central Michigan University.

Principal **(1998 - 2002)**

Serve as the educational leader of the School, responsible for implementing and managing the policies, regulations, and procedures of the Board of Directors to ensure that all students are supervised in a safe learning environment and provided instruction that meets and exceeds the State Core Curriculum Content Standards. Work collaboratively to lead and nurture all members of the school staff and to communicate effectively with parents, members of the community, and colleagues in other districts and schools. Inherent in the position were the responsibilities of planning, curriculum development, program evaluation, extracurricular activities, personnel management, financial management, emergency procedures, resource scheduling, and facilities operations.

- Establish and promote high standards and expectations for all students and staff for academic performance and responsibility for behavior.
- Organize, manage, evaluate, and supervise effective and clear procedures for the operation and functioning of the entire school consistent with the philosophy, mission, values and goals of the school and district,

including instructional programs in the Core Curriculum Content Standards, extracurricular activities, discipline systems to ensure a safe and orderly climate, financial management, facilities maintenance, program evaluation, personnel management, office operations, emergency procedures, and community relations.
- Ensure compliance with all laws, administrative codes, board policies and regulations.
- Provide leadership to staff to establish programs and activities that would yield student enrichment, rewards and self esteem enhancement.
- Recommend to the CAO the renewal, dismissal, withholding of increment, promotion or other actions for all personnel assigned to the school, following established procedures and timelines.
- Organize and maintain a public relations system for the school that consistently celebrates and informs parents and the community of the accomplishments of students, staff, and the school.
- Ensure that personnel and student record keeping procedures comply with state and federal law and district policy.
- Organize and supervise procedures for identifying and addressing special needs of students including health related concerns, and physical, emotional, and learning disabilities, coordinating the resources of the school and community to assist the student and family.

Wayne State University Public School, Detroit, Michigan **1993 - 1998**

Assistant Principal for Student Services **(1997 - 1998)**

Coordinate activities of the Student Services Team which include technology, transportation, teen health clinic, social work, special education, extended day tutoring, enrichment and recreation classes, athletic program, dance, health and physical education as directed by the Principal.

- Direct a team of 15 professional staff and 40+ part time staff.
- Responsible for the implementation of school-wide goals, and goals specific to the Student Services Team as developed from time to time.
- Monitor staff lesson plans, program activities and/or daily routines on a timely basis.
- Assist team members with the development of annual individual professional development plans.
- Approve all contractual time-off for team members forwarding recommendation to the Principal.
- Assist academic/support staff with routine/special needs.
- Approve all team level field trips/deviations from normal school schedule with other Assistant Principals.
- Keep informed grade level teams as needed.
- Evaluate academic/support staff performance as per school policy and practices.
- Chair search committee to fill team vacancies, recommending candidates for consideration to the Principal.
- Locate funding sources and write grant proposals to supplement team budget.
- Prepare and administer budget for the Student Services Team.
- In charge of building operation during the extended day program.
- Developed and implemented Mentors Club for at-risk male students.

Athletic Director **(1994 - 1998)**

Piloted and administered organized sports program for middle school students thus becoming the first charter school recognized by the Michigan High Athletic Association.

- Prepare schedules for all levels of competition and make contracts with officials.
- Coordinate transportation for all teams to games and practices.
- Order uniforms and equipment for all sport programs.
- Manage athletic program budget.
- Generate revenues through fundraising.
- Provide parents, students and staff members with information and interpretations regarding the policies and procedures of the Michigan High School Athletic Association.
- Implemented academic eligibility requirements for players above and beyond those mandated by the MHSAA.

Director of Physical Fitness, Health & Recreation **(1994 - 1997)**

Launched school-wide Physical Fitness, Health and Recreation programs for middle school students.

- Designed Physical Fitness and Health classes for students in grades 6th-8th.
- Implemented the use of the Michigan Model for Health Education in all health classes.
- Transformed basement rooms into fitness instruction areas.
- Implemented physical testing of all students utilizing the Fitnessgram program.
- Developed relationships with community organizations resulting in contracted use of facilities for after-school recreation activities.

Middle School Teacher **(1993 - 1998)**

Teacher of Language Arts and African American History to middle school students.

- Plan a program of study that meets the individual needs of students.
- Create a classroom environment that is conducive to learning.
- Develop reasonable rules of classroom behavior and procedure.
- Establish clear objectives for all lessons and units.
- Ensure that lessons are in line with State of Michigan objectives and school-wide curriculum goals.
- Assess students on a regular basis.
- Maintain accurate and complete records as required.
- Communicate with parents and make provisions for being available outside normal hours.
- Attend extra curricular activities on a regular basis.
- Maintain professional competence by attending conferences and membership in professional organizations.

Wayne State University Public School Committee Involvement

Steering Team: Functioned in the role of an Executive Committee of the Faculty/Staff. Reviewed internal policy of the University Public School, and developed needed policy from time to time. Decided what issues needed to be taken to the faculty/staff at-large. Established sub-committees as needed. Developed agenda for monthly faculty/staff meetings. Decisions arrived at by consensus or majority vote.

Budget Development Committee: Charged with the preparation of budget recommendations for the 95/96 school year. Included operating expenses, salary increases, full time position staffing, etc.

Salary/Merit Pay Sub-Committee: Developed a proposal for annual performance-based faculty/staff salary increase; developed a proposal which established a salary scale for full-time educators and full-time educational support staff; developed criteria and created evaluation tool used to determine recipients of performance based salary increases; reviewed the complete benefit package available to full-time faculty/staff members of the University Public School.

International Union, UAW Legal Department, Detroit, Michigan **(1992 - 1993)**

Law Clerk **(1992 - 1993)**

Perform research and writing activities for the UAW Legal Department. Assist attorneys in preparing pleadings, motions, research memoranda and briefs on various labor issues including employment discrimination and wrongful discharge. Perform a variety of related duties as assigned.

