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Multimedia Technology in the Lives of Urban Middle School Students: Contextual and Social Influences on Multimedia Confidence

By

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ABSTRACT

MULTIMEDIA TECHNOLOGY IN THE LIVES OF URBAN MIDDLE SCHOOL STUDENTS: CONTEXTUAL AND SOCIAL INFLUENCES ON MULTIMEDIA CONFIDENCE

By

Darryl Theodore Hall

The purpose of this research was to study variations among urban middle school students in their confidence with multimedia technology. Rarely have researchers examined within-group differences in order to understand the disparities between urban and suburban students in their ownership of computers, Internet access, and other uses of multimedia technology. This study used both quantitative and qualitative methods to examine within-group variations among 124 urban middle school students to understand social and contextual influences on students' patterns of computer use. Specifically, the study examined the influence of time spent on multimedia activities; social support networks for multimedia use; physical access to multimedia technology; and early adoption of multimedia technology on multimedia confidence among students.

Results revealed that students who spend more time on multimedia activities, had larger social support networks that encouraged multimedia use, had more physical access to multimedia technologies and had adopted multimedia technology at an earlier age had higher confidence levels with multimedia technology. Environmental factors such as physical access and the amount of time spent on multimedia activities were the strongest

predictors of students' confidence with multimedia. Both quantitative and qualitative data supported the importance of social and contextual factors such as social support network influences from the home and school environment. Future research should include social and contextual factors along with socioeconomic and other environmental considerations when examining students' use of multimedia and the digital divide.

Dedicated to my beautiful mother.

She continues to express her love through her sacrifice for family and friends.

For you, I am so grateful!

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CHAPTER I

INTRODUCTION

There seems to be agreement among policymakers, educators, and researchers on the growing need to prepare students to use information technology in their future careers. According to an industry survey by the Information Technology Association of America (Joyner, 2000), United States companies create on average 1.6 million new information technology jobs per year. Based on the current application pool, more than half of the job openings may go unfilled because of a lack of qualified applicants (Joyner, 2000). Also, it is estimated that in the coming years, almost half of the U.S. workforce will be employed by industries that are either major producers or intensive users of information technology products and services (Joyner, 2000). It is now common knowledge that students need to be prepared to work in a technology-based economy (Kvasny, 2002).

Multimedia technology has revolutionized how future generations will communicate and participate throughout the nation and the world. New technologies have been compared to the locomotive during the Industrial Age (Castell, 1996). Multimedia technology revolution has important implications for children and their future. While we know that multimedia technology plays a crucial role in their social and cognitive development, it is somewhat uncertain what the mechanisms and processes are that account for differences among individual users. Historically, social and contextual factors have played a part in the relationship between individual behavior and new technologies.

Statement of the Problem

Recently the term "digital divide" has been used to describe the disparities in computer ownership and Internet access. Early national survey data illuminated these differences and the terms "haves" and "have-nots" emerged (Hoffman, Novak, & Venkatesh, 1997; Katz & Aspden, 1997). These studies presented findings that link the divide to ethnic and minority affiliation, geographic location, household composition, age, education and income level (Hoffman et al., 1997; Katz & Aspden, 1997; Kvasny, 2002). To bridge the digital divide, national policies and initiatives were implemented to make physical access more abundant to ethnic minorities and low-socioeconomic communities (Kvasny, 2002). The policies were based upon research that provided social and psychological explanations for the divide.

Sociological explanations similar to those on diffusion patterns of new innovations such as the telephone and television were used to frame studies on the digital divide. Sociologists linked the divide to differences in social networks and economic resources. More specifically, findings indicated that sparse economic resources and restricted social networks as explanations for lower rates of physical access in urban communities (Kvasny, 2002). Alternatively, psychological explanations drawing on Bandura's (1986) theory of self-efficacy linked the digital divide to differences in computer efficacy and computer anxiety (Weil & Rosen, 1995).

This early research is problematic for several reasons. First, by focusing on the relationship between socioeconomic status and physical access only,

social explanations created binary relationships such as "haves" and "have nots" that oversimplified the complexity of the digital divide. Multimedia users fall somewhere along a continuum in their physical access to multimedia. Secondly, psychological explanations alone ignore important sociocultural and environmental factors that might impact the divide. Additionally, each of these explanations tends to use a deficit lens that locates the problem within individuals or cultural groups.

Purpose Statement

This study attempts to overcome these shortcomings by integrating theories from psychology and sociology to explain the digital divide. The relationship between multimedia confidence and contextual and social factors such as physical access (Hoffman et al., 1997; Katz & Aspden, 1997), early adoption (Brancheau & Wetherbe, 1990), social support networks (Kvasny, 2002), and time spent on multimedia (Alvarez, 2002; Robinson, Kestnbaum, Neustadtl, & Alvarez, 2002; Wartella & Jennings, 2000) have been viewed as affecting patterns of use.

In addition, an assets-based approach is used, which focuses on strengths and differences related to disparities in multimedia use. The quantitative data examined the relationship between multimedia confidence and four independent variables. The qualitative data focused on contextual and social factors that influence individuals in confidence with multimedia. Respondents were considered to have a high level of confidence if on the

eleven-item multimedia confidence scale, they had a reported mean of four or more on a five point Likert scale.

The study was designed to examine contextual and social factors that affect multimedia confidence as suggested by our knowledge of children's development and their sociocultural contexts. While an understanding of contextual and social factors that influence multimedia confidence for all children is needed, this study focused specifically on urban children. Digital divide literature suggests urban communities tend to be on the low end of the digital divide. When children are considered, there are additional social and developmental considerations that are necessary to understand their patterns of use. It is unknown how the digital divide may affect children in urban communities. Understanding how urban students use multimedia must be studied as distinctive in nature. This study focused on within-group divides that emerged as students participated in everyday uses of multimedia.

Educational research on urban populations abounds; however, disentangling what urban means is often misunderstood. Educational researchers commonly oversimplify our notions of urban communities by depicting them as downtrodden neighborhoods with dilapidated buildings for the desperately poor. What is lost in this portrayal is the economic diversity that exists among urban communities. Indeed, urban students are more likely than their suburban counterparts to experience greater exposure to poverty. Even within the family, there may be challenges such as greater family mobility rates and less stable home environments. However, it is a mistake to assume that all

urban students live in poverty and that those who do experience poverty will experience poverty in the same way. Many urban students are part of working class and middle class families. In the coming decades, urban gentrification may create more economic diversity and more urban students may come from affluent homes.

The site for the study was a magnet school that was situated in a working class to lower middle class stable neighborhood. While the school attracted students from a variety economic backgrounds, the majority of students would be considered working class or lower socioeconomic status. The majority of students walk to school from the surrounding neighborhood, while others either ride the bus or are dropped off by parents. Throughout conversations with students, a number of students referred to their parents' employment as factory workers, teachers, or secretaries. The school is flanked by a residential neighborhood where most of the tenants have been long-term residential homeowners.

Rationale

Understanding the plight of urban students is important for several reasons. First, despite multimedia technology becoming an important and rapidly growing part of our society and our children's lives, everyday uses of multimedia among urban students are understudied. There is limited data on adult urban populations as well. Rarely, are urban students discussed in ways that demonstrate the wide variation that exists among urban students. Various

developmental perspectives on children's social and cultural development with multimedia and learning informed this study.

Secondly, the prevailing assumption among many researchers conducting cross-cultural research in information technology is that understanding patterns of use for urban students is the same for suburban and rural students. Theorists propose that beyond individual differences, what works in one context will generalize to other contexts as well. Indeed, there are some practices that transcend regional boundaries and geographical location. However, understanding variations in patterns of use among urban communities is fundamentally contextual. It can be argued that a different set of social, contextual, political and historical factors impact how we make sense of the ways in which urban communities engage with multimedia. Therefore, any attempt to understand urban students patterns of use should be first studied as distinctive in nature. While political and historical factors are important aspects that may help explain patterns of use among urban communities (Castell, 1996; Kvasny, 2002), for the scope and size of this study only social and contextual factors were examined.

Additionally, many conversations regarding the multimedia needs and performances of urban students discuss them as if they were a homogeneous group. Rarely is research generated that focuses on within-group comparisons. Comparisons of this kind require understanding individual differences that may exist among cultural groups with similar social, contextual and historical experiences.

Finally, this study builds on prior research on the digital divide by providing another perspective that informs the current discourse on urban communities and multimedia by using an approach that highlights the assets of high multimedia confidence and users who are engaging in multimedia tools in sophisticated ways. Narratives from their voices will challenge the current discourse, which often characterize urban students as lacking technology skills. These narratives reflect the long tradition of urban community-based technology organizations such as the Black Data Processing Association, which hold annual computer competitions involving urban youth, during which these urban students demonstrate their mastery of complex multimedia skills such programming languages including XTML and ColdFusion MX 7 (Bell, 2005; Meritz, 2004).

It is hoped that findings from this study can lead to the development and support of education policies and programs that will allow more opportunities for children from urban communities to more fully access and participate with multimedia technology. A study such as this one can perhaps challenge the way we think and talk about urban youth in general and particularly around multimedia confidence.

CHAPTER II

LITERATURE REVIEW

Each year billions of dollars are spent on multimedia to provide children access in school, at home, and in the community (Becker, 2000). At some level the majority of American schools are equipped with multimedia technology, and over two-thirds of American children have some type access at home. They are socialized and mature in a world permeated with multimedia. The relationship between children and multimedia technology has spawned new areas of research in educational technology, communications, sociology, policy and education.

This chapter begins with a literature review on multimedia technology access. Secondly, this review explores factors such as confidence, efficacy, and anxiety related to computer use. Third, adoption patterns for multimedia technology among adults and children are discussed. Fourth, the amount of time children spend on multimedia activities is discussed. Fifth, a brief summary of the role of social support networks on computer use is explored. Finally, tenets from social cultural theories are offered as a conceptual framework to inform this study.

