Effects of Limited Technology and Internet Access Within a Low Income, Rural Community

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Effects of Limited Technology and Internet Access
Within a Low Income, Rural Community

by
Tracey Y. Stewart

An Applied Dissertation Submitted to the
Abraham S. Fischler School of Education
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

Nova Southeastern University
2014
Approval Page

This applied dissertation was submitted by Tracey Y. Stewart under the direction of the persons listed below. It was submitted to the Abraham S. Fischler School of Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova Southeastern University.

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I declare the following:

I have read the Code of Student Conduct and Academic Responsibility as described in the Student Handbook of Nova Southeastern University. This applied dissertation represents my original work, except where I have acknowledged the ideas, words, or material of other authors.

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March 28, 2014
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Acknowledgments

I would like to express my sincere appreciation to my committee chair, Dr. Carolyn Buckenmaier, for keeping the fire burning for the dissertation process. Her assessment of my writing gave me the courage to persevere through the process. She evaluated my work with just the right blend of constructive criticism and positive reinforcement; she made me believe in my abilities to accomplish this overwhelming process. I am blessed by having had the opportunity to work with her.

My pride and joy comes from my three daughters, Lauren, Taylar, and Ashton. They inspire me with their accomplishments and make me want to strive for more. Their laughter and their love is the very best medicine.

It is through the Godly example of my loving parents, Tim and Lynne Young, that I learned the value of education. More importantly, they taught me that, through a relationship with Jesus, all things are possible.

I am most thankful for my husband, Dr. R. Allen Stewart. He inspired me with his own doctoral work and his gentle pushing and prodding kept me on task. Daily, he puts aside his own needs to meet my needs and those of our girls. I am blessed beyond measure by this man of God.
Abstract

Effects of Limited Technology and Internet Access Within a Low Income, Rural Community. Tracey Y. Stewart, 2014: Applied Dissertation, Nova Southeastern University, Abraham S. Fischler School of Education. ERIC Descriptors: At Risk Students, Career Readiness, College Readiness, Internet, Technology

This phenomenological study was implemented within a rural community in the southeastern area of the United States. The purpose of the study was to examine perceptions of prior graduates in order to identify specific effects of limited technology and Internet access in public schools. No related investigation has occurred within the research setting. To achieve this purpose, the researcher acquired perceptual data from 33 adults who attended the local high school during School Years 2003-2004 through 2012-2013. Data were collected through the administration of an anonymous questionnaire.

Several primary findings were derived from the study. First, although participants did not perceive limited access to technology and Internet access while in high school, the collective perception was that technology was minimally integrated within high school instruction and that the high school experience insufficiently prepared students for the role of technology within the college setting. Second, technology was not fully utilized for acquiring information involving college or career selection. Third, participants reported the lack of availability or dependability of Internet service in the rural areas.

Recommendations for educational practice, based on findings of the study, are to provide professional development for all teachers within the high school to increase the integration of technology within instruction and to provide professional development for teachers and school guidance counselors for the purpose of increasing the use of technology when assisting students in acquiring college and career information. Recommendations for future research, also based on findings, are (a) to determine how participants acquired a high level of technology skill for college with the limited use of technology in high school and the minimal Internet access within homes, (b) to engage in further research to assist school guidance counselors in acquiring the skills to recognize and provide initial treatment involving the onset of Internet addiction among students, and (c) for city council members and leaders within the private sector to research possible options for acquiring more dependable Internet service within the outlying rural areas so that all residents can enjoy the potential benefits of current technology.
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Chapter 1: Introduction

The following text introduces a phenomenological investigation implemented to collect and analyze qualitative data involving the effects of limited technology and Internet access in public schools within a low income, rural community. In this introductory chapter, the researcher identifies and develops the problem addressed through the study by describing the (a) phenomenon that was studied, (b) background and relevance of the problem, (c) deficiencies in the evidence, (d) audience of the study, (e) pertinent terms, and (f) purpose for conducting the study. This initial chapter establishes a descriptive foundation substantiating the importance of implementing the investigation within the local community serving as the research setting.

Statement of the Problem

The problem addressed through this phenomenological study was that the effects from limited technology and Internet access throughout the local community during the formative years of public schooling had not been identified. Through the study, the researcher examined the effects of limited access on adults’ (a) early school experiences; (b) early educational achievement; (c) technology adoption; (d) college readiness, pursuit, and performance; (e) career selection and readiness; and (f) income levels.

Phenomenon of interest. While technology and Internet access are presumed to be readily available to all citizens of the United States, the historic digital divide that began in the 1980s (DiMaggio & Hargittai, 2001) continues to exist in rural America (Association for Supervision and Curriculum Development, 2011; Guan & Subrahmanyam, 2009; Zhao, Lu, Huang, & Wang, 2010). In some rural, low-income communities, approximately 40% of homes are not equipped with Internet service, and up to 10% of rural communities lack access to high-speed Internet (Association for
Supervision and Curriculum Development, 2011; U.S. Department of Commerce, National Telecommunications and Information Administration, 2011). Furthermore, budget reductions within the majority of public school districts across the country have minimized purchases of computer hardware and the provision of professional development involving technology integration within instruction (Association for Supervision and Curriculum Development, 2011). A perceived inadequacy of training is the most frequently cited reason for teachers’ avoidance of the technology integration within instructional practice (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). These collective influences may have lasting effects within rural areas which are simultaneously affected by additional familial and community challenges stemming from generational poverty.

**Background and justification.** A review of the professional literature supports the belief that technology and Internet integration within educational practice improves academic achievement and student motivation (Dardenne, 2010; Guan & Subrahmanyam, 2009; Papastergiou, 2009; Zhao et al., 2010). For this reason, the No Child Left Behind legislation of 2001 (U.S. Department of Education, Elementary and Secondary Education, 2010) required the increased use of technology by students and teachers alike. Researchers in the field of education also perceive technology, including Internet usage, as an integral and positive influence in the college and career readiness of students (Ballard, 2010; Campbell, 2012; Ray, 2012). The research additionally underscores the belief that technology has the potential to improve the social inclusion of individuals (Chatzoglou & Vraimaki, 2010) as well as the socioeconomic, cultural, and environmental conditions within communities (Guan & Subrahmanyam, 2009; Thackeray & Hunter, 2010).
In direct contrast to these various beliefs, many residents of low socioeconomic status within the rural community serving as the research setting have limited technology and Internet access throughout their early educational experiences. As a veteran educator and community activist, the researcher works closely with families within the local setting to support students in their goal of achieving high school graduation prior to pursuing careers and post-secondary education. In this role, it has been apparent that students are hindered in the pursuit of a high school diploma by the lack of technology and Internet access from a home computer. Managing without technological resources leaves students at a disadvantage in comparison with peers who have these resources at their disposal. Barriers also exist for parents, as school grades and attendance are also communicated through an online data management system.

In actuality, the educational possibilities of success for students without technology and Internet access on a home computer are limited. In the school setting, for example, students are instructed to access teacher websites to acquire assistance with homework problems. Furthermore, because functional computers are lacking within the high school, teachers often require students to complete research projects at home. Teachers also place students in groups to complete team activities, and team members are required to communicate via electronic mail to document their interactions and progress.

Similar challenges exist when students are preparing for college entrance. For example, registration for college entrance examinations must be completed online. Furthermore, the majority of college applications must be completed online. To the exclusion of potential students without technology and Internet access, college representatives frequently post upcoming events and reminders on websites. These factors limit student access to college although students may otherwise be qualified.
Few community alternatives exist for students who do not have access to technology and the Internet on a home computer. The researcher has observed that students often travel to the home of a family member or neighbor to use technological resources. Students can also use the Internet access in the local library or in the school computer laboratory; however, both locations have only a few computers and often students must wait for the opportunity. Once gaining access, students are limited in the amount of time they may spend on the computers. Under these limitations, students frequently opt to not complete tasks that require technology or the Internet and choose to suffer the consequences in the lower grading of their assignments. The observations described herein have been experienced by other community members as well. Residents have openly stated that public resources within the community remain inadequate to compensate for this gap in technology and Internet resources; consequently, young adults native to the area often enter careers lacking in related experiences and exposure.

Prior to implementing this study, perceptions of local residents involving the effects of limited technology and Internet access had not been examined. Consequently, the long-term academic, career, and personal ramifications were unknown. This study was designed to explore the perceptions of participants as an initial contribution toward developing an understanding of effects derived from the limited technology and Internet access within public schools.

**Deficiencies in the evidence.** By examining the perceptions of participants involving the effects of limited technology and Internet access during the formative years of public schooling, the researcher discovered findings to support related recommendations for consideration of city councilmembers, the superintendent of public schools, and leaders within the private sector. A review of the professional literature
failed to identify any type of agreement involving technology sharing between public school districts, city entities, and private businesses. Therefore, such an arrangement may not have been considered by leaders within rural communities wherein public education funds are historically limited. More than 25% of American students, however, attend schools within rural settings (Griffin, Hutchins, & Meece, 2011). Consequently, the deficiency in the literature involving a possible technology-sharing agreement between public school districts, city entities, and private businesses may affect thousands of students as well as their families of origin, future educational and employment opportunities, and future families.

The importance of this study is further underscored by the belief that technology integration within instruction is “influenced by the support that comes from . . . the community” (Inan & Lowther, 2010, p. 147). Smith (2010) reported, however, that insufficient evidence exists involving the role of technology in the lives of students as they emerge into adulthood. Similarly, the level of technology adoption within the community serving as the research setting had not been explored prior to the implementation of this study.

Residents in the area wherein the study was conducted had expressed concerns related to the limited technology and Internet access during the formative years of public schooling for several years, and conducting this study was an initial step in identifying alternatives and addressing related needs of the community. As a veteran educator and community activist, the researcher was committed to this undertaking and to the expectation of contributing findings and recommendations as a basis for social improvement within the community. Findings of the study have the potential to contribute viable perspectives and reflections to assist in improving experiences for the
subsequent generation of students within the community.

**Audience.** This study was implemented in the southeastern area of the United States. At the onset of the study, the rural community contained approximately 8,000 residents (U.S. Census Bureau, 2013). Over 77% of area residents were Caucasian, almost 19% were African American, over 3% were Hispanic, and the remaining population was representative of multiple cultural and racial ethnicities. The average annual income for families in the area was just under $35,700; consequently, almost 21% of residents lived below the poverty line (U.S. Census Bureau, 2013). For a family of four, for example, almost 21% of residents received income of less than $23,550 per year (Families USA, 2013). City residents primarily lived in government housing; other families resided on farms within the surrounding county. Retirees, new to the community, resided in nearby lake communities and enjoyed a much higher average income level than the inner city residents.

At the time this study was implemented, the local school district had approximately 3,400 enrolled students from several surrounding communities and consisted of three elementary schools, one middle school, and one comprehensive high school. Approximately 60% of the students were qualified as economically disadvantaged, 10% participated in special education, 3% qualified as English Language Learners, and none were categorized as migrant students. Atypical of the overall population of the county, the school system had a population that consisted of approximately 65% Caucasian, 25% African American, 6% Hispanic, 3% Multiracial, and 1% Asian students (Georgia Department of Education [GDOE], 2012a, 2012b). This cross-section of students contributed to a minimal tax base for supporting educational resources. Of interest was that a 5-year technology plan noted within the prior year’s
school improvement plan had not been developed. At the conclusion of the study, the plan remained undeveloped and related changes represented in the plan were unrealized.

In the state wherein this study was implemented, student achievement is measured through performance on the Georgia Criterion Referenced Competency Test (GCRCT). A comparison of GCRCT scores for the target school district and the state over the 5-year period of 2008 through 2012 reflected that economically disadvantaged students in Grades 9 through 12 attending local school district facilities were performing below their grade-level, economically disadvantaged peers throughout the state (see Tables 1 and 2). Scores in English language arts reflected a difference of 4.8 percentage points over the 5-year period (GDOE, 2008a, 2009a, 2010a, 2011a, 2012a); scores in mathematics reflected a difference of 5.0 percentage points over the 5-year period (GDOE, 2008b, 2009b, 2010b, 2011b, 2012b).

Table 1

*Comparison of English Language Arts Performance*

<table>
<thead>
<tr>
<th>Year</th>
<th>District %</th>
<th>State %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>22</td>
<td>16</td>
</tr>
<tr>
<td>2009</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>2010</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>2011</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>2012</td>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>

*Note.* Performance reflects the percent of economically disadvantaged students in Grades 9-12 failing to demonstrate grade-level achievement on the GCRCT (GDOE, 2008a, 2009a, 2010a, 2011a, 2012a). Figures rounded to the nearest whole.
Table 2

**Comparison of Mathematics Performance**

<table>
<thead>
<tr>
<th>Year</th>
<th>District %</th>
<th>State %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>44</td>
<td>35</td>
</tr>
<tr>
<td>2009</td>
<td>38</td>
<td>36</td>
</tr>
<tr>
<td>2010</td>
<td>39</td>
<td>34</td>
</tr>
<tr>
<td>2011</td>
<td>26</td>
<td>21</td>
</tr>
<tr>
<td>2012</td>
<td>39</td>
<td>35</td>
</tr>
</tbody>
</table>

*Note.* Performance reflects the percent of economically disadvantaged students in Grades 9-12 failing to demonstrate grade-level achievement on the GCRCT (GDOE, 2008b, 2009b, 2010b, 2011b, 2012b). Figures rounded to the nearest whole.

**Definition of Terms**

Terms pertaining to this study are defined in the following text to provide clarification.

**Career readiness.** High school graduates have attained career readiness when they have sufficient knowledge and skills in the core subject areas of mathematics and English language arts to succeed in entry level employment without remediation (Parrott, 2012; Tucker, 2011).

**College readiness.** High school graduates have attained college readiness when they have developed the preparatory knowledge and skills needed for successful performance in first-year college courses without remediation (Farris, 2012).

**Georgia Criterion Referenced Competency Test (GCRCT).** The GCRCT is a standardized assessment designed to measure the degree to which students demonstrate...
the skills and knowledge described in the mandated state standards (Georgia Department of Education, 2012c, 2013). The assessment yields scores for (a) individual students, (b) student subgroups within each school, (c) student subgroups throughout the school district, (d) the school district, and (e) all schools throughout the state. This information is used to diagnose individual student strengths and weaknesses, to gauge the quality of education throughout Georgia, and to determine achievement of adequate yearly progress as required through No Child Left Behind legislation (U.S. Department of Education, Elementary and Secondary Education, 2010). The GCRCT scores reflect three levels of mastery. The first performance category, basic, indicates students have not demonstrated achievement of the mandated state standards (Georgia Department of Education, 2013). The second, proficient, indicates students have demonstrated a minimal level of achievement of the standards (Georgia Department of Education, 2013). The third performance category, advanced, indicates students have excelled in demonstrating mastery of the standards (Georgia Department of Education, 2013).

**Phenomenological research.** The phenomenological research approach is useful in exploring the essence of human experiences, as described by participants, involving a specific phenomenon under study (Creswell, 2014).

**Qualitative data.** A narrative collection of the perceptual views of others involving experiences and understandings is described as qualitative data (Gay, Mills, & Airasian, 2012).

**Qualitative inquiry.** This phenomenological study is one of qualitative inquiry. As noted in the literature, qualitative studies are useful when researchers desire to discover and explore the views and interests of participants involving phenomena of interest (Creswell, 2014). As Gay et al. (2012) emphasized, qualitative data are useful for
capturing various life experiences as they are lived and understood.

