EQUITY AMONG SECONDARY STUDENTS IN COMPUTER USAGE AT A NORTHWEST FLORIDA HIGH SCHOOL

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ABSTRACT

EQUITY AMONG SECONDARY STUDENTS IN COMPUTER USAGE AT A NORTHWEST FLORIDA HIGH SCHOOL

Bobbie Ann Brown Dawson

In the educational arena, computers are tools that are used to enhance and provide student learning. The current study was conducted to examine the effect of computer usage among secondary students identified by gender, ethnicity, and socioeconomic status in a rural area. Also investigated was the effect that teachers in academic areas had upon technology use of their students. Findings showed that the gap between ethnicity, gender, and socioeconomic status of rural students is marginal. Teachers will continue to need inservice training in the areas of technology use by students in the classroom.

CHAPTER I

INTRODUCTION

During 1997-1998, more than 4.5 million computers were being utilized in elementary and secondary schools in the U.S.—a ratio of 1 computer for every 10.1 students (Quality Education Data, 1998). From the research literature (Glennan, 1996) and the experiences of teachers and students, it is suggested that the effective use of technology can have a positive influence on educational processes, outcomes, and student performance. Technology can impact education in the following ways:

1. Yield significant results in terms of educational attainment and skill acquisition. Students can acquire greater knowledge and develop active learning and thinking skills. The best technology can complement and enhance what teachers do.
2. Contribute to educational reform. Using technology can reinforce interdisciplinary instruction such as focusing on (a) outcomes, (b) peer-based instruction, (c) teachers as mentors, (d) team teaching, (e) project-oriented learning, (f) attention to individual learning styles, and (g) many other aspects of leading-edge educational practice.
3. Bridge the educational disparities of race, income, and region. One of the more heartening findings of prior research is that poor or rural schools can become leading-edge performers (Casson et al., 1997).

In the educational arena, computers are considered tools to enhance and provide student learning. The Constitution of the United States provides equal opportunities for all. Can we say this is a true statement in our educational system today regarding the use of computers? School districts spend millions of dollars every year providing technological equipment and software for student learning. In 1998, Quality Education Data reported that 85,900 of the 87,200 public schools in the U.S. (over 98%) have 11 or more microcomputers. When the total number of microcomputers is considered, there are approximately 4,519,494 units, or an average of 53 units per school (Quality Education Data, 1998). In 2001, the ratio of students to computers in public schools was 5.4:1, an improvement from the 12.1:1 ratio in 1998 (Tabs, 2002).

Hadnot (1999) states that a great deal of pressure is placed on schools to assist minority students to become computer literate because of the low percentage of minority students with home computers. Hadnot states that schools with low minority enrollment have 6.6 students for every 1 computer; however, the figure is 8.4 students to each computer for schools with high minority enrollment, according to a 1998 report (Hadnot). One of the greatest fears of those who are skeptical about the potential for technology to assist in reinventing schools is that it benefits only elite schools and will, therefore, widen the gap between the haves and the have-nots (Office of Educational Technology, 1995).

The future of our society is becoming increasingly dependent upon technology. Entry-level jobs require some basic knowledge of computers. The U.S. Department of Labor formed a commission to study the kinds of competencies and skills needed in the workplace. The document entitled "*What Work Requires of Schools: A SCANS Report*

for America 2000" (U.S. Department of Labor, 1991) identifies five competencies that a student in today's educational system needs to succeed in the workplace:

1. Identifies, organizes, plans, and allocates resources.
2. Works well with others.
3. Acquires and evaluates information.
4. Understands complex interrelationships.
5. Works with a variety of technologies.

The SCANS Report for America 2000 reports that more than half of our young people leave school without the knowledge or foundation required for finding and holding a good job (Milone & Salpeter, 1996).

The fastest growing occupations through the year 2005 will be computer scientists and systems analysts (Milone & Salpeter, 1996). In addition, tens of thousands of job openings will result annually from the need to replace workers who move into managerial positions and other occupations. A career in computer technology has unlimited professional growth for graduates who are adequately prepared to perform at high standards. Will the graduates from the secondary schools be able to compete in this career field or will they be left behind?

Among the issues that face educators in the next decade, perhaps none is more important than providing all students with comparable educational opportunities, particularly with respect to technology. As the uses of technologies become more prevalent, education approaches a societal divide. Technology will either improve the life chances of all students or it will continue to widen the gap between those students who have access to technology at home and at school and those students who do not

(Brown, 2000). Equity in access to educational resources is a new challenge in our age of rapid technological change, potentially producing a society of information haves and have-nots. This is particularly true in those schools where disparity in access to educational technology is already glaring (Sayers, 1995). If educators at every level do not seek a common cause in the effort to demand equal access to communication and computing resources for students, whatever potential computer networking may hold for creating, nourishing, and sustaining the genuine learning communities will have been squandered. Access to communication and computing resources are desperately needed if we are to confront the social, cultural, economic, and ecological challenges of the future. That is the sort of learning environment that has deep local roots in the community, as well as an extensive global reach. Instead, the information-age haves will retain or strengthen their ability to shape technological innovations to their own advantage, and the have-nots (when not completely excluded from access to technology) will more likely be manipulated by computers and computer networking than in control of these powerful technologies (Sayers).

Female students and those from low-income and ethnic and linguistic minorities tend not to have the same access to computers as do their male, middle income, and nonminority counterparts (Sayers, 1995). The more exciting programs are reserved for students who choose to select a college-entry degree. When students enrolled in general education do achieve access, they are much more likely to be assigned to drill and practice rather than to problem-solving activities (Sayers).

The computer has been compared to the invention of writing and the printing press for its potential to create revolutionary benefits for all members of our society

(Neuman, 1991). Introduced into secondary schools in the 1970s, computers were heralded as the means for developing nondiscriminatory learning environments for all (Neuman). The growing popularity of computers in school curricula and the growing roles of computers in the workplace should warrant that all students have the opportunity to benefit from instruction in computer technology. This position is supported by the fact that a body of knowledge underlies our culture, which makes effective communication and cooperation possible. Without technological knowledge, a person functions at a disadvantage. The result may be unfulfilled realization of personal and professional aspirations. The National Telecommunications and Information Administration (1998) states that 20% of the African American and Hispanic American student population were less likely than other ethnic groups to own or have access to a computer at home, whereas 47% of the Asian American and American Indian combined and 41% of the European American student population have access to or own a computer at home. Wilson (1999) states that 19% of the African American and 19% of the Hispanic American student population still does not have access to or own a computer at home a year later.

Inadequate access to technology not only makes it difficult for young people to find and keep a job in today's market but also prevents them from participating completely in civic dialogue. In addition, it raises the issue of how students, who are identified by their ethnicity, socioeconomic level, and gender, use the computer in education.

Significance of the Study

Technological change has been a force for the democratization of knowledge and education. Before Gutenberg, knowledge was an instrument of power guarded by conservative and secret elite (Kreuzer, 1993). In recent years, computers have radically changed the world of knowledge and education. From historical perspective, innovative information technologies at first widen inequities within civilization, because initial access to the differential advantage they bring is restricted to the few who can afford the substantial expense of this increased power (Dede, 1995).

The use of technology must be integrated into classroom practices to effectively prepare students for the global economy of the 21st century. Achieving the goal of technology integration requires recognition of gender, ethnicity, and socioeconomic effect exists and adoption of strategies to attain equity as being important for progress to take place. The information revolution of the last 15 years has transformed society, business, and culture, placing preeminence on the ability to access and use information and will continue to do so at an accelerating pace (Reif & Morse, 1992).

As emerging media mature, drop in price, and are widely adopted, however, the ultimate impact of information technology should make society more egalitarian. The challenge for current educational policy is to minimize the period during which the gap between haves and have-nots widens, rapidly moving to a maturity of usage and universality of access that promotes increased equity.

In addressing the statements of educational fairness, the focus has been on the differences between gender, ethnicity, and socioeconomic groups. This does not mean

that there are no differences in other equity groups in education. In the current study, I have focused on two questions in dealing with equity in computer usage:

1. How are ethnicity, gender, and socioeconomic status related to access to computers?
2. How does the teacher direct technology toward males and females, and toward European Americans, African Americans and other minority groups that comprise the study group population, and toward high- and low-level socioeconomic groups?

Statement of the Problem

All educational institutions in the U.S. are faced with the same dilemma in providing an equal education with the use of computers. The educational systems have a diverse population varying in gender, ethnicity, and socioeconomic status. The purpose of this study is to determine whether gender, ethnicity, and socioeconomic status have any influence on computer usage by students in a rural secondary school setting.

Definition of Terms

Access. The opportunities afforded to all students to interact with computers and the removal of barriers that might stand in the way of these opportunities.

College-entry. Courses designed at the high school level to prepare students who have a desire to enter college.

Computer. An electronic device, operating under the control of instructions stored in its own memory unit, which can accept data, process data arithmetically and

logically, produce output from processing data, and store the results for future use.

Direct. To guide or show.

Equity. The implementation of fair-minded and even-handed policies and practices affecting access to, and use of facilities, provisions, and resources. An equitable claim or right.

Ethnicity. Relating to people whose unity rests on racial, linguistic, religious or cultural ties.

Minority. A racial, religious, ethnic, or economic group that is different from the dominant group.

Regular education. Courses designed at the high school level to prepare students for the world of work after high school. Courses could lead to college entrance.

Secondary students. Students who are members of the high school in grades 9-12.

Socioeconomic. Relating to combined social and economic conditions.

Technology. The use of computers in the classroom, as well as access to databases, such as the Internet.

Usage. The way in which someone or something is implemented or treated.

CHAPTER II

REVIEW OF THE LITERATURE

The literature review for this study includes the following topics: (a) equity among gender, ethnicity, and socioeconomic groups' access to the use of computers; (b) issues that might promote inequities; and (c) summary.

Effective education with computers requires that all students, rich and poor, female and male, at all levels of ability, and of all ethnic origins gain equitable access to and use of computers in schools (Nolan, McKinnon, & Soler, 1992). Our society is constantly changing due to technological change with concomitant changes in the work environment. All students should be able to function in a knowledgeable manner to survive in this technologically changing society. Sanders (1990) noted that in ways we cannot imagine today, tomorrow's adult will need to be technologically literate as citizens and technologically skilled as workers.

Access to computers is influenced by ability, ethnicity, gender, and socioeconomic status of individuals (McKinnon, Nolan, & Soler, 1990). Within the traditional context of secondary education, research literature has painted an ominous picture of widespread inequities of computer access and use that cut across ability, ethnicity, gender, and socioeconomic divisions (Nolan et al., 1992).

With the rapid increase of microcomputer use in schools came a concern for inequalities in their access and use. Malter and Wodarz (2000) noted that schools have been charged with providing equitable opportunities for all students, regardless of gender, socioeconomic status, ethnic background, or learning exceptionality. An enormous amount of financial resources has been allocated to provide schools with computer technology. Within this context, the issue of technology equity in our schools has become quite controversial (Malter & Wodarz). The work force no longer consists of European American upper-class males in the areas of management and consulting. The work force today has changed drastically from the 19th century. Manufacturers have moved factories to foreign countries. More jobs are based on technological knowledge instead of skilled labor. The number of working females has increased dramatically. If the U.S. is to maintain a competitive place in the world economy, it must educate female and minority children because they are needed as productive workers (Sutton, 1991).

For years, the microcomputer was cited as the vehicle for overcoming a wide array of inequities (Neuman, 1991). Today, distance education approaches like teleconferencing, interactive television, electronic mail, and expanded telecommunications networks are promoted as avenues to improve resources for underserved students. Prior research on computer equity revealed that many students (not only minority, disadvantaged, and inner-city, but also female, handicapped, and rural) have been hampered by inequitable access to computers and by widespread patterns of inequitable distribution and use of computers within and across schools (Neuman).

Barriers

Barriers to equitable computer learning have been identified as (a) dominance by one student over another during computer time, (b) bias against females and minorities in software and advertising, (c) potential value of computer learning more apparent to males, (d) lack of encouragement for females and minority students to use computers, (e) pressure from peers not to participate in computer activities, (f) underrepresentation of females and minority students in computer clubs, (g) limited computer access for females during free time at school, (h) underrepresentation of females in computer leadership roles, (i) inappropriate location of computers within schools, (j) shortage of qualified personnel for computer instruction, (k) lack of out-of-school computer access, (l) lack of early childhood computer readiness, (m) irrelevant prerequisites for computer instruction, and (n) inability of teachers and students to recognize and deal with problems in computer learning (Bakke et al., 1985). Even though we are now in a different century and years ahead in the use of technology, the aforementioned barriers are still plaguing the educational system. A 1998 national survey showed that serious disparities still exist across important social, economic, and geographic boundaries (Anderson & Ronnikuist, 1999). Dede (1995, p. 8), in testimony to the U.S. Congress on educational technology in the 21st century, identified five major barriers to educational technology at this time:

1. Education has been seen as something that happens through teaching students in isolated school settings, rather than through empowering and interrelating learning in homes, classrooms, communities, workplaces, and via the media.