Physical Access

Computer ownership and access to the Internet continues to be at the forefront of debates on patterns of multimedia use. A series of national reports have illuminated the disparities in computer ownership and Internet access (National Telecommunications and Information Administration (NTIA), 1999,

2000, & 2002). The reports revealed that while more Americans than ever before own computers and access the Internet, the gap between information "haves" and "have nots" persists and has widened. Despite declining costs of multimedia technology and rising incomes, the digital divide appears to have increased (Kvasny, 2002; NTIA, 1999, 2000, & 2002).

These annual studies report a gap between what is described as the "information rich", who are characterized as Whites, Asian Americans, and those with higher incomes and education levels; and the "information poor" who are characterized as those with lower incomes and lower educational levels, African Americans, Hispanics and those living in central cities and rural areas (NTIA, 1999, 2000, & 2002). For example, a summary of the NTIA findings indicated that households with incomes of $75,000 or above are more than 20 times more likely to have Internet access than those at lower income levels (NTIA, 1999, 2000, & 2002). Black and Hispanic households are roughly two-fifths less likely to have home Internet access as White households. A child in a low-income White family is three times as likely to have Internet access as a child in a comparable Black family, and four times as likely to have access as children in a comparable Hispanic household. Adults with a college degree are more than eight times as likely to have a computer at home, and nearly sixteen times as likely to have home Internet access, than those without a college degree (NTIA, 1999, 2000, & 2002).

The inequities in multimedia access portrayed by these statistics are often disputed and recent reports present an alternative view of multimedia access

(Kvasny, 2002). A government report, "A Nation Online: How Americans Are Expanding Their Use of the Internet" (2002), presented findings that show a U.S. population rapidly growing with multimedia technologies across all demographic groups and geographical regions with more than half of the nation online. In September 2001, 143 million Americans (about 54 percent of the population) were using the Internet, which was an increase of 26 million in 13 months (NTIA, 2002). In September 2001, 174 million people (or 66 percent of the population) in the U.S. used computers.

Additionally, computers at schools have substantially narrowed the gap in multimedia use. Research findings suggest that individuals across racial and economic lines are increasing their use of the Internet by finding alternative places for accessing information technology (Warschauer, 2003). Researchers conclude that not only are many more Americans accessing the Internet and computers at home, but they are also using them at work, school, and other locations (Warschauer, 2003). Recent data in the annual "Technology Counts" issue published by Education Week (Education Week, 2005) support a narrowing technology gap.

In short, over the past several years, multimedia access has increased steadily for all demographic categories (NTIA, 2002). While some notable differences remain in Internet use related to income categories, computer ownership has grown considerably among people who live in lower income households (less than $15,000 annually) from 9.2 percent in October 1997 to 25 percent in September 2001. If the current trend continues aspects of the digital

divide related to multimedia access will diminish to the point of no longer being an issue.

Confidence and Self-Efficacy

Bandura's concept of self-efficacy is widely used within educational research (Lent, Brown, & Hackett, 1994, 1996; Mitchell & Krumboltz, 1984). Briefly, as originally proposed by Bandura from social cognitive theory (1977), self-efficacy expectations refer to an individual's beliefs concerning his or her ability to successfully perform a given task or behavior. Bandura (1977) postulated that beliefs are the major mediators of modifying behavior. Self-efficacy is a form of self-evaluation that influences decisions about what behaviors to undertake, the amount of effort and persistence put forth when faced with obstacles, and finally, the mastery of the behavior. Therefore, low self-efficacy expectations regarding a behavior or behavioral domain lead to avoidance of those behaviors, and increases in self-efficacy expectations should increase the frequency of approach versus avoidance behavior. Thus, self-efficacy beliefs can be useful in understanding and predicting behavior.

Bandura's concept of self-efficacy focused primarily on clinical treatments by psychologists (Betz & Hackett, 2002). However, Hackett and Betz (2002) were the first to apply the concept to other areas of research like career counseling. They developed the occupational self-efficacy scale, which is widely used today in career counseling and educational research (Betz & Hackett, 2002). Two formats of the self-efficacy have been developed. One format requires single responses such as "yes" or "no", while an alternative format

provides respondents with Likert-type ratings (Betz & Hackett, 2002). In each of these formats, "confidence ratings" represent measures of self-efficacy.

More recently self-efficacy scales have been applied to research on individual behavior and multimedia technology. Research has supported the link between self-efficacy and individual responses to multimedia technology, both in regards to adoption and integration of computers (Higgins, 1995B; Hill et al., 1987; Talylor & Todd, 1995), and in terms of learning to use multimedia technology (Compeau & Higgins, 1995a; Gist et al. 1989; Webster & Martocchio, 1992).

Computer self-efficacy does not refer to a person's skill at performing specific computer related tasks, such as writing HTML, using a web browser, or transferring data files. Instead, it assesses a person's judgment of his or her ability to apply computer skills to basic and complex tasks that require critical thinking rather than rote learning of specific computer tasks. Extending component skills such as formatting disks and booting up the computer to behaviors that can be accomplished with component skills requires higher computer self-efficacy (Compeau & Higgins, 1995). Using software to analyze data, finding new information, or troubleshooting errors, are examples of activities that require high computer self-efficacy. Novice computer users need self-efficacy to overcome any fear and to master more complex computer skills necessary for the advanced multimedia tasks now a part of effective computer use. Higher self-efficacy in remote computing situations has also been associated with more productive and satisfied users when working remotely

(Staples, Holland, & Higgins, 1998).

Researchers have used cognitive models base on self-efficacy and anxiety to examine disparities in multimedia technology use. In their work titled "The Psychology of The Digital Divide", Eastin and LaRose (2000) conducted a study that examined the Internet and self-efficacy among college students. Their findings indicated that Internet usage could be linked to initial barriers such as self-efficacy deficits, or low self-efficacy. Their research was a response to prominent psychological explanations of the digital divide, which focused exclusively on the relationship between multimedia technology disparities and anxiety, namely computer anxiety. Other studies have explored human factors such as inexperience, needs, and anxiety involved when using computers (Paxton & Turner, 1984). Some have suggested that gender differences might affect anxiety, efficacy and computer use (Gilroy & Desai, 1986).

In summary, differences in computer use between non-users and users, and basic skill users versus advanced users are related to differences in computer efficacy. Those with lower computer efficacy are less likely to perform computer related behaviors in the present and future than those with higher computer efficacy.

Research on computer self-efficacy has primarily focused on adult users. However, these theoretical models can be applied to adolescents as well. While all adolescents may learn basic computer skills by participating in various multimedia activities, those with higher computer efficacy are able to apply these skills for complex tasks such as publishing to the Internet and creating digital

videos.

In this study, an eleven-item Likert type scale was used to assess respondents' beliefs in performing multimedia related task that ranged from basic to complex. For example, a basic multimedia task was surfing the Internet, while a more complex task was using publishing software. The survey instrument was derived from two surveys used in earlier research studies that examined access to multimedia (Dickson & Phillips, 2004) and computer efficacy (Murphy, Coover, & Owens, 1989). The Murphy, Coover, & Owens (1989) study referred to confidence with computers as an application of self-efficacy theories of students computer use. Similar to the methods in this research study, they developed a 32-item Likert scale that measured domains of computer self-efficacy.

Applying the theories and research on self-efficacy and computer use in this research study, a student's belief regarding his or her ability to perform multimedia tasks or multimedia self-efficacy was operationalized as multimedia confidence. Confidence ratings were proposed to be a valid indicator of self-efficacy. Therefore, perceived confidence level with multimedia technology is the construct that was measured and explored as the dependent variable and major outcome for this study.

Adoption Patterns

Research studies have largely examined the adoption of technology in workplace settings, but not for personal use at home and for students in schools (Brancheau & Wetherbe, 1990). There appears to be a range of behaviors for adoption of multimedia. Some individuals may adopt very early compared to

their peers. Others may adopt when technology has become the expected behavior and standard. A longitudinal study found that those who adopted technology later stated that they were afraid that rapidly changing technologies would be obsolete (Brancheau & Wetherbe, 1990).

To describe this range of behaviors, Rogers (1995) defined five categories of adopters: "innovators, early adopters, early majority, late majority, and laggards" to describe the patterns of adoption of technologies in the home. Results showed that innovators and early adopters represented a small percent of adopters (16%) who integrated to technology quickly. Interestingly, the early majority (34%) and late majority (34%) represented most adopters. The laggards represented a similar small percentage (16%) who had not yet adopted technology. However, this categorization assumes that eventually everyone will adopt technology at some point, when in fact some individuals may never adopt technology. Those who are resistant to adopt technology may use surrogates such as friends and family to assist them with technology and never become adopters themselves, or remain "laggards."

Applying these characterizations of adoption and use for multimedia technology among children suggests that the age at which a child adopts technology may differentiate them from their peers. Early adoption could also affect success in future educational and occupational outcomes mediated by their confidence and skill level with multimedia technology.

Many of the home personal computer users (Kraut, Miller & Siegel, 1996) will include innovators, early adopters, and part of the early majority type groups

will include innovators, early adopters, and part of the early majority type groups described by Rogers (1995). Children in these homes may fit these characterizations, but their use of multimedia in school could provide additional opportunities for early adoption that do not rely on the purchase and use of a home personal computer.

A recent report by the National Center for Educational Statistics (2004) revealed interesting results regarding where and what age children are adopting new technologies. For example, home and school are the primary locations where children and adolescents began to use computers. About 90% of children and adolescents ages 5-17 used computers for general applications while approximately 59% used computers for accessing the Internet. Surprisingly, among younger children who were five years old, 75% used computers for general use, while 59% used computers for the Internet (NCES, 2004). Trends suggest that the majority of children are adopting computers at earlier ages and for a variety of reasons.

Similar trends among families suggest dramatic increases in computer use rates. During a five-year period from 1996-2000, among families with children from ages 2 to 17, home computer use increased from 48% to 70%, while Internet connections penetrated homes at a 150% rate over the same period (Woodward & Gridina, 2000). Current estimates project that computer ownership and Internet access will reach 90% market penetration by the end of the decade (Woodward & Gridina, 2000). The rapid diffusion of physical access of

computers is described as nine times faster than that of radio and three times faster than television (Woodward & Gridina, 2000).