**Purpose of the Study**

The purpose of this phenomenological study was to examine perceptions of adults, between 18 and 30 years of age, within the community in order to identify specific effects of limited technology and Internet access in public schools. The study was designed to examine the perceived effects of limited access on participants’ (a) early school experiences; (b) early educational achievement; (c) technology adoption; (d) college readiness, pursuit, and performance; (e) career selection and readiness; and (f) income levels. To achieve this collective purpose, the researcher acquired perceptions from 33 adults who attended the local high school during School Years 2003-2004 through 2012-2013.
Chapter 2: Literature Review

Within this chapter is a report of findings derived from a review of both the current and seminal professional literature. The chapter begins with a description of diffusion of innovations ([DOI], Rogers, 2003), which is the theoretical perspective serving as the conceptual lens of this phenomenological study. Results of a quantitative study conducted by Chatzoglou and Vraimaki (2010) are then discussed, as the study was conducted to examine the application of the DOI theory in a “real-life context” (Chatzoglou & Vraimaki, 2010, p. 338). Discussion involving three selected roles of technology and the Internet is also provided: (a) undergraduate education, (b) career preparation, and (c) upward career mobility. The text then transitions into an overview of the historical context of technology integration within education, the emerging roles of technology in education, and college and career readiness. Discussion regarding the influences of poverty on educational outcomes and technology access complete the review of the literature. After a brief summary, the questions that guided this study are presented as the concluding segment of the chapter.

Theoretical Perspective

This phenomenological study was designed to identify perceived effects of limited technology and Internet access occurring during participants’ early years in public schools. Also central to the study was the examination of subsequent technology adoption within the local social system. The DOI theory (Rogers, 2003) is referenced within the professional literature as a viable perspective involving voluntary technology adoption (Chatzoglou & Vraimaki, 2010; Moore & Benbasat, 1991). Because of the acceptance of the theory by published scholars, the researcher selected the work of Rogers (2003) as an effective theoretical perspective for use in this study.
The DOI theory (Rogers, 2003) was developed in the early 1960s to delineate the general process involved in the diffusion of innovations, or new ideas, among members of a local social system. Although diffusion can involve any innovation, technology diffusion, or adoption, became central to the theory developed by Rogers (2003) during the 1980s. As clearly emphasized within the DOI theory, technology adoption occurs over time and as a result of communication among individuals amidst social support. Rogers described interpersonal communication within the local social system as more effective than mass media in forming and changing attitudes that influence decisions involving the adoption or rejection of technology.

Rogers (2003) promoted the belief that technology adoption varies according to innovativeness, or the “degree to which an individual . . . is relatively earlier in adopting new ideas” when compared to other members of a social system (p. 22). As also noted within the DOI theory and throughout the professional literature, individuals who have voluntarily adopted technology often serve as diffusion agents within their communities by promoting the benefits of technology use through interpersonal communication (Chatzoglou & Vraimaki, 2010; Moore & Benbasat, 1991; Rogers, 2003).

The DOI theory (Rogers, 2003) identifies five adopter categories involving technology use: (a) innovators, (b) early adopters, (c) the early majority, (d) the late majority, and (e) laggards. Rogers (2003) underscored the belief that adoption occurs on a continuum with no identifiable breaks, or discontinuities, between adjacent adopter categories. Although categorizing the technology adoption of participants is beyond the scope of this study, a brief description of each category is provided in the following text to ensure the overview of the DOI theory is complete:

1. Innovators, who fulfill an important role in the diffusion process, are
venturesome and maintain a keen interest in new technological ideas and innovations (Moore & Benbasat, 1991; Rogers, 2003). Generally, innovators have the ability to understand and apply technical knowledge; these individuals typically hold substantial financial resources when compared with the general population within a local social system (Rogers, 2003). Innovators also have a tendency to manage a high degree of uncertainty involving the new technology at the point of adoption (Rogers, 2003).

2. Early adopters, when compared with innovators, are more integrated within the local social system and typically serve as peer leaders within the system because of their positions of respect (Moore & Benbasat, 1991; Rogers, 2003). As Rogers (2003) purported, members of local social systems seek the advice of early adopters before adopting new technological ideas or innovations. As early adopters begin demonstrating acceptance of the new technology, these individuals additionally decrease the uncertainties of others by communicating subjective evaluations through interpersonal networks (Rogers, 2003).

3. The early majority, which typically includes one third of the members of the local social system, includes deliberate individuals who adopt new technological ideas or innovations before the majority of the members of the system (Moore & Benbasat, 1991; Rogers, 2003). Although Rogers (2003) underscored that those within the early majority frequently interact with their peers, the belief that these individuals seldom serve as peer leaders within the system was also emphasized. Members of this adopter category are an important group within the diffusion process, as they link the interpersonal networks of the systems between the early and late adopters (Rogers, 2003).

4. The late majority is depicted as a group of skeptical individuals who adopt new technological ideas and innovations after the average member of the local social system
has done so (Moore & Benbasat, 1991; Rogers, 2003). This adopter category typically represents one third of the members of the system; these individuals often adopt technology as an economic necessity or as a result of increased, ongoing peer pressure (Rogers, 2003). Because members of this category typically have limited resources, most of the uncertainties surrounding new technology must be resolved by peers before the adoption occurs (Rogers, 2003).

5. Laggards, who were described as traditional individuals, are the final adopter category within the social system (Moore & Benbasat, 1991; Rogers, 2003). Rogers (2003) described laggards as “near isolates” in the local social system who hold a point of reference in the past (p. 284). Not only are laggards suspicious of new technological ideas and innovations, but they are often wary of change agents within the social system (Rogers, 2003). Although laggards may be aware and knowledgeable, their adoption of technology lags far behind in comparison with others in the system. Rogers further described laggards as individuals who typically have limited resources; as a result, these individuals must be extremely cautious when considering adopting technology.

As can be ascertained from the description of the five adopter categories, technological innovativeness is primarily dependent upon knowledge involving new technological ideas or innovations yet also varies according to the characteristics of socioeconomic status, personality variables, and communication behavior (Moore & Benbasat, 1991; Rogers, 2003). The following overview is intended to describe the relationship between each of the three characteristics and adoption categories.

Socioeconomic status. Of specific importance in this study is Rogers’ (2003) perception involving the influence of socioeconomic status on technology adoption. According to Rogers, early adopters may be no different in age than late adopters, yet
early adopters typically have achieved a greater degree of upward social mobility and higher levels of (a) education, (b) social status, (c) income, and (d) occupational standing. Consequently, the lack of technological access can potentially affect individuals within these four critical areas (Rogers, 2003).

**Personality variables.** Early adopters, in comparison with late adopters, typically have the ability to (a) adopt an innovation based upon abstract stimuli, such as advertisements circulated through mass media; (b) manage uncertainty more effectively; (c) tolerate higher levels of risk; and (d) view change more favorably (Rogers, 2003). Early adopters also hold a higher value for formal education and social status and a positive attitude toward science and scientific research (Moore & Benbasat, 1991; Rogers, 2003). Santa Maria (2011) similarly purported that youth with increased access to updated technology view themselves as “superior to those who have less exposure” (p. 113).

**Communication behavior.** Rogers’ (2003) DOI theory includes the concept that persons in the different adopter categories use diverse communication behaviors. Within the framework, Rogers described early adopters, as compared with late adopters, as those with higher degrees of social involvement, including efforts to acquire information, and greater exposure to mass media channels. Early adopters were also depicted as individuals who maintain greater levels of contact with change agents and who strive to maintain pronounced knowledge levels involving new technological ideas and innovations (Rogers, 2003).

**A Quantitative Study of Diffusion of Innovations Theory**

The theoretical perspective developed by Rogers (2003) was used by Chatzoglou and Vraimaki (2010) as the framework of a quantitative investigation involving the adoption of new technology and the Internet. By conducting the study, Chatzoglou and
Vraimaki attempted to identify the population sector that is most receptive to adopting new technological ideas and innovations. Underpinning the study was the belief that technology usage significantly affects individuals’ access to accurate and timely information, employment opportunities, and prospects for social inclusion (Chatzoglou & Vraimaki, 2010).

The target population of the investigation included the residents of a small urban community, and the random sample included 150 individuals (Chatzoglou & Vraimaki, 2010). Questionnaires were personally administered, and voluntary respondents were primarily female, high school graduates who were either employed in the private sector or full-time students. The data analysis indicated the following results (Chatzoglou & Vraimaki, 2010):

1. Findings involving technology usage, in terms of experience and frequency of use, reflected that over 56% of respondents had used a computer for 3 to 5 years. Results further indicated that females were less experienced in computer use than their male counterparts, and the most experienced users within both genders were between the ages of 26 and 64. In support of the DOI theory (Rogers, 2003), Chatzoglou and Vraimaki (2010) found that the least experienced computer users were those whose educational pursuits ended following high school.

2. Findings involving Internet access suggested that just more than 53% of respondents aged 19 through 63 accessed the Internet from home, and no statistically significant gender differences were noted in home Internet access. Although just over half of respondents aged 19 through 63 reported having home Internet access, almost 71% of homes with children below the age of 18 had Internet access within the home. No respondents over the age of 63 reported having home Internet access. Similar to Rogers’ (2003) DOI theory, Chatzoglou and Vraimaki (2010) additionally found that the rate of
home Internet access increased proportionately with increased formal educational levels. Respondents between the ages of 19 and 63 who were without home Internet access most frequently cited the costs of acquiring technological equipment and Internet service as the primary obstacle; those over the age of 63 cited a lack of skills as the reason they had not acquired home access.

3. Findings involving Internet frequency of use indicated that over 62% of respondents were recent users, yet almost 31% reported not using the Internet at all. Almost 93% of respondents ages 19 to 25 were frequent Internet users, meaning they accessed the Internet on a daily basis. The percent of nonusers increased with age; those over 63 reported never using the Internet. In support of Rogers’ (2003) DOI theory, Chatzoglou and Vraimaki (2010) additionally reported that the frequency of Internet use increased commensurate to increased levels of continued formal education.

4. The final category of findings involved the specific technology-based activities of respondents using the Internet within the past 3 months. In the order of reported use, categories included (a) communication, (b) information searches and online services, (c) the ordering or selling of goods or services and banking, (d) interacting with public authorities, (e) training and education, and (f) health-related activities. Men were the primary Internet users for communication; accessing online publications; and downloading games, music, and software. Women reported the higher level of Internet use for accessing travel information, conducting employment searches, banking, and purchasing or selling goods. Moreover, educational activities were reported only by women. Findings involving gender reflected similar beliefs espoused by Helsper and Eynon (2010). Chatzoglou and Vraimaki (2010) additionally noted age differences, with respondents ages 25 and below reporting the greatest use of the Internet for communication and those 26 to 39 reporting the widest variety of activities. Conversely,
Rogers’ (2003) DOI theory did not compare the variables of gender or age in terms of technology or Internet usage.

Critical to this present study, Chatzoglou and Vraimaki (2010) also examined the effects of the three characteristics of socioeconomic status, personality variables, and communication behavior central to the DOI theory (Rogers, 2003). Unlike the variables used in this present study, however, Chatzoglou and Vraimaki maintained that socioeconomic status was determined by the years of accrued formal education rather than by income levels. Regarding socioeconomic status, findings indicated agreement with the DOI theory through a positive statistically significant relationship between educational levels and technology usage (Chatzoglou & Vraimaki, 2010). Regarding personality variables, findings reflected agreement with the DOI theory through positive statistically significant relationships between technology usage and the abilities to deal successfully with abstract stimuli and manage higher levels of risk (Chatzoglou & Vraimaki, 2010).

Regarding communication behavior, findings reflected agreement with the DOI theory through a positive statistically significant relationship between information seeking and technology usage (Chatzoglou & Vraimaki, 2010). A negative statistically significant relationship, however, was noted between social involvement and the three tenets central to the DOI theory: (a) socioeconomic status, (b) personality variables, and (c) communication behavior (Chatzoglou & Vraimaki, 2010). These latter findings refuted Rogers’ (2003) belief that interpersonal communication within the local social system is effective in forming and changing attitudes that influence decisions involving the adoption or rejection of technology. The negative relationship involving social involvement and communication behavior was also oppositional to a position espoused by Holzinger, Searle, and Wernbacher (2010), who espoused the belief that technology
acceptance requires the development of trust based on personal association.

**Various Roles of Technology and the Internet**

Technology, often encompassing the Internet, is used for addressing a wide variety of purposes within the realm of education (Campbell & Jane, 2012; Hechter, Phyfe, & Vermette, 2012; Liu & Cavanaugh, 2011) yet also has practical applications involving career preparation, exploration, acquisition, and promotion (McDonnell & O’Mally, 2012; Shaw & Fairhurst, 2008; Symonds, 2012). Rural students, and especially those of low socioeconomic status, have limited access to personal career services within their schools and communities (Griffin et al., 2011). Consequently, participating in career exploration and related activities often would be challenging for rural students without the use of technology (Griffin et al., 2011).

When considering the realm of careers and other practical applications of technology, Ballard (2010) and Ray (2012) agreed that educational success is determined by employee performance capacities upon workforce entry. Lang (2012) and Smith (2010) emphasized the importance of various practical applications of technology beyond high school, and these practical applications are in alignment with this present research study. An overview of four different applications, all of which are unarguably critical in communities with high levels of poverty, is provided within this section to underscore the importance of technology throughout the lifespan.

**Undergraduate education.** Online, postsecondary courses of study are embedded within technology because of the many benefits of Internet-based delivery (Campbell, 2012; Venable, 2010). One of the primary educational areas involving technology is that of undergraduate college courses which often incorporate an online format. Since the introduction of online courses in the 1990s, an increasing number of high school students has enrolled in entry-level college courses prior to high school graduation (Association
for Career and Technical Education, 2009; Compton, Laanan, & Starobin, 2010; Venable, 2010). By completing entry-level courses in advance, students have the opportunity to achieve postsecondary degrees more quickly and at lower costs when compared to acquiring traditional college degrees wherein all courses occur in a classroom setting (Venable, 2010).

The two primary types of technology integration used in all levels of college and university courses are those of synchronous and asynchronous communication. Synchronous technology provides the opportunity for simultaneous communication. A prime example of synchronous technology is a virtual classroom which affords various opportunities for students and instructors to communicate and exchange information online; examples include (a) whiteboards; (b) two-way audio; (c) text chat; (d) online webinars, which are also useful in presenting workshops and seminars; and (e) video (Venable, 2010). Alternatively, asynchronous technology also enables students to communicate with their peers and instructors but involves the limitation of time delays in the communication experiences. Examples of asynchronous communication include (a) electronic mail, (b) discussion boards, (c) podcasts, and (d) webpages (Venable, 2010).

**Career preparation.** A holistic view of career preparation includes the high school experience and involves student participation in career and technical education (CTE). This blended educational approach, which attracts students in all socioeconomic and geographical settings but especially those in rural areas, emphasizes both academics and career preparation (Dworsky, 2011; McDonnell & O’Mally, 2012; Stone & Lewis, 2012). The CTE model is designed to collectively (a) improve academic achievement, (b) encourage students to graduate from high school, (c) assist students in the transition between high school and college, and (d) promote career preparation (Association for
The current emphasis on CTE began in the early 20th century in response to needs involving the labor force, yet the approach continues to serve as a viable educational model in both high schools and community colleges for promoting career preparation (Compton et al., 2010). Interest in CTE increased during the 1990s, during a sustained period of economic growth in the United States, when concerns were initially voiced about the need for students to successfully transition from high school to either college or careers (Hyslop, 2009; Medina, 2010; Stone & Lewis, 2012). Since the initial establishment of the earlier CTE model, the requirement to develop a skilled workforce for active participation in the growing U.S. economy has caused educational leaders across the country to refine related policies, in an ongoing manner, to align with federal legislation such as the Carl D. Perkins Vocational and Applied Technology Act (U.S. Department of Education, 2006) and No Child Left Behind legislation (U.S. Department of Education, Elementary and Secondary Education, 2010).

The potential benefits of participation in CTE for young adults entering the workforce, which include increased income compared with their same-age peers, were recently evaluated by Compton et al. (2010). Data for the evaluation were acquired from the Iowa Department of Education, Iowa Workforce Development, and the National Student Clearinghouse (Compton et al., 2010). The purpose of the research was to identify relationships between economic outcomes and the student characteristics of gender and ethnicity. Results of the investigation reflected that (a) males, both with and without an associate’s degree, earn higher salaries in business and marketing fields than their female peers; (b) females earn higher salaries in information-technology fields than their male peers; and (c) when based on ethnicity, differences in salaries were not
statistically significant for either males or females (Compton et al., 2010).