2. The major focus of educational technology implementation so far has been automating marginally effective models of presentational teaching, rather than innovating by making more effective models of learning-through-doing affordable and sustainable.
3. Psychological, organizational, political, and cultural barriers from every type of stakeholder in education have impeded implementing educational innovations that undercut traditional models of pedagogy, content, assessment, and institutional organization.
4. Cost and productivity calculations for educational technology have largely been framed in the limited context of a budget for schooling, rather than assessed against the larger economic context of human resource issues in our society.
5. Teachers and school administrators are overwhelmed by their current responsibilities and do not have the support systems necessary to enable reconceptualizing their role to enable learning with the aid of technology.

Educational institutions do not face the same types of pressures as the business world to move beyond impediments to innovation (Dede, 1995). Dede posited that the largest impediment to effective use of new technologies for learning is the outmoded paradigm of education.

In a report submitted to the U.S. Congress, the U.S. General Accounting Office noted that the country's schools do not have the physical capacity to support learning into the 21st century (Bradley, 1995). Among issues reported by the U.S. General Accounting Office, the most striking was the fact that not all students have equal access

to facilities that can support education into the 21st century, even those attending the same school in the same district. Overall, schools in central cities and schools with 50% or more minority population were more likely to have more insufficient technology elements and a greater number of unsatisfactory environmental conditions (Bradley).

Social and economic inequities have existed in public education in many forms (Fredman, 1990). The literature on equitable access and use of technology indicates that many students--not just students of color, students who are at risk, and inner-city children, but also females, persons with disabilities, and rural children--have been hindered by inequitable access to technology within the school environment (Brown, 2000). Brown notes physical access, instruction and pedagogy, and barriers to equitable access are the three issues that arise in the literature with regard to students at risk and technologies.

Access, lack of role models, and materials were major issues in 1986 and still are today. Minorities predominantly go to school in less wealthy school districts; these districts do not have the funds to buy adequate or state-of-the-art technology. Access is further impeded by the fact that minority families are overrepresented in the ranks of the poor. Poor parents cannot afford to buy home computers for their children. Role models are needed to show that minority men and women can succeed in careers involving high technology. Some researchers report that minorities often are exposed to technology in remedial programs. These programs consist of drill and practice exercises rather than the use of technology in creative problem solving. Other issues that hinder the usage of technology are (a) fear of technology, (b) de facto segregation, (c) unconscious stereotyping with females, and (d) poorly supervised access. Many minority parents fear

technological change in the workplace since such changes have led to the phase-out of jobs traditionally held by minorities. Moreover, this attitude of fear communicates itself to their children. Tracking and assigning to specific curricular areas still result in relegating minorities to lower tracks with fewer academic programs and with less access to technology. This is not always conscious policy on the part of school administrators. Teachers may expect less of some minority students, leading them, in turn, to perform less well. Computers are then taken over by one particular group to the exclusion of others. This can result in the children of less aggressive minorities, such as Native Americans, being left out (Brown, 2000).

Socioeconomic Status

Factors other than sheer numbers can also limit computer access to selected groups. Locating hardware in labs and classrooms restricted to advanced students and setting unnecessarily difficult prerequisites for computer courses can easily deprive average and slower students of computer opportunities. Software that incorporates stereotypes and uses of technology that reflect subtle biases can create the most pernicious inequities of all (Neuman, 1991). Poor or underachieving students do not have the same access to computers as wealthy or talented students, even in schools owning microcomputers. Children identified in the low socioeconomic status group, who are disproportionately African American and Hispanic American, have been gaining most of their experience with a computer when they were in control, asking questions, expecting a response, and being informed when they were correct. In contrast, the high socioeconomic status students, who are disproportionately European

American, have been gaining considerable experience when they were in control, giving the computer a series of instructions, and by observing the consequences of those instructions (Sutton, 1991). Students in the high socioeconomic group have been allowed to manipulate the computer while students in the low socioeconomic group have basically done drill and practice work.

The U.S. Department of Commerce has shown in its most recent study that access to computers and the Internet is highly dependent on income, racial and ethnic group, and urbanicity (U.S. Department of Commerce, 1999). Other studies indicate that access varies greatly by income, age, education, and technology optimism (Forrester Research, 2000). Much of the racial differences in access to computers, though not all, can be accounted for by corresponding differences in family socioeconomic status or school performance levels. Schools with higher ability students and schools with students from more advantaged backgrounds had better student-computer ratios. They also maintained a higher proportion of teachers who were expert computer users and spent less time on computer-assisted instruction and more time on programming than did schools with lower ability students with less advantaged backgrounds. Teacher use and expertise seemed to be differentiated more by student achievement levels than by socioeconomic factors. Higher student achievement was also associated with a greater proportion of students using computers, mainly at the middle school grades.

Coley, Cradler, & Engel (1997) found that students attending poor and high minority schools have less access to most types of technology than students attending other schools. Students from minority groups were less likely to (a) have courses or

experience in word processing and computer literacy, (b) use computers in English courses, and (c) solve problems in mathematics and natural science. Minority group students were more likely to have courses in data processing and computer programming. Unfortunately, updated reports by Silver, Smith, and Nelson (1995), Leder (1995), and Tate (1995) have shown that these conditions have not improved much from the 1980s when Ingle conducted his original studies.

In "*Learning and Leading With Technology,*" Hayes (1995) reported that equity has been an issue in American education since its existence. As a nation, individuals have looked at separate but equal systems and decided that they were, indeed, not equal. Our society is becoming increasingly dependent on technology, the equality debate now centers on access to educational technologies.

Hayes (1995) notes (using the data provided by Quality Education Data, 1995) access to computers is seriously affected by the relative wealth of the school's student population. Schools with the lowest percentage of Title I students have the best ratio of students-to-computer at 11.7:1. The lowest wealth school districts report a student-to-computer ratio at 13.9:1 (Hayes). Hayes also reports students in schools with high percentages of multicultural students have less access to computers. The disparity between high- and low-multicultural percentages is greater than the disparity between low-wealth and high-wealth schools. The more ethnically diverse a school's population, the less access individual students have to personal computers (Hayes).

If students are to perform well in an increasingly knowledge-based society, technology equity is needed for all students, regardless of income or ethnic background (Hayes, 1995). Hancock (1995) argues that the United States has been dividing into two

societies: one that is comfortable with computers and the other with insufficient computer access. Hancock reports schools with the largest concentration of poor children have the least and most obsolete technological equipment.

Some schools with a high number of low socioeconomic and multicultural students have successfully improved the gap with technology. By increasing the number and use of computers in the classroom, schools have experienced an improvement in student scores, performance, and attendance. In a school located in New Jersey, 80% of the children are poor, but due to technology or a combination of factors, reading, mathematics, attendance, and writing scores are reportedly the best in the district (Richey, 1994). Later, Hayes (1995) corroborated these earlier findings. When schools are committed to quality opportunities for learning by what they do in the environment and by the way they integrate real opportunities for the students' use of technology, student achievement outcomes are impacted (Hayes).

Gender

Gender comparisons of computer skills consistently favor males (Grossman & Damarian, 1994). Males outperform females on tests of computer literacy and they do so even when both genders have equal exposure to computers and instruction in computer skills (Grossman & Damarian). Haugland (1994) argued research has shown that at 4 and 5 years of age, no differences exist between computer use by males and females. However, by the time children are 8 and 9, gender differences have emerged with males using computers more than females (Haugland). To facilitate universal

accessibility, it is important that teachers ensure that all children have adequate initial exposure and that these beginning experiences are positive.

Society and parental influences play major roles in gender inequalities favoring males; studies show that teachers and schools reinforce gender inequity in computer use (Sutton, 1991). Such results suggest there is a gender effect that is associated with expectations of teachers toward females and males in science, the types of interactions that occur between teachers and students and among students in science classrooms, and the kinds of evaluations that assess what kind and how much science has been learned by females and males. The gender effect is manifested when expectations, interactions, or measured achievements are related to students' sex rather than based upon their own potential; because of this, the gender effect influences females' attitudes toward science, their self-confidence in performing scientific tasks, their achievement levels in science, and their motivation to continue to study science (Kahle, Parker, Rennie, & Riley, 1993).

Gender bias in schools is rarely overt. Educators do not readily believe sex equity proponents who argue that sex bias occurs all the time. It is masked by its subtlety (Armitage, 1993). The main reason for the gender gap in mathematics and science and technology education is also the subtlest. It is the message females receive that computers are for males (Armitage). According to Armitage, other factors include society's view of computers as machines, coupled with socialization that makes many females uncomfortable with machines. Females do not identify with the stereotypes of the typical computer user. The media and advertising industry portray females in subordinate roles when using the computer.

Females have unequal access to computers at school in three areas: less frequent computer use, lower enrollment in computer classes, and less comfort in using the Internet (Wilson, 1999). Numerous studies have shown small but consistent gender differences both at school and at home (Chiaramonte, 1999; Kirkpatrick & Cuban, 1998; Reinen & Plomp, 1997; Sutton, 1991). Females were also less likely than males to take computer literacy and advanced computer classes or to use computers to solve mathematics and natural science problems, but they were more likely than males to use computers for word processing or in English class (American Association of University Women, 1998; Coley et al., 1997; Schofield, 1995). Nationwide, in the fall of 1998 about 8% fewer women than men who entered college had taken a half-year of computer science (Sax, Astin, Korn, & Mahoney, 1998). A spring 1998 Roper survey found that teenage females were 2% less likely than males to use computers at school, 8% less likely to use them at home, and 7% less likely to have their own computer (Chiaramonte).

As access to and usage of computers has increased, there has been a shift away from concerns regarding only the amount of time that is spent on computers. The confidence and interest in computers by females were unaffected by time. This became an issue of benefit equity as people began to examine why gender differences persisted even as the amount of time using computers leveled out. The manner in which both sexes use computers has led to the stereotype that computing is a male domain.

The gender gap in computer interest and skills commences in the early grades, persists in the home environment, and continues into adulthood, leaving females with limited exposure to female role models with computer expertise (Giacquinta, Bauer, &

Levin, 1993). Sakamoto (1994) found that among 4th through 6th grade students considered heavy users of computers, the ratio of males to females was 4:1. This gender disparity in technology has become so profound that it spans everything from the number of female computer science majors to differences in each gender's conceptualizations of computer ability (Miller, 1996).

Giacquinta et al. (1993) found that males conceptualize computers differently from females; males are more likely to play games, to program, and to view the computer as a playful recreational toy. Females tend to view the computer as a tool–a means to accomplish a task, such as word processing or other clerical duties. At all educational levels, males have greater access to computers than do females. They are more interested in learning about computers and find working with computers more enjoyable (Badagliacco, 1990; Ogletree & Williams, 1990; Shashaani, 1993). The following categories of factors have been found by Sutton (1991) to reflect the difference between female and male students: (a) input–access and socialization, (b) differences in access to computers, at school as well as at home, and different socialization experiences are important contributors to gender differences in computer use; and (c) process–equity issues in school. Factors found to influence gender inequality are (a) female role models in the class (or the number of female teachers working with the computer in the school and the type of role model they furnish); (b) organizational issues (like schools being coeducational or not, or time tabling of school subjects); (c) type of computer use in school (with gender differences mainly appearing in programming courses and voluntary activities); and (d) output–student attitudes and ability (Sutton).

Sex-role stereotyping, particularly for adolescent females, continues to be a powerful factor in deterring participation in technology. According to Thurston (1990),

1. There is a lack of adequate role models for females, especially in elementary school where they do not see women successfully involved with technology.
2. There is reticence on the part of female elementary teachers to use and participate in technology. In fact, most elementary teachers are women. Many still feel uncomfortable using technology in the classroom.
3. Many female elementary teachers report they feel uncomfortable in the areas of science and mathematics and lack confidence in their ability to teach these subjects.
4. There is the perception that science and mathematics are male subject areas. There is a mistaken idea among some teachers that technology is only usable in science and mathematics subject areas, both of which are seen as predominately male subjects.
5. Teachers unconsciously reinforce sex stereotyping by assuming males are more interested in technology than females.

Unequal access for both males and females into the world of computers is well documented; many studies demonstrate a pattern of sex differences in computer use, levels of interest, and achievement in programming skills (Thurston, 1990). Furthermore, females are poorly represented in courses that have the greatest potential for high cognitive development (Thurston).

Rural School Access of Computers

Most of the nation's schools are located in rural areas with rural teachers educating a third of the student population (Thurston, 1990). Although transportation and telecommunication have reduced some of the differences between rural and urban areas, there is still an increasing gap between urban and rural areas with regard to available resources, higher poverty rates, lower incomes for women, and lower youthful aspirations in rural areas (Thurston). Rural young women remain victims of cultural lag where home and school continue to condition them to accept a role definition that is no longer valid. The rural young women's view of themselves, their life, and their career may be partially circumscribed by access to technology and their perception of their role in technology (Thurston). Rural teachers who are interested in computer education or gender equity have few resources to acquire specific learning strategies to assure quality and equitable computer learning for the males and females in their classrooms (Thurston).