Technology adoption patterns have important implications for predicting later use. Findings by Brancheau and Wetherbe (1990) suggested that early adopters of new multimedia technology developed more positive attitudes and sustained their use over time. Early technology adopters were less likely to experience "end-user frustration" (Brancheau & Wetherbe, 1990). Early adopters were better educated, had higher income levels, had more access to various multimedia, and were more computer-literate than later adopters. Conversely, late adopters experienced an array of barriers to overall use such as lower self-efficacy levels and increased anxiety. Late adopters also spent less time engaged in multimedia activities. Higher rates of self-efficacy demonstrated by early adopters are important indicators of later use.

Time Spent

The emergence of multimedia has drastically changed the way children spend their time. Studies such as the Kaiser Family Foundation's 1997 *Report on Kids Multimedia & The New Millennium* (Kaiser, 1999) and the *Hemmingway Foundation's 2000 Report on Children and Interactive Media* (Wartella & Jennings, 2000) indicated that young people spent as much time engaged in multimedia activities as they did in school or with family or friends. According to one national survey, children between the ages of 2 and 17 spent approximately ninety minutes a day using the computer and/or playing video games (Subrahmanyam, Kraut & Greenfield, 2000). Multimedia activities can include

everything from video games, and the Internet to handheld computers. Multimedia activities appear to be the most common way that children ages 2-18 spend their time (Becker, 2000).

Time has been conceptualized in two ways: discretionary time and non-discretionary time (Robinson, Kestnbaum, Neustadtl, & Alvarez, 2002). On average most adults and students engage in activities regarding during non-discretionary time, which includes a number of activities that occur on a regular basis. For students, attending school would be an example of an activity during the academic school year that would be classified as non-discretionary time (Robinson, et al., 2002). Self-maintenance activities such as eating, dentist appointments, and exercise are all activities that are considered discretionary time. In this study, students reported on their engagement of multimedia activities during discretionary time.

Research findings suggest some positive outcomes for children who have access to computers and spend more time engaged in multimedia. The Annenberg Public Policy Center found that children in households without computers watched approximately one hour more television each day than homes with computers (Subrahmanyam et al., 2000). Children in homes with computers spent less time playing video games and more time doing homework and reading magazines (Subrahmanyam et al., 2000).

Additionally, children who spend more time engaged in multimedia activities gain more expert knowledge and are typically able to use multimedia in more productive ways. Time was an important construct in the current study,

which explored the relationship between multimedia confidence and time spent on multimedia.

Social Support

Computers have allowed individuals to create social networks by linking them to people, organizations and knowledge (Wellman, 2001). Technologies such as the Internet have the potential to increase a person's social capital by linking him or her to friends and families. The diffusion of innovations literature expresses the importance of social support networks in the spread of new technologies (Hargittai, 2003). Newer technologies are more likely to be adopted by individuals in communities who have greater exposure (Hargittai, 2003).

The digital divide has been linked to restricted social networks (Kvasny, 2002). Researchers have suggested that restricted social support networks are linked to variations in patterns of use in urban communities (Rice, Grant, Schmidt, & Torobin 1990). Anecdotal evidence has proposed that social support networks where experienced users can draw upon the expertise of more experienced users are important to new users in underserved communities (Kvasny, 2002). Fulk and Boyd (1991) have argued that social networks influence behavior through messages and signs that are assigned to specific activities. Whereas physical capital refers to physical access, human capital refers to the properties of individuals, and social capital refers to connections among individuals such as social networks and the norms of reciprocity and trust that arise from them (Putnam, 2000).

Within urban communities, poverty must be considered in terms of its impact on social support networks. William Julius Wilson (1987) provided theoretical and empirical work in social network analysis and social capital theory and contended that social isolation perpetuates poverty. Wilson originally proposed that social isolation was an alternative explanation to the then prominent cultural deficit explanations. Since then, social capital theory has argued that those in poverty find it difficult to access resources related to social and human capital, such as, information, health care, housing and education.

Wilson's analysis has been important for researchers who have attempted to understand multimedia use in urban communities (Becker, 2000; Kvasny, 2002; Warschauer, 2003). It has been argued that disparities in multimedia access and integration may be linked to social spheres with an abundance of resources compared with those in which resources and opportunity are scarce (Kvasny, 2002). The implications of scarce resources or restricted social support networks have implications for students in urban schools. In a recent qualitative study on the digital divide, Warschauer, Knobel and Stone (2004) compared the availability of, access to, and use of new technologies in a group of low-SES and high-SES California high schools. They found that social contexts for computer use was negatively influenced by differences in human support networks among low-SES school students. These differences included parental attitudes toward computer use for school purposes (Warschauer, et al., 2004).

Theoretical Framework

There are few studies on children and multimedia, particularly in urban communities. Yet, there are theories on children's social and cognitive development that can be applied to frame this problem.

Cognitive theories have served as dominant approaches to examining human development. The more recent dramatic shift from behaviorism to cognitivism focuses our attention on rich descriptions of mental processes (Kirshner & Whiton, 1997). In cognitive theories, knowledge is viewed as symbolic mental representations in the individual mind, and learning is the means by which these symbolic representations are memorized (Greeno, Collins & Resnick, 1997). Notions of progress and development reflect changes in the organization of mental operations. Therefore, teaching for transfer of knowledge from one context to another is an important concept. Cognitive theorists make the separation between knowing and doing and the context in which it may occur (Collins, Brown, & Newman, 1989). Recent investigations on learning and development offer an alternative view of learning and development that examines the "situatedness" of knowledge.

Sociocultural theory emerging from the work of Vygotsky (1978) raised issues that challenge the notion of a separation of how knowledge is constructed from the way it is constructed, submitting instead that learning and cognition are situated in the activity, context, and culture in which it occurs (Brown, Collins, & Duguid, 1989). Vygotsky's developmental theory emphasized the inherent social nature of all human endeavors (Smagorinsky & Lee, 2000). A fundamental

premise of Vygotsky's (1978) theoretical framework is that social interaction plays a fundamental role in the development of cognition. Vygotsky offered two propositions concerning his work the "genetic law of cultural development" and "the zone of proximal development".

First, the "genetic law of cultural development" theorizes the connection between the social and the psychological. Vygotsky proposed that learning and development occurred in the social realm and then the psychological realm. Vygotsky viewed these fundamental sign-means as confirmation of the historical transition from natural to culturally mediated forms of behavior. He asserts:

> "Any function in the child's cultural development appears twice, or on two planes. First it appears on the social plane, and then on the psychological category, and then within the child as an intrapsychological category. This is equally true with regard to voluntary attention, logical memory, and formation of concepts, and the development of volition. We may consider this position as a law in the sense of the word, but it goes without saying that internalization transforms the process itself and changes its structure and functions, social relations or relations among people genetically underlie all higher functions and their relationships" (Vygotsky, 1978, p. 163).

Second, the zone of proximal development has been interpreted as the "distance" between the problem solving abilities by an individual working alone versus the learner's problem solving in collaboration with a more capable other (Vygotsky, 1978). The distance is viewed as the space between everyday actions

and historically new forms of social activity. Aspects of the zone of proximal development have been studied in a variety of ways. For example, African American discourse patterns have served as a scaffold for literacy development (Lee, 1995). Latino families' indigenous knowledge has been linked to classroom learning (Moll, 1990). Young adults have learned to use multimedia through collaborative learning systems (Cole, 1996). Despite some variations, scholars focus on the how individuals participate with others within a seamless involvement of social cultural activity (Rogoff, 1990).

The sociocultural perspective maps onto understanding learning as it occurs in everyday routine activities. Anthropologists and cross-cultural psychologists have examined the differences between learning as it occurs through participation in everyday activities within informal environments and formal settings such as school (Cole, 1989). Early on researchers discovered a mismatch between how cognitive strategies were used in informal settings versus formal settings. For example, research by Lave, Murtaugh, and de la Roche (1984) on mathematics and everyday practices found that grocery shoppers who scored poorly on a formal arithmetic test were able to use legitimate arithmetic operations to make informed choices at a supermarket. As Gordon asserted, "This substantiates the fact that students appeared to use memory strategies suboptimally when performing a task in one setting often used them strategically on a different task in a different setting" (Gordon, 2003, p. 200). These important findings speak to the situatedness of knowledge and serve as the foundation for further research models that can be used to explore notions

of individual progress and development as it occurs in real world contexts for learning and technology.

Apprenticeship learning models have served as a useful paradigm for understanding the mutual embedeness of learning and activities in authentic settings. Apprenticeship applies to a specific group of individuals who are working toward the establishment of mutually shared goals (Rogoff, 1990). The group may involve colleagues or peers who are novices or experts who serve as resources in examining shared activity. In the apprenticeship paradigm, newcomers to a community of practice advance their understanding through participation with others in shared activity. Apprenticeship is often associated with the apprentice-master relationship of traditional crafts (Lave &Wenger, 1998).

Lave and Wenger's (1998) seminal research on apprenticeship learning explored how individuals move from novice to experts in communities of practice. Their concept of legitimate peripheral participation is a framework of social learning theory that focuses on "old-timers" and "newcomers" and how their individual identities are transformed and shaped as they participate in communities of practice and engage in everyday activities (Lave & Wenger, 1989). Learners acquire some skills, become knowledgeable and have new understanding of the application of those skills. Through participation in shared activities and culturally defined norms, individuals move from peripheral participants to more established members. Legitimate peripheral participation

conceives of learning as a process of increasing participation within sociocultural contexts known as communities of practice.