- Perform research and writing activities for the UAW Legal Department; prepare opinions, reports and drafts of research activities.
- Assist attorneys in preparing for litigation; compile and analyze legal data pertinent to cases; prepare summaries of research.
- Develop and draft legal documents, filings, and memoranda.

- Research, gather, and compile data on legal cases; utilize the law library to conduct research.
- Participate in computer data base research.
- Perform related duties and responsibilities as required.

EDUCATION

Walden University, Minneapolis, Minnesota
School of Education
Doctor of Philosophy Program
K-12 Educational Leadership Program
[Expected graduation – May 2008]

Wayne State University, Detroit, Michigan
College of Education
Education Specialist Program
General Administration and Supervision – Secondary
[Transferred to Walden University]

Wayne State University, Detroit, Michigan
College of Education
Master of Arts in Teaching (M.A.T.)
G.P.A. 3.88

State of Michigan Professional Teacher Certification
- English/Language Arts
- Social Sciences

University of Maryland, Baltimore, Maryland
School of Law (1991-1993)

University of Michigan, Ann Arbor, Michigan
School of Literature, Science and the Arts
Bachelor in General Studies

Cass Technical High School, Detroit, Michigan
Computer Programming Curriculum
Class of 1987

HIGHLIGHTS

- Led Plymouth Educational Center through North Central Accreditation process and received full accreditation in first year of application (2005)

- Directed the bond refunding effort at Plymouth Educational Center and received investment grade (BBB-) rating from Standard & Poor's. This effort led to a 7% reduction in the interest rate resulting in a yearly savings of $200,000 to the district.

- Led district through five consecutive clean audits and maintained or increased fund balance on a yearly basis.

- Oversaw the construction of the Plymouth Educational Center Park, additional classroom space for Special Education and Art instruction, and a $1,000,000 synthetic turf football/soccer field named in my honor.

- Assisted Board of Directors is overseeing the construction of new 75,000 sq. ft. K-8th grade facility. At the time, this was the first school built from the ground up in the City of Detroit since 1984.

- Former owner and operator of three Sylvan Learning Centers - first African American owned Sylvan franchises in the State of Michigan.

GRANT PROPOSALS

2007 **Skilling-Andrews Foundation,** ($150,000 – Received)
Funding for high school land acquisition

2007 **NFL Grassroots Program** ($50,000 – Received)
Funding for Athletic Field (football & soccer)

2006 **Skilling-Andrews Foundation,** ($50,000 – Received)
Funding for MicroSociety Program

2005 **Skilling-Andrews Foundation,** ($100,000 – Received)
Funding for MicroSociety Program

2002 **Comprehensive School Reform Demonstration Program,** ($225,000 – Received)
Funding for ATLAS Reform Model implementation over a three year period

2002 **Thompson-McCully Foundation,** ($150,000 – Received)
Funding for ATLAS Reform Model optional components implementation over a three year period

2001 **Technology Literacy Challenge Fund Grant Program,** ($75,000 – Received)
Funding for new computer equipment and professional development

1999 **Walton Family Foundation,** ($84,000 – Received)
Funding for addition of paraprofessional positions to school organizational structure

1998 **21st Century Community Learning Centers Program,** ($600,000 – Received)
Funding for Extended Day program over a three year period

1998 **U.S. Department of Education Charter School Grant Program,** ($20,000 – Received)
Funding for School Library

1998 **Youth Sports and Recreation Commission,** ($1,500 – Received)
Funding for Golf Instruction Program

CONFERENCE PRESENTATIONS

2007 **National Association of Black Social Workers**, Presenter
2004 **National Association of Black Social Workers**, Presenter
2002 **Michigan Association of Public School Academies Conference**, Presenter
1998 **Helping Children Learn: Families, Schools and Communities Working Together**, Presenter
1997 **National Governor's Conference on Quality in Education**, Presenter

AWARDS AND HONORS

2003 **Economic Development Corporation of the City of Detroit**, Appointed Special Director by Mayor
2003 **Wayne County Juvenile Detention Facility Advisory Board**, Appointed by Wayne County Commission
1995 **Presidential Bonus Award Recipient,** Wayne State University
1993 **Presidential Bonus Award Recipient,** Wayne State University

COMPUTER SKILLS

Windows 95/98/2000/ME/XP, Power Point, WordPerfect, Microsoft Word, Microsoft Works, Microsoft Excel, Adobe PageMaker, Adobe Acrobat, QuickBooks Pro, Microsoft Trips & Streets, BlackBoard, eCollege

MEMBERSHIPS/AFFILIATIONS

ASCD, Member; National Council of Teachers of English, Member; National Council of Social Studies, Member; NAACP, Member; Black Alliance for Educational Options – Life Member; Phi Beta Sigma Fraternity, Inc., Member; University of Michigan Alumni Association, Member; Wayne State University Alumni Association, Member

REFERENCES

Herman Gray, M.D., M.B.A.
President
Children's Hospital of Michigan
Detroit, Michigan
(313) 745-5450 [W]

James Spruill
President
Urban Divide Technology, Inc.
Detroit, Michigan
(313) 999-1797

Wayne Washington, Counselor
Cass Technical High School
Detroit, Michigan
(248) 443-0757 [H]
(313) 407-0437 [C]

Christopher Plum, Principal (9-12)
Plymouth Educational Center
Detroit, Michigan
(734) 354-9884 [H]
(313) 282-7618 [C]

Idowu Jegede, Chief Financial Officer
Plymouth Educational Center
Detroit, Michigan
(248) 355-4564 [H]
(313) 999-1801 [C]