Socialization experience, as one possible factor of influence on student outcomes in the field of computer use, refers to the influence of differential socialization of males and females, often resulting in stereotypical sex-specific roles (Reinen & Plomp, 1994). These socialization differences can be influenced by the stimulation of parents or through imitation of significant others. Reinen and Plomp found that the use of the computer in school is an important process indicator that might explain gender differences. Reinen and Plomp's study compared computer use at school only versus computer use at school and other venues. The comparison in secondary education found that females more often belonged to the group that used the computer

only at school, whereas males more often appeared in the group that used the computer both at school and outside the school. When analyzing the type of activities that students performed at school, it has been found that males are often engaged in a greater number of activities than females, regardless of the intensity of the activities (Reinen & Plomp).

Differences Defined in Middle School

Gender differences have been documented in both computer use and access. Females are more likely to use computers for word processing, whereas males are more often programming computers (Mark & Hanson, 1992). A computer gender gap usually starts becoming noticeable at the middle school level and widens as females become older (Sanders, 1988). Females tend to have less confidence in their use of computers, and both males and females perceive computers as predominantly in the domain of males. These attitudes contribute to lower enrollments in computer courses and in varying levels of interest (Mark & Hanson). According to Mark and Hanson, in another study of students who had not yet received computer instruction in school, over 60% of males had a computer at home compared to 18% of females; and 28% of females versus 64% of males reported knowing how to work with computers.

Sadker, Sadker, and Klein (1991) found that experience with computers reduces the attitudinal differences regarding male versus female abilities with computers and, therefore, reduces the prevalence of sex stereotypes among males and females. Silverman and Pritchard (1996) found that, in middle school, females appear to enjoy technology education and have confidence in their abilities, but emerging sexism among

peers begins to differentially affect participation on the basis of gender. Hands-on activities were very attractive to the females. While females come into class with less experience using tools and machinery than males, they learn quickly and do not seem to be at a disadvantage (Silverman & Pritchard). Silverman and Pritchard also found middle school females are discouraged from taking more technology education in high school because of two major factors that tend to reinforce each other. First, technology has, until recently, been a field dominated by men. The authors found evidence that traditional stereotypes about male/female occupations are still operating and are strong enough to outweigh females' positive feelings about their experiences in technology. Second, the findings showed females were uninformed about economic realities and the world of work; they lacked basic information about careers, including any sense of salaries, promotion prospects, or the amount of education and training needed to pursue different occupations. While males and females may share this lack of information, for females it is combined with stereotypes about technology as a male occupation that reinforces their reluctance to consider nontraditional occupations.

Teacher Influence

Teachers exert a major influence on how children learn (Grossman & Damarian, 1994). Through the attention and feedback teachers provide students and the expectations they communicate to students, teachers tend to create and maintain gender differences in school in several ways (Grossman & Damarian). For example, teachers reinforce the behaviors of males and females in different ways, model sexist behavior that students can copy, and provide students with information that could contribute to

the cognitive gender stereotypes students form (Grossman & Damarian).

The pace of change has made it impossible for teachers to keep up with expanding technology on their own (Grandgenett & Mortenson, 1993). Teachers need support and inservice activities to enhance or build their knowledge on the use of technology in the classroom. Traditional approaches to integrating new curricula into the classroom may not be successful when applied to technology (Rice, 1995). Rice noted merely supplying teachers with technology often does little good unless the teachers are also carefully trained to use the technology through an appropriate inservice program. Grandgenett and Mortenson posit that teacher inservice programs need to be well planned and delivered to be successful. Grandgenett and Mortenson emphasize that sporadic workshops are not enough to successfully integrate technology into instruction. Inservice support of teachers in the area of information technology must address gender equity (Rice).

Teachers often unconsciously direct computer-related questions and challenging software and programming assignments toward males, while giving females drill and practice. Teachers can determine access to microcomputers in their classrooms, question and change the current practice of providing almost only drill and practice to lower achieving students, and reduce sex-role stereotyping or other conditions that influence females' interest in and access to computers. It has long been a principle of sex equity in education that females need to view females enacting roles in fields normally identified as male. It is further held that these female role models are most effective if they are clearly competent and show enthusiasm for their work. Previous research and prevailing beliefs suggest that the backgrounds of male and female

teachers may differ in at least two ways. Male and female teachers usually have dissimilar academic backgrounds. Recent statistics on the distribution of male and female graduates with bachelor's degrees show that men outnumber women more than 2:1 in the attainment of a degree in computer science.

The research literature over the past decade has firmly documented that women have overwhelmingly less positive attitudes toward computers than men. Statistics show that women have been left far behind in academic achievement in computer-related fields (Shashaani, 1994). Shashaani conducted a study that examined the effect of family socioeconomic status and parental sex-typed views and behaviors on children's attitudes toward computers. The results indicated that socioeconomic status had a significant effect on students' attitudes toward computers. Gender differential attitudes were more pronounced in the lower socioeconomic group. Socioeconomic status had a stronger effect on females than males. Analysis of the research findings revealed that both females and males perceived the gender stereotypes about computing held by their parents and such attitudes negatively affected the female students' own attitudes. Teachers need to understand the different value systems of various minority groups and where conflicts in values might occur. Helping teachers develop diverse teaching strategies should help them meet the needs of all their students. Minority-group children would especially benefit. Inadequately trained teachers, in an attempt to give their students an opportunity on the computer, may give them programmed games and rote drill-and-practice materials that do little to enhance skills in any area and do nothing to make students effective computer users who can access and process information (Fredman, 1990). The American education system has not kept up with the changes

brought about by the pace of technological advancements (Reif & Morse, 1992; Schneiderman, 1993).

Research repeatedly confirms that teachers' expectations of their students are the key to scholastic outcome and performance (Graybill, 1997). Teachers' academic expectations can influence their students' achievement and teachers' cultural backgrounds can also influence their perceptions of what is considered appropriate behavior (Graybill). Teachers bring their own culture and values into the classroom. Therefore, when teachers face a conflict in cultural values, they often react by rigidly adhering to their own set of values; thus, inadvertently, a teacher's behavior can interfere with learning—even limit the learning of their students (Graybill). Our prejudices and stereotyping can lead to assumptions that influence our own actions and interfere with effective teaching.

Becker (1991) found that a small proportion of instructional activities actually incorporate technology. Computers in most subject-matter classes serve primarily as enrichment or for occasional individual remediation rather than as a major way for students to learn to think and accomplish learning and understanding in that subject (Becker). Hadley and Sheingold (1993) noted technologies are peripheral to learning and teaching for most teachers and students. Bosch (1993) conducted a study of teachers and students and found a computer crisis exists in middle-level classrooms; a number of classrooms had no computers, and in the classrooms equipped with computers, they were not being used.

In the present educational environment, one finds that instructional activities are being incorporated more than during Becker's study. The computer is used more for

students to have the opportunity to enhance their learning process. A continuation of the existence of updated equipped is still a problem within the classrooms.

Zammit (1992) found that a major obstacle to successful technology integration is the lack of teacher confidence and skill when using technology. Becker (1991) and Zammit reported teachers perceive the largest impediment to skilled computer use to be the lack the time to learn how to use the technology efficiently. During Zammit's research, evidence was found that schools provided more funds for equipment than for inservice training of teachers to operate the equipment efficiently. Handler (1993) found that teacher computer literacy is not yet a significant concern for most teacher education programs. Despite the growing need for technology training, there is little evidence that typical preservice education programs are permeated with opportunities to gain expertise in technology (Handler).

The benefits of instructional technology use in the classroom cannot be realized if available technologies are not being used; this problem needs to be addressed and rectified (Buck & Horton, 1996). Buck and Horton conducted a study of the Brevard County School District in Florida and found that teachers were not utilizing the available equipment for student instruction. Teachers who received hands on inservice training were found to be more comfortable using technology in the classroom (Buck & Horton).

Jones (1991) and Byers (1992) found a relationship between inservice instruction and technology integration. Buck and Horton (1996), along with previous researchers, found the following variables to be significant in the study: (a) teachers taking classes on their own time and (b) the grade level being taught. Along with

previous researchers, the same variables were significant in their studies (Becker, 1991; Hadley & Sheingold, 1993).

Ethnicity

Researchers have identified a number of social and economic reasons why minority students leave the secondary schools with less computer experience than nonminority students (Schwalm, 1995). Because students build their expertise by spending regular and extensive time on computers, the ratio of students to computers in a school setting is critical. They develop a sense of self-efficacy by experiencing success in computing tasks and watching others like themselves succeed (Olivier & Shapiro, 1993). While some schools have an unequal number of computers in the classroom, minority students are less likely to have alternative access points, either at home or in public libraries where they can supplement the computer time provided at school (Resta, 1992). In schools, more aggressive students are likely to monopolize computer use; they frequently have access to more sophisticated programs and more extensive resources like the Internet (Schwalm). Minority students, because they are often at risk, are frequently directed toward the use of explicit-goal software, the use of which, according to Stanley Pogrow (1993), causes the learning gap between themselves and other students to widen.

A number of cultural issues affect minority students' ability to develop extensive computer expertise (Schwalm). Instruction in computing is linked to mathematics and science instruction; if minority students proceed more slowly in these content areas, they will also proceed more slowly in developing computer skills (Oliver

& Shapiro, 1993). The kinds of computing activities available in the past for students have fallen into a restricted range–one tied more closely to majority culture than to the interests of members of minority groups (Lucas & Schecter, 1992). There are few mentors and role models that exist for minority students in the computer labs. Consequently, minority students, over the course of their secondary school careers, may not develop the equivalent levels of computer competence as their nonminority peers.

Schwalm (1995) found that when minority students enter college with less computer experience, they could feel the effects almost immediately. Any perceived inadequacy, whether it is in preparation, experience, or skill level, contributes to students' decision to drop out of school. Differing levels of computer experience have measurable effects on student abilities to complete assigned work in a timely and different manner (Resta, 1992). Students with well-developed computer skills recognize the benefits of and know how to use various productivity tools like spreadsheets, databases, and word processors. They also know the worth of using the Internet to secure up-to-date information. Students who neither have access to these tools nor have prior experience using them may spend their available time doing mechanical tasks manually, running out of time before they advance to more intellectually rewarding activities. In addition to inhibiting student academic success, lack of computer experience can close off opportunities for career development and thus restrict minority students' chances of long-term economic success (Badagliacco, 1990).

Students' sense of their own computing competence is affected not only by their own ability to perform adequately, but also by their observations of others similar to themselves who are also successful (Olivier & Shapiro, 1993). Role models for minority

students are critical (Resta, 1992); that means that not only must there be adequate numbers of minority group members who can model computer competence, but they must also be visible, interacting with students on a regular basis. Light (1990) has suggested that in order to address the needs of minority students effectively, educational institutions will have to develop alternatives to the conventional pattern of lecture and large-group discussion. Devaney (1993) suggests that members of minority groups should be able to construct technological environments that reflect their culture and practices.

Summary

The Improving America's School Act of 1994 authorized $200 million for technology education in 1995 and an additional $200 million for the new education infrastructure improvement grants (Bradley, 1995). *Goals 2000: The Educate America Act* establishes the Office of Educational Technology in the U.S. Department of Education. Central to both of these acts is the idea, often referred to as opportunity to learn, that children are entitled to an opportunity to acquire the knowledge and skills identified by these standards (Bradley). Society and the workplace need people who know how to access, organize, and interpret relevant information. Increasingly, these skills involve the use of microcomputers and electronic databases. Malcom (1998) posited that poor children, who are disproportionately minority, are unlikely to have other resources apart from the school system for meeting their learning needs.

CHAPTER III

METHOD

The purpose of this study was to determine whether factors such as gender, ethnicity, and socioeconomic status have any relationship to the usage of computers in a rural secondary school setting. This study also examines how the teachers direct technology toward the students in their classes based on gender, ethnicity, and socioeconomic status. A description of the research design, instrumentation, population of the study, and methods of data collection and analysis is shown in this chapter.

Research Design

This study was a mixed-method design, which combined quantitative and qualitative techniques. The design was used to determine access to computer usage based on ethnicity, gender, and socioeconomic status of rural secondary students. Patton (1990) posed that when investigating human behavior and attitudes, it is most fruitful to use a variety of data-collection methods. The use of the mixed-method approach can increase both the validity and reliability of the evaluation data. By this design, the attitudes of the teachers and their perspectives of how they influence the use of computers within their classrooms based on the student's ethnicity, gender, and socioeconomic status was also investigated.

Methods Related to Research Questions

Question 1: How are Ethnicity, Gender, and Socioeconomic Status related to Access to Computers? The researcher addressed this question with the use of a student survey instrument. Responses to the survey instrument identified the attitudes of students in the usage and knowledge of the computer and whether or not the individual felt the teacher provided adequate computer time. The surveys provided the researcher information to help in identifying whether there was equality in computer usage in the academic areas at Vernon High School.