The concept of communities of practice are linked to learning in social contexts. Members of a community of practice are bound by their focus on and participation in culturally developed practices. Communities of practice have been studied in a variety of settings such as apprenticeship settings (Jordan, 1993), the workplace (Wenger, 1990) and school classrooms (Carlock, 1995). The shared practice component differentiates a community of practice from an interest group. Wenger (1998) asserted that a community of practice defines itself along three dimensions:

1) What it is about (i.e. its joint enterprise as understood and continually renegotiated by its members)?
2) How it functions as a "mutual engagement" that binds members together into a social entity?
3) What capability it has produced (the shared repertoire of communal resources, including routines, sensibilities, artifacts, vocabulary, styles, etc.) that members have developed over time?

Many people participate and learn in a variety of communities of practice--at home, at school, and at work. These settings evolve over time as new technologies emerge.

Recently, scholars have used a sociocultural lens to look specifically at learning and young people's appropriation of various multimedia in informal

learning settings. In his seminal work on children and video games, Gee (2003) identifies thirty-six learning strategies such as probing, hypothesizing, reprobing and rethinking that young people employ as they learn to master video games. Findings also support our understanding of students' enculturation into video game culture through manipulation of various kinds of multimedia activities. For example, he asserted that "within the chatrooms and the online exchanges, web sites, documentation manuals, underground cheats and language associated with computer games--young people learn semiotic and the cognitive skills they will need in the changing contemporary high-tech world as well as the values and skills that make such skills important" (Gee, 2003, p. 142). Gee's findings support learning in informal spaces while participating as a member of a community of practice. Leander (2003) made a similar observation in his examination of everyday uses of the Internet.

Given the characteristics of the sociocultural lens and the scholars associated with this perspective, tenets of the sociocultural perspective serve as the framework for the current study. Students' multimedia activities reflect their participation in various multimedia literate communities. Within these communities, they operate with varying levels of confidence as experts or novices with multimedia tools. Cognitive apprenticeship assumes that students are active agents that are purposefully seeking and constructing knowledge within a meaningful context with computers. As students use various multimedia tools such as computers and video games players, they are acting in purposeful ways. They are attempting to achieve some underlying goal.

Students gain expertise with multimedia through participating in activities. They create and produce knowledge within communities of practice. As they move from novice to expert users, their identities change. They participate in multiple communities of practice in formal and informal learning spaces. Operating in the zone of proximal development, teachers, parents, peers and multimedia serve as scaffolds to support their mastery of multimedia activities.

Variations in students' multimedia activities can be linked to the ways in which they have been apprenticed into communities of practice, and the situated knowledge that stems from their experiences. Some students are operating within multimedia communities of practice on the periphery, while others have moved toward the center.

CHAPTER III

METHODOLOGY

Background of the Setting

The study was conducted in a small midwestern city in the U.S. According to city reports, the median income for a household was $34,833, and the median income for a family was $41,283 (Lansing Report, 2001). The city is located in the south central part of the lower peninsula of the state where two rivers meet. There were 119,128 people, 49,505 households, and 28,366 families residing in this city according to 2000 U.S. Census reports (Lansing Report, 2001). The research questions for this study included information on social and contextual patterns among urban communities. Therefore, a culturally diverse, urban community was necessary for the subject population of this study. The racial makeup of the city was diverse with White (65%), African American (22%), Hispanic or Latino (10%), Native American/American Indian (1%), and Asian (3%) populations. Given the city's status as a state capital, many residents were employed by the local state government (Lansing Report, 2001). The city was home to an automotive plant that employed another large sector of the population at the time of the study.

School District

The school district where the study was conducted included 43 schools that served approximately 17,000 students from K through grade twelve (Lansing, 2001). The school superintendent was the city's first female and African American individual in this position. One of the early challenges for the

superintendent was student retention that posed a serious threat to the viability of urban school systems in the state. Through a statewide "school of choice" program, students were allowed to attend any school in their area. Therefore, urban school districts began to compete with suburban school districts for the same students.

To address this issue, the new superintendent implemented the magnet school concept. Historically, magnet schools in urban areas were designed to assist schools with racial desegregation (Kahlenberg, 2003). These schools offer similar features like those of a traditional public school but specialize in a specific subject area, such as math, science, or performing arts (Kahlenberg, 2003). Unlike charter schools, magnet schools remain part of a school district. Magnet schools are often not limited by neighborhood boundaries and can draw students from across the district. For this reason, magnet schools are often referred to as "schools of choice". Critics have suggested that magnet schools drain important resources such as outstanding teachers and school supplies from neighborhood schools (Kahlenberg, 2003).

The site for this study was a magnet school for middle school students. The school integrated an academic curriculum with an enriched exposure to the visual and performing arts. Additionally, the school was a recipient of a state grant program designed to bridge the digital divide by expanding multimedia technology opportunities to students, especially those students living in rural areas and experiencing poverty. The aim of this grant program was to improve student achievement in core academic subjects by providing an enriched

educational environment with access to multimedia technology (Lansing Report, 2001). The program provided assistance with technology-enhanced art, digital music composition and Internet research (Lansing Report, 2001). With this grant, the school provided laptops for all of its students. However it is important to note that during the time of the study, none of the students had received laptops because of administrative and logistical delays. Therefore, the grant program was not able to change student's level of multimedia access by providing increased physical access to multimedia.

Data Collection Site

The school where data was collected for the study was situated in a working-class, ethnically diverse, urban neighborhood. The building was converted from an elementary school. The interior reflected the open classroom design concept that was popular in the early seventies era. There were no permanent doors on classrooms, but only pre-fabricated sliding doors to separate classrooms. Both teachers and students complained about the organizational layout of the school. Teachers cited high noise levels and lack of privacy as problems within the classroom environment. Students expressed concerns that the design of the building did not allow them to have space for amenities such as personal lockers.

Like many schools in middle size or small school districts throughout the U.S., the majority of teachers at the school were White and female (Darling-Hammonds, 1999). Teachers were selected based on their interests in the visual arts and outstanding prior experience (Lansing Report, 2002). The teacher ratio

was 22:1, which is considered good for an urban school setting. Compared to other middle schools in the district, the school had the smallest student population. The school population reflected the ethnic and socioeconomic diversity of the larger school district and bordering neighborhoods. The school consisted of mostly low to working class families with 53% of students participating in free or reduced-lunch assistance programs (Lansing Report, 2002). The predominantly minority student population was in stark contrast to the largely White teaching staff. Table 3.1 provides a summary of the demographic data for the district and the larger community.

Table 3.1: Ethnic Composition of the School District and Middle School Research Site

School District		Middle School Research Site	
White	46%	African American	60%
African American	33%	White	30%
Hispanic/Latino	12%	Hispanic/Latino	8%
Asian American	5%	Asian American	1%

Respondents

Originally, 150 students from a local area middle school participated in the study. After accounting for missing data and lost surveys, there were 124 valid surveys for analyses from both female (n=83, 67%) and male students (n=41, 33%) who were enrolled in sixth (n=43), seventh (n=37), and eighth (n=44) grades (See Table 3.2). The response rate for this study was very good at 83%.

Respondents participated according to the policies and guidelines of the University Committee on Research Involving Human Subjects (UCRIHS) at Michigan State University.

Table 3.2: Gender and Grade Level of Respondents

	Males	Females
Grade Six	17	26
Grade Seven	10	27
Grade Eight	14	30

Procedures

Mixed Methods Research

Within the social sciences, mixed methods research has garnered widespread support as a stand alone research design (Creswell, 2002, 2003; Tashakkori &Teddie, 2003). It may be defined as "the collection or analysis of both quantitative and qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority, and involve the integration of the data at one or more stages in the process of research" (Creswell, 2002, 2003; Tashakkori & Teddie, 2003). When both quantitative and qualitative data are included in a study, researchers may enrich their results in ways that one type of data does not allow (Creswell, 2002, 2003; Tashakkori & Teddie, 2003). Using both forms of data, for example, allows researchers to simultaneously generalize results from a sample to a population and to gain a deeper understanding of the phenomenon of interest. It also allows researchers to test theoretical models and to modify them based on participant feedback.

Results of precise, instrument-based measurements may, likewise, be augmented by contextual, field-based information.

The use of both quantitative and qualitative data improved the construct validity of the current study. In order to understand the social and contextual reasons for variations in the patterns of students' multimedia use, a mixed method approach was very effective. The quantitative survey data were particularly useful in exploring the variety of access of multimedia in the lives of students. It further revealed variations in patterns of use. The qualitative interviews provided a deeper exploration of the findings from the quantitative data.

Validity and Reliability of Self-Report Data

Kuh (2001) has discussed several issues regarding reliability and validity. The arguments concerning reliability and validity were heavily influenced by Kuh's work on surveys of college freshman at Indiana University and informed this dissertation study, which relied on self-report data. Using self-reported data from students to assess their use of various multimedia tools is common practice. By and large, achievement tests have failed to adequately measure outcomes such as beliefs or attitudes or gains in social and practical competence (Kuh, 2001). Student self-reports are an informative source of data to provide insight into student perceptions and the indicators of good educational practices with multimedia. For example, how students use their time with multimedia technology can be most accurately assessed using student self-reports. Teacher

and parents may not be aware of how students spend their time in multiple environment contexts.

Other researchers have examined the validity and credibility of self-reports extensively (Pike, 1995). In using self-reports, accuracy can be affected by two problems. One problem is that self-reports involve the respondents' inability to provide accurate information in response to a question (Wentland & Smith, 1993). Students might lack knowledge regarding various technological terms to provide precise judgment on their multimedia use or they might simply not understand the questions. The second problem involves how willing respondents are to provide truthful information (Kuh, 2001). Students could intentional misrepresent information about their multimedia use. Bradburn and Sudman (1988) argued that respondents typically provide accurate information related to their past experiences, except in cases in which information can place them in uncomfortable situations. To optimize self-report data for students' self-reports of multimedia the questions should be easy to understand and administered in a manner that is appropriate and comfortable for their developmental age.

Self-report data can raise questions about validity. For example, in the present study, respondents were asked to report the amount of time they spent engaging in various Internet activities. According to Kuh (2001), estimates of time usage tend to be less accurate than diary entries. To reduce this threat to validity, Kuh suggested that respondents should be asked about recent activities that they are more likely to remember with accuracy. It is also important to reference specific time frames to obtain accurate information on behaviors.