Critical to this present study is that Compton et al. (2010) underscored the need for guidance counselors in high schools and community colleges to promote participation in CTE among students in preparation for workforce entry. Gordon (2008) agreed with Compton et al. that the need to reinforce this linkage is critical and particularly underscored the importance of CTE in low socioeconomic areas and high-growth areas such as information technology. Similarly, a shortage of highly technological and skilled workers in the United States was reported by Feller (2011) who wrote that “adding value through innovation and creativity [is imperative in acquiring] future employment and sustainable careers” (p. 6).

**Employment exploration and acquisition.** Lang (2012) reported that parents, personal experiences, and family background and culture are the primary influences in the career choices of students exiting high school and college. Griffin et al. (2011) reiterated the parental role in children’s career choices but added that racial ethnicity and culture are additional influences in career selection. In congruency with these various influences, enrollment in CTE is believed to remain a helpful approach in assisting students in their transition from school into the labor market with related background knowledge (Beltram, 2010). Career counseling is another central component of the student experience; consequently, counseling should begin in high school and continue throughout college (Clemens, Milsom, & Cashwell, 2009; Dahir, 2009; Symonds, 2012). While high school counselors are integrally involved in the implementation of the CTE model, career exploration, and preparations to assist college-bound students (Dahir, 2009; Stipanovic, 2010; Young & Kaffenberger, 2011), college counselors assist students in developing coursework to further prepare them for the career paths they have selected.
Dahir, 2009; Symonds, 2012).

Venable (2010) emphasized that technology, which is embedded within high school and college career-counseling programs to embellish traditional programs, is an additional, critical resource for use in career exploration and acquisition. Using online resources, traditional career-based services can be offered to an expanded variety of student populations; examples include Internet-delivered guidance and information systems which offer personalized and searchable self-help career information to guide individuals in career exploration and acquisition (Lang, 2012; Venable, 2010). As asserted by representatives of the Association for Career and Technical Education (2009), guidance and information systems bridge the gap between synchronous and asynchronous communication and enable individuals to communicate with career and school counselors regardless of geographical locations or time constraints. Potential employers, many of whom represent the technology industry, also use several technology-based resources to attract, recruit, and communicate with employee candidates: (a) websites, (b) databases, (c) instant messages, and (d) online assessments (Lee & Mirchandani, 2010; Venable, 2010).

**Upward career mobility.** Careers are dynamic in nature, and upward mobility often requires increased levels of technological competency (Becker, Fleming, & Keijsers, 2011; Wang, Ran, Liao, & Yang, 2010; Weiss & Adams, 2011). Mitzner et al. (2010) added that employees, regardless of age, also recognize the importance of technological literacy. Becker et al. (2012) underscored the belief that familiarity with technology is as critical in employment success as literacy skills in the traditional subjects of mathematics, reading, and writing.

Shaw and Fairhurst (2008) conducted an applied research study to examine the educational preferences of workers for the purpose of identifying effective components of
on-the-job training. Through their work, Shaw and Fairhurst identified the enrichment brought through the incorporation of technology-based training. The use of graphics and vibrant colors, immediate feedback, and rapid transitioning through the online training program was also found to be instrumental in continued development and promotion efforts (Shaw & Fairhurst, 2008). These findings explicitly identified the interests and needs of workers and justified the use of technology in enhancing employees’ upward career mobility.

**Historical Context of the Phenomenon**

**Technology integration within education.** The historic report entitled *A Nation at Risk* (National Commission on Excellence in Education, 1983) initially promoted the concept that technology integration within educational practices is critical for student success. In addition to embedding technology within educational practice, the collective recommendations within the report included an increase in the course requirements for high school graduation, an increased minimum length or number of school days, and improved teacher training (National Commission on Excellence in Education, 1983). As noted in the following text, this report was the impetus for numerous efforts, including federal legislation, intended to ensure technology integration within education would increase over time.

An additional outcome of *A Nation at Risk* (National Commission on Excellence in Education, 1983), beyond the initial recommendations to modify educational practices, was an emphasis on the adoption of mandated academic standards specific to each state (Bennett, 2010; Campbell, 2009). State standards were initially conceptualized during the first National Education Summit in 1989 (Bennett, 2010; Campbell, 2009). The standards were intended to improve the academic achievement of all students by establishing
measurable competencies in the core subject areas at each grade level (Bennett, 2010; Campbell, 2009).

**Achieve, Inc.** Members of the National Education Summit continued their ongoing, collaborative work by creating Achieve, Inc. in 1996. Achieve, Inc. is a nonprofit and independent organization created to support continued educational reform. In 2004, representatives of Achieve, Inc. (2014) initiated the American Diploma Project for the purpose of establishing and developing a collaborative network of educational and state leaders to ensure the continuation of ongoing educational reform.

**America’s Technology Literacy Challenge.** Also in 1996, approximately 13 years after members of the National Commission on Excellence in Education (1983) offered initial recommendations involving the development and implementation of academic standards, America’s Technology Literacy Challenge was issued. This federal declaration was provided to ensure technology would be integrated within classrooms across the country through the (a) establishment of Internet connections, (b) use of educational software within instructional practices, (c) requirement for professional development to prepare teachers for integrating technology within educational practices, and (d) provision of multimedia computers in classrooms throughout the country (The White House, 1996). These goals were commonly known as the Four Pillars (The White House, 1996).

**The Telecommunications Act.** During the same year as the America’s Technology Literacy Challenge was issued, federal legislators supported the Four Pillars by approving the Telecommunications Act (William J. Clinton Presidential Library and Museum, 1997). This legislation required that technology be provided in public schools and libraries throughout the country. The federal enactment additionally provided
funding for initial technology purchases (William J. Clinton Presidential Library and Museum, 1997).

No Child Left Behind. Five years later, No Child Left Behind of 2001 (U.S. Department of Education, Elementary and Secondary Education, 2010) was passed into law. In part, this federal legislation promoted technology integration within public school classrooms (U.S. Department of Education, Elementary and Secondary Education, 2010). Within the legislative enactment was a component, entitled Enhancing Education Through Technology, designed to strengthen the technological literacy of classroom teachers. This component additionally required the Secretary of Education to conduct a long-term evaluation of student performance for the purpose of identifying the effects of educational technology on academic achievement (U.S. Department of Education, Elementary and Secondary Education, 2010). Enhancing Education Through Technology additionally provided funding for use in improving classroom infrastructures involving technology integration and in providing professional-development training for teachers employed in public schools with large populations of low socioeconomic students (U.S. Department of Education, Elementary and Secondary Education, 2010). As a related component, the legislation required that all public school students demonstrate technology literacy by the conclusion of the eighth grade (U.S. Department of Education, Elementary and Secondary Education, 2010).

An additional component embedded within No Child Left Behind legislation (U.S. Department of Education, Elementary and Secondary Education, 2010) required educators to objectively measure and report the academic growth of students each school year using standardized assessments. Because of this process, educators began to measure academic performance by student subgroups of substantial size; related practices have
continued for over a decade. Results derived from the measurement of academic performance are useful in determining whether students have achieved grade-level skills, as delineated in state-mandated standards, and in determining schools’ and school districts’ achievement of adequate yearly performance (U.S. Department of Education, Elementary and Secondary Education, 2010).

Another component of No Child Left Behind legislation required the development of a national technology plan for the purpose of improving technology integration within instructional practices (U.S. Department of Education, Elementary and Secondary Education, 2010). As an initial effort in developing the technology plan, members of the U.S. Department of Education (2010) identified specific goals for school district and state leaders. The goals were then delineated as action steps and incorporated within the National Education Technology (NET) Plan in 2004 (U.S. Department of Education, 2010):

1. Increase the leadership focus involving the integration of technology by (a) creating partnerships among businesses, the community, public schools, and higher education; (b) encouraging students to participate in activities that promote the integration of technology within instruction; and (c) developing programs to promote technology integration within schools.

2. Encourage district and state educational leaders to allocate substantial portions of their educational budgets for assisting in technology development.

3. Promote teachers’ use of technology with financial allocations for use in developing methods for integrating technology within instructional practices and in skills development involving the interpretation of student-performance data. As one component of this action step, teachers were to be encouraged to enroll in online courses to access
professional development in the topics of technology integration and the analysis of student-performance data.

4. Promote the integration of technology along with the differentiation of instruction in order to meet the instructional needs of students with different abilities and interests.

5. Install broadband Internet access within all public schools to ensure access to technology.

**Technology standards for administrators.** Members of the International Society for Technology in Education also developed formal expectations for administrators involving the use of technology. The purpose of the NET Standards for Administrators (NETS-A) was to establish leadership priorities within the area of educational technology (International Society for Technology in Education, 2012a). The standards collectively emphasized the (a) importance of technology integration within instruction, (b) skillful application of technology as an instructional medium, and (c) necessity of professional development in the integration of technology within instruction (Dalton & Roush, 2010; International Society for Technology in Education, 2012a). As noted in the following enumeration, the NETS-A standards support the use of technology as an effective educational medium:

1. Through the establishment of the standard of visionary leadership, the expectation was established that administrators would “inspire and lead development and implementation of a shared vision for comprehensive integration of technology to promote excellence and support transformation throughout the organization” (International Society for Technology in Education, 2012a, para. 1).

2. Through the establishment of the standard of digital-age learning culture, the
expectation was established that administrators would “create, promote, and sustain a dynamic, digital-age learning culture that provides a rigorous, relevant, and engaging education for all students” (International Society for Technology in Education, 2012a, para. 2).

3. Through the establishment of the standard of excellence in professional practice, the expectation was established that administrators would “promote an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources” (International Society for Technology in Education, 2012a, para. 3).

4. Through the establishment of the standard of systematic improvement, the expectation was established that administrators would “provide digital-age leadership and management to continuously improve the organization through the effective use of information and technology resources” (International Society for Technology in Education, 2012a, para. 4).

5. Through the establishment of the standard of digital citizenship, the expectation was established that administrators would “model and facilitate understanding of social, ethical, and legal issues and responsibilities related to an evolving digital culture” (International Society for Technology in Education, 2012a, para. 5).

**Technology standards for teachers.** The majority of teachers within public education are knowledgeable about the use of instructional technology (Lowther, Strahl, Inan, & Ross, 2008; McDaniel & Shaw, 2010). Those who were teaching prior to the initial integration of technology within instruction, however, may not have received the necessary training for skillfully integrating technology within instruction (Lowther et al., 2008; McDaniel & Shaw, 2010). Moreover, without related training, teachers may be
unaware of the effectiveness of technology in differentiating instruction to meet the needs of all students (Buckenmeyer, 2010; Cobb, 2010). The need for educational leaders to prepare teachers in the integration of technology through professional-development training is critical in promoting educational equity (Buckenmeyer, 2010; Davies, 2011). To assist leaders in designing effective training, representatives of the International Society for Technology in Education (2012c) identified five performance indicators in the NET Standards for Teachers (NETS-T):

1. Through the standard of facilitating and inspiring student learning and creativity, the expectation was established that teachers would “use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments” (International Society for Technology in Education, 2012c, para. 1).

2. Through the standard of designing and developing digital-age learning experiences and assessments the expectation was established that teachers would “design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the [National Educational Technology Standards for Students]” (International Society for Technology in Education, 2012c, para. 2).

3. Through the standard of modeling digital-age work and learning, the expectation was established that teachers would “exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society” (International Society for Technology in Education, 2012c, para. 3).

4. Through the standard of promoting and modeling digital citizenship and
responsibility, the expectation was established that teachers would “understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices” (International Society for Technology in Education, 2012c, para. 4).

5. Through the standard of engaging in professional growth and leadership, the expectation was established that teachers would “continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources” (International Society for Technology in Education, 2012c, para. 5).

**Technology standards for students.** In support of the various governmental legislative acts (U.S. Department of Education, 2010; U.S. Department of Education, Elementary and Secondary Education, 2010; The White House, 1996), members of the International Society for Technology in Education (2012b) also developed formal expectations for students involving the use of technology. The expectations were based upon an interest in promoting higher-order thinking and citizenship skills. The expectations comprise the NET Standards for Students (NETS-S) and promote skills in five areas: (a) “demonstrate creativity and innovation”; (b) “communicate and collaborate”; (c) “conduct research and use information”; (d) “think critically, solve problems, and make decisions”; and (e) “use technology effectively and productively” (International Society for Technology in Education, 2012b, para. 1).

**Emerging roles of technology in education.** As technology has become more commonplace within education, Musawi (2011) identified the need to redefine its roles. Three emerging roles of technology were identified, indicating the emergence of technology for use (a) as a resource for information; (b) in noninstructional management,
including student enrollment and registration, library services; and (c) in instructional
delivery, using the Internet or multimedia presentations (Musawi, 2011). Because of
these emerging roles, Musawi predicted that technology will change pedagogical
practices, by effectively addressing individuals’ learning needs and shaping educational
activities, as well as social processes. Weiss and Adams (2011) similarly emphasized that
leaders must embrace changes brought by the emerging roles of technology in order to
strategically identify and implement the most relevant technologies available.

**College and career readiness.** In 2004, representatives of Achieve, Inc. (2014)
brought educational leaders throughout the United States together and promoted the
establishment of national common core standards in English and mathematics. The
standards were designed to align high school academic standards, graduation
requirements, and assessment and accountability systems throughout the country
(Achieve, Inc., 2014; Tucker, 2011). The common core standards continue serving as
benchmarks to ensure that high school graduates have acquired college and career
readiness skills (Achieve, Inc., 2014). Through the initial efforts of Achieve, Inc., four
related action steps were identified for use in guiding continued educational reform in
American public schools:

1. High school standards and related assessments are to be aligned “with the
knowledge and skills required for the demands of college and careers” (Achieve, Inc.,
2014, The ADP Network section, para. 3).

2. High school graduation requirements are to include the expectation that all
graduates will “complete a college and career ready curriculum so that earning a diploma
assures a student is prepared for postsecondary education” (Achieve, Inc., 2014, The
ADP Network section, para. 3).
3. High school assessment systems are to emphasize expectations involving college and career readiness (Achieve, Inc., 2014).

4. School leaders are to develop “comprehensive accountability and reporting systems that promote college and career readiness for all students” (Achieve, Inc., 2014, The ADP Network section, para. 3).

These action steps have been adopted throughout the state wherein this present study will be conducted (Georgia Department of Education, 2012c). As a result, state-mandated standards require students to demonstrate attainment of college and career readiness prior to high school graduation. The standards are intended to ensure that high school graduates have the skills and requisite knowledge to transition from high school to postsecondary education or to entry-level employment positions without remedial instruction (Georgia Department of Education, 2012c).

**The Influences of Poverty on Educational Outcomes and Technology Access**

Researchers believe that children of low-income parents, when compared with their grade-level peers, typically perform lower on classroom tests and standardized assessments and are more likely to be retained to repeat grades prior to eventually dropping out of school (Hughes, 2010; Medina, 2010; Thackeray & Hunter, 2010). One salient contributor to the failure pattern is that children of poverty, and especially rural children of poverty, often read below grade level (Bursuck, Robbins, & Lazaroff, 2010). Another reason that children of low-income parents become prey to educational failure and generational poverty is that they are less likely to enroll in postsecondary studies or be prepared for viable careers immediately following high school (Dworsky, 2011; Santa Maria, 2011). Irvin, Meece, Byun, Farmer, and Hutchins (2011) held that, by encouraging students to identify career goals in early high school years, educators can
become vital interventions in changing the trend involving generational poverty.