Question 2: How do Teachers Direct Technology toward Males and Females, and toward European Americans, African Americans, and other Minority Groups that Comprise the Study Group Population, and toward High- and Low-Level Socioeconomic Groups? Responses to teacher interviews and student surveys were combined in addressing this research question. Individual statements on the student survey were compared with the responses from the teacher interviews and provided data about differences in perception of teacher direction of technology with respect to the gender, socioeconomic status and ethnicity of the students.

Instrumentation

A student survey (see Appendix A) was designed to investigate the computer use and attitudes of the study sample group at Vernon High School. A proportional stratified sampling of the target population was interviewed. Stratified random sampling involves dividing the population into subgroups, or strata, on the basis of a variable chosen by the researcher (McMillan & Schumacher, 2001). Proportional stratified

sampling is based on the percentage of subjects in the population that is present in each stratum (McMillan & Schumacher). With the information obtained from the surveys and interviews, the researcher determined whether students, based on their ethnicity, socioeconomic status and gender, had as equal an opportunity as their counterparts.

The survey instrument was designed by the researcher to gather data from the individual students about their present attitudes toward computers, incorporating student grade level, gender, socioeconomic status of participants, and ethnic origin. Statements were scored by means of a Likert-type scale response pattern as follows: 1 = *strongly disagree*, 2 = *disagree*, 3 = *have no opinion*, 4 = *agree,* and 5 = *strongly agree*. Each student was given an instrument to determine the degree of usage of computers in their respective classes. Statements pertaining to the teacher's use of computers were included on the student survey.

A sample of individuals from a population similar to the study group was randomly selected to participate in the piloting of the student survey. A total of 25 students were asked to complete the survey. Of the 25 randomly selected students, 2 surveys were not included in the study (one was incomplete, the other not returned). Cronbach's coefficient alpha was used to determine the internal consistency of the survey. Cronbach's coefficient alpha reliability test results range from .00 (poor reliability) to 1.00 (high reliability). The calculation of the reliability coefficient was based on 23 student surveys with 36 items included on the survey. The Cronbach coefficient alpha was .77, which showed a high level of reliability for the survey.

Population and Sample

The target population for this study, during the 2000-2001 school year, was comprised of 348 students from Vernon High School in grades 9-12. Vernon High School is located in Washington County, Florida, which is defined as a rural area with varying ethnic and socioeconomic backgrounds of students. Vernon High School services approximately seven different communities. Technology has been a priority of the Washington County School District since the beginning of the 1980s.

The target group consisted of 58 males and 51 females in Grade 9. Grade 10 consisted of 44 males and 42 females. There were 46 males and 35 females in the 11th grade, along with 39 males and 33 females in the 12th grade. The study group population was comprised of 54% males and 46% females.

The ethnic composition of the study group consisted of 262 European Americans, 80 African Americans, 4 Hispanic Americans, 1 American Indian and 1 other. *Other* includes individuals who did not fit into any of the other categories mentioned above. The population was comprised of 75% European Americans, 23% African Americans, 1% Hispanic American, and 1% American Indian and other.

Forty-four percent of the students at Vernon High School were either on free or reduced-rate lunch. Free or reduced-rate lunch students are identified by the parent's income. Students took home a free or reduced-rate lunch form to be filled out by the parent and returned by the student. One hundred and twenty-five students did not return their forms. Of the 152 students that did not receive free or reduced-rate lunch, the composition was African American, 54; European American, 94; Hispanic American, 3; and American Indian, 1.

Along with the study of the individual students, teachers of these students were also included in this study. There were a total of 22 instructors who taught the core curriculum at Vernon High School. Eleven of the 22 instructors were randomly selected for the interview process. The media specialist, guidance counselor, physical education instructors, and administrators were omitted from this study, because these positions very seldom had students who actually use the computer. Students in the media center used computers, but the instructor did not have a specific class. Fourteen of the instructors held the bachelor's degree, 7 the master's degree, and 1 the educational specialist degree. There were 20 European Americans and 2 African Americans. There were 13 males and 9 females.

Florida public schools reported a total of 549,725 microcomputers primarily used for student instructional purposes and programs during the 1999-2000 school year (Florida Department of Education, 2000). Florida public school districts reported student use of computers by grade levels, programs and curriculum areas. The number of students using computers in grades 9-12 was 16%. The highest usage of computers during the 1999-2000 school year was found in grades PK-3 (45%), and grades 4-5 (22%). According to research information provided by the Florida Department of Education, the usage continues to be the highest in the curriculum areas of computer literacy, mathematics, language arts, and reading. Increases in the usage of computers were also reported in the area of science and instructional management.

In Washington County, during the 1999-2000 school year, the reported number of computers in the schools was 1,193. The enrollment of the public schools located in Washington County was 3,148, which gives a ratio of students to computers of 3:1.

In a 1997-98 study by Quality Education Data, Florida public schools reported a total of 342,167 microcomputers primarily being used for student instructional purposes and programs during the 1997-1998 school year (Quality Education Data, 1998). Florida ranked 11th out of the 50 states in the number of students (6.9) per computer.

Procedures

Approval from The University of West Florida Institutional Review Board (IRB) was obtained to use human participants in the study (see Appendix B). A letter was composed by the researcher and presented to the Superintendent of Washington County Schools and the principal of Vernon High School requesting permission to conduct this study at Vernon High School (see Appendixes C and D). After the superintendent and principal granted permission to conduct the study, a letter was sent to the Vernon High School faculty and parents for participants' permission (see Appendixes E and F). The researcher waited for 1 week after distributing the letters of request to the parents and faculty members before the Language Arts instructors administered the student survey. These instructors were selected because every student attending Vernon High School was enrolled in an English class with 1 of the 5 instructors. This permitted easier access to the student body. The researcher consulted the Language Arts instructors about the time frame in which the surveys were to be completed and returned to the researcher. Instructors were given 1 week to have the students complete the surveys and return them to the researcher. Instructors were also informed of the students whose parents declined to agree to participate in the study. No survey was given to nonparticipating students.

A personal interview questionnaire (see Appendix G) was developed by the researcher for the instructors who participated in the study. The questionnaire assessed the instructors' views of showing or not showing bias toward any group of students who used the computer in their class. Eleven instructors were interviewed individually by the researcher. The student survey and instructor interview data were used to address the research questions in this study.

Data Analyses

Data collected from the student surveys were analyzed using a frequency distribution converting to percentages. For purposes of this study, response differences of 15 or more percentage points are considered significant. The means and standard deviations for each subcategory were calculated. Relationships or associations between access to and use of computers and ethnicity, gender, and socioeconomic status were determined based on frequencies of response from each survey statement.

To ensure validity of the study and to determine whether interactions between the variables existed, an analysis of variance (ANOVA) was performed. The survey statements were grouped in the following categories: (a) individual, (b) time, (c) gender, (d) general use, and (e) general interest. A 5-point, Likert-type scale was used to establish the degree of usage of computers relating to the variables. Results are presented in tables with *strongly agree* and *agree* percentages combined as *agree* responses, and *strongly disagree* and *disagree* percentages combined in the same manner.

Teacher interviews were utilized in conjunction with student survey responses to ascertain if the independent variable (teacher) had influence over the use of computers by students between ethnic, gender, and socioeconomic groups. A single case analysis was used to report the results from the interviews.

Summary

In summary, the purpose of this study was to examine the relationship to computer usage among Vernon High School students identified by gender, ethnicity and socioeconomic status, and how teachers in the academic areas directed computer usage of their students. The researcher intended to use qualitative research strategies to answer the research questions. The information obtained from the surveys and interviews is described in chapter 4. Based on this data the researcher determined whether computer usage was equitable among secondary students, and, if the data indicated that inequity existed, the researcher defined ways to improve equity among students. Also, if inequity in computer usage by students existed among the teachers in the classroom, suggestions were noted to remove those inequities.

Background of the Researcher

The researcher taught business technology education for 14 years in the Washington County School District. She earned a bachelor of science degree in business education from The University of West Florida in 1980. In 1988, she attended The University of West Florida and earned a master's degree in vocational education, specializing in business education. She earned an educational specialist degree from

The University of West Florida in educational leadership in 1996. The researcher has taught grades 7-12 in the vocational area (business technology). At the time of this study, she was the Assistant Principal at Vernon High School; currently, she is the Principal at Vernon Elementary School.

The researcher is a self-taught computer instructor with knowledge of the following computer platforms: Macintosh and Windows. The researcher has dealt with changes in the manner that information is delivered in the classroom and the way information has changed in today's world. She knows the importance of the knowledge individuals need to gain from using computer technology. She is interested in knowing whether the students in our school system are gaining all the knowledge possible in the area of technology usage. This information will assist students in becoming productive citizens in the information age.

CHAPTER IV

RESULTS

The data collected in this study is addressed in this chapter. The survey data and interview responses are presented. The purpose of this study was to determine whether gender, ethnicity, and socioeconomic status of secondary students have any relationship in the use of the computer in a rural secondary school setting and if teachers displayed any biases among gender, ethnic or socioeconomic status of students.

Surveys were distributed to 348 secondary students at Vernon High School; 223 students responded for a 64% return rate. The students responded to the survey statements by selecting 1 of 5 responses ranging from *strongly agree* to *strongly disagree*. A frequency distribution was computed for each statement on the survey instrument. The researcher sorted each item in the survey by the content of the question. The researcher then placed each item in a categorical subscale. The subscales identified were (a) individual factors, (b) time factors, (c) gender factors, (d) general use, (e) general interest and (f) teacher usage. To analyze the data, the researcher sorted student surveys into the following categories: gender, ethnicity and socioeconomic status. To gain additional information dealing with the research questions posed in this study the researcher interviewed eleven teachers.

Study Design

The Language Arts instructors administered the survey to every student who participated in the study. These instructors were chosen because all students attending this school were enrolled in an English class that allowed the researcher a better opportunity to administer and collect the necessary data. This method provided easier access to the student body. Surveys were not given to students whose parents requested that the student not participate in the study. The instructors were given 1 week to collect the completed surveys from their students. Vernon High School operated on a 4 x 4 block schedule during the study period in which every student had an English class. The researcher interviewed eleven academic teachers. Data from the student surveys and instructor interviews were used to answer the research questions addressed in this study.

Research Question 1

The first research question, "How are ethnicity, gender, and socioeconomic status related to access to computers?" was answered based on the results of the student survey instrument. The data was summarized by each subgroup in the study population.

Gender

A summary of responses by gender is provided in Table 1. Responses were returned from 105 female and 115 male students. Three students did not respond to the survey questions. For the purpose of analyzing the data by gender the 3 student surveys were not included.

Seventy-one percent of the female populations agree that they receive a fair chance in school usage of computers while 52% of the male populations agree that they

receive a fair chance in school usage of computers. In response to the statement, "the boys in our class get to use the computer more than the girls," 31% of the female and 67% of the male students disagreed with this statement. In response to the statement, "My friends of the same sex have a positive attitude towards computers," 56% of the females and 39% of the males agreed. Seventy-six percent of the females and 60% of the males did not believe computers were mainly for males. Sixty-three percent of the females did not believe the males in their school were better with computers than the females while 34% of the males did not believe the males in their school were better with computers than the females. In response to the statement, "I use the computer to play games only," 65% of the females and 49% of the males disagreed with the statement.

To further analyze the relationship between the responses of females and males with respect to access to computers based on the survey statements, a one-way ANOVA was performed (see Table 2). The ANOVA revealed no significant difference ($\alpha = .05$) in the means for the male and female participants.

The student perception of computer usage by gender, as shown in Table 1, was favorable in the area of Vernon High School students receiving access to computers. Significant differences in response percentages by gender were found for the following statements:

1. A fair chance to use the computer in school (agree).

13. Boys in our class get to use the computer more than girls (disagree).

15. My friends of the same sex have a positive attitude towards computers (agree).

16. I believe computers are mainly for males (disagree).

18. The males in my school are better with computers than the females (disagree).

22. I use the computer to play games only (disagree).

Ethnicity

A summary of responses by ethnicity is provided in Table 3. Responses were returned from 4 Asian, 47 African American, 4 Hispanic American, 3 American Indian and 161 European American students. Four students chose not to respond to the survey questions.

Twenty-five percent of the Asians and 33% of the American Indians did not agree that they receive a fair chance to use the computer at school. Seventy-five percent of the Asians and 66% of American Indians did not have a computer at home for their use. Fifty percent of the Asians and 66% of the American Indians had no future goals including computers. Forty-seven percent of the African Americans, 33% of American Indians, and 35% of the European Americans do not agree that they were treated differently in using the computers on campus. Seventy-five percent of the African Americans, 50% of Hispanic Americans, 66% of American Indians, and 75% of European Americans did not agree that computers make them nervous. Fifty percent of the Asians, 61% of African Americans, 50% of Hispanic Americans, 66% of American Indians, and 53% of European Americans did not spend more than 10 hours using the computers.