Referencing a specific, recent period of time to be considered can improve memory recall and reduce distortion since respondents tend to remember more current events (Converse & Presser, 1989; Singleton, Straits, & Straits, 1993).

A halo effect can also impact the accuracy of student self-reports. That is, there is a possibility that students might inflate certain aspects of their behavior, such as time spent on educational activities with computers or their confidence level interacting certain technologies. Fortunately, Pike (1995) has argued that in the event that the halo effect occurs, it appears to be consistent across different types of students. As Kuh (2001) distinguished, "while the absolute value of what students report may differ somewhat from what they actually do, the effect is consistent across schools and students, so that the halo effect does not appear to advantage or disadvantage one student group compared with another."

Given these considerations, self-reports are considered valid under five general conditions according to Pike (1995). The first condition is that the information requested has strong psychometric validity and reliability. The second condition requires that questions be phrased clearly and unambiguously. The third condition is that questions should refer to recent activities. Fourthly, respondents should believe that the questions merit serious and thoughtful responses. Finally, answering the questions should not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to respond in socially desirable ways.

The survey design of this dissertation attempted to satisfy all conditions related to validity for self-report data among the students who participated in the

study. Prior to administering the survey, the researcher met with teachers and students to familiarize them with each section of the instrument. Memory recall was enhanced by asking students about the frequency of their participation in multimedia activities during the past month. To eliminate the variability in day-to-day fluctuations, students reported the number of hours spent in multimedia activities during a normal week. This also allowed for an accuracy check on the total number of hours students reported. The format for most of the responses was a simple Likert-type rating scale. This repetitive simple scale formatting helped students to understand the Likert scaling system and accurately recall and record their multimedia activities to minimize this as a possible source of error.

In summary, evidence clearly supports the use of self-report surveys in collecting data. Under the right circumstances, including clearly written questions and pertinent information, students can accurately report on their daily activities with multimedia. Middle school students often spend a majority of their time alone and with peers across multiple contexts. Conceivably, they are the most appropriate reporters of their own weekly activities with multimedia.

Survey Questionnaire

The complete battery of instruments was administered during a two-week period in the spring of 2004. The general purpose of the study was described to the students first and then any remaining questions were answered. Both parent and student consent forms were required for the study (See Appendices A and B). As part of this consent form, participants were informed of their right to

refuse to answer any questions and to withdraw from the study at any time without any consequences.

At the end of the testing session, students were thanked and debriefed about the research project. Students were provided the opportunity to receive results of the study when the study was completed, to be contacted for further interviews, withdraw from the study without consequence, and to ask further questions. In addition, the names and phone numbers of the experimenter and dissertation advisor were listed on the consent forms that were provided to the respondents to serve as contact persons for any questions or concerns regarding the study. Each respondent was assured anonymity and confidentiality in later reports. Data were for research purposes only and were analyzed as group data only. All data were kept secure in a locked room.

Psychometrics and Scaled Validity

Subscales from the questionnaire assembled for use in this study were originally developed and validated on college populations (Dickson & Phillips, 2004; Robinson, 2001). Given the importance of validity, a considerable amount of time was dedicated to ensure that the survey instrument was clearly worded, well defined, and had good content validity for middle school students. The responses to the questionnaire items were normally distributed. The patterns of responses to clusters of items (i.e. multimedia confidence, early adoption of multimedia technology, social support networks for multimedia use, access to multimedia technology, and time spent on multimedia activities) discriminated among students both within and across gender and grade levels.

The degree to which an instrument is reliable is another important indicator of an instrument's psychometric quality. Reliability is the degree to which a set of items consistently measures the same thing across respondents and institutional settings (Kuh, 2001). Reliability analyses were conducted on each of the constructs and are reported in the results section in Chapter IV.

Measures

The questionnaire ascertained demographic data; early adoption of multimedia technology; social support networks for multimedia technology use (Kvasny, 2002), physical access to multimedia (Katz & Aspden, 1997; Hoffman et al., 1997), time spent on multimedia activities and perceived confidence with multimedia. Each of these subscale constructs are described below.

Demographic information. Demographic information including academic grade level and gender was collected (See Table 3.2 for summary data) to determine any differences between male and female students and their current grade level expectations.

Early adoption (Brancheau & Wetherbe, 1990) (See Appendix C , Section A). The early adoption of multimedia technology subscale consisted of seven items that assessed students' first use of various multimedia activities and first access of physical multimedia hardware. Respondents indicated their age at first use. Early adoption was coded as "0" if there was no participation indicated for a particular activity.

Social support networks (Kvasny, 2002) (See Appendix C, Section A). Three questions assessed students' available social support networks for

multimedia use. One question asked respondents to identify from a list of ten persons such as parents and teachers, who influenced their use of multimedia. Respondents could identify multiple supports. Another question sought information on the place where students' first used computer technology. Students were also asked where they most often engaged in computer multimedia activities.

Physical access (Hoffman et al., 1997; Katz & Aspden, 1997) (See Appendix C, Section A). This measure was designed to assess students' overall physical access to entertainment multimedia such as televisions and compact disc players, as well as school related multimedia such as desktop computers and educational software outside the school environment where standard equipment was provided for all students. Respondents had a list of sixteen multimedia items to choose their level of access outside of school. "Easy" access was defined as physical availability to multimedia technology as frequently as possible.

Time spent (Wartella & Jennings, 2000; Robinson) (See Appendix C, Section B). The time subscale included seventeen items to assess the time spent on multimedia activities. Time was measured in hours per week. Respondents indicated their time spent on various multimedia activities related to school and entertainment purposes including television, video games, Internet, and educational software.

Multimedia confidence (Brancheau & Wetherbe, 1990) (See Appendix C Section C). Confidence level with multimedia technology was the major

dependent construct in the study. The measure was designed to appraise students' confidence level in completing eleven multimedia activities related to school and entertainment. Some activities involved more basic skills such as surfing the Internet, while other activities involved more complex skills such as designing a webpage. Respondents indicated their confidence level on a five-point Likert scale (i.e., 0=strongly disagree; 1=somewhat disagree; 2=neither; 3=somewhat agree; and 4=strongly agree) to designate their degree of confidence for each multimedia activity.

Interviews

Ten students in groups of two and three were interviewed using small-scale focus group interviews by one researcher. The use of the focus group interviews is now a well-established part of research in educational settings (Flores & Alonso, 1995). Because interviewing middle school students can be challenging, the use of small focus groups was intended to encourage students to feel comfortable while talking and to decrease possible interviewer effects, exaggeration or deceit (Bogdan & Biklen, 1992). Each group of students was selected from the same classroom so that they might feel more comfortable when sharing information among each other. Interviews lasted between 30 to 35 minutes.

The interview protocol included open-ended questions on multimedia use (See Appendix D). Students were asked when they first used a computer. They were also queried about what type of multimedia activities they typically engaged in. Interviews questioned who within students' social support networks fostered

their engagement with multimedia. Various opinions on multimedia use were also collected as part of the interview.

The data analysis proceeded according to Leininger's (1995) four phases of analysis for qualitative data. During phase one, the interview data were described and documented. The second phase consisted of the identification of descriptions in relation to students' activities with multimedia at school and home. The third phase included formulation of themes and an analysis of the context in which they occurred. In the final phase, the reduction of raw data was clustered around the major quantitative constructs, which included: early adoption of multimedia technology, social support networks for multimedia use, access to multimedia technology, time spent on multimedia activities and multimedia confidence.

Research Questions and Hypotheses

The development of these constructs and measures were key to explore social and contextual influences on multimedia use and multimedia confidence. The quantitative and qualitative methodologies were used to examine five research questions as part of this study.

Questions One: Does the time spent by students on multimedia tasks influence their confidence with multimedia?

Question Two: How do social support networks influence variations in patterns of computer multimedia use among students?

Question Three: What is the relationship between access to multimedia technology and confidence with multimedia for students?

Question Four: What environmental factors impact students' confidence with multimedia?

Question Five: Does early adoption of multimedia increase students' level of confidence with multimedia technology?

Questions Six: Does early adoption of multimedia technology, social support networks for multimedia use, access to multimedia technology, time spent on multimedia activities predict multimedia confidence among students?

In order to answer these research questions, six corresponding hypotheses were explored through the data analyses. It was expected that the multimedia confidence of students was influenced by all of the key constructs that included: early adoption of multimedia technology, social support networks for multimedia use, access to multimedia technology, and time spent on multimedia activities.

Hypothesis One: Students who spend more time on multimedia tasks will have higher confidence levels on multimedia.

Hypothesis Two: Students with larger social support networks will have increased confidence levels with multimedia.

Hypothesis Three: Those students who adopt multimedia technology at an earlier age will have higher confidence levels.

Hypothesis Four: Students who have more physical access to multimedia technology will have higher confidence levels with multimedia.

Hypothesis Five: Students who spend more time using multimedia tools for educational purposes will spend less time using it for entertainment purposes.

Hypothesis Six: Those students who adopt to multimedia use at an earlier age, have larger social support networks that encourage multimedia use, have more physical access to multimedia technologies, and spend more time on multimedia activities, also have higher confidence levels with multimedia technology.

CHAPTER IV

QUANTITATIVE RESULTS

The methodology developed for this study combined both quantitative procedures for identifying trends. Preliminary analyses included the validity of responses to the items; examination of missing data; characteristics of the sample; descriptive analyses; reliability measures; analyses of gender differences that might account for differences on the key study variables; and relationships between variables to address hypotheses outlined in the previous chapter. Finally, additional exploratory analyses investigated the relationship between the main dependent construct variable of multimedia confidence and the independent variables: early adoption of multimedia technology, social support networks for multimedia use, access to multimedia technology, and time spent on multimedia activities.

Participants. The final sample included 124 respondents consisting of a distribution of females (*n* = *83,* 67%) and males (*n* = 41, 33%) across grades sixth to eighth. Respondents participated according to the policies and guidelines of the University Committee on Research Involving Human Subjects at Michigan State University.