Bornsheuer, Polonyi, Andrews, Fore, and Onwuegbuzie (2011), as well as Guan and Subrahmanyam (2009), additionally promoted the belief that the integration of technology provides a stimulating environment wherein rural children, as well as those of low-income parents, can flourish and experience academic success. Researchers have credited the hands-on activities that are supported through technology for improving student success and satisfaction (Campbell & Jane, 2012; Hechter et al., 2012). DiMaggio and Hargittai (2001), while also describing technology and Internet access as an important resource and a significant public policy issue, stated that inequality in Internet access negatively affects rural and low-income families, as the same population subgroups that have “greater access to education, income, and other resources that help people get ahead” also have greater access to technology (p. 1).

The professional literature has often described children in rural and other low-income areas as those negatively affected by the digital divide because of the inequality in access to technology (Berrett, Murphy, & Sullivan, 2012; Howley, Wood, & Hough, 2011; Inan & Lowther, 2010). In their seminal research, although DiMaggio and Hargittai (2001) recognized the digital divide as a challenge inherent to the technology-diffusion process, they also emphasized “digital inequality” as an additional, salient challenge to children in rural and other low-income areas (p. 8). According to DiMaggio and Hargittai, digital inequality encompasses the digital divide, or inequality of access to technology, as well as the inequality among persons involving gender, age, social class, and socioeconomic status, with Internet access.

Because of the persistence in digital inequality beginning in the middle 1990s, the concern exists that technology may “exacerbate inequality rather than ameliorate” efforts
to equalize technology diffusion (DiMaggio & Hargittai, 2001, p. 1). DiMaggio and Hargittai (2001) identified five “dimensions of digital inequality”: (a) hardware, software, and Internet connection; (b) autonomy of use; (c) skills; (d) social support; and (e) the purposes for which technology is employed (p. 8). Of critical importance to this present study is DiMaggio and Hargittai’s belief that, as technological resources penetrate new sectors of the population, the need for social support in the use of technology increases. DiMaggio and Hargittai further underscored the need for new users to draw on social support, from experienced users, in efforts to become more competent in the use of technology.

**Summary of the Literature Review**

The preceding literature review, which was derived from both the current and seminal professional literature, began with a description of DOI (Rogers, 2003). The theoretical perspective of DOI served as the conceptual lens of this phenomenological study. Through the DOI theory, Rogers (2003) purported that technology adoption occurs over time and varies according to the innovativeness of individuals. As also noted within the theory, and important within the study, individuals who have adopted technology often serve as diffusion agents within their communities by promoting technology use (Chatzoglou & Vraimaki, 2010; Rogers, 2003).

Of specific importance in this study is Rogers’ (2003) perception involving the influence of socioeconomic status. Although early adopters may be no different in age than later adopters, early adopters typically have achieved higher levels of education and enjoy a higher level of (a) education, (b) social status, (c) income, and (d) occupational standing. Consequently, the lack of technology and Internet access has the propensity to affect individuals within these four critical areas. Early adopters also hold a higher value for education and social status and a positive attitude toward science and scientific
research (Rogers, 2003). As a final note, early adopters often demonstrate higher degrees of social involvement.

The review of the research reflected that technology is used for a wide variety of purposes within the realm of public education (Campbell & Jane, 2012; Hechter et al., 2012; Liu & Cavanaugh, 2011) yet also has practical applications beyond classroom instruction. The three practical applications of technology aligned with the current study involve (a) undergraduate education, (b) career preparation, and (c) upward career mobility. These applications of technology are unarguably critical within communities with high levels of poverty.

The historical context of the phenomenon of technology and Internet access was also depicted. Related history began with a report entitled A Nation at Risk (National Commission on Excellence in Education, 1983); this document promoted the concept that technology integration within educational practices was critical for student success. The text then described the collective influences of (a) the initial development of stated-mandated, academic standards by members of the first National Education Summit (Bennett, 2010; Campbell, 2009); (b) America’s Technology Literacy Challenge (The White House, 1996); (c) the Telecommunications Act (William J. Clinton Presidential Library and Museum, 1997); (d) the No Child Left Behind legislation of 2001 (U.S. Department of Education, Elementary and Secondary Education, 2010); and (e) the work of Achieve, Inc. (2014) in promoting national common core standards and college and career readiness skills. The NETS-A, NETS-T, AND NETS-S (International Society for Technology in Education, 2012a, 2012b, 2012c) were also presented because of their role in promoting educational technology. Discussion regarding the influences of poverty on educational outcomes and technology access completed the review of the literature.
This present study was designed to examine perceptions of adults within the local rural community in order to identify specific effects of limited technology and Internet access in public schools. The literature review established the importance of technology integration within the early school experience and the role of technology throughout postsecondary education and employment. The influence of social relationships on technology diffusion was also established through the literature review.

Central Research Question

One central research question guided this phenomenological study. The question was as follows: What are the effects of limited technology and Internet access in public schools? Five subquestions were used in answering this question; each was answered by analyzing responses to a qualitative, anonymous questionnaire (see Appendix A):

1. What are the effects of limited technology and Internet access on early school experiences?

2. What are the effects of limited technology and Internet access on early educational achievement?

3. What are the effects of limited technology and Internet access on college readiness, pursuit, and performance?

4. What are the effects of limited technology and Internet access on career selection and readiness?

5. What are the effects of limited technology and Internet access on income levels?
Chapter 3: Methodology

This study was conducted over a 6-week period of time. This chapter begins with a brief description of the researcher’s intentions concerning the study and then addresses the topic of qualitative inquiry. Following the description of the research design, the participant group is presented. The data collection instrument and the process through which the instrument was piloted are then described. Procedures involving the data collection and analysis are then presented. Next, the chapter addresses ethical considerations and trustworthiness. The discussion involving potential researcher bias concludes the chapter.

Aim of the Study

In reflection of the qualitative method, the aim of this phenomenological study was to understand “phenomena within the context of the meaning that people express without attempting to infer causation” (Edmonds & Kennedy, 2013, p. 112). By conducting the study, the researcher had the opportunity to examine perceptions of adults, between 18 and 30 years of age, within the community in order to identify specific effects of limited technology and Internet access in public schools. The study was designed to examine the perceived effects of limited access on participants’ (a) early school experiences; (b) early educational achievement; (c) technology adoption; (d) college readiness, pursuit, and performance; (e) career selection and readiness; and (f) income levels. To achieve this purpose, the researcher acquired perceptual data from 33 adults who attended the local high school during School Years 2003-2004 through 2012-2013.

Qualitative Research Approach

This phenomenological study was conducted using a qualitative approach. A review of the professional literature suggested that this design, which yields
nonnumerical data consisting of narrative descriptions, was appropriate for use in the present study. Edmonds and Kennedy (2013), for example, described the qualitative method as “a form of data collection and analysis with a focus on understanding and an emphasis on meaning” (p. 112). Merriam (1998) further supported the use of qualitative inquiry when a researcher desires to acquire both richness and depth from a study. Moreover, the qualitative approach was the most applicable for use in answering the central research question and subquestions of the study and to provide direction involving the content of the data collection. Collected data were analyzed with the intention of identifying patterns which could be explored within the literature for use in making interpretations and supporting related recommendations.

The study was a nonexperimental investigation, as no experimental treatment was applied. By conducting the study, qualitative responses were collected to garner the perceived realities of participants involving the effects of limited access to technology and the Internet during the formative years in public schooling. Phenomenology is interpretive in nature (Creswell, 2014), which makes the approach useful for gaining an understanding of the perceptual views and realities of others (Creswell, 2014; McMillan, 2012). Collectively, these characteristics supported the choice of a phenomenological approach as the methodological design of this study.

**Participants**

The target population included all adults who had attended the public high school within the rural community serving as the research setting. The accessible population included the 95 prior students enrolled in the local high school during Years 2004 through 2013. No sampling procedures were used; the opportunity to participate in the study was extended to all members of the accessible population who attended the 2013
community Thanksgiving holiday celebration. In recent years, this group has contained approximately 75 individuals who attended the local high school during School Years 2003-2004 through 2012-2013.

The researcher anticipated that about 50% of the accessible population, or 48 individuals, would volunteer for participation in the study. Mertler and Charles (2011) cautioned that the response rate is “always a concern” when surveys or questionnaires are administered (p. 114). The researcher opted to not limit the number of participants based on replication logic; by acquiring the perceptions of as many members of the accessible population as possible, the expectation was that adequate data would be collected (Yin, 2009). The total number of participants was 33, or 68.75% of the anticipated 48.

Based on demographic information of the community (U.S. Census Bureau, 2013), participants were assumed to be primarily Caucasian (78%) and African American (19%), with the remaining participants being representative of multiple cultural and racial ethnicities. It was estimated that participants would range from 18 to 30 years of age. Based again on community demographics (U.S. Census Bureau, 2013), it was expected that participants would be nearly equally divided in terms of gender.

The adults volunteering for participation in the study were asked to complete an anonymous questionnaire (see Appendix A) containing open-ended questions. Mertler and Charles (2011) indicated that, although preselected response choices would be easier to tabulate and analyze, open-ended questions provide the opportunity to collect important information that may be excluded when using preselected response choices. Another advantage to using questionnaires is that the administration of the instrument required less time in comparison with interviewing participants. The researcher believes that a written data collection instrument with open-ended questions elicited reflective
responses, as they were useful in answering the central research question and achieving the purpose of this study.

**Data Collection Tool**

The self-developed questionnaire consists of 50 open-ended questions (see Appendix A). Participants were provided the option of completing the questionnaire either in handwriting, using a printed version of the instrument, or through SurveyMonkey® (2013), a secure web-based tool. The researcher uploaded the web-based questionnaire the day prior to recruitment so that the web address could be added to the questionnaire for use in accessing the instrument. With both options, the questionnaire was administered as an anonymous data collection instrument. The questions were designed to acquire the perceptions of participants regarding the various effects of limited technology and Internet access in public schools involving (a) early school experiences; (b) early educational achievement; (c) technology adoption; (d) college readiness, pursuit, and performance; (e) career selection and readiness; and (f) income levels:

1. Questions 1 through 14 were designed to answer Subquestion 1. The question was: What are the effects of limited technology and Internet access on early school experiences? As reflected in Table 3, the questions explored six constructs collectively derived from the work of Aflalo and Gabay (2012), Chatzoglou and Vraimaki (2010); Griffin et al. (2011); Guzey & Roehrig (2009); Irvin et al. (2011); Julien and Barker (2009); Lang (2012); and Rai and Rai (2010).

2. Questions 15 through 18 were designed for use in answering Subquestion 2. The question was: What are the effects of limited technology and Internet access on early educational achievement? As reflected in Table 4, the questions explored two constructs collectively derived from the work of Irvin et al. (2011), Ludden (2012), and Schneider,

Table 3

*Early School Experiences: Alignment of Questionnaire Items*

<table>
<thead>
<tr>
<th>Item</th>
<th>Construct</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>Acquisition of academic information</td>
<td>Guzey and Roehrig (2009), Julien and Barker (2009)</td>
</tr>
<tr>
<td>4, 5</td>
<td>School communication</td>
<td>Guzey and Roehrig (2009)</td>
</tr>
<tr>
<td>6, 7</td>
<td>Progress monitoring</td>
<td>Aflalo and Gabay (2012), Rai and Rai (2010)</td>
</tr>
<tr>
<td>8-11</td>
<td>Technology accessibility</td>
<td>Chatzoglou and Vraimaki (2010), Irvin et al. (2011)</td>
</tr>
<tr>
<td>14</td>
<td>Overall learning experiences</td>
<td>Chatzoglou and Vraimaki (2010), Irvin et al. (2011)</td>
</tr>
</tbody>
</table>

Table 4

*Early School Achievement: Alignment of Questionnaire Items*

<table>
<thead>
<tr>
<th>Item</th>
<th>Construct</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-17</td>
<td>Academic achievement</td>
<td>Irvin et al. (2011), Ludden (2012), Schneider et al. (2012)</td>
</tr>
<tr>
<td>18</td>
<td>Influences on academic achievement</td>
<td>Irvin et al. (2011), Ludden (2012)</td>
</tr>
</tbody>
</table>

3. Questions 19 through 27 were designed for use in answering Subquestion 3.

The question was: What are the effects of limited technology and Internet access on college readiness, pursuit, and performance? As reflected in Table 5, the questions explored three constructs collectively derived from the work of Achieve, Inc. (2014), Day

Table 5

**College Readiness, Pursuit, and Performance: Alignment of Questionnaire Items**

<table>
<thead>
<tr>
<th>Item</th>
<th>Construct</th>
<th>Source</th>
</tr>
</thead>
</table>

4. Questions 28 through 34 were designed for use in answering Subquestion 4. The question was: What are the effects of limited technology and Internet access on career selection and readiness? As reflected in Table 6, the questions were collectively derived from the work of Day (2012), Finley (2012), Griffin et al. (2011), Lang (2012), and Rhodes, Stevens, and Hemmings (2011).

Table 6

**Career Selection and Readiness: Alignment of Questionnaire Items**

<table>
<thead>
<tr>
<th>Item</th>
<th>Construct</th>
<th>Source</th>
</tr>
</thead>
</table>

5. Questions 35 and 36 were designed for use in answering Subquestion 5. The question was: What are the effects of limited technology and Internet access on income levels? As reflected in Table 7, the questions explored two constructs collectively derived from the work of Families USA (2013) and Irvin et al. (2011).
6. Questions 37 through 50 were designed for use in delineating the adoption and diffusion of technological innovations among participants following high school. Based primarily upon the DOI theory (Rogers, 2003) yet supplemented by the work of Chatzoglou and Vraimaki (2010) and Zhao et al. (2010), the questions explored two constructs (see Table 8).

Table 8

Technology Adoption and Diffusion: Alignment of Questionnaire Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Construct</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>43-50</td>
<td>Internet usage</td>
<td>Chatzoglou and Vraimaki (2010), Rogers (2003), Zhao et al. (2010)</td>
</tr>
</tbody>
</table>

Because the anonymous questionnaire (see Appendix A) was self-developed, it was incumbent upon the researcher to ensure the appropriateness of the psychometric properties, as well as the clarity of the design and verbiage, of the instrument. To accomplish this objective, the researcher piloted the draft version with an ad hoc panel as recommended by Chenail (2011). Panel members reflected similar demographics as those of the participants.

Panel feedback reflected that the items were well designed but that each construct
should be labeled within the instrument to help establish clarity for participants. The researcher worked iteratively with panel members to develop the construct labels within the instrument. Panel members also identified specific words and phrases within the questionnaire for bolding. Once the revisions were completed, the panel agreed that the final version of the questionnaire was appropriate for use in this study. In addition, panel members stated that completion of the questionnaire should require no more than 1 hour of time.

Procedures

**Participant recruitment and data collection.** Recruitment occurred during the 2013 community Thanksgiving holiday celebration. The attendees were provided two options for participation. The first option was to complete the questionnaire in handwriting and return their completed instruments via the U.S. Postal Service, without identification. The second participation option was for candidates to access an electronic version of the questionnaire through SurveyMonkey® (2013). All participants opted to complete the questionnaire using the secure website.

**Data analysis.** Within the field of phenomenology, different views exist involving the degree of interpretation researchers should contribute when analyzing data. For example, the Duquesne school of phenomenology recommends that researchers minimally interpret data by limiting the interpretation to a description of the narratives provided by participants (Hays & Singh, 2012). Moustakas (1994), on the other end of the spectrum, promoted the school of interpretive phenomenological analysis (IPA) through seminal research efforts. When using IPA, researchers are more active in interpreting the data, through an inductive process which was also described by Edmonds and Kennedy (2013), to determine the meaning of the data and to identify how the data
address each research question. Edmonds and Kennedy described the inductive process as a method “involving the organization of data into categories and the subsequent identification of patterns and relationships among these categories” (p. 113). Brown (2012) similarly stated that, through the inductive analysis of qualitative data, researchers are able to identify core themes central to the purpose of the study. The IPA approach (Moustakas, 1994) was employed for analyzing collected data in this study. Findings and interpretations derived from the study, supported by the continued review of the literature, were used for identifying recommendations for the consideration of city councilmembers, the superintendent of public schools, and leaders within the private sector. Analysis occurred as follows:

1. The researcher grouped and documented responses to each question as questionnaires were downloaded from the secure website. After waiting 3 weeks to ensure all completed questionnaires were received and documented, the researcher then completed data horizontalization; the data were annotated to identify embedded themes.