Table 1

Student Perceptions of Access to Computers by Gender Expressed in Percentages

Response item	Females			Males		
	A	HNO	DA	A	HNO	DA
Individual factors						
1. I get a fair chance to use the computer in school.	71	10	18	52	17	30
2. I have a computer at home for my use.	66	4	32	65	5	30
3. My future goals include computers.	35	35	19	47	31	21
4. I have a positive attitude towards computers.	79	14	6	69	18	12
5. I am treated differently in using the computers on campus.	15	42	42	22	46	32
6. Compared with other students my age, I am more interested in computers.	13	48	38	37	42	20
7. My family encourages me to get involved with the use of computers.	52	25	23	46	28	24
8. Computers make me nervous.	13	12	74	6	21	73

(table continues)

Response item	Females			Males		
	A	HNO	DA	A	HNO	DA
Time factors						
9. I have spent more than 10 hours using the computers in my classes.	37	10	54	34	10	56
10. I have spent more than 25 hours using the computers in my classes.	22	17	59	25	18	58
11. I have spent between 11-25 hours using the computers in my classes.	24	12	62	26	19	54
12. I get to use the computer at least twice during the week.	61	13	24	51	16	33
Gender factors						
13. The boys in our class get to use the computer more than the girls.	5	30	31	5	27	67
14. Girls like to use the computers more than boys.	14	51	33	13	60	25
15. My friends of the same sex have a positive attitude towards computers.	56	39	5	39	46	15
16. I believe computers are mainly for males.	3	22	76	9	31	60
17. Learning about computers is just as important for females as for males.	87	10	2	77	17	5

(table continues)

Response item	Females			Males		
	A	HNO	DA	A	HNO	DA
18. The males in my school are better with computers than the females.	8	28	63	14	50	34
General use						
19. I feel confident about my ability to use computers.	75	14	10	67	21	10
General interest						
20. I like computers because they seem to be interesting.	78	17	21	71	14	15
21. Being able to use a computer would give me a sense of accomplishment.	54	33	11	52	36	12
22. I use the computer to play games only.	15	20	65	29	20	49
23. Computers are important.	87	9	5	75	18	6
24. I would be interested in knowing more information about computer subjects.	51	31	17	56	28	16
25. I enjoy using computers.	79	15	6	72	16	12

Note. A = agree; HNO = have no opinion; DA = disagree. Number of respondents:

Females = 105; males = 115.

Seventy-five percent of the Asians, 58% of the African Americans, 100% of the American Indians and 58% of the European Americans did not spend more than 25 hours using the computers in classes. Fifty percent of the Asians, 66% of the African Americans, 100% of the Hispanic Americans, 33% of the American Indians and 54% of the European Americans get to use the computer at least twice during the week. The amount of time spent in the class using the computers showed whether there was a difference in the usage by ethnic groups.

Table 2

Analysis of Variance for Access to Computers Based on Gender

Source	*df*	*F*	*SS*
	Between subjects		
Females X males	1	0.03*	0.001
S within-group error	219	(0.01)	
	Within subjects		
Females X males	8		2.035
S within-group error	219	(0.25)	

Note. Values enclosed in parentheses represent mean square errors. S = subjects.

*p < .05.

Table 3

Student Perceptions of Access to Computers by Ethnic Group and Expressed in Percentages

Response item	Ethnic Group	Response		
		A	HNO	DA
1. I get a fair chance to use the computer in school.	A	--	75	25
	AA	78	9	13
	HA	25	9	25
	AI	--	67	33
	EA	61	12	28
2. I have a computer at home for my use.	A	25	--	75
	AA	62	2	36
	HA	50	--	50
	AI	33	--	66
	EA	69	4	27
3. My future goals include computers.	A	25	25	50
	AA	45	26	28
	HA	100	--	--
	AI	--	33	66
	EA	48	35	18
4. I have a positive attitude towards computers.	A	25	75	--
	AA	68	19	10
	HA	100	--	--
	AI	67	--	33
	EA	67	15	9
5. I am treated differently in using the computers on campus.	A	25	50	25
	AA	13	38	47
	HA	25	50	25
	AI	60	--	33
	EA	21	44	35

(table continues)

Response item	Ethnic Group	Response		
		A	HNO	DA
6. Compared with other students my age, I am more interested in computers.	A	--	100	--
	AA	26	40	30
	HA	25	50	25
	AI	--	100	--
	EA	27	42	30
7. My family encourages me to get involved with the use of computers.	A	--	100	--
	AA	49	26	26
	HA	--	75	25
	AI	66	33	--
	EA	51	24	23
8. Computers make me nervous.	A	25	50	25
	AA	11	15	75
	HA	25	25	50
	AI	--	33	66
	EA	8	16	75
9. I have spent more than 10 hours using the computers in my classes.	A	50	--	50
	AA	30	9	61
	HA	50	--	50
	AI	--	33	66
	EA	36	11	53
10. I have spent more than 25 hours using the computers in my classes.	A	25	--	75
	AA	26	17	58
	HA	25	50	--
	AI	--	--	100
	EA	24	19	58
11. I have spent between 11-25 hours using the computers in my classes.	A	25	--	75
	AA	22	17	58
	HA	50	25	25
	AI	--	33	67
	EA	27	16	57

(table continues)

Response item	Ethnic Group	Response		
		A	HNO	DA
12. I get to use the computer at least twice during the week.	A	50	25	25
	AA	66	15	20
	HA	100	--	--
	AI	33	67	--
	EA	54	14	31
13. The boys in our class get to use the computer more than the girls.	A	--	25	31
	AA	4	23	72
	HA	--	50	50
	AI	33	33	33
	EA	5	29	66
14. Girls like to use the computers more than boys.	A	25	50	25
	AA	21	50	23
	HA	--	75	25
	AI	--	100	--
	EA	12	55	32
15. My friends of the same sex have a positive attitude towards computers.	A	--	75	25
	AA	49	40	10
	HA	25	75	--
	AI	--	77	33
	EA	40	42	8
16. I believe computers are mainly for males.	A	25	25	50
	AA	8	19	72
	HA	--	50	50
	AI	--	67	33
	EA	5	27	68
17. Learning about computers is just as important for females as for males.	A	75	25	--
	AA	64	21	10
	HA	50	50	--
	AI	--	33	66
	EA	90	8	2

(table continues)

Response item	Ethnic Group	Response		
		A	HNO	DA
18. The males in my school are better with computers than the females.	A	--	100	--
	AA	4	38	54
	HA	--	50	50
	AI	--	67	33
	EA	13	36	50
19. I feel confident about my ability to use computers.	A	50	50	--
	AA	76	13	8
	HA	75	25	--
	AI	33	33	33
	EA	71	18	9
20. I like computers because they seem to be interesting.	A	100	--	--
	AA	70	15	15
	HA	50	50	--
	AI	67	--	33
	EA	76	16	8
21. Being able to use a computer would give me a sense of accomplishment.	A	50	50	--
	AA	47	36	10
	HA	25	75	--
	AI	--	100	--
	EA	57	31	11
22. I use the computer to play games only.	A	50	25	25
	AA	30	13	55
	HA	--	25	75
	AI	67	--	33
	EA	19	22	58
23. Computers are important.	A	75	--	25
	AA	83	11	6
	HA	50	50	--
	AI	33	33	33
	EA	82	13	4

(table continues)

Response item	Ethnic Group	Response A	Response HNO	Response DA
24. I would be interested in knowing more information about computer subjects.	A	100	--	--
	AA	49	30	22
	HA	50	50	--
	AI	33	67	--
	EA	54	30	15
25. I enjoy using computers.	A	75	--	25
	AA	72	15	13
	HA	50	50	--
	AI	33	67	--
	EA	78	14	7

Note. A = agree; HNO = have no opinion; DA = disagree. Groups: A = Asian = 4; AA = African American = 47; HA = Hispanic American = 4; AI = American Indian = 3; EA = European American = 161. Dashes indicate no responses.

Thirty-one percent of Asians, 72% of African Americans, 50% of Hispanic Americans, and 66% of European Americans did not agree that boys in the class get to use the computer more than the girls. Thirty-two percent of European Americans did not agree girls like to use the computers more than boys. Thirty-three percent of American Indians did not agree their friends of the same sex had a positive attitude towards computers. Sixty-six percent of American Indians did not agree that learning about computers was just as important for females as for males. Fifty-five percent of African Americans, 75% of Hispanic Americans, and 58% of European Americans did not use the computer to play games only.

To further analyze the relationship between ethnic responses on access of computers based on the survey statements, a one-way ANOVA was performed (see Table 4). The ANOVA revealed a significant difference ($\alpha = .05$) in the means for the subjects when grouped by ethnic category.

Table 4

Analysis of Variance for Access to Computers Based on Ethnicity

Source	*df*	*F*	*SS*
	Between subjects		
A, AA, HA, AI, EA	4	1.31*	1.15
S within-group error	218	(0.29)	
	Within subjects		
A, AA, HA, AI, EA	20		4.39
S within-group error	218	(0.22)	

Note. Values enclosed in parentheses represent mean square errors. A = Asian; AA = African American; HA = Hispanic American; AI = American Indian; EA = European American. S = subjects.

*$p < .05$.

As may be seen from the data displayed in Table 3, survey responses related to the perception of computer usage showed significant differences among ethnic groups.

The Asian students showed a significant difference from the other ethnic groups identified in the study in response to the following statements:

1. A fair chance to use the computer at school.
2. I have a computer at home for their use.
3. Future goals including the use of computers.
9. Spent more than 10 hours using the computers.
13. Boys get to use the computers more than girls.

The African American students showed a significant difference from the other ethnic groups identified in the study in response to the following statements:

5. I am treated differently in using the computers on campus.
8. Computers make them nervous.
9. I spend more than 10 hours using the computers.
13. Boys get to use the computers more than girls.
22. I use the computer to play games only.

The American Indian students showed a difference from the other ethnic groups identified in the study in response to the following statements:

1. A fair chance to use the computer at school.
2. I have a computer at home for their use.
3. My future goals including the use of computers.
5. I am treated differently in using the computers on campus.
8. Computers make them nervous.
9. I spend more than 10 hours using the computers.
15. My friends of the same sex have a positive attitude towards computers.
17. Learning about computers is just as important for females as for males.

The Hispanic American students showed a difference from the other ethnic groups identified in the study in response to the following statements:

8. Computers make them nervous.

9. I spend more than 10 hours using the computers.

13. Boys get to use the computers more than the girls.

22. I use the computer to play games only.

The European American students showed a difference from the other ethnic groups identified in the study in the following statements:

5. I am treated differently in using the computers on campus.

8. Computers make them nervous.

9. I spend more than 10 hours using the computers.

13. Boys get to use the computers more than girls.

22. I use the computer to play games only.

The Asian and Hispanic Americans spent 10 hours or more using computers in their classes than the other ethnic groups identified in the study.

Socioeconomic Status

A summary of responses by socioeconomic status (SES) is provided in Table 5. Responses were returned from 89 students who receive free or reduced lunch and 127 students who did not receive free or reduced lunch. Seven students chose not to respond to the survey questions.

Table 5

Student Perceptions of Access to Computers by Socioeconomic Status and Reported in Percentages

Response item	Group	Response		
		A	HNO	DA
1. I get a fair chance to use the computer in school.	Low	63	15	22
	High	60	12	28
2. I have a computer at home for my use.	Low	60	3	36
	High	63	5	28
3. My future goals include computers.	Low	45	29	25
	High	49	35	16
4. I have a positive attitude towards computers.	Low	68	18	12
	High	79	14	7
5. I am treated differently in using the computers on campus.	Low	18	47	24
	High	18	42	41
6. Compared with other students my age, I am more interested in computers.	Low	22	47	28
	High	28	41	30
7. My family encourages me to get involved with the use of computers.	Low	42	33	24
	High	55	21	23
8. Computers make me nervous.	Low	10	21	66
	High	8	11	81
9. I have spent more than 10 hours using the computers in my classes.	Low	45	9	46
	High	28	10	61

(table continues)

Response item	Group	Response		
		A	HNO	DA
10. I have spent more than 25 hours using the computers in my classes.	Low	29	21	48
	High	20	14	66
11. I have spent between 11-25 hours using the computers in my classes.	Low	32	21	45
	High	22	12	66
12. I get to use the computer at least twice during the week.	Low	63	16	20
	High	51	13	36
13. The boys in our class get to use the computer more than the girls.	Low	3	30	65
	High	7	26	67
14. Girls like to use the computers more than boys.	Low	20	58	21
	High	9	53	36
15. My friends of the same sex have a positive attitude towards computers.	Low	42	48	10
	High	51	39	11
16. I believe computers are mainly for males.	Low	7	31	60
	High	4	24	72
17. Learning about computers is just as important for females as for males.	Low	74	17	5
	High	87	10	3
18. The males in my school are better with computers than the females.	Low	8	42	47
	High	12	36	51
19. I feel confident about my ability to use computers.	Low	74	17	8
	High	71	18	10
20. I like computers because they seem to be interesting.	Low	71	18	12
	High	81	12	8

(*table continues*)

Response item	Group	Response		
		A	HNO	DA
21. Being able to use a computer would give me a sense of accomplishment.	Low	49	36	9
	High	54	33	13
22. I use the computer to play games only.	Low	21	17	57
	High	22	22	57
23. Computers are important.	Low	80	13	4
	High	82	13	6
24. I would be interested in knowing more information about computer subjects.	Low	48	33	17
	High	59	26	15
25. I enjoy using computers.	Low	71	17	9
	High	80	13	8

Note. A = agree; HNO = have no opinion; DA = disagree. Number of respondents by socioeconomic status: Low SES = 89; High SES = 127.