Descriptive Analyses. Background differences on key study variables were inspected by examining means, medians, standard deviations, and ranges.

Reliability of Measures. Internal consistency coefficients for existing measures and newly formed constructs were computed. It was critical that the measures used in this study were internally consistent.

Major Constructs

The surveys used in this study were designed to measure five main constructs. The construct of confidence with multimedia was seen as the dependent measure of interest. The other four constructs were examined as possible predictors of students' confidence level: confidence with multimedia, time spent on multimedia activities, social support networks, and early adoption of multimedia technology. In this section, each major construct is described, descriptive statistics on the items within each construct are reported, and the reliability of each construct is considered.

A. Multimedia Confidence Construct. This construct is a combined measure of students' reported confidence level on various multimedia tasks, such as surfing the Internet or designing a webpage. Students indicated their confidence level on 5-point Likert scales, ranging from strongly disagree to strongly agree for 11 items. The mean and standard deviation for each of the items is shown in Table 4.1.

The mean confidence levels varied considerably by type of multimedia use. This suggested that students were thoughtfully responding to the questions. For example, the students rated their confidence highest with "surfing" the Internet and using Microsoft PowerPoint (mean = 4.5). Both of these activities are relatively simple for computer users and widely used. By comparison, the students rated their confidence level on more complex tasks such as using Microsoft Excel or publishing to the Internet much lower (mean = 2.8). This pattern of variation provided evidence of the validity of the measures.

Reliability of Multimedia Confidence Construct. The reliability and internal consistency of the multimedia confidence construct was developed in two steps. First, a correlation matrix was computed for all items on the original scale. An inspection of the matrix revealed that the items showed generally positive correlations, supporting the view that these items were measuring an underlying construct that applies to the domain of multimedia tools (See Table 4.2 Correlation Matrix of Students' Confidence Level with Multimedia).

An interesting exception was that confidence with Microsoft Excel was negatively correlated with other items. Perhaps middle school urban students had less experience with Microsoft Excel or lower performance in mathematic activities for which Microsoft Excel is often used. For the purposes of this study, these negative correlations suggested that the item about Microsoft Excel should be left out of the major constructs and final analyses.

The remaining 10 items were summed together to form the "confidence with multimedia" construct. SPSS reliability procedures were conducted on these 10 items, yielding a Cronbach alpha coefficient for reliability of .74, which is considered fairly strong.

B. Time Spent on Multimedia Activities. This construct was a combined measure of students' reported time spent on various multimedia activities such as watching television or surfing the Internet. Students indicated the number of hours they spent per week for each activity, ranging from 0-12 or more hours. The mean and standard deviation for each of these items is shown in Table 4.3.

Table 4.1 Mean and S.D. for Students' Confidence in Their Abilities by Multimedia Activities

Overall Confidence	**Mean**	**S. D.**
General computer use	4.1	.91
Computer knowledge	4.0	1.21
Confidence Using the Internet	**Mean**	**S.D.**
Surfing the Internet	4.5	.92
Instant messaging	4.1	1.44
Internet use for homework	3.7	1.32
Publishing to the Internet (HTML Editor)	2.8	1.51
Confidence with Computer Software	**Mean**	**S.D.**
Microsoft PowerPoint	4.5	1.32
Video editing software	3.2	1.66
Concept map	3.0	1.54
Microsoft Excel	2.8	1.52
Copying compact discs (CDs)	2.8	1.55

Confidence Level Multimedia

	1	2	3	4	5	6	7	8	9	10	11
Overall Confidence Level											
1 Computer use	1.00										
2 Computer knowledge	.41**	1.00									
Confidence with Using the Internet											
3 Surfing the Internet	.32**	.21*	1.00								
4 Instant messaging	.27*	.22	.10	1.00							
5 Internet use for homework	.18*	.10	.21*	.09	1.00						
6 Publishing to the web (HTML editor)	.18*	.11	.14	.21*	.19*	1.00					
Confidence with computer software											
7 Microsoft PowerPoint	.26**	.11	.28**	.33**	.19*	.11	1.00				
8 Microsoft Excel	- .01	-.06	- .05	.22*	- .05	.14	.15	1.00			
9 Concept Map	.26**	.02	.18*	.22*	- .02	.16	.33	.48**	1.00		
10 Video editing software (I-movie)	.37**	.25**	.17	.30**	.02	.23*	.29**	.33**	.40**	1.00	
11 Copying compact discs (CDs)	.24**	.18*	.08	.42**	.08	.22*	.22*	.20*	.22*	.30**	1.00

Note: *significant at $p<.05$; **significant at $p<.01$

When examining the actual number of hours students spent on multimedia, there was wide variation (See Table 4.3 Mean and S.D. for Time Spent on Multimedia Activities). Students reported spending several hours per week engaging in multimedia activities. Most of their time was spent on Internet related activities such as games (mean = 3.0), email (responding to email, mean = 2.4 hours; sending email, mean = 2.0 hours) and instant messaging (mean = 2.5 hours). Data also indicated that most students reported a minimum of 8-12 hours per week watching television (mean = 8.0 hours). After watching television, students spent the next most significant amount of time using a phone either by talking on their home telephone (mean = 4.00 hours), talking on their mobile phone (mean = 1.3 hours), or instant messaging on their mobile phone (mean = .70 hour).

Reliability of Time Spent on Multimedia Activities Construct. The reliability and internal consistency of the time spent on multimedia construct was examined in two steps. First, a correlation matrix was compiled for all 16 items on the original scale. An inspection of the matrix revealed that the items showed generally positive correlations, supporting the view that these items measured an underlying construct that applied to the domain of multimedia tools (See Table 4.4 - Correlation Matrix for Time Students Spend on Multimedia Activities).

Table 4.3 Mean and S.D. for Time Spent on Multimedia Activities

Activity	Mean Number of Hours	S.D.
Internet		
Sending email	2.00	3.26
Responding to email	2.40	3.53
Instant messaging	2.50	3.72
Internet messaging for homework	.70	2.11
Text messaging	.62	1.82
Blogging	.73	2.00
Internet periodicals	1.89	2.66
Internet games	3.00	3.6
Computer software		
Word Processing	2.60	3.30
Educational software	.90	1.90
Entertainment/Games		
Video games	3.0	3.54
Computer video games	1.92	3.20
Television	8.00	4.00
Phone		
Home Phone	4.00	4.00
Mobile phone- general use	1.30	1.87
Mobile phone- internet messaging	.70	1.82

Table 4.4 Correlation Matrix of Time Spent on Multimedia Activities

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Internet																
1 Sending email	1.00															
2 Responding to email	.88**	1.00														
3 Instant messaging	.57**	.60**	1.00													
4 Instant messaging for homework	.39**	.41**	.30**	1.00												
5 Time spent internet	.38**	.41**	.25**	.36**	1.00											
6 Internet periodicals	.34**	.26**	.27**	.27**	.53**	1.00										
7 Blogging	.29**	.29**	.33**	.19*	.28**	.26**	1.00									
8 Internet games	.26**	.27**	.54**	.08	.18*	.14	.27**	1.00								
Computer																
9 Word processing	.34**	.34**	.17	.28**	.62**	.45**	.02	.18*	1.00							
10 Educational software	.31**	.30**	.15	.53**	.47**	.30**	.04	.1	.43**	1.00						
Entertainment/Video Games																
11 Video games	.18	.13	.26**	-.01	.32**	.15	.11	.40**	.16	.11	1.00					
12 Computer video games	.25**	.19*	.42**	.15	.32**	.29**	.16	.61**	.24**	.12	.46**	1.00				
13 Television	.10	.15	.17	-.07	.21*	.13	.17	.19*	.04	.04	.15	.14	1.00			
Phone																
14 Home phone	.42**	.46**	.27**	.37**	.22*	.22*	.18	.09	.27**	.34**	.01	.02	.23	1.00		
15 Mobile phone-general use	.39**	.39**	.41**	.19*	.23*	.31**	.44**	.18	.10	.11	.06	.03	.04	.44	1.00	
16 Mobile phone-text messaging	.29**	.26**	.44**	.13	.17	.21*	.35**	.18**	.05	.04	.18*	.05	.07	.18*	.56**	1.00

The 16 items were summed together to form the "time spent on multimedia" construct. SPSS reliability procedures were run on these 16 items and the construct had good reliability (Cronbach's alpha =. 83). As anticipated, on average most students spent more time on entertainment related multimedia activities than school related activities. Interestingly, 45 % respondents reported that they did not spend any time on school related multimedia activities.

C. Social Support Networks for Multimedia Activities Construct. This construct is a combined measure of the number of people students cited as influencing their use of multimedia. Students indicated their choices from a list of ten people including academic and parental figures. The mean and standard deviation for each of these items is shown in Table 4.5. Social support networks are viewed as playing an important part in multimedia use (Rice, Grant, Schmidt & Torbin 1990).

Findings indicated a median of three individuals who served as a part of the social support network for students' multimedia use. About 25% of the students reported 1 person or less in their social support network. A small percentage (4%) of students indicated a large social support network with 6 of more persons. Students are typically part of two types of social support networks: school and home. Teachers represented the highest percentage of those who supported a student's multimedia use in school. Additionally, students identified mothers (mean =. 52), peers (mean = .50) and fathers (mean =. 42) as social supports at home. Other influences such as grandparents, mentors or school counselors had low rates of influence on multimedia use.

Table 4.5 Mean and S.D. for Social Support Network for Multimedia Use

	Mean	S.D.
School/Peers		
Teacher	.78	.41
Mentor	.52	.50
School counselor	.10	.30
Youth peer counselor	.02	.13
Friend	.48	.50
Family		
Mother	.52	.50
Father	.42	.50
Sibling	.22	.43
Grandmother	.14	.34
Grandfather	.09	.30

Reliability of Social Support Networks for Multimedia Activities

Construct. The reliability and internal consistency of the social support networks was developed in two steps. First, a correlation matrix was compiled for all 10 items on the original scale. An inspection of the matrix revealed that the items showed generally positive correlations, supporting the view that these items are measuring an underlying construct that applies to the domain of multimedia tools (See Table 4.6. Correlation Matrix of Persons as Part of Students' Social Support Networks).