2. Thematic clustering was completed in order to recognize themes that cut horizontally across the narratives.

3. The data were synthesized to identify patterns and inferences for use in making interpretations and for drawing conceptual inferences between the data and the research question.

4. After answering the central research question, additional interpretations were made involving the adoption and diffusion of technological innovations based primarily upon the DOI theory (Rogers, 2003) yet supplemented by the work of Chatzoglou and Vraimaki (2010) and Zhao et al. (2010).
**Ethical Considerations**

Because this study involved the participation of volunteers within the research setting, ethical considerations were imperative. At the onset of the study, the researcher recognized possible issues involving ethical considerations and maintained the highest ethical safeguards by adhering to four practices. First, no coercion occurred. Second, anonymity was safeguarded. Third, no documents containing participant names, such as letters of informed consent, were collected. Fourth, completed questionnaires will be stored in a locking filing cabinet for a period of 3 years for the possible review of Nova Southeastern University Institutional Review Board members or the dissertation adviser. At the end of the 3 years, questionnaires will be shredded and discarded as outlined in regulations of the Institutional Review Board.

**Trustworthiness**

Inherent methodological weaknesses occur when collecting and analyzing the perceptual views of others; these weaknesses have the potential of minimizing the trustworthiness of a study (Gay et al., 2012; Merriam, 1998). Trustworthiness is critical in qualitative inquiry, as the degree of trustworthiness determines the worth of the study (Chenail, 2011). Chenail (2011), as well as Gay et al. (2012), credited the seminal work of Lincoln and Guba (1985) for the initial emphasis on the role of trustworthiness in qualitative inquiry.

The trustworthiness of a study is determined by four types of criteria: (a) credibility, or whether participants would view results of a study as credible; (b) transferability, or the level to which inferences from a study are transferable to an alternate setting; (c) dependability, or the extent to which the data derived from the inquiry process are repeatedly, systematically coded; and (d) confirmability, or the level
of objectivity embedded within the analysis and interpretation of data (Teddlie & Tashakkori, 2009). To ensure the trustworthiness of findings derived from this present study, the researcher followed Merriam’s (1998) recommendations to provide detailed and rich descriptions of participant responses to the questionnaire. In this way, the data analysis was credible and other researchers also will have the opportunity to ascertain the usefulness of the data within other settings. The researcher additionally engaged in peer debriefing, through professional discourse, with one educational leader and one community leader. Peer debriefing was used to verify the coding of data that were unclear or confusing. This approach increased the dependability and confirmability of the analysis process.

**Potential Researcher Bias**

Because of the interpretative characteristics of qualitative inquiry, Chenail (2011) emphasized the importance of managing research bias. Butler-Kisber (2010) similarly advised researchers to clearly state biases that may affect the trustworthiness of qualitative inquiry. To assist in managing potential researcher bias in this study, the questionnaire was piloted by an ad hoc panel. The researcher also remained sensitive to possible bias or subjectivity while analyzing the data central to this study.

In addition, the professional discourse that occurred with one educational leader and one community leader included discussions of recognized instances of bias. These discussions were limited to two points. First, because of the limited access to technology during the school experience of participants, the researcher was surprised that no participants completed the paper version of the questionnaire. Instead, all participants demonstrated access to technology and the Internet by completing the web-based version of the instrument. The second instance of bias was the assumption that most participants
would report lower incomes than what were reported.
Chapter 4: Results

The problem addressed through this phenomenological study was that the effects from limited technology and Internet access throughout the local community during the formative years of public schooling had not been identified. The purpose of the study was to examine perceptions of adults, between 18 and 30 years of age, within the community in order to identify specific effects of limited technology and Internet access in public schools. To achieve this collective purpose, the researcher acquired perceptions from 33 adults who attended the local high school during School Years 2003-2004 through 2012-2013.

The study was guided by one central research question that was as follows: What are the effects of limited technology and Internet access in public schools? Five subquestions were used in answering this question; each was answered by analyzing responses to a qualitative, anonymous questionnaire (see Appendix A):

1. What are the effects of limited technology and Internet access on early school experiences?
2. What are the effects of limited technology and Internet access on early educational achievement?
3. What are the effects of limited technology and Internet access on college readiness, pursuit, and performance?
4. What are the effects of limited technology and Internet access on career selection and readiness?
5. What are the effects of limited technology and Internet access on income levels?

This chapter presents the results derived from the data collection and subsequent
analyses. Results are presented first for the subquestions and then for the central research question. The final section delineates the adoption and infusion of technological innovations among participants following high school based primarily on the DOI theory (Rogers, 2003) yet supplemented by the work of Chatzoglou and Vraimaki (2010) and Zhao et al. (2010).

**Effects of Limited Technology and Internet Access on Early School Experiences**

Research Subquestion 1 was as follows: What are the effects of limited technology and Internet access on early school experiences? This question was answered through an analysis of responses to Items 1 through 14.

**Construct: The acquisition of academic information.** Question 1, designed to measure the construct of acquisition of academic information, was: What types of information were needed for completing school assignments? Of the 33 participants, all responded to this question. The majority of participants provided brief answers indicating (a) a combination of textbooks, class materials, and the Internet (52%); (b) a combination of textbooks and software programs (27%); and (c) a combination of textbooks and class materials (21%). One participant, however, went into detail by stating,

> I needed historical information of all types, including details of past wars, presidencies, and revolutions around the world. I also needed information on business matters such as legal terms, court cases, and the stock market. Internet access was critical for me to get good grades.

Question 2, designed to measure the construct of acquisition of academic information, was: How much of the information was available through computers and the Internet? Of the 33 participants, 23 responded to this question; 22 provided brief responses and one contributed a lengthy reply. The majority (78%) of brief responses reflected that the needed information was available through computers. Three others
(13%) provided the following similar responses: (a) “an average amount,” (b) “not a whole lot but good enough,” and (c) “enough to get by.” The remaining participant relayed,

Well, the information was available on the Internet, but whether we were allowed to access that information was the teacher’s decision. Normally we could not use the Internet, as it was not really needed unless we had to do a research project.

Question 3, designed to measure the construct of acquisition of academic information, was: What other sources were available for acquiring the information for completing school assignments, and how did these sources compare to accessing computers and the Internet? Of the 33 participants, 19 (58%) responded to this question. Each of the participants identified textbooks and the school or public library as the alternative sources; all, however, expressed preference for accessing the Internet.

As an example, one participant remarked, “The Internet was easier to use because you could sort out the information more proficiently and faster.” Another responded, “I preferred the Internet because I was able to access more information and gain a wider range of ideas and interpretations on a given subject in a shorter amount of time.” As a third responded, “There was always the library but, compared to the computer, searching for what you need in books is more time consuming.” A fourth participant contributed the following response: “Using the computer and Internet was much more time effective.” A fifth stated, “The Internet could give a wide variety of information from multiple databases at one time.” As a final example, a participant expressed, “There were magazines and newspapers in the library, but they did not compare to the vast amount of information that could be pulled up on the Internet.”

**Construct: School communication.** Question 4, designed to measure the construct of school communication, was: How often were you required to communicate
with classmates outside of class in order to complete school assignments? Of the 33 participants, 31 (94%) responded to this question. All responses were brief phrases indicating that communication with classmates outside of class was either never (26%) or seldom (74%) required. Six expounded on their replies as follows: (a) “only during group projects,” (b) “everything basically was done at school,” (c) maybe once a year,” (d) “most assignments were individual,” (e) “not even one time,” and (f) “maybe twice a year.” A seventh participant additionally expressed the following: “The only time I would interact with my peers is when I took it upon myself to go study or go over homework with them.”

Question 5, designed to measure the construct of school communication, was: How much of the communication was expected to occur through computers and the Internet? Of the 33 participants, 28 (85%) responded to this question. Without exception, participants stated that no expectations for communicating through computers and the Internet existed. Five offered further explanation. One stated, “I don’t think communication was expected across the Internet.” A second replied, “Most of my communication was expected to occur with my instructors and classmates during class, in person. I don’t remember talking with any teachers through the Internet.” Another offered the following explanation: “During my senior year I filled out financial-aid and college applications. That was the extent of my computer use during high school.” As a fourth participant expressed, “There was not much use of emailing instructors, from my experience.” A final participant remarked,

Communication through the Internet was rare. When it came to speaking with my teachers, I either met them after school or spoke with them the next day. Communication via the Internet just didn’t happen. Most communication was done in person during class.
Construct: Progress monitoring. Question 6, designed to measure the construct of progress monitoring, was: How were you expected to monitor your academic progress? Of the 33 participants, 18 (55%) responded to this question. All responses were brief phrases indicating that academic progress was monitored using (a) progress reports (33%), (b) the student portal on the Internet (28%), (c) report cards (22%), or (d) discussions with teachers (17%). No participants offered extended responses.

Question 7, designed to measure the construct of progress monitoring, was: How were your parents expected to monitor your academic progress and school attendance? Of the 33 participants, 26 (79%) responded to this question. Responses were brief; the majority indicated that parents monitored student progress through the parent portal accessed through the Internet (46%). Remaining responses identified the following methods: (a) report cards and progress reports (31%), (b) personal or telephone meetings with teachers (15%), and (c) test grades (8%). Three participants provided additional perceptions; one offered, “The progress reports were supposed to be signed and returned to the school.” Another added, “Parents could see both attendance and grades on report cards and progress reports, so they knew how I was doing each 4 to 6 weeks.” The third participant remarked,

I always had to have my homework laid on the table before I could think about going to band or basketball practice. My mom would look at my homework and, if it looked wrong or messy, I had to redo it before I could go. Also, skipping school was out of the question unless I was sick. So my parents made sure I was at school and doing my work.

Construct: Technology accessibility. Question 8, designed to measure the construct of technology accessibility, was: How accessible were computers and the Internet? Of the 33 participants, 21 (64%) responded to this question. Without exception, participants stated that computers and the Internet were readily accessible. Fourteen
(67%) indicated that computers were available in the school library, and the remaining participants stated that they accessed computers in the school computer laboratory. Eight (38%), however, indicated that computers were rarely needed to complete school assignments. Six (29%) additionally stated that they had a computer and Internet access at home and exclusively used the home equipment. One participant added, “Computers were very accessible at the time I was in school, but we didn’t use them often because they didn’t have a whole bunch of them.” Another remarked, “Although computers were pretty accessible, I used them more as a junior and senior.”

Question 9, designed to measure the construct of technology accessibility, was: Where did you access computers and the Internet? Of the 33 participants, 23 (70%) responded to this question. Responses were brief, with the majority (74%) reporting they accessed computers and the Internet from school. One (4%) indicated that computer usage occurred at home; the remaining participants stated that computers and the Internet were accessed from both school and home. One added, “When I was in high school we used dial-up modems, so homework assignments took longer than it does now.” Another remarked, “Although I could access computers at school, there was a block on everything. A lot of important websites were blocked, so I never went online.” Another stated, “Teachers reserved the computer lab during class time if we were required to use them to complete assignments.”

Question 10, designed to measure the construct of technology accessibility, was: If you did not have a computer and Internet service at home, what factors prevented your family from owning these resources? Of the 33 participants, 21 (64%) responded to this question. While 62% reported having a computer and Internet service at home, the remaining 38% identified a lack of family income precluded them from having computer
access at home. Nine (43%) additionally indicated that Internet access was either not 
available or undependable in the rural areas. As one reported, “Coverage to the area was 
the main factor. Most carriers don’t support connections in the country.” Another 
expressed similar thoughts by stating, “Our Internet was extremely slow. Living in a rural 
area where high speed access wasn’t an option made it hard to utilize the luxury.”

Question 11, designed to measure the construct of technology accessibility, was:
If you had a computer and Internet service at home, how difficult was it for your family 
to afford these resources? Of the 33 participants, 20 (61%) responded to this question. 
Eighteen (90%) stated that their families experienced no difficulty in affording a 
computer and Internet service at home. One other (5%) reported, “I have no idea.” The 
final participant shared the following: “It was very difficult to own a computer. I 
built my 
family a computer from old parts given to me by a teacher.”

Construct: Computer use. Question 12, designed to measure the construct of 
computer use, was: How often did you use computers and the Internet to complete online 
high school courses or job training while in high school? Of the 33 participants, 32 (97%) 
responded to this question. Although 44% reported only occasionally enrolling in online 
classes, 31% indicated they often participated in online classes. The remaining 25% of 
participants reported that they did not enroll in online classes while in high school. No 
participant indicated enrolling in online job training. As one explained, “I took online 
classes but only in my senior year.” Another stated, “There was no need to take online 
classes as I passed all my classes.” A third expressed not remembering.

Question 13, designed to measure the construct of computer use, was: Other than 
to participate in learning activities, how did you use computers and Internet service while 
in high school? This question was inadvertently excluded from the questionnaire.
**Construct: Overall learning experience.** Question 14, designed to measure the construct of overall learning experience, was: How helpful were computers and the Internet in your high school learning experiences? Of the 33 participants, 29 (88%) responded to this question. The majority of participants (62%) expressed the belief that computers and the Internet were “very helpful” or “extremely helpful.” One added, “They made my life easier to find resources and complete the task.” Another expressed the following: “Computers and the Internet were very helpful. I relied heavily on them for most of my assignments whether I needed information for research papers or daily assignments.” A third stated, “They were a great tool when they were needed, although most tasks could be performed using textbooks.”

The remaining participants (38%) indicated that computers and the Internet were only somewhat helpful because they used a combination of resources which included teacher lectures, textbooks, and class notes. As one explained, “They were not that important. I learned the majority of the material from the teacher in class or by reading the textbook.” As another expressed, “It was a helpful resource when I couldn’t find something in the textbook. But I always tried the textbook first.” Another added, “They helped with research but were never the only source of my information or learning.”

**Effects of Limited Technology and Internet Access on Early Educational Achievement**

Research Subquestion 2 was as follows: What are the effects of limited technology and Internet access on early educational achievement? This question was answered through an analysis of responses to Items 15 through 18.

**Construct: Academic achievement.** Question 15, designed to measure the construct of academic achievement, was: What was your average course grade? All 33
participants responded to this question. While 64% reported an average grade of B, the remaining students reported an average grade of A.

Question 16, designed to measure the construct of academic achievement, was: How many times were you required to repeat a course in summer school or during the following school semester? All 33 participants responded to this question by stating they were never required to repeat a course.

Question 17, designed to measure the construct of academic achievement, was: Did you graduate from high school? If not, what was the highest grade that you completed? All 33 participants responded to this question by reporting that they graduated from high school. Furthermore, no participants mentioned any interruption in their school enrollment.

**Construct: Influences on academic achievement.** Question 18, designed to measure the construct of influences on academic achievement, was: What factors or resources could have helped you to improve your grades and/or remain in high school until you graduated? Of the 33 participants, 10 (30%) responded to this question. Two (20%) expressed the belief that access to additional computer technology would have improved their performance. The remaining participants cited the belief that they could have improved their grades with more effort. As one expressed, “I should have studied and applied myself more.” Another stated, “I should have cared more.” A third contributed the following perception: “I feel like I was not focused enough to strive for good grades. The material was easy enough to coast by with minimal effort.” The following perception was offered by another participant: “I honestly think that all the resources I needed to improve my grades were there. I was just young and more lazy than I am now that I’m older.” A fifth participant cited the belief that, “I could have been more
dedicated to my schoolwork.” A final participant offered that, “When I was in school, if you was an athlete you pretty much had it made. Now I wish I would have taken high school more serious.”

**Effects of Limited Technology and Internet Access on College Readiness, Pursuit, and Performance**

Research Subquestion 3 was as follows: What are the effects of limited technology and Internet access on college readiness, pursuit, and performance? This question was answered through an analysis of responses to Questions 19 through 27.