Twenty-four percent of the low socioeconomic status (SES) students and 41% of the high SES students did not feel that they were treated differently in using the computers on campus. Sixty-six percent of the low SES students and 81% of the high SES students did not feel that computers made them nervous. Forty-six percent of the low SES students and 61% of the high SES students disagreed with spending more than 10 hours using the computers in their classes. Forty-eight percent of the low SES students and 66% of the high SES students did not agree they spent more than 25 hours using the computers in their classes. Forty-five percent of the low SES students and

66% of the high SES students did not agree they had spent between 11-25 hours using the computers in their classes.

Sixty-five percent of the low SES students and 67% of the high SES students did not feel that boys in their class get to use the computer more than the girls. Thirty-six percent of the high SES students disagreed that girls like to use the computers more than boys. Sixty percent of the low SES students and 72% of the high SES students disagreed that computers are mainly for males. Forty-seven percent of the low SES and 51% of the high SES students disagreed that males in their school were better with computers than the females.

Seventy-four percent of the low SES students and 71% of the high SES students felt confident about their ability to use computers. Seventy-one percent of the low SES students and 81% of the high SES students agree that they like computers because they seem to be interesting. Forty-nine percent of the low SES and 54% of the high SES students agree that being able to use a computer would give them a sense of accomplishment.

Fifty-seven percent of the low and high SES students disagree that they use the computer to play games only. Eighty percent of the low SES students and 82% of the high SES students agree that computers are important. Forty-eight percent of the low SES students and 59% of the high SES students agreed that they would be interested in knowing more information about computer subjects. Seventy-one percent of the low SES students and 80% of the high SES students enjoy using computers.

To further analyze the relationship between socioeconomic status student responses on access of computers based on the survey questions, a one-way ANOVA

was performed (see Table 6). The ANOVA revealed a significant difference ($\alpha = .05$) in the means for the subjects.

Table 6

Analysis of Variance for Access to Computers Based on Socioeconomic Status

Source	*df*	*F*	*SS*
	Between subjects		
Low X high	1	0.08*	0.02
S within-group error	215	(0.02)	
	Within subjects		
Low X high	8		0.27
S within-group error	215	(0.27)	

Note. Values enclosed in parentheses represent mean square errors. S = subjects.

*p < .05.

Responses by low SES students and high SES students to statements related to student perception of computer usage showed a significant difference in percentages. A difference was shown in the percentage of low and high SES students who disagreed with the following survey statements:

5. They were treated differently in using the computers on campus.

8. They felt that computers made them nervous.

9. I have spent more than 10 hours using the computers in their classes.

10. I have spent more than 25 hours using the computers in their classes.

11. I have spent between 11-25 hours using the computers in their classes.

13. Students felt that boys in their class get to use the computer more than girls.

14. Girls like to use the computers more than boys.

16. Computers are mainly for males.

18. Males in their school were better with computers than the females.

22. Using the computer to play games only.

A significant difference was shown in the percentage of low and high SES students who agreed with the following survey statements:

19. Students felt confident about their ability to use computers.

20. They like computers because they seem to be interesting.

21. Being able to use a computer give me a sense of accomplishment.

23. Computers are important.

24. They would be interested in knowing more information about computer subject.

25. They enjoy using computers.

Research Question 2

The second research question, "How does the teacher direct technology toward males and females, toward European Americans, African Americans, and other minority groups that comprise the study group population, and toward high- and low-level socioeconomic groups?" was answered from the data gathered from the student

survey instrument (see Table 7) and teacher interviews. The following evidence was discovered from the study population in response to the survey question relating to teachers' directing the use of computers by gender, ethnicity and socioeconomic status.

Table 7

Student Responses in Relation to How Teachers Guide Computer Usage Toward Gender, Ethnicity, and Socioeconomic Status Reported in Percentages

		Response		
Response item	Group	A	HNO	DA
	Gender			
1. Teacher's rules	Females	25	32	42
	Males	33	37	30
2. Teacher's interest in usage	Females	43	39	17
	Males	43	24	33
3. Class usage	Females	37	21	41
	Males	42	21	36
4. Teacher's incorporation of computers	Females	17	42	40
	Males	25	37	36
5. Drill and practice	Females	21	25	52
	Males	22	31	45
6. Teacher's influence	Females	30	34	34
	Males	29	31	39
7. Teacher's impatience	Females	27	34	39
	Males	23	38	38

(*table continues*)

Response item	Group	Response A	HNO	DA
8. Makes subject interesting	Females	10	40	48
	Males	26	34	39
	Ethnicity			
1. Teacher's rules	A	50	25	25
	AA	30	32	38
	HA	50	25	25
	AI	33	67	--
	EA	27	34	38
2. Teacher's interest in usage	A	25	50	25
	AA	53	28	18
	HA	50	25	25
	AI	33	67	--
	EA	42	35	22
3. Class usage	A	50	--	50
	AA	40	19	49
	HA	25	25	50
	AI	--	33	66
	EA	43	21	35
4. Teacher's incorporation of computers	A	75	25	--
	AA	36	43	19
	HA	--	100	--
	AI	--	67	33
	EA	16	38	34
5. Drill and practice	A	25	50	25
	AA	43	14	34
	HA	25	50	25
	AI	--	33	66
	EA	17	30	51

(*table continues*)

Response item	Group	Response		
		A	HNO	DA
6. Teacher's influence	A	25	50	25
	AA	42	23	34
	HA	25	50	25
	AI	--	67	33
	EA	28	34	39
7. Teacher's impatience	A	50	25	25
	AA	41	30	30
	HA	25	25	50
	AI	--	67	33
	EA	20	39	39
8. Makes subject interesting	A	75	25	--
	AA	24	30	45
	HA	25	25	50
	AI	33	67	--
	EA	14	39	47
Socioeconomic status				
1. Teacher's rules	Low	35	33	33
	High	24	37	37
2. Teacher's interest in usage	Low	48	35	16
	High	41	33	26
3. Class usage	Low	34	21	44
	High	44	19	36
4. Teacher's incorporation of computers	Low	29	48	21
	High	16	32	50
5. Drill and practice	Low	38	30	32
	High	14	25	59

(table continues)

Response item	Group	Response		
		A	HNO	DA
6. Teacher's influence	Low	35	35	29
	High	26	30	43
7. Teacher's impatience	Low	28	36	34
	High	21	36	41
8. Makes subject interesting	Low	21	36	40
	High	15	39	44

Note. A = agree; HNO = have no opinion; DA = disagree. Dashes represent no response.

Forty-two percent of the females and 30% of the males disagreed that teacher's rules are a factor in the use of computers by students. Seventeen percent of the females and 33% of the males disagreed that the teacher's interest in usage was a factor in the use of computers by students. Ten percent of the females and 26% of the males agreed that teachers make the subject interesting.

Fifty percent of the Asian and Hispanic Americans agree that the teacher's rules were a factor in the use of computers by students, while 30% of the African Americans, 33% of the American Indians, and 27% of the European Americans agree teacher's rules are a factor in computer usage by students. Twenty-five percent of the Asian students agree that the teacher's interest in computer usage is a factor in usage by students.

Forty-nine percent of the African Americans and 35% of the European Americans disagree that class usage is a factor while 66% of the American Indians disagree with class usage as a factor in computer usage by students. Twenty-five percent of the Hispanic Americans agree class usage is a factor in computer usage by students. Seventy-five percent of the Asians, 36% of the African Americans, and 16% of the European Americans agree that how teachers incorporate computers in their classes affects computer usage. Forty-three percent of the African Americans agreed teachers use the computer for drill and practice compared to 17% of the European Americans. Fifty percent of the Asians agreed teachers are impatient with them while using the computer compared to 20% of the European Americans. Seventy-five percent of the Asians agreed teachers make the subject interesting compared to 24% of the African Americans, 25% of the Hispanic Americans, 33% of the American Indians, and 14% of the European Americans.

Twenty-one percent of the low SES students and 50% of the high SES students disagree that teachers incorporate the use of computers in their classes. Thirty-eight percent of the low SES students and 14% of the high SES students agree teachers allow student use of the computers mainly for drill and practice, while, 32% of the low SES students and 59% of the high SES students disagree that teachers allow student use of the computers mainly for drill and practice. Twenty-nine percent of the low SES student disagree that teachers influence them in computer usage compared to 43% of the high SES students.

As may be seen from the data displayed in Table 7, survey responses related to the student perception of computer usage showed a significant difference among

gender, ethnic groups and socioeconomic status. A significant difference was shown in the following statements:

1 and 2. Teacher's rules and interest are not a factor.

8. Teachers make the subject interesting.

A single-case analysis was conducted with the teachers. The interviews consisted of participants (N = 11) who were teachers at Vernon High School; 10 of the participants were European Americans and 1 was African American. There were 6 female and 5 male participants. The individuals interviewed were from different disciplines.

Teacher Survey Question 1. How do you feel about the use of computers in the classroom?

The attitude of Teacher 1 toward the use of computers in the classroom was "computers could be a vital resource to the classroom teacher and students if the following things occur: computers are online; teachers are trained on their class computer; computers, equipment, and programs are updated in a timely manner; students are allowed to have school email addresses; resources and support are available for questions; and monies are available for computer materials and repair. Otherwise, computers can be time consuming and very frustrating to both the teacher and the students."

Teacher 2 answered, “I feel that this day and time we must have technology in the classroom. It allows for a more up-to-the-minute knowledge base with which to draw from. Half the biology textbooks in print can’t do this. Negative feelings come in when the technology is not working correctly.”

Teacher 3 answered, “I think computers are extremely beneficial to the students in education today. Having the knowledge of computer usage allows our students to be able to compete in today’s society in the job market. This technology also allows me another media for teaching.”

Teacher 4 answered, “I feel they are a necessary part of our students’ education. The world we live in is information based and our students must know how to manipulate data."

Teacher 5 answered, “I think that computers are a valuable tool if used properly. They should not be relied upon as the main means of teaching, but rather as a complement to teaching. They are indispensable as a research source or tool and there should be more of them in each classroom.”

Teacher 6 answered, “I think computers are an excellent tool for teaching and learning. I wish we had computers available to use in every class. However, I don’t think they should totally replace paper and pencil.”

Teacher 7 answered, “I feel that we need more of them in the classroom.”

Teacher 8 answered, “I do not oppose the use of computers in the classroom.”

Teacher 9 answered, “I feel computers are very, very useful to students in the classroom. There is so much you can do with your students with the proper software for your computers.”

Teacher 10 answered, “Computers have their place more in some classes than others. Computers are not a cure all for teaching problems in the classroom.”

Teacher 11 answered, “Good tools to complement the overall class setting and methods of instruction.”

Regarding the teacher's perception of how they feel about the use of computers in the classroom, 10 out of 11 teachers stated that computers are a useful and important source to the classroom teacher. Also, technology is important in the classroom as a tool. Teachers did feel that more computers were needed to accomplish the classroom tasks. One teacher felt that computers had their place in education and computers were not the cure all for teaching problems in the classroom.

Teacher Survey Question 2. How much training have you had with computers?

Teacher 1 answered, "In the last 20 years we have had a lot of training with computers. Much of the training is outdated by the time equipment or programs are available in the classroom."

Teacher 2 answered, "My training comes from hands on--actually doing it and from the best teacher."

Teacher 3 answered, "I have been to several computer workshops with hands-on experience."

Teacher 4 answered, "I have had numerous years of training in all aspects of computer usage. I have participated in the following workshops: hardware repair and usage, software usage, networking (all aspects), and I have also provided training to my colleagues on the usage of hardware and software."

Teacher 5 answered, "I have moderate use in training in the use of computers. I have had some training, but not enough to be efficient in using the computer."

Teacher 6 answered, "I've had training off and on for the last 10 years. Just short, one-topic courses; never a full-time course of instruction."

Teacher 7 answered, “I’ve had quite a bit of training. I’ve attended several workshops dealing with different programs and types of software.”

Teacher 8 answered, “A few workshops. In other words, not enough.”

Teacher 9 answered, “I have had an extensive amount of training during my professional career.”

Teacher 10 answered, “I have had lots of training. Some of the training includes spreadsheets, data analysis, powerpoint, and word.”

Teacher 11 answered, “Beyond beginning word processing, use of powerpoint, email, Web-page design and using FTP programs.”

The teacher's response to how much training they had with computers varied from lots of training to some training in software programs including word processing, spreadsheets with data analysis, PowerPoint, Web-page design, and FTP programs. One teacher had hardware repair and usage, software usage, and networking training.

Teacher Survey Question 3. Do you feel that as an instructor you give every student ample opportunity to use the computer in your class?