The social support network construct included two sub-constructs of school and home relationships that influence students' use of multimedia. Home influences consisted of the seven people in the students' home environment. School influences consisted of three variables related to school personnel who provided social support.

Table 4.6 Correlation Matrix of Persons as Part of a Social Support Network for Multimedia Use

	1	2	3	4	5	6	7	8	9	10
School/Peer										
1 Teacher	1.00									
2 Mentor	- .01	1.00								
3 School counselor	.04	.25*	1.00							
4 Youth counselor	-.09	.17	.18	1.00						
5 Friend	.23**	-.01	.18*	.01	1.00					
Family										
6 Mother	.08	.07	.04	.12	.31**	1.00				
7 Father	.02	.03	.01	.15	.21*	.24**	1.00			
8 Other	-.05	.13	.09	.23*	-.04	- .08	- .05	1.00		
9 Grandmother	-.02	.09	.19*	.14	.27**	.29**	.18*	.13	1.00	
10 Grandfather	.17	.16	.26**	.18	.17*	.20*	.16	.15	.35	1.00

The 10 items on the social support network were summed together to form the "social support" construct. SPSS reliability procedures were conducted on these 10 items, yielding a Cronbach alpha coefficient for reliability of .83, which is fairly strong.

In addition to their social support to engage in multimedia use, students reported their social interactions with other users on the Internet via chat rooms. Most students (67%) did not report any interactions with other users using chat rooms. However, it is potentially a cause for concern that a few students (3%) reported meeting 20 or more people in chat rooms. The related data on these items was considered exploratory and had good reliability (Cronbach's alpha = .68), but were not included as a major construct.

D. Multimedia Access Construct. Multimedia access has been linked to disparities in multimedia use (Kvasny, 2002). This construct is a combined measure of students' reported physical access to multimedia tools. Students reported their physical access to multimedia from a list of sixteen items such as mobile phones and computers. The mean and standard deviation for each of the items is shown in Table 4.7.

Students had remarkably high levels of access to multiple forms of multimedia. This is worth noting because urban students are often characterized as lacking availability to new entertainment/receptive and school/productive technologies. However, a majority of the students reported access not only to television and home phones, but recent technologies such as video game players (mean = .86) and digital video disc (DVD) player (mean = .78). A

majority of students had a mobile phone (mean = .73). School related/productive multimedia was highest for desktop computers (mean = .88) and computer printers (mean =. 75). Students also had access to digital cameras (mean = .49) and laptop computers (mean = .36).

Reliability of Multimedia Access Construct. The reliability and internal consistency of multimedia access was examined in two steps. First, a correlation matrix was compiled for all items on the original scale (See Table 4.8 Correlation of Students' Access to various Multimedia Access). An inspection of the matrix revealed that the items showed generally positive correlations, supporting the view that these items were measuring an underlying construct that applies to the domain of multimedia tools. The 16 items were summed together for the multimedia access construct. SPSS reliability procedures were conducted on these 16 items, yielding a Cronbach alpha coefficient with good reliability of .83.

E. Early Adoption of Multimedia Construct. Early adoption of multimedia activities determined by age of first use is shown in Table 4.9. Age four was the average age that students reported using a computer for the first time, confirming the view that they are part of a generation that has grown up with computers. Students were older, at an average age of eight, when they reported their first time for Internet use. As age increased, the types and levels of sophistication of Internet use also increased. For example, most of the respondents began to surf the Internet at age 8, advanced to email use at age 9, and began to use instant messaging at age 10. Further analyses using descriptive statistics showed a rather wide distribution. A few respondents (8%)

Table 4.7 Mean and S.D. for Students' Access to Various Multimedia

Multimedia Type	Mean	S.D.
Entertainment/Receptive		
Television	.90	.30
Sound system	.83	.38
Compact Disc (CD) player	.78	.41
Digital Video Disc (DVD) player	.78	.41
Digital Video Disc (DVD) Recorder	.25	.43
MP3 player	.26	.44
Video game player	.86	.35
Home phone	.86	.35
Mobile phone	.73	.45
School/Productive		
Desktop computer	.88	.33
Laptop computer	.36	.48
Digital camera	.49	.50
Printer	.75	.45
Personal Digital Assistant	.15	.36

Table 4.8 Correlation Matrix of Students' Access to Various Types of Multimedia

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Entertainment/ Receptive Technologies																
Television	1.00															
Sound system	.22*	1.00														
DVD player	.29**	.34**	1.00													
DVD Recorder	.06	.16	.08	1.00												
CD Recorder	.10	.31**	.20*	.48**	1.00											
Portable CD player	.36**	.39**	.34**	.17	.12	1.00										
Mp3 player	.01	.17	.09	.23*	.29**	.14	1.00									
Video game player	.25**	.36**	.28**	.03	.12	.28**	.12	1.00								
Home phone	.25**	.24**	.12	.03	.12	.28**	-.02	.22*	1.00							
Mobile phone	.29**	.16	.25**	.10	.16	.29**	.08	.26**	.26**	1.00						
School/Productive Technologies																
Desktop computer	.05	.10	.10	.10	.26**	.04	.11	.20*	.13	.10	1.00					
Laptop computer	.13	.02	.11	.12	.16	-.02	.11	-.03	.02	.19*	.07	1.00				
Scanner	.10	.28**	.19*	.30**	.27**	.15	.10	.19*	.10	.09	.25**	.13	1.00			
Printer	.32**	.29**	.33**	.25**	.41**	.24**	.13	.13	.24**	.23*	.47**	.16	.43**	1.00		
Digital camera	.10	.19*	.29**	.25**	.31**	.13	.28**	.09	.22*	.21*	.17	.11	.26**	.46**	1.00	
PDA	.06	.13	.12	.12	.12	.06	.08	.05	.05	.06	.02	.25**	.16	.40	.30**	1.00

Table 4.9 Mean and S.D. For Adoption of Students' Multimedia

Age of First Use	Mean	S. D.
Computer		.
School Computer	7.1	2.30
Home Computer	6.2	3.37
Internet	**Mean**	**S.D.**
Surfing the Internet	8.1	2.2
Email	9.5	2.23
Instant Messaging	10.3	2.34
Computer Software	**Mean**	**S.D.**
Software of Any Type	7.5	2.70
Word Processing	8.2	2.21

reported instant messaging as early as age 6. Respondents were considered "early adopters" because they engaged in multimedia activities earlier than would be expected in comparison to their peers. The seven items for the early adoption scale had good reliability (Cronbach's alpha = .80). The mean age for adoption of all multimedia activities was seven years old.

Reliability of Early Adoption Construct. The reliability and internal consistency of the multimedia confidence construct was examined in two steps. First, a correlation matrix was compiled for all items on the original scale (See Table 4.10 Correlation Matrix of Age of Adoption of Multimedia). An inspection of the matrix revealed that the items showed generally positive correlations,

supporting the view that these items were measuring an underlying construct that applies to the domain of multimedia tools.

The 7 items were added together for the age of adoption a construct "early adoption". SPSS reliability procedures were run on these 7 items, yielding a Cronbach alpha coefficient of .80, which is considered good reliability.

Table 4.10 Correlation Matrix of First Age of Adoption of Multimedia Tools

	1	2	3	4	5	6	7
Computer							
1 Home computer	1.00						
2 School computer	.24*	1.00					
Internet							
3 Suring the Internet	.53**	.36**	1.00				
4 Email	.34**	.19	.51**	1.00			
5 Instant messaging	.26*	.30**	.38**	.64**	1.00		
Computer software							
6 Software of any type	.37**	.43**	.58**	.33**	.25*	1.00	
7 Word processing	.44	.39	.29**	.27**	.30**	0.31**	1.00

Relationship of Major Constructs

Overall the major constructs that were examined showed strong reliability and indicated a range in students' experience of multimedia. The multiple forms of multimedia and the early age that students' engaged in multimedia was a surprising finding. These constructs also indicated the role of both family and school contexts for successful multimedia access and use. Students spent a significant amount of time engaged in multimedia for both entertainment and school purposes. These constructs proved to be significant factors for multimedia use and will be used in the next section to predict confidence level with multimedia.

Main Hypotheses

Hypothesis Testing (1-5): Correlations among Measures

To test the key hypothesis about the relationship between confidence level and social and environmental factors, several correlations were computed. Individual constructs and the final model were investigated to provide an understanding of the relationships and interactions that were present among the key variables.

A level of significance of $\alpha = .05$ was used as the minimum rejection level of all statistical analyses. The Statistical Package for the Social Sciences (SPSS) software version 11.0 was used in all of the statistical data analysis. Missing data on the subscales were treated as missing with no imputed values. Gender differences were examined for all main hypotheses. However, no significant gender differences were noted for any of the correlations.

A. Hypothesis one predicted that students who spent more time on multimedia activities had higher multimedia confidence levels. A correlation of .31 suggested a moderate relationship that was significant ($p < .01$). The scatterplot shows that many students spent between 0 and 6 hours and rated between 3 and 4.5 in their confidence level (See Figure 4.1).

An examination of the hours per week spent on school related multimedia activities and confidence with school multimedia indicated that there was no significant correlation between hours per week participants spent on school-related activities per week and multimedia confidence. Visual inspection of Figure 4.2 suggested a post-hoc hypothesis that a positive correlation exists among

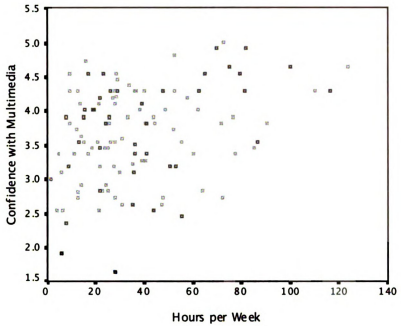

Figure 4.1 - Multimedia Confidence and Hours Per Week

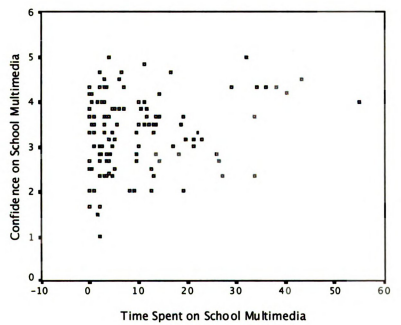

Figure 4.2 - Multimedia School Confidence and Time on School Multimedia

high level users. An analysis only of those who reported 10 or more hours per week showed a positive correlation of .22 between confidence levels and time spent on school related multimedia that was statistically significant ($p < .05$).