**Construct: College readiness.** Question 19, designed to measure the construct of college readiness, was: Following high school, how would you describe your perceived ability to succeed in entry level college classes? Of the 33 participants, 24 (73%) responded to this question. The majority (79%) used various brief phrases to describe positive expectations such as, “very confident,” “successful,” and “highly strong.” The remaining participants indicated lower expectations, such as “average” and “okay.” Four specifically cited challenges. One participant, for example, offered the following reply: “I had to learn how to study since high school was so easy that I did not have to.” Another stated, “I felt like I was prepared in some ways but not in others.” A third responded as follows: “I came into college thinking it would be as breezy as high school, but there was a great awakening!” The final participant remarked, “It was rough compared to high school!”

Question 20, designed to measure the construct of college readiness, was: What role did access, or lack of access, to computers and the Internet play in your readiness to enter college? Of the 33 participants, 14 (42%) responded to this question. Analysis of responses indicated that 10 participants (71%) credited the role of computers and the
Internet for their readiness to enter college.

Although five participants only provided brief responses, others expounded by sharing examples to identify the various roles or influences of the Internet. One participant stated, “Without the Internet I would have failed.” Another provided examples of how the Internet was helpful by stating, “I was able to read about college classes and see how other students did in them.” The third participant cited the belief that, “It played a huge role. I relied on the Internet to register for classes, take online classes, communicate with classmates and instructors, and complete assignments.” The fourth participant expressed the belief that, “The Internet helped a great deal in my readiness to enter college, as most of the courses that I had required an Internet connection.” The fifth participant remarked, “I was able to apply online instead of going to the campus, and I was able to communicate through e-mail.” Another offered the following thoughts:

My access to computers and the Internet was helpful when I got to college. I knew enough about computers and the Internet to do well with it in college. It plays a much bigger, important role now that I’m in college and is a primary way to communicate with some of my instructors. Many of my exams and quizzes have been online since being in college as well. I use the Internet and the computer a lot more now than in high school.

The remaining four participants expressed different perceptions of the role of computers and the Internet on their college readiness. Two, for example, said that technology made no difference. One other, though, stated, “College pushes us to retrieve our information through the Internet. High school did not prepare me for that.” The final participant reported, “It was hard. When it was time to fill out our financial aid papers, college applications, and loans, I was lost because of a lack of knowledge.”

**Construct: Educational pursuit.** Question 21, designed to measure the construct of educational pursuit, was: While in high school, where did you acquire information
about college or job/career training? Of the 33 participants, 15 (45%) responded to this question. Responses consisted of brief phrases, yet every participant clearly identified information sources: (a) a combination of guidance counselors, job and college fairs, and the Internet (6%); (b) guidance counselors (33%); (c) teachers (27%); (d) the Internet (27%); and (e) parents (7%).

Question 22, designed to measure the construct of educational pursuit, was: What is the highest college degree (associate’s, baccalaureate, graduate, or doctorate) you have attempted? Of the 33 participants, 27 (82%) responded to this question. Three levels of college degrees were indicated in brief responses: (a) associate’s (30%), (b) baccalaureate (59%), and (c) graduate (11%).

Question 23, designed to measure the construct of educational pursuit, was: What is the highest college degree (associate’s, baccalaureate, graduate, or doctorate) you have completed? Of the 33 participants, 20 (61%) responded to this question. Again, three levels of college degrees were indicated in brief responses: (a) associate’s (50%), (b) baccalaureate (45%), and (c) graduate (5%). The remaining participants left this response field blank without specifying whether they were still pursuing their degrees.

Question 24, designed to measure the construct of educational pursuit, was: What types of job or career training, other than college, have you pursued? Of the 33 participants, nine (27%) responded to this question. Three participants reported acquiring training for sales positions; one each indicating participating in training to qualify as (a) a veterinary assistant, (b) an entry level manager, (c) childcare provider, (d) law enforcement officer, (e) physical therapist, and (f) delivery position.

Question 25, designed to measure the construct of educational pursuit, was: How frequently have you searched for college courses or job and career training using
computers and the Internet? Of the 33 participants, 16 (48%) responded to this question. The majority (81%) indicated they frequently used computers and the Internet in related searches by providing responses such as “always,” “often,” “everyday,” and “constantly.” The remaining participants provided the following phrases: (a) “not very often,” (b) “a little,” and (c) “not frequently.”

**Construct: College performance.** Question 26, designed to measure the construct of college performance, was: If you have taken college courses or job/career training, what was your average course grade? Of the 33 participants, 30 (91%) responded to this question. The majority (57%) cited earning an A average, and the remaining indicated earning a B average.

Question 27, designed to measure the construct of college performance, was: How, if at all, did the use of computers and the Internet affect your performance in college or job/career training? Of the 33 participants, 24 (73%) responded to this question. The majority (92%) indicated that the use of computers and the Internet was of benefit. Samples of brief phrases include (a) “very much,” (b) “much better,” (c) “helpful,” (d) “an aid to my success,” and (e) “a key role.” Three provided more detailed responses; one stated, “All of my teachers required multiple assignments to be completed online, so being familiar with computers was very beneficial to me.” Another responded, “The Internet has positively affected my college performance in many ways.” A third participant replied,

> The use of computers and the Internet affected my performance a great deal. With the knowledge that I had acquired in high school, I was very proficient with computers and could navigate through the Internet to find what I needed with ease. It made college courses much easier!

The remaining two participants shared differing perceptions. The first stated, “I
normally was distracted from my work because of social media sites. When I got to my work on the Internet, it wasn’t a very successful study session.” The second participant offered the following thought: “Computers and the Internet were no help at all.”

**Effects of Limited Technology and Internet Access on Career Selection and Readiness**

Research Subquestion 4 was as follows: What are the effects of limited technology and Internet access on career selection and readiness? This question was answered through an analysis of responses to Questions 28 through 34.

**Construct: Career selection.** Question 28, designed to measure the construct of career selection, was: To what degree did your high school educational experiences influence your early thoughts involving your career? Of the 33 participants, 16 (48%) responded to this question. Ten (63%) responses consisted of brief phrases such as “a lot,” “very helpful,” and “motivated me.” Others provided descriptions of ways in which high school experiences influenced early career thoughts. One participant, for example, stated, “I was able to observe and teach in actual schools during my high school career.” A second responded, “High school influenced me to try video production. Without that class in high school I’d probably have no idea what I wanted to be.” A third participant remarked, “My high school experience encouraged me to stay in school longer and pursue a college degree.”

The remaining participants primarily provided brief phrases such as, “not much,” “very little,” and “slightly.” One, however, further stated, “It helped me know what I didn’t want to be.” Another expressed the following belief: “My time in high school is what helped me form ideas about what some of my interests are and how I can find a career to satisfy those interests.” The third participant who expounded on the brief
response shared, “I haven’t searched very often. I’ve been carrying a lot of classes, and my focus has been on those along with other responsibilities.”

Question 29, designed to measure the construct of career selection, was: While in high school, where did you acquire information about careers? Of the 33 participants, 11 (33%) responded to this question. Participants provided brief responses that indicated five information sources: (a) career day (45%); (b) guidance counselors (36%); and (c) one (10%) each friends, adults, and online.

Question 30, designed to measure the construct of career selection, was:
Following high school, where did you acquire information about careers? Of the 33 participants, 12 (36%) responded to this question. Although providing only brief responses, participants identified six sources: (a) a combination of guidance counselors and the Internet (33%), (b) career fairs (17%), (c) guidance counselors (17%), (d) the Internet (17%), (e) a combination of teachers and the Internet (8%), and (f) word of mouth (8%).

Question 31, designed to measure the construct of career selection, was: What factors involving the use of computers and the Internet influenced your early career interests? Of the 33 participants, seven (21%) responded to this question. Responses included (a) acquiring general information about careers (58%), (b) learning the projected income of different careers (14%), (c) learning the experiences of others within careers of interest (14%), and (d) identifying the requirements for certain careers (14%).

**Construct: Career readiness.** Question 32, designed to measure the construct of career readiness, was: How, if at all, did access to computers and the Internet help to prepare you for entering your chosen career field? Of the 33 participants, eight (24%) responded to this question. The majority of responses consisted of brief phrases such (a)
provided information (75%), (b) enabled the completion and submission of related paperwork (13%), and (c) assisted in goal setting (13%).

Question 33, designed to measure the construct of career readiness, was: How, if at all, did the limited access to computers and the Internet within the school setting affect your efforts to enter your chosen career field? Of the 33 participants, 13 (39%) responded to this question. With one exception, all participants reported that the limited access to computers and the Internet within the school setting did not affect their career entrance. The one participant who reported a concern stated, “It was frustrating when the Internet connection was weak, because I wasn’t able to respond to e-mails in a timely manner. I lost patience with trying to find information about career paths.”

Question 34, designed to measure the construct of career readiness, was: What other resources were instrumental in your efforts to enter your chosen career field? Of the 33 participants, 10 (30%) responded to this question. The majority of participants (60%) reported gaining information from friends and family. Three (30%) cited internship positions as a helpful source for career information, and the final participant expressed the belief that the guidance counselor was helpful.

**Effects of Limited Technology and Internet Access on Income Levels**

Research Subquestion 5 was as follows: What are the effects of limited technology and Internet access on income levels? This question was answered through an analysis of responses to Questions 35 and 36.

**Construct: Family size.** Question 35, designed to measure the construct of family size, was: How many family members live in your household? Of the 33 participants, 23 (70%) responded to this question. Responses indicated family sizes ranging from one to seven (see Table 9).
**Construct: Household income.** Question 36, designed to measure the construct of household income, was: What is the combined annual income in your household? Please select one of the following: (a) below $11,490; (b) $11,490 to $15,509; (c) $15,510 to $19,529; (d) $19,530 to $23,549; (e) $23,550 to $27,569; (f) $27,570 to $31,589; (g) $31,590 to $35,609; (h) $35,610 to $39,629; and (i) above $39,630. Of the 33 participants, 23 (70%) responded to this question. The majority of participants reported combined annual incomes of $31,590 or above (see Table 9).

Table 9

*Family Size and Combined Annual Income*

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*Note.* *N* = 22 families.

**Effects of Limited Technology and Internet Access in Public Schools**

The central research question was as follows: What are the effects of limited technology and Internet access in public schools? Results acquired from answering the five subquestions of the study provided the data for answering this question. The analysis of responses involving each research subquestion is presented in the following text.
Effects of limited technology and Internet access on early school experiences.

The first subquestion was: What are the effects of limited technology and Internet access on early school experiences? To answer this question, participant perceptions involving six constructs were examined: (a) the acquisition of academic information, (b) school communication, (c) progress monitoring, (d) technology accessibility, (e) computer use, and (f) the overall learning experience. Results derived from exploring each construct are presented in the following text.

Within the construct of the acquisition of academic information, responses of the majority of participants reflected the need for Internet access in order to complete school assignments; one participant described Internet access as “critical.” Moreover, the majority indicated that the needed information was available through computers and the Internet. One participant, however, stated that permission to use the Internet was not always granted by the teacher. Although all participants reported that the needed information could be acquired through alternative sources, preference for using the Internet was expressed. Six participants explained their reasons for preferring the Internet over using textbooks or other resource materials at the library, with most citing the benefits of time savings and the wide variety of information available through the Internet.

Within the construct of school communication, responses of all participants indicated that communication with classmates outside of class was either seldom or never required and, moreover, that communication through computers and the Internet was never expected by teachers. Two participants reported not conducting any discussion with teachers through the Internet.

Within the construct of progress monitoring, the majority of participants
identified alternative methods, as opposed to using computers and the Internet, for monitoring academic progress. These participants identified methods such as progress reports, report cards, and discussions with teachers. Uniquely, almost half of participants reported that parents monitored academic progress through the parent portal accessed through the Internet. No responses explained this discrepancy.

Within the construct of technology accessibility, all participants described computers and the Internet as being readily accessible within the school setting, and the majority reported accessing technology only within the school setting. Furthermore, almost one third stated that computers and the Internet were available in their homes and indicated they accessed technology strictly from home. The remaining participants reported accessing technology from both home and school. One participant expressed that technology was rarely used until Grades 11 and 12. Participants additionally remarked that computers at school had limitations in accessible Websites because of blocks that had been placed on the computers. In another question, just over one third of participants stated that a lack of income had prevented their families from having Internet access and almost one half further reported that Internet service was either not available or undependable in the rural areas. One participant additionally indicated building the family computer from discarded parts acquired from a teacher.

Within the construct of computer use, the majority of participants reported enrolling in online college classes and none indicated enrolling in online job training. Data involving this construct were limited, because one related question was inadvertently excluded from the questionnaire.

Within the construct of the overall learning experience, the majority of participants expressed the belief that computers and the Internet were helpful in their high
school learning experiences. Participants further expressed the preference for technology even though school assignments could be completed using textbooks. As a final contribution, three other participants indicated that technology was only one source and that assignments could be completed without this type of resource.

**Effects of limited technology and Internet access on early educational achievement.** The second subquestion was: What are the effects of limited technology and Internet access on early educational achievement? To answer this question, participant perceptions involving the two constructs of academic achievement and influences on academic achievement were examined. Results derived from exploring each construct are presented in the following text.

Within the construct of academic achievement, all participants reported maintaining an average grade of A or B in high school. The majority, however, reported earning an average grade of B. No participants were required to repeat a course, and all reported graduating from high school without any interruption in their school enrollment.

Within the construct of influences on academic achievement, the majority of participants expressed the belief that they could have improved their high school performance by investing more effort. The minority did, however, stated that access to additional computer technology would have improved their performance.

**Effects of limited technology and Internet access on early educational achievement.** The third subquestion was: What are the effects of limited technology and Internet access on college readiness, pursuit, and performance? To answer this question, participant perceptions involving the three constructs of college readiness, educational pursuit, and college performance were examined. Results derived from exploring each construct are presented in the following text.
Within the construct of college readiness, the majority of participants reported that they were both confident and successful in entry level college classes. The majority additionally credited their skills involving technology for their readiness level. Four expounded on the topic by describing the specific areas in which they needed to improve in preparation for college; three of the four indicated that college was much more difficult than high school. Several participants reported the use of technology in (a) reading about college classes and how prior students had performed, (b) registering for college classes, (c) taking online college classes, (d) communicating with classmates and instructors, (e) completing assignments; (f) taking examinations and quizzes, and (g) applying for financial aid. Two expressed concern that the high school experience was not sufficient preparation for the role of technology within the college setting.

Within the construct of educational pursuit, one third of participants cited school guidance counselors as the primary source of information regarding college, and almost one third cited the Internet as the primary source. Furthermore, one third of participants credited teachers as the primary source of information. The remaining participants cited parents and a combination of guidance counselors, job and college fairs, and the Internet as the source of information regarding college. Participants additionally indicated the pursuit of college degrees: (a) associate’s (30%), (b) baccalaureate (59%), and (c) graduate (11%). The following percentage of participants reported having earned college degrees: (a) associate’s (50%), (b) baccalaureate (45%), and (c) graduate (5%). Less than one third of participants indicated pursuing any types of job or career training other than college. The majority of participants additionally cited that they had used computers and the Internet to search for college courses or job and career training.

Within the construct of college performance, the majority of participants reported
maintaining an A average in college; the remaining indicated maintaining a B average. When asked how the use of computers and the Internet affected their performance, the majority expressed the perception that technology was of notable benefit to them. Participants additionally cited their ability to meet instructor expectations through their technology skills. One participant, however, cited the distractions to studying brought through the Internet-based social media sites.

**Effects of limited technology and Internet access on career selection and readiness.** The fourth subquestion was: What are the effects of limited technology and Internet access on career selection and readiness? To answer this question, participant perceptions involving the two constructs of career selection and career readiness were examined. Results derived from exploring each construct are presented in the following text.