Teacher 1 answered, “No, there is not enough computers located permanently in the classroom. The computers we do have don’t have ink in the printers or we don’t have updated programs. Many problems exist with repairs and materials.”

Teacher 2 answered, “Very much so . . . we do assignments, interactive activities, labs, and research using the technology available at Vernon High School.”

Teacher 3 answered, “Not always. Social Studies didn’t always lend itself to classroom use. They do use laptops in Economics for stock portfolios.”

Teacher 4 responded, "Yes, I allow students free use of the computers in my classroom, even students who are not assigned to my class any time of the day."

Teacher 5 answered, "Not entirely so. There aren't enough computers to go around for each student to spend the time on for one to develop proficiency."

Teacher 6 answered, "No, I only have one computer. I could use the laptops, but it is not always convenient. They are not always available when I need them."

Teacher 7 answered, "No, because it is hard to use computers in band with only a limited number to use with the software available."

Teacher 8 responded, "I have one computer in the room that I use for email. Sometimes students are allowed to go to the library and use the computers there when the need arises."

Teacher 9 answered, "Yes, my students are given ample time to use the computers. All my classes are technology classes. Therefore, it is mandatory that they have knowledge in using the computers."

Teacher 10 answered, "No, too hard to include with the time needed to be sure course content is covered."

Teacher 11 answered, "Yes, but we don't use computers every day."

Regarding how teachers feel about giving every student ample opportunity to use the computer in their class, 7 of the 11 teachers responded that they did not give students ample opportunity to use the computer in their class. Various individuals stated the reason for this situation was due to having access to only one computer in their class or the type of subject being taught in that particular class.

Teacher Survey Question 4. Which group of students based on gender, ethnicity, or socioeconomic status have you noticed using the computer more frequently in class?

Teacher 1 answered, "Not any one group more than the other."

Teacher 2 answered, "Not any one group more than the other. But the smarter students tend to catch on quicker and are more apt to use the computer."

Teacher 3 answered, "White males seem to be more experienced on an average."

Teacher 4 answered, "All students males, females and all racial groups."

Teacher 5 answered, "White females seem to use the computer more frequently in my class."

Teacher 6 answered, "Have not used laptops enough this year to notice."

Teacher 7 answered, "Not any one group more than the other."

Teacher 8 answered, "All students use the computer an equal amount in my class. There is no discrepancy between ethnicity and gender."

Teacher 9 answered, "All of my students use the computers each day."

Teacher 10 answered, "When computers are used, all students in the class utilize the computers. Outside of my class, I have seen (observed) about an even number between male and female and between black and white students."

Teacher 11 answered, "Those who have computers at home use the computers more in class."

In response to which group of students have teachers noticed using the computer more frequently in class, 7 teachers did not see any difference between gender, ethnicity or socioeconomic status students. One teacher felt that European American males seemed more experienced, while 1 teacher felt European American females seem to use

the computer more frequently. Of the 2 remaining teachers, 1 had not used the computers enough to notice and 1 felt that those students who had computers at home used the computer more in class.

Teacher Survey Question 5. How often do you allow students to use the computer in the course of a day?

Teacher 1 answered, "At least once a week when we can get laptops. Students can use the computers in the classroom as often as they like, but they are not on line and don't have any interesting programs."

Teacher 2 answered, "Some weeks every day, some weeks not at all."

Teacher 3 answered, "On average not at all. Some days, like in Economics, the students get to use the computers for their stock portfolios."

Teacher 4 answered, "Students are allowed to use the computers in my classroom all during the day and sometimes after hours."

Teacher 5 answered, "Depends on the class and the students. Some students use the computer for the entire class. Student behavior and materials being taught play an important part in the decision to use computers."

Teacher 6 answered, "None unless we have the laptops."

Teacher 7 answered, "Very seldom do I allow students to use the computer in the course of a day."

Teacher 8 answered, "I have no set amount of time. It varies from day to day."

Teacher 9 answered, "Each student uses the computer everyday, at least 2 hours per day."

Teacher 10 answered, “I only have one computer in classroom, must schedule lab sets so I do not utilize computers on a daily basis. I might use more, if I had more in the classroom on an every day basis.”

Teacher 11 answered, “Varies, according to today’s topic and teaching goals. I don’t rely on computers to take the place of instruction in a one-on-one setting.”

In response to how often do you allow students to use the computer in the course of a day, teachers responded (a) not at all, (b) once a week, (c) everyday some weeks, (d) during the day and after hours, or (e) various days.

Teacher responses varied to the interview questions. Ten of the teachers interviewed saw the need to use computers to enhance their subject areas. Training is an important aspect toward the usage of computers in classes. The teachers felt that training was necessary. The teachers embarked upon varying degrees of training, ranging from some to an extensive amount. Seven teachers did not feel, overall, that they had ample amount of time to be able to use computers more extensively. Seven teachers did not recognize any particular group (ethnic, gender, or socioeconomic) of students using the computer more in classes. Two teachers recognized European American males and females as using the computer more in classes. Three out of 8 teachers allow some use of the computer throughout the week, depending on class activities.

Summary

The first research question, “How do ethnicity, gender, and socioeconomic status influence access to computers?” was addressed by analyzing the results from the

student questionnaire. Significant differences in response percentages by gender were found for the following statements:

1. I get a fair chance to use the computer in school.
2. Boys get to use the computer more than girls.
8. Friends of the same sex have a positive attitude towards computers.
9. Computers are mainly for males.
19. Males are better with computers than the females.
25. I use the computers to only play games.

Significant differences in response percentages by the Asian students from the other ethnic groups identified in the study were found for the following statements:

1. I get a fair chance to use the computer at school.
2. Boys get to use the computers more than girls.
6. I have a computer at home for my use.
7. I have spent more than 10 hours using the computers.
10. My future goals include the use of computers.

The African American students showed a significant difference in response percentages from the other ethnic groups identified in the study for the following statements:

2. Boys get to use the computers more than girls.
7. I have spent more than 10 hours using the computers.
13. I am treated differently in using the computers on campus.
25. I use the computer to play games only.
29. Computers make them nervous.

The American Indian students showed a significant difference in response percentages from the other ethnic groups identified in the study for the following statements:

1. I have a fair chance to use the computer at school.

6. I have a computer at home for their use.

7. I spent more than 10 hours using the computers.

8. Friends of the same sex have a positive attitude towards computers.

10. My future goals include the use of computers.

13. I am treated differently in using the computers on campus.

18. Learning about computers is just as important for females as for males.

29. Computers make me nervous.

The Hispanic American students showed a significant difference in response percentages from the other ethnic groups identified in the study for the following statements:

2. Boys get to use the computers more than the girls.

7. I spend more than 10 hours using the computers.

25. I use the computer to play games only.

29. Computers make them nervous.

The European American students showed a significant difference in response percentages from the other ethnic groups identified in the study for the following statements:

2. Boys get to use the computers more than girls.

7. I spent more than 10 hours using the computers.

13. I am treated differently in using the computers on campus.

25. I use the computer to play games only.

29. Computers make them nervous.

Significant differences were shown in response percentages by socioeconomic status in disagreeing with the following statements:

2. Boys in their class get to use the computer more than girls.

3. Girls like to use the computers more than boys.

7. I spend more than 10 hours using the computers in their classes.

9. Computers are mainly for males.

13. I am treated differently in using the computers on campus.

15. I have spent more than 25 hours using the computers in their classes.

16. I have spent between 11-25 hours using the computers in their classes.

19. Males were better with computers than the females.

25. I use the computer to only play games.

29. Computers made me nervous.

Significant differences were shown in response percentages by socioeconomic status in agreeing with the following statements:

4. I like computers because they seem to be interesting.

21. Using computers give them a sense of accomplishment.

22. Feeling confident about their ability to use computers.

30. Computers are important.

32. Students would be interested in knowing more information about computer subject.

34. I enjoy using computers.

The second research question, “How do teachers direct technology toward males and females, toward European Americans, African Americans and other minority groups that comprise the study group population, and toward high- and low-level socioeconomic groups?” was answered by analyzing the results from the student questionnaire and teacher interviews. A significant difference was shown in response percentages toward computer usage by gender, ethnicity and socioeconomic status in the following statements:

5. Teacher's rules and interest are not a factor.

31. Teachers make the subject interesting.

The teachers' responses to feelings about the use of computers in the classroom were indicated as useful as a tool and an important source to the teacher. Technology is important in the classroom as a tool. Teachers did feel that more computers were needed to accomplish tasks and one teacher felt computers had their place in education and computers were not the cure all for teaching problems.

The teachers responded that the amount of training with computers varied from lots of training to some training in software programs including word processing, spreadsheets with data analysis, PowerPoint, Web-page design, and FTP programs, and one teacher had hardware repair and usage, software usage, and networking training. The teachers' responses for ample student opportunity to use the computer in class indicated they do not give ample time for computer usage and the reason given by some of the teachers was having access to only one computer in the class. The teachers' responses to which group of students, based on gender, ethnicity and socioeconomic

status, more frequently used the computers indicated (a) they do not see any difference between gender, ethnicity or socioeconomic status of students in computer usage, (b) feeling that European American males seemed more experienced, (d) feeling European American females seem to use the computer more frequently, (e) did not use the computers enough to notice and (f) feeling that those students who had computers at home used the computer more in class. The teachers' responses to how often they allow students to use the computer in the course of a day were indicated as (a) not at all, (b) once a week, (c) everyday some weeks, (d) during the day and after hours, and (e) various days.

CHAPTER V

DISCUSSION AND CONCLUSION

As technologies become more powerful, the field of education approaches a societal divide in which the technology will either improve the life chances of all students or continue to widen the gap between children and youth who have access to technology at home and in the school and those who do not. Ensuring that we offer all students equitable opportunities to a competitive education will drive many future decisions. Technology may level the playing field for many of our students. However, it may also further widen the educational gap, creating a digital divide. How we manage the reality of technological equity will surely affect how students across districts in the U.S. fare in their ability to compete academically with peers (Malter & Wodarz, 2000).

The purpose of this study was to examine how gender, ethnicity, and socioeconomic status of students located in a rural secondary school setting relate to computer use. Secondly, the researcher examined the perception of the students and teachers at Vernon High School relating to how teachers across the academic areas relate with students in computer usage.

Study Design

A letter was composed by the researcher to the Superintendent of Washington County Schools and the Principal of Vernon High School for permission to perform this study at Vernon High School in Vernon, Florida. A letter was also distributed to the faculty and parents of the students. The researcher waited for 1 week after distributing the letters of request to the parents and faculty members before the Language Arts instructors administered the student survey. These instructors were chosen because every student attending Vernon High School was enrolled in an English class. This permitted easier access to the student body. The researcher informed the Language Arts instructors of the time frame in which the surveys were to be completed and returned. Instructors were given 1 week to have the students complete the forms and return the packet to the researcher. Instructors were also notified of the students whose parents did not want them to participate in the study. Surveys were not given to nonparticipating students.

A personal interview questionnaire was developed by the researcher for the 5 Language Arts instructors who participated in the study. The questionnaire assisted the researcher in assessing the instructors views on showing or not showing bias toward any group of students who used computers in their class. The researcher interviewed eleven instructors individually. The student survey and instructor interview generated data to answer the research questions addressed in this study.

Discussion

The following is a discussion of the findings from the results presented in chapter 4 in relation to the research questions on how ethnicity, gender, socioeconomic status and teachers influence access to computers.

Research Question 1

Research Question 1 asked if ethnicity, gender, and socioeconomic status were related to student access to computers. The results from the survey indicated 66% of the females and 65% of the males had access to computers at home. Sixty-one percent of the female and 51% of the male students got to use the computer at least twice during the week. Seventy-five percent of the female students and 67% of the male students felt confident about their ability to use computers.

Based on a 1998 study by Roper, Chiaramonte (1999) reported from a that adolescent females were 2% less likely than males to use computers at school, 8% less likely to use them at home, and 7% less likely to have their own computers. In the present research study, there was a difference of 11 percentage points between female and male students' reported access to computers at home. Thirty-seven percent of the female and 34% of the male students spent more than 10 hours using the computers in their classes. Sixty-one percent of the females used the computer at least twice a week compared to 51% of the males. Also, in the study, 14% of the males felt they were better with computers than females, while 8% of the females said they were better users than males. Seventy-five percent of the females felt more comfortable using computers compared to 67% of the males.

In the current study, based on the data collected by ethnicity, 78% of the African Americans and 61% of the European Americans agree they have a fair chance to use computers. Sixty percent of the American Indian felt they were treated differently on the usage of computers in the class. Sixty-six percent of the American Indians and 51% of the European Americans were encouraged to get involved with the use computers by their families. Equal access is necessary to the survival of our students in this era. Some type of technological skills will influence every aspect of a student's life. Brown (2000) noted that it would appear that equal access is an important component of the issue of inequity in technology and education, but equal access does not guarantee equal learning. A survey was conducted by the U.S. Department of Commerce (Brown) in which the percentage of U.S. households with computers by ethnicity in rural areas was as follows: European Americans, 42%; African Americans, 18%; Hispanic American, 23%; American Indian, 27%; and Asian or Pacific Islander, 41%. In this study, 69% of the European Americans, 62% of the African Americans, 50% of the Hispanic Americans, 33% of the American Indians and 25% of the Asians had access to a computer at home. In a study by the U.S. Department of Commerce, Economics, and Statistics Administration (1997), the percentage of students having computer access at school was 62% for European American, 52% for African American, and 52% for Hispanic American. In the current study, 50% of the Asian, 66% of the African American, 100% of the Hispanic American, 33% of the American Indian, and 54% of the European American used the computer at least twice a week.