Also explored was the relationship between time spent on school multimedia and entertainment multimedia. A correlation of .52 indicated a positive relationship between time using these two types of multimedia that was significant ($p < .01$). This result is interesting because one might expect that time spent on one would take time away from the other. This correlation suggests that there are high frequency users and low frequency users of multimedia in general.

An additional correlation examined time spent socializing on the Internet and numbers of friends online. There was a moderate correlation at .32 that was statistically significant (p. < 05). In general students reported having 2 or more friends online and spending 0-2 hours socializing online (See Figure 4.4). This finding supports theories on social networks that propose that persons with more acquaintances online typically spend more time online.

B. Hypothesis two predicted that students with more social support from home and school would have higher confidence levels with multimedia. A correlation of .31 was positive in direction, but not statistically significant. Figure 4.5 displays the findings.

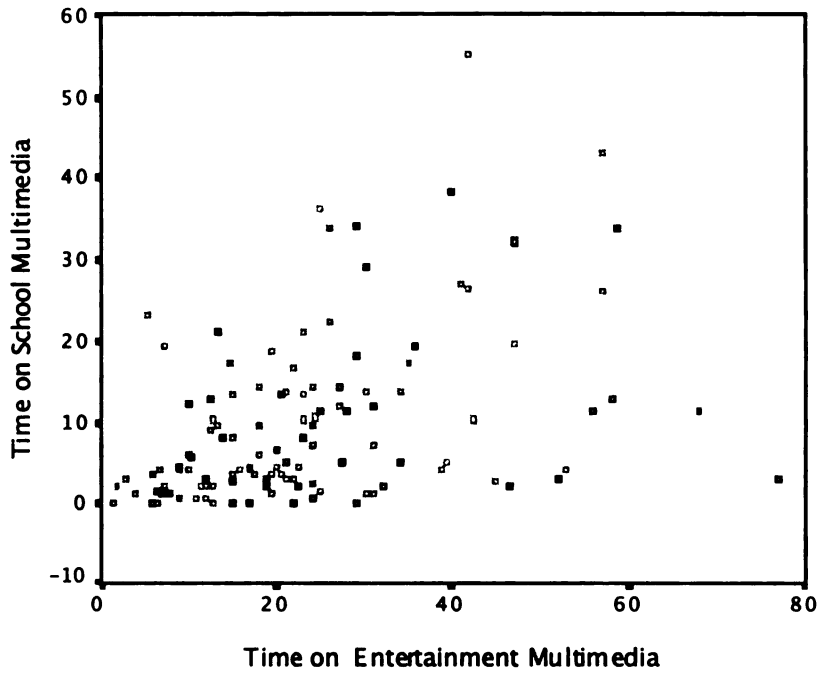

Figure 4.3 - Time on School and Time on Entertainment Multimedia

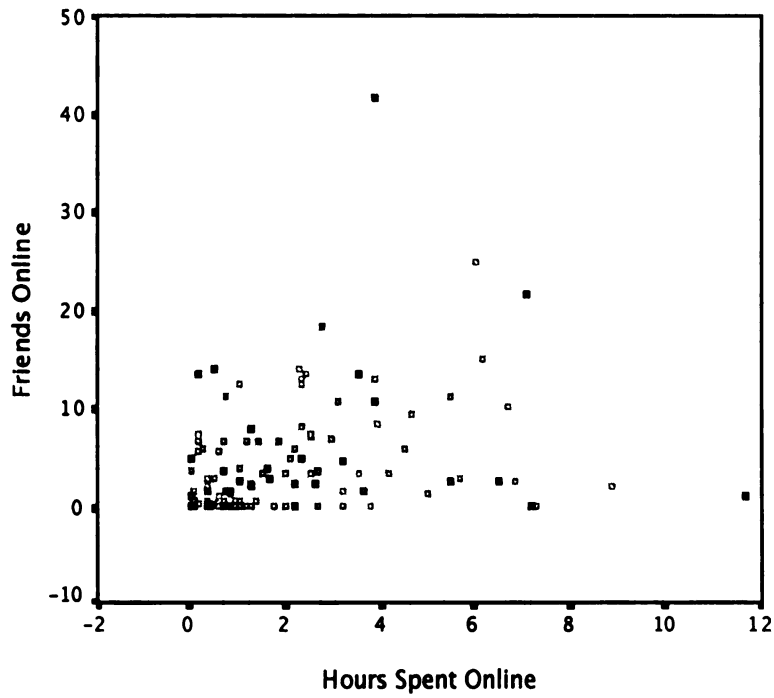

Figure 4.4 - Friends Online and Time Spent Online

Also explored was the relationship between school social support networks and confidence with school-related multimedia. A correlation of .15 suggested a small correlation that was not significant. Figure 4.6. displays a scatterplot of these findings.

C. Hypothesis three predicted that students who have more access to multimedia have higher confidence levels with multimedia. A correlation of .19 suggested a small correlation that was statistically significant ($p < .05$). A scatterplot displays the findings in Figure 4.7.

The relationship between multimedia access to school related multimedia and time spent on school related multimedia was explored (See Figure 4.8). Several students spend no hours on school multimedia, yet they have higher levels of multimedia access. Therefore, similar to access to all multimedia and confidence with school multimedia, there does not appear to be a positive correlation between access to school multimedia and time spent on school multimedia. A correlation of .05 indicates a small relationship that was not statistically significant.

D. *Hypothesis four* predicted that early adoption of multimedia results in higher confidence levels. A correlation of -.22 indicated a small negative correlation that was statistically significant at ($p < .03$). A scatterplot displays the findings in Figure 4.9.

An additional relationship explored was the relationship between school related technology programs and confidence. A correlation of .33 indicated a

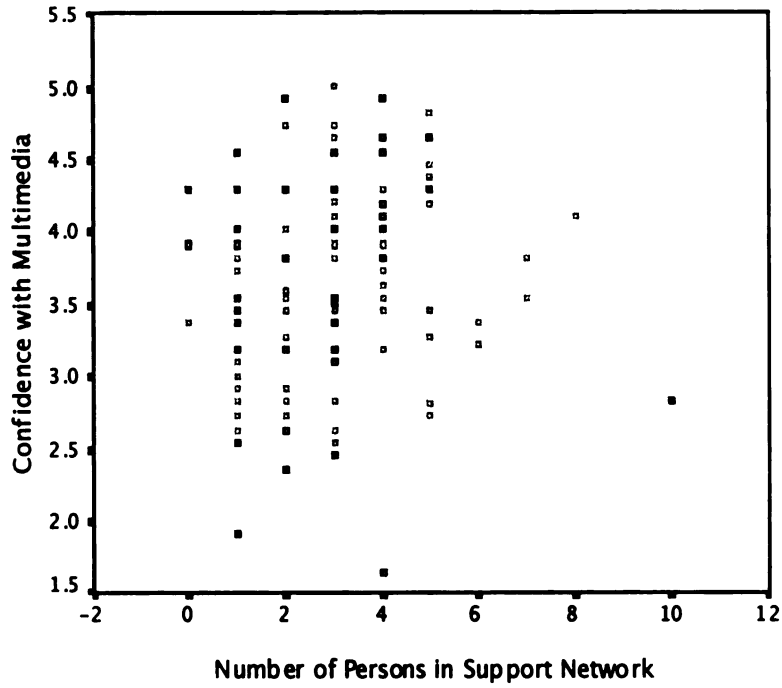

Figure 4.5 – Multimedia Confidence and Social Support Networks

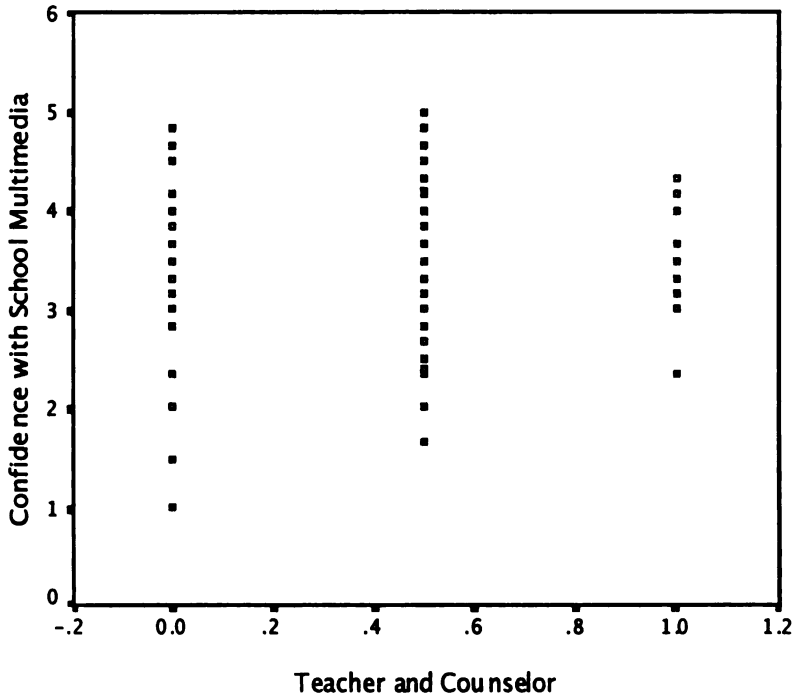

Figure 4.6 - School Multimedia Confidence and School Social Supports