Within the construct of career selection, the majority of participants expressed the belief that high school experiences influenced their early career thoughts. One further stated that graduating from high school helped to establish a desire to pursue a college degree. The majority of participants indicated that career days at school, as well as high school guidance counselors, were the primary sources for career information prior to high school graduation. Internet resources were only minimally accessed for career information during high school. After graduation, participants continued to primarily credit guidance counselors as sources of information. Participants did not indicate whether the guidance counselors were within the high school or college setting. As also noted within the high school time period, Internet resources were only minimally accessed. All participants additionally cited ways in which they used technology in the processes of career selection, with the majority indicating they accessed only general
information about careers through the Internet.

Within the construct of career readiness, the majority of participants again reported accessing general information about careers through the Internet. Only one participant reported that the limited access to computers and the Internet within the school setting affected entrance into a career; this participant cited the interruptions to communication because of a weak Internet connection. Other than the use of technology, the majority of participants identified friends and family members as a primary source for career information.

**Effects of limited technology and Internet access on income levels.** The fifth subquestion was: What are the effects of limited technology and Internet access on income levels? To answer this question, participant perceptions involving the two constructs of family size and household income were examined. Results derived from exploring each construct are presented in the following text.

Within the construct of family size, participants reported family sizes ranging from one to seven. A total of 22 participants responded to this question. The majority of families consisted of one person, yet three families consisted of seven people. Within the construct of household income, the 22 participants reported annual income ranging from below $11,490 to above $39,630. Only one participant, as a one-member family, reported income of below $11,490. In comparison, 12 participants reported income of above $39,630 (see Table 9).

**The Adoption and Diffusion of Technological Innovations Among Participants**

Questions 37 through 50 were designed for use in delineating the adoption and diffusion of technological innovations among participants following high school. Based primarily upon the DOI theory (Rogers, 2003), the two constructs of computer usage and
Internet usage were explored.

**Construct: Computer usage.** Question 37, designed to measure the construct of computer usage, was: For how many years have you been using a computer? Of the 33 participants, 14 (42%) responded to this question. Participants stated they had been using a computer for a wide range of years: (a) 8 years (14%), (b) 10 years (14%), (c) 11 years (21%), (d) 14 years (7%), (e) 15 years (7%); (f) 16 years (7%), (g) 17 years (14%), and (h) 19 years (14%).

Question 38, designed to measure the construct of computer usage, was: In the past 3 months, how often have you used a computer? Of the 33 participants, 14 (42%) responded to this question by stating they have used the computer every day over the past 3 months. Nine (64%) additionally expressed that they have used the computer several times each day.

Question 39, designed to measure the construct of computer usage, was: What computer programs (such as word processing, spreadsheets, and presentation software) are you comfortable using? Of the 33 participants, 14 (42%) responded to this question. Thirteen (93%) reported using all of the example computer programs but no more; the remaining participant indicated using only the Internet and word processing.

Question 40, designed to measure the construct of computer usage, was: What other computer-based technology (such as scanning and saving documents in various file formats, playing computer games, composing music, saving files to discs, etc.) are you comfortable in using? Of the 33 participants, 14 (42%) responded to this question. While six (43%) specifically indicated they use all of the suggested technology, the remaining participants did not mention the suggested technology but did describe using other forms of technology: (a) saving files in various formats (29%), (b) playing games (21%), and
Question 41, designed to measure the construct of computer usage, was: What benefits have you noticed in using a computer? Of the 33 participants, 14 (42%) responded to this question. Responses indicated several benefits: (a) completing tasks more easily (29%), (b) saving time by completing tasks more quickly (29%), (c) learning (29%), and (d) improving communication (14%).

Question 42, designed to measure the construct of computer usage, was: What drawbacks have you noticed in using a computer? Of the 33 participants, 14 (42%) responded to this question. Most of the responses were brief: (a) the distractions of technology (43%), (b) computer viruses (14%), (c) computer crashes (14%), (d) the occasional difficulty of use (7%), (e) eye strain (7%), (f) the potential of losing documents (7%), and (g) the frustration of a weak Internet connection (7%). One participant added the following explanation: “I don’t always know how to troubleshoot problems that I occasionally have.” Another identified three concerns:

I sometimes worry that information could be lost in things that do not save properly. Also, there is constant communication between myself and the whole work world, which is not always a positive thing. As a third concern, my children seem to not know how to play or use a textbook, as they’ve used computers all of their lives.

Question 43, designed to measure the construct of Internet usage, was: If you have been accessing the Internet, how many years have you been doing so? If not, please explain the factors that have interfered with you accessing the Internet. Of the 33 participants, 14 (42%) responded to this question. Participants stated they had been accessing the Internet for a wide range of years: (a) 8 years (14%), (b) 10 years (14%), (c) 11 years (21%), (d) 14 years (7%), (e) 15 years (7%); (f) 16 years (7%), (g) 17 years (14%), and (h) 19 years (14%). A comparison of responses to Question 37 indicated that
participants have accessed the Internet for the same number of years they have used computers.

**Construct: Internet usage.** Question 44, designed to measure the construct of Internet usage, was: How much time have you spent on the Internet over the past 3 months? Of the 33 participants, 14 (42%) responded to this question. Eight participants (57%) only indicated they had used the Internet on a daily basis. The remaining six participants reported computer use on an average daily basis of (a) 1 hour (21%), (b) 2 hours (7%), (c) 4 hours (7%), and (d) 5 hours (7%).

Question 45, designed to measure the construct of Internet usage, was: If you have Internet access at home, what are the primary reasons you acquired access? Of the 33 participants, 12 (36%) responded to this question. Responses were brief and indicated the following five purposes: (a) entertainment – watching movies (25%), (b) entertainment – playing games (25%), (c) education (25%), (d) shopping (17%), and (e) working (8%).

Question 46, designed to measure the construct of Internet usage, was: If you do not have Internet access at home, what are the reasons you haven’t acquired access? Of the 33 participants, none responded to this question.

Question 47, designed to measure the construct of Internet usage, was: From where do you usually access the Internet? Of the 33 participants, 13 (39%) responded to this question with brief expressions indicting Internet was accessed from (a) home only (31%); (b) home or school (23%); (c) home, work, and cellular telephone (23%); (d) home or cellular telephone (8%); (e) work or cellular telephone (8%); and (f) work only (8%).

Question 48, designed to measure the construct of Internet usage, was: When you
are on the Internet, what kinds of resources or applications (such as personal
communication, information search, acquisition of online services, education,
buying/selling, banking, accessing the news, etc.) do you use? Of the 33 participants, 13
(39%) responded to this question with brief phrases or lists: (a) all of the above (23%);
(b) education, entertainment, and communication (15%); (c) banking, social networking,
and communication (15%); (d) accessing news and shopping (8%); (e) games and social
media (8%); (f) banking and shopping (8%); (g) social networking, banking, and
education (8%); (h) banking and social networking (8%); and (i) social networking,
shopping, and banking (8%).

Question 49, designed to measure the construct of Internet usage, was: What
benefits have you noticed from accessing the Internet? Of the 33 participants, 12 (36%)
responded to this question by stating either one or two benefits or by listing benefits: (a)
saving time (33%); (b) accessing information (17%); (c) communicating easier and faster
(8%); (d) using the global positioning system on a cellular telephone (8%); (e) enjoying
more opportunities to succeed and relieving stress (8%); (f) learning current events
quickly (8%); (g) conducting research (8%); and (h) working while communicating with
family and friends (8%).

Question 50, designed to measure the construct of Internet usage, was: What
drawbacks have you noticed in accessing the Internet? Of the 33 participants, 14 (42%)
responded to this question. Although 36% cited the belief that no drawbacks occur from
accessing the Internet, the remaining participants indicated numerous drawbacks: (a) the
distraction from family and friends (21%); (b) the possibility of becoming addicted or
dependent on the Internet (21%); (c) a lack of balance in time usage (7%); (d) the receipt
of misleading information (7%); and (e) the negative side of social media (7%).
Chapter 5: Discussion

This concluding chapter begins with an overview of this applied dissertation. The second section presents an elaboration and interpretation of results and delineates each theme noted in the analysis of the data. Implications, drawn from the analysis of results, are presented next. After identifying the limitations of the study, recommendations for educational practice are presented. The chapter concludes with additional recommendations for future research involving the role of technology within the school setting.

Overview of the Applied Dissertation

The problem addressed through this phenomenological study was that the effects from limited technology and Internet access throughout the local community during the formative years of public schooling had not been identified. Through the study, the researcher examined the effects of limited access on adults’ (a) early school experiences; (b) early educational achievement; (c) technology adoption; (d) college readiness, pursuit, and performance; (e) career selection and readiness; and (f) income levels. To achieve this collective purpose, the researcher acquired perceptions from 33 adults who attended the local high school during School Years 2003-2004 through 2012-2013.

One central research question guided the study: What are the effects of limited technology and Internet access in public schools? Five subquestions were used in answering this question; each was answered by analyzing responses to a qualitative, anonymous questionnaire (see Appendix A):

1. What are the effects of limited technology and Internet access on early school experiences?

2. What are the effects of limited technology and Internet access on early
educational achievement?

3. What are the effects of limited technology and Internet access on college
readiness, pursuit, and performance?

4. What are the effects of limited technology and Internet access on career
selection and readiness?

5. What are the effects of limited technology and Internet access on income
levels?

After answering the central research question, additional interpretations involving
the adoption and diffusion of technological innovations based primarily upon the DOI
theory (Rogers, 2003) yet supplemented by the work of Chatzoglou and Vraimaki (2010)
and Zhao et al. (2010).

Elaboration and Interpretation of Results

The central research question. The question was as follows: What are the
effects of limited technology and Internet access in public schools? Responses to Items 1
through 36 of the questionnaire were analyzed for the purpose of answering this question.
The primary theme intended to be established through this research question, which also
was the substantiation for conducting this applied dissertation study, involved the
perceived limitation of technology and Internet access in public schools within the
research setting. This theme, however, was not supported in the analysis of responses.
Seven ancillary themes were supported, however, and each is discussed in the following
text.

Ancillary theme: Participant performance in high school and college. All
participants reported maintaining an average grade of A or B in high school. No
participants reported having to repeat a course, and all indicated they had graduated from
high school with no interruption in school enrollment. Likewise, all participants reported maintaining an average grade of A or B in college. Moreover, all had earned college degrees and some were continuing to pursue additional degrees.

**Ancillary theme: Technology use in high school.** Participants recognized the need for Internet access in order to complete school assignments and believed that the information they needed could be obtained from the Internet. Although participants also believed the information could be acquired from other resources, their preference was to use the Internet because they believed of the benefits involving time savings and the wide range of available information. Participants reported that technology was readily accessible within the school setting and, furthermore, the majority indicated they accessed the Internet only through the school computers.

**Ancillary theme: Limitations in technology use in high school.** Teachers did not routinely grant students permission to use the Internet; moreover, teachers did not require students to communicate with them or other students via the Internet. Assignments also rarely required technology until students reached Grade 11. Also according to participants, progress monitoring in high school was accomplished through progress reports, report cards, and discussions with teachers rather than through the Internet.

In the early years referred to in this study, dial-up modems were in use at the high school, and this limitation affected students because of the slowness and frequent interruptions to service. An additional limitation in the high school setting was that a block was placed to disable access to many Websites. When describing their early college experience, participants expressed concern that the high school experience was insufficient in preparing them for the role of technology within the college setting.
Ancillary theme: The role of technology involving college readiness and pursuit. The majority of participants reported that they were both confident and successful in entry level college classes; moreover, participants credited their skills involving technology for their readiness. Because the use of technology was limited in high school, the question exists as to how participants acquired this level of technology skills. Several participants reported the use of technology in (a) reading about college classes and how prior students had performed, (b) registering for college classes, (c) taking online college classes, (d) communicating with classmates and instructors, (e) completing assignments; (f) taking examinations and quizzes, and (g) applying for financial aid. When identifying the primary source of information regarding college, less than one third cited the use of technology; instead, participants identified guidance counselors and teachers as their primary information sources.

Ancillary theme: The role of technology involving career selection and readiness. When identifying the primary source of information regarding career selection, less than one third of the participants reported the use of Internet resources as their primary information source. Instead, participants cited career fairs and guidance counselors as their primary information sources while in high school. After high school graduation, participants continued to primarily credit guidance counselors as their information sources for career selection although they did report accessing general information about careers using technology.

Ancillary theme: Socioeconomic levels of participants. Of the 33 participants, 22 reported family size and income. While family sizes ranged from one to seven, annual income ranged from below $11,490 to above $39,630. Only one participant, as a one-member family, reported income of below $11,490. In comparison, 12 participants
reported income of above $39,630. The purpose of acquiring these data was to determine whether the perceived lack of technology within the school setting had affected the ability of students to maintain an average standard of living after high school graduation.

According to the federal poverty guidelines reported by Families USA (2013), only three of the 22 families (13.6%) were living in poverty. Almost 21% of all residents in the county, however, lived below the poverty line (U.S. Census Bureau, 2013). The comparison reflects that high school graduates participating in this research study were faring better, from an economic standpoint, than the overall population.

**Ancillary theme: Technology access within the home.** Almost one third of participants stated that computers and the Internet were available in their homes. These participants additionally stated that they accessed technology strictly from home. The remaining participants reported accessing the Internet from home as well as school. Just over one third of participants additionally stated that a lack of income had prevented their families from having Internet access. Almost one half of participants further remarked that Internet service was either not available or undependable in the rural areas wherein they lived.

**The adoption and diffusion of technological innovations following high school.** After answering the central research question, additional interpretations were made involving the adoption and diffusion of technological innovations based primarily upon the DOI theory (Rogers, 2003) yet supplemented by the work of Chatzoglou and Vraimaki (2010) and Zhao et al. (2010). Questions 37 through 50 were designed for use in delineating these constructs.

**Computer usage.** Participants reported using computers for between 8 and 19 years; however, the majority reported computer use over the past 11 or more years.
Almost half reported using the computer every day during the prior 3-month period, and more than half described computer use involving multiple sessions each day. Although the applications varied, all participants reported being comfortable with a wide range of technology.

Participants additionally cited four benefits from using technology: completing tasks more easily, saving time by completing tasks more quickly, learning, and improving communication. Drawbacks identified by participants included (a) the distractions of technology, (b) possible computer crashes and related viruses, (c) the occasional difficulty of use, (d) eye strain, (e) the potential loss of documents, and (f) the frustration of a weak Internet connection. One participant additionally underscored concerns about the loss of social skills among children as well as the inability of children to use a textbook.

**Internet usage.** Participants reported using the Internet for the same number of years as they had used computers. Consequently, the majority reported Internet use of 11 or more years. Over one half of the participants described using the Internet on a daily basis from a minimum of an hour up to 5 hours. Participants expressed that they accessed the Internet from home, school, work, and cellular telephones.

Almost 70% of participants reported using the Internet for entertainment, involving watching movies and playing games, and shopping. Other uses for the Internet included conducting personal communication, running information searches, acquiring online services, gaining education, buying or selling, banking, watching the news, playing games, and working. Several benefits of using the Internet were also identified: saving time, accessing information, communicating easier and faster, using the global positioning system, enjoying more opportunities to succeed, relieving stress, learning
current events quickly, conducting research, and communicating with others while working. Drawbacks cited by participants included the distraction from family and friends, a lack of balance in time usage, the possibility of becoming addicted or dependent on the Internet, the receipt of misleading information, and the negative side of social media.

**Conclusions**

This study was designed to explore the effects from limited technology and Internet access throughout the local community during the formative years of public schooling. It should be noted that the researcher was surprised that the analysis of data did not support the supposition of the study that technology hardware was limited as initially alleged. The data did support, however, that the Internet connection within the school and the surrounding geographical area was weak and sporadic. Furthermore, the potential applications of technology within the school setting were not fully available to students because of the limited use in the instructional program. Although the data do not support the initial assumption involving the limitation of technology and Internet access, benefits were still acquired by conducting the study because challenges have been identified and supported through the study findings. In the following text, the findings are discussed and compared with the professional literature.

**Computer and Internet adoption.** According to Rogers (2003), the DOI theory is useful in delineating the general process involved in the diffusion of innovations among members of a local social system. The primary topic addressed within this study is the adoption of technology; Rogers found that technology adoption occurs over time and as a result of communication among individuals amidst social support. The analysis of data pertinent to this study indicates that individuals who graduated from the high school
within the research setting have, in fact, adopted technology within all realms of their daily lives.

Technology adoption varies according to the three characteristics of socioeconomic status, personality variables, and communication behavior (Moore & Benbasat, 1991; Rogers, 2003). In terms of socioeconomic status, Chatzoglou and Vraimaki (2010) supported the belief of Rogers (2003) that technology adoption occurs earlier with persons who have achieved higher levels of education, social status, income, and occupational standing. Because all participants of this study have acquired at least an associate’s degree, and some are pursuing additional college degrees, they have demonstrated the attainment of educational goals. Furthermore, only 13.6% of participants were living in poverty according to the federal poverty guidelines reported by Families USA (2013); this is a smaller percentage than noted in the surrounding geographical area (U.S. Census Bureau, 2013).

Although ascertaining personality variables was beyond the scope of this study, technology adoption is also influenced by communication behavior as well as information seeking (Chatzoglou & Vraimaki, 2010; Rogers, 2003). Several participants cited the use of social media in their questionnaire responses; therefore, the preference of communication using social networking was established. The combined attributes of education, socioeconomics, and communication behavior collectively support the assumption that participants have adopted technology. Findings are also consistent with those of Chatzoglou and Vraimaki (2010) who found that individuals with greater educational pursuits, those ranging in age from 19 through 63 who have home Internet access, and those between the ages of 19 and 25 are more likely to be daily Internet users. The majority of the purposes for Internet access cited by Chatzoglou and Vraimaki are
also mirrored in the responses provided by participants.

**The digital divide.** Participants in this study additionally described weak and intermittent Internet connections within the rural area serving as the research setting. This reality supports the belief that the historic digital divide involving Internet access, which began in the 1980s (DiMaggio & Hargittai, 2001), continues to exist in rural America (Association for Supervision and Curriculum Development, 2011; Guan & Subrahmanyam, 2009; Zhao et al., 2010). In some rural communities, up to 10% of homes do not have access to high-speed Internet (Association for Supervision and Curriculum Development, 2011; U.S. Department of Commerce, National Telecommunications and Information Administration, 2011). This concern, which substantiates one of the recommendations for future research, was also reported by participants of the study.

**The critical role of technology in college and career readiness.** Through the 1990s and into the early 2000s, state-mandated standards at the high school level were limited to the demonstration of skills and knowledge necessary for graduating from high school (Sanzo, Sherman, & Clayton, 2010; Singh, 2011; Tucker, 2011). Compared to the core academic areas of mathematics and reading, technology was a minor component within the graduation requirements. Moreover, technology standards were limited to a focus on terminology and basic computer applications such as word processing, presentation software, and spreadsheets (Collins & Halveson, 2009). Because participants in this present study may have graduated from high school as early as 2004, these individuals attended school when technology was not considered central to the high school experience. Furthermore, the shift in high school standards to college and career readiness did not occur until after 2005 and involves progressive changes that are still

Technology and Internet integration within educational practice is viewed as a positive influence on academic achievement and student motivation (Dardenne, 2010; Guan & Subrahmanyam, 2009; Zhao et al., 2010). For this reason, the No Child Left Behind legislation (U.S. Department of Education, Elementary and Secondary Education, 2010) requires an increased emphasis of technology within academic programs. Educational researchers also perceive technology and Internet usage as integral and positive influences in the college and career readiness of students (Ballard, 2010; Campbell, 2012; Ray, 2012).

Moreover, the more current common core standards, which have been adopted within the local research setting, establish the expectations that high school graduates will demonstrate proficiency in the use of technology (Achieve, Inc., 2014; Farris, 2012; Parrott, 2012). In support of this emphasis within the common core standards, technology is believed to be central in the promotion of college and career readiness (McDonald & Farrell, 2012). Participants within this present study similarly described the instrumental role of technology within their college experiences. Improving public education, by preparing high school students to demonstrate college readiness within the realm of technology as well as the core academic areas, is a noteworthy goal that requires improved instructional processes (Adams, 2011; Means, 2010; Thompson & Ongaga, 2011). Based on the salient role of technology in college, as described by participants, a recommendation for related ongoing professional development is warranted.

The potential for Internet addiction. Researchers have consistently reported that young adults have a favorable attitude toward technology as a useful and necessary tool for daily activities (Broady, Chan, & Caputi, 2010; Collins & Halveson, 2009;
Guffey, 2012). These attitudes are strongly influenced by peer and social pressures to communicate through the use of social media and to interact through Internet-based games (Broady et al., 2010; Collins & Halveson, 2009; McAlister, 2009). Yet when excessive engagement occurs, whether through gaming, Internet browsing, or communicating through social-media sites, an addiction to the Internet can develop (Bergmark, Bergmark, & Findahl, 2011; Christakis, 2010; Young, 2011).

Although related studies are only recently emerging, early findings suggest that individuals addicted to the Internet share excessive-compulsive behaviors common to other addictive behaviors involving biological brain mechanisms (Bergmark et al., 2011; Hagedorn & Young, 2011). Thus far, researchers have agreed that Internet addiction, as addictions to other behaviors, primarily affect perceptions involving rewards (Bergmark et al., 2011; Saville, Gisbert, Kopp, & Telesco, 2010; Young, 2011). Clinical diagnoses have recently supported the classification of Internet addiction as a new clinical disorder because, as noted with other addictions, related behaviors often cause academic, health, occupational, relational, and social problems (Saville et al., 2010; Young, 2011).

The primary subgroups of Americans with Internet additions are believed to be high school and college students (Saville et al., 2010) as well as individuals of all ages with attention-deficit disorder, depression, and social-isolation issues (Christakis, 2010; Kuss & Griffiths, 2011). Because Internet use is neither illegal nor illegitimate, practitioners additionally report that the addiction is often masked as either the legitimate business or personal use of technology (Young, 2011). Regardless, the Internet provides “many reinforcing activities . . . as found with alcohol, drugs, and gambling” (Saville et al., 2010, p. 273).

Although Internet addiction is an emerging field of study and one not required for
certification as a guidance counselor, related effects typically endanger the academic, familial, and social functioning of students (Hagedorn & Young, 2011; Kuss & Griffiths, 2011). Consequently, Internet addiction is one of the threats to student performance that is included within the responsibilities of school guidance counselors (American School Counselor Association, 2005, 2007). In support, researchers have identified school guidance counselors as key professionals in not only recognizing Internet addictions but also in providing initial treatment for this addiction (Hagedorn & Young, 2011).

Participants in this current study repeatedly recognized and reported the distractions brought by technology affecting (a) involvement with family and friends, (b) time spent studying, and (c) a lack of balance in time usage. Several participants specifically cited concerns about possibly becoming addicted to, or dependent on, the Internet. Based on these insights, a recommendation for related ongoing professional development for school guidance counselors is warranted. This outcome of the study, although unexpected, supports emerging research and contributes to professional discourse.

Limitations

This phenomenological study was one of applied research and, consequently, held inherent limitations (Creswell, 2014). Each limitation presents a potential threat to the validity of outcomes derived from the study and warrants recognition:

1. The questionnaire (see Appendix A) has a narrow scope, as the instrument was not designed to explore the use of any electronic social media or technological devices other than those of computers and the Internet. This scope was based upon the premise that the technology laboratory in the local public high school was similarly limited to the provision of only computers and the Internet.

2. The researcher developed the questionnaire, yet a panel review was conducted
to determine whether the instrument should be revised in any way. Although a limitation, the researcher expects that the review process limited researcher bias in the composition of the instrument and helped to establish the clarity and appropriateness of the instrument.

3. All participants chose to respond to the questionnaire through the online format and, furthermore, responded that they were comfortable using computers and other forms of technology. These data suggest that perhaps the earlier group of graduates did not participate in the study, as the use of technology within the high school had increased over the 10-year period encompassed by this study. These collective factors may have presented a biased picture of the total set of the population.

4. Participant responses to the questionnaire may have varied because of factors beyond the knowledge or control of the researcher. Factors included the diversity in respondents involving (a) computer knowledge, (b) level of postsecondary education, (c) career-industry affiliation, (d) employment experience, (e) use of social media, and (f) technological experience involving computers.

5. The emotions, experiences, judgments, and preferences of participants occurring beyond the scope of the study may have influenced reported perceptions.

6. Participation in the study required that individuals volunteer without compensation of any kind. This factor, in addition to the length of the questionnaire and time involved in completion of the instrument, may have reduced the number of participants.

7. The researcher is a veteran educator within the community. Some individuals who qualified for participation in the study may have hesitated because of prior negative school experiences or disconcerting memories involving authoritative actions of the
researcher during the fulfillment of employment responsibilities.

8. Generalizeability is often limited in applied research studies. As Merriam (1998) recommended, the researcher endeavored to acquire rich and thick data from participant responses in order to increase the generalizeability of results.

**Recommendations for Educational Practice**

Based on findings of the study, the researcher recommends the provision of professional development for all teachers within the high school with the intent of increasing the integration of technology within instruction. The researcher additionally recommends professional development for teachers and school guidance counselors for the purpose of increasing the use of technology when assisting students in acquiring college and career information.

**Recommendations for Future Research**

Three recommendations, based on findings of the study, are offered for future research. First, participants reported confidence in their technology skills when entering college, yet the question exists as to how this level of technology skill was acquired. Because of the importance of college and career readiness established in the common core standards, acquiring this information through continued study is recommended. Second, the researcher encourages further research to assist school guidance counselors in acquiring the skills to recognize and provide initial treatment to minimize the onset of Internet addiction among high school students. The third recommendation is for city council members and leaders within the private sector to research possible options for acquiring more dependable Internet service within the outlying rural areas so that all residents can enjoy the potential benefits of current technology.
References


Christakis, D. A. (2010). Internet addiction: A 21st century epidemic? BMC Medicine,


Studies website: http://www.princeton.edu/~artspol/workpap15.html


Parrott, T. N. (2012). *ACT test preparation course and its impact on students’ college-
and career-readiness (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3552840)


Appendix

Questionnaire
Appendix

Questionnaire

As a young adult who attended high school in our local community, your participation in completing this anonymous questionnaire is critical to conducting my applied research study. Through the following questions, I am seeking your perceptions regarding technology and Internet access both within the public high school and in the years following your high school experience. Should you need additional room for your responses, feel free to write on the back of these sheets or attach additional pages. Please do not place your name or initials anywhere on the instrument.

Upon completion, please return the questionnaire to me via the U.S. Postal Service in the envelope I have provided. Please do not place your name, initials, or address on the envelope.

If you would prefer to complete the questionnaire using SurveyMonkey®, the questionnaire can be accessed using this link:

https://www.surveymonkey.com/s/StewartInternetQues

When you access the SurveyMonkey® web site, you will first find an electronic copy of the participation letter. If you agree to participate in the study, click on the begin the questionnaire icon.

Regardless of whether you prefer to complete this printed version of the questionnaire or access the instrument using SurveyMonkey®, please complete the questionnaire within 7 days. Thank you very much for participating in this study!
Part A: Your High School Experience
Please think about the time during which you attended high school as you answer the questions in this section:

(Acquisition of Academic Information)
1. What types of information were needed for completing school assignments?

2. How much of the information was available through computers and the Internet?

3. What other sources were available for acquiring the information for completing school assignments, and how did these sources compare to accessing computers and the Internet?

(School Communication)
4. How often were you required to communicate with classmates outside of class in order to complete school assignments?

5. How much of the communication was expected to occur through computers and the Internet?

(Progress Monitoring)
6. How were you expected to monitor your academic progress?
7. How were your parents expected to monitor your academic progress and school attendance?

(Technology Accessibility)
8. How accessible were computers and the Internet?

9. Where did you access computers and the Internet?

10. If you did not have a computer and Internet service at home, what factors prevented your family from owning these resources?

11. If you had a computer and Internet service at home, how difficult was it for your family to afford these resources?

(Computer Use)
12. How often did you use computers and the Internet to complete online high school courses or job training while in high school?

13. Other than to participate in learning activities, how did you use computers and Internet service while in high school?
(Overall Learning Experience)
14. How helpful were computers and the Internet in your high school learning experiences?
Part B: Your High School Achievement
Please think about the time during which you attended high school as you answer the questions in this section:

(Academic achievement)
15. What was your average course grade?

16. How many times were you required to repeat a course in summer school or during the following school semester?

17. Did you graduate from high school? If not, what was the highest grade that you completed?

(Influences on academic achievement)
18. What factors or resources could have helped you to improve your grades and/or remain in high school until you graduated?
Part C: College Readiness, Pursuit, and Performance:

(College Readiness)
19. Following high school, how would you describe your perceived ability to succeed in entry level college classes?

20. What role did access, or lack of access, to computers and the Internet play in your readiness to enter college?

(Educational Pursuit)
21. While in high school, where did you acquire information about college or job/career training?

22. What is the highest college degree (associate’s, baccalaureate, graduate, or doctorate) you have attempted?

23. What is the highest college degree (associate’s, baccalaureate, graduate, or doctorate) you have completed?

24. What types of job or career training, other than college, have you pursued?

25. How frequently have you searched for college courses or job/career training using computers and the Internet?
(College Performance)
26. If you have taken college courses or job/career training, what was your average course grade?

27. How, if at all, did the use of computers and the Internet affect your performance in college or job/career training?
Part D: Career Selection and Readiness

(Career Selection)

28. To what degree did your high school educational experiences influence your early thoughts involving your career?

29. **While in high school**, where did you acquire information about careers?

30. **Following high school**, where did you acquire information about careers?

31. What factors involving the use of computers and the Internet influenced your early career interests?

(Career Readiness)

32. How, if at all, did access to computers and the Internet help to prepare you for entering your chosen career field?

33. How, if at all, did the **limited access to computers and the Internet** within the school setting affect your efforts to enter your chosen career field?

34. What other resources were instrumental in your efforts to enter your chosen career field?
Part E: Income Levels

(Family Size)
35. How many family members live in your household?

(Household Income)
36. What is the combined annual income in your household? Please select one of the following:

- □ Below $11,490
- □ $11,490 - $15,509
- □ $15,510 - $19,529
- □ $19,530 - $23,549
- □ $23,550 - $27,569
- □ $27,570 - $31,589
- □ $31,590 - $35,609
- □ $35,610 - $39,629
- □ Above $39,630
Part F: Technology Adoption and Diffusion

(Computer Usage)
37. For how many years have you been using a computer?

38. In the past 3 months, how often have you used a computer?

39. What computer programs (such as word processing, spreadsheets, and presentation software) are you comfortable using?

40. What other computer-based technology (such as scanning and saving documents in various file formats, playing computer games, composing music, saving files to discs, etc.) are you comfortable in using?

41. What benefits have you noticed in using a computer?

42. What drawbacks have you noticed in using a computer?

(Internet Usage)
43. If you have been accessing the Internet, how many years have you been doing so? If not, please explain the factors that have interfered with you accessing the Internet.
44. How much time have you spent on the Internet over the past 3 months?

45. If you have Internet access at home, what are the primary reasons you acquired access?

46. If you do not have Internet access at home, what are the reasons you haven’t acquired access?

47. From where do you usually access the Internet?

48. When you are on the Internet, what kinds of resources or applications (such as personal communication, information search, acquisition of online services, education, buying/selling, banking, accessing the news, etc.) do you use?

49. What benefits have you noticed from accessing the Internet?

50. What drawbacks have you noticed in accessing the Internet?

Thank you very much for participating in this study! Please return the questionnaire to me in the envelope provided, without personal identification of any kind, via the U.S. Postal Service.