Based on the socioeconomic status of the members study group, a high percentage of the students, 63% of the low SES and 60% of the high SES, felt they were

provided a fair chance to use computers. Sixty-three percent of the low SES and 51% of the high SES students used the computer at least twice during the week. Computers were found in homes of 60% of the low SES students and 63% of the high SES students.

Tumposky (2001) posited that by the end of this decade, 94% of schools in wealthy districts would have access to the Internet, whereas only 84% of schools in districts serving low-income students would be connected to the Internet. Additionally, schools serving affluent families offered their students access to computer technology and used the technology for imagination. In contrast, students at schools with high numbers of poor and minority students had less access to technology at school, especially to multimedia computers and computers with Internet access, and also the poor and minority students used the computers they had for more routine and traditional learning tasks, such as drill and practice. Students in the high- and low-socioeconomic status groups recognized the importance of the use of computers in their education.

The growing popularity of the computer in school curricula and the growing roles of computers in the workplace should be a concern for everyone; all students should have the opportunity to benefit from instruction in computer technology. In the current study, gaps still exist for computer usage in the rural areas based on ethnicity, gender and socioeconomic status of students. A high mean score of 1.31 was shown in access to computer usage by ethnicity based on $p < .05$. A difference of 0.08 was also shown in access to computer usage by socioeconomic status.

Research Question 2

Research Question 2 asked how teachers direct technology toward males and females, toward European Americans, African Americans and other minority groups that comprised the study group population, and toward high- and low-level socioeconomic groups. In this study, results were analyzed from the student questionnaire and teacher interviews. Student responses showed that teachers did not treat them differently with respect to use of computers within their classes. Both the female and male population agreed that teachers do not incorporate enough computer activities within their classes. Based on ethnic and socioeconomic status, there was no difference among the ethnic or socioeconomic groups in response to the statements in the survey. Teacher interviews indicated that teachers believe that computer usage is important for the students and that the teachers had some basic training in computers. Only 4 of the teachers felt that they spent an adequate amount of time incorporating computers within their classes; no teacher viewed any group as using the computer more than another, and all students used the computer at least some during the week.

Wilson (1999) noted 13% of the teachers in the U.S. agree that access to computer and the Internet will help students learn. Teachers of minority, poor, and urban students are less likely to have had training in using computers in their classrooms and less likely to ask their students to solve complex problems (Weglinsky, 1998). In one survey (Rowand, 2000), teachers were asked the degree to which they used computers or the Internet to prepare for and manage their classes. Sixty-six percent of public school teachers reported using computers for instruction during class time. Forty-one percent of teachers reported assigning students work that involved computer

applications such as word processing and spreadsheets to a moderate or large extent; 31% of teachers reported assigning practice drills and 30% reported assigning research using the Internet to a moderate or large extent. The ways teachers direct students to use computers varied by instructional level, school poverty level, and hours of professional development (Rowand). Furthermore, secondary school teachers in the lowest poverty schools were more likely to report assigning students work involving computer applications, research using CD-ROMs, and research using the Internet to a moderate or large extent than teachers in the highest poverty schools.

Recommendations

With technology becoming more visible in the educational system, community and workplace, demographics such as ethnicity and gender of the child are worthy empirical study variables. There is still a need for these groups (ethnic, gender and socioeconomic groups) to continue to increase their knowledge base of computers investigated in this research study. The equality gap is closing, but without a continuation in incorporating technology in schools and at home, the gap could again be widened without the knowledge of computers. If research of this type is conducted again, investigators might study comparisons between rural and urban schools with a different set of the variables than that used in the current research. A comparison between other rural schools might be worthwhile in the study of computer access. The relationship of ethnicity, gender, and socioeconomic status in computer access to how teachers assist in helping to alleviate the gaps in computer usage is worthy of further study.

Summary

Computers are used in most aspects of today's society. It is critically important that all students gain expertise in technology and have access to computers on an equal basis. The gap in computer access is narrowing considerably, but there is still work that must be done to help and assist students of all groups in obtaining the skills necessary to be successful in today's workforce. Teachers are also still in need of further training in how to incorporate technology into their classes and feeling comfortable in using this tool to enhance the learning process. Today's society cannot continue to afford the consequences of the different conditions placed on our students in the educational arena or at home. All educators must continue to improve access to computers and other technological resources for the haves and have nots.

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APPENDIXES

Appendix A

Student Survey Form

STUDENT SURVEY

Please fill in the information given below. Place a check mark in the areas of Ethnicity, sex and socioeconomic status. Please do not write your name on this survey.

School _____

Ethnicity: Asian _____ American Indian ____ Black _____ Hispanic _____
White _____

Sex: Female _____ Male _____

Socioeconomic Status: Receive free/reduced lunch _____
Do not receive free/reduce lunch _____

Do you take a computer class? Yes _____ No _____

DIRECTIONS: Please mark your answer that shows the extent to which you agree or disagree with each statement on the scantron sheet provided.

(1) means you STRONGLY AGREE with this statement

(2) means you AGREE with this statement

(3) means you HAVE NO OPINION on the statement

(4) means you DISAGREE with the statement

(5) means you STRONGLY DISAGREE with the statement

1. I get a fair chance to use the computer in school.	1	2	3	4	5
2. The boys in our class get to use the computer more than the girls.	1	2	3	4	5
3. Girls like to use the computers more than boys.	1	2	3	4	5
4. I like computers because they seem to be interesting.	1	2	3	4	5
5. The teacher has too many rules about the using the computers.	1	2	3	4	5
6. I have a computer at home for my use.	1	2	3	4	5

7. I have spent more than 10 hours using the computers in my classes.	1	2	3	4	5
8. My friends of the same sex have a positive attitude towards computers.	1	2	3	4	5
9. I believe computers are mainly for males.	1	2	3	4	5
10. My future goals include computers.	1	2	3	4	5
11. I have a positive attitude towards computers.	1	2	3	4	5
12. The teacher seems interested in the use of computers by students.	1	2	3	4	5
13. I am treated differently in using the computers on my school campus.	1	2	3	4	5
14. I do not get to use the computers often in my classes.	1	2	3	4	5
15. I have spent more than 25 hours using the computers in my classes.	1	2	3	4	5
16. I have spent between 11-25 hours using the computers in my classes.	1	2	3	4	5
17. I take a computer class at school.	1	2	3	4	5
18. Learning about computers is just as important for females as for male.	1	2	3	4	5
19. The males in my school are better with computers than the females.	1	2	3	4	5
20. Compared with other students my age, I am more interested in computers.	1	2	3	4	5
21. Being able to use a computer would give me a sense of accomplishment.	1	2	3	4	5
22. I feel confident about my ability to use computers.	1	2	3	4	5

23. The teachers incorporate a lot of computer usage in their classes.	1	2	3	4	5
24. I use the computer to do a lot of drill and practice in class.	1	2	3	4	5
25. I use the computer to play games only.	1	2	3	4	5
26. I get to use the computer at least twice during the week.	1	2	3	4	5
27. My teacher has influenced me in the use of computers.	1	2	3	4	5
28. My family encourages me to get involved the use of computers.	1	2	3	4	5
29. Computers make me nervous.	1	2	3	4	5
30. Computers are important.	1	2	3	4	5
31. The teacher makes the subject of computers very interesting to me.	1	2	3	4	5
32. I would be interested in knowing more information about computer subjects.	1	2	3	4	5
33. The teacher is impatient when I don't pick up information about computers.	1	2	3	4	5
34. I enjoy using computers.	1	2	3	4	5
35. I have a positive attitude toward the use of computers.	1	2	3	4	5
36. The teacher seems interested in the things I do on the computer.	1	2	3	4	5

Appendix B

Approval Letter from UWF Institutional
Review Board for Human Subjects

Appendix C

Superintendent Permission Letter

Mr. Jerry Tyre, Superintendent
652 Third St.
Chipley FL 32428

Dear Mr. Tyre:

I am presently working toward my doctorate degree in Educational Management at the University of West Florida. As part of my graduation requirement, I must a complete a dissertation. My dissertation topic is "Equity Among Secondary Students in Computer Usage at a Northwest Florida High School." During this research, I will be researching for specific information on the equity of gender, ethnic and socioeconomic status of students in using the computer in the classroom. I will also be observing the classroom teacher to see if there are any biases among the specified groups in computer usage.

I would like to request your permission for the participation of your faculty and students at Vernon High School in my study. If given the permission, I will contact the parents of each student enrolled for their permission to be a part of this study. Only the study site and its' statistics will be published in the written dissertation. Students will not participate without parental consent.

If you have any questions, you may contact me at the following telephone number: 535-2090. I would like to thank you in advance for your cooperation. If you would like a copy of my results, I will be glad to send it to you. Please respond by letter.

Sincerely,

Bobbie Dawson
Assistant Principal

Appendix D

Vernon High School Principal Permission Letter

Mr. James (Bill) W. Lee, Principal
2808 Yellow Jacket Dr.
Vernon FL 32462

Dear Mr. Lee:

I am presently working toward my doctorate degree in Educational Management at the University of West Florida. As part of my graduation requirement, I must a complete a dissertation. My dissertation topic is "Equity Among Secondary Students in Computer Usage at a Northwest Florida High School." During this research, I will be researching for specific information on the equity of gender, ethnic and socioeconomic status of students in using the computer in the classroom. I will also be observing the classroom teacher to see if there are any biases among the specified groups in computer usage.

I would like to request your permission for the participation of your faculty and students at Vernon High School in my study. If given the permission, I will contact the parents of each student enrolled for their permission to be a part of this study. Only the study site and its' statistics will be published in the written dissertation. Students will not participate without parental consent.

If you have any questions, you may contact me at the following telephone number: 535-2090. I would like to thank you in advance for your cooperation. If you would like a copy of my results, I will be glad to send it to you. Please respond by letter.

Sincerely,

Bobbie Dawson
Assistant Principal

Appendix E

Faculty Refusal Letter

April 24, 2000

TO: Vernon High School Faculty

Dear VHS Faculty:

I am presently working toward my doctorate degree in Educational Management at the University of West Florida. As part of my graduation requirement, I must a complete a dissertation. My dissertation topic is "Equity Among Secondary Students in Computer Usage at a Northwest Florida High School." During this research, I will be researching for specific information on the equity of gender, ethnic and socioeconomic status of students in using the computer in the classroom. I will also be observing the classroom teacher to see if there are any biases among the specified groups in computer usage.

I would like to request your permission to observe your classroom and your participation in an interview for my study. Only the study site and its' statistics will be published in the written dissertation. This will not take a lot of your valuable time.

If you have any questions, please feel free to ask. I would like to thank you in advance for your cooperation. If you would like a copy of my results, I will be glad to send it to you.

Sincerely,

Bobbie Dawson
Assistant Principal

I would not like to participate in the above-mentioned study.

_____
Instructor Signature

Appendix F

Parental Refusal Letter

TO THE PARENTS OF VERNON HIGH SCHOOL STUDENTS

Dear Parents:

I am presently working toward my doctorate degree in Educational Management at the University of West Florida. As part of my graduation requirement, I must a complete a dissertation. My dissertation topic is "Equity Among Secondary Students in Computer Usage at a Northwest Florida High School." During this research, I will be researching for specific information on the equity of gender, ethnic and socioeconomic status of students in using the computer in the classroom. I will also be observing the classroom teacher to see if there are any biases among the specified groups in computer usage.

I would like to request your permission for the participation of your student(s) at Vernon High School in my study. The student(s) will be required to fill out a survey. This survey contains questions dealing with the concerns of computer usage at Vernon High School. The identification of students will not be listed on the survey or dissertation. Only the study site and its' statistics will be published in the written dissertation. Students will not participate without parental consent.

If you have any questions, you may contact me at the following telephone numbers: 535-2090 or 535-2046. I would like to thank you in advance for your cooperation. If you do not want your student to participate in this study, please return the attachment on the bottom of this letter by your child before the date of April 10, 2000.

Sincerely,

Bobbie Dawson
Assistant Principal

I would not like my child _____ participating in the
Student Name

research study at Vernon High School.

_____Parent Signature

Appendix G

Teacher Questionnaire

Teacher Questionnaire

Computer Usage

1. How do you feel about the use of computers in the classroom?

2. How much training have you had with computers?

3. Do you feel that as an instructor you give every student ample opportunity to use the computer in your class? (Explain)

4. Which group of students have you noticed using the computer more frequently in class?

5. How often do you allow students to use the computer in the course of a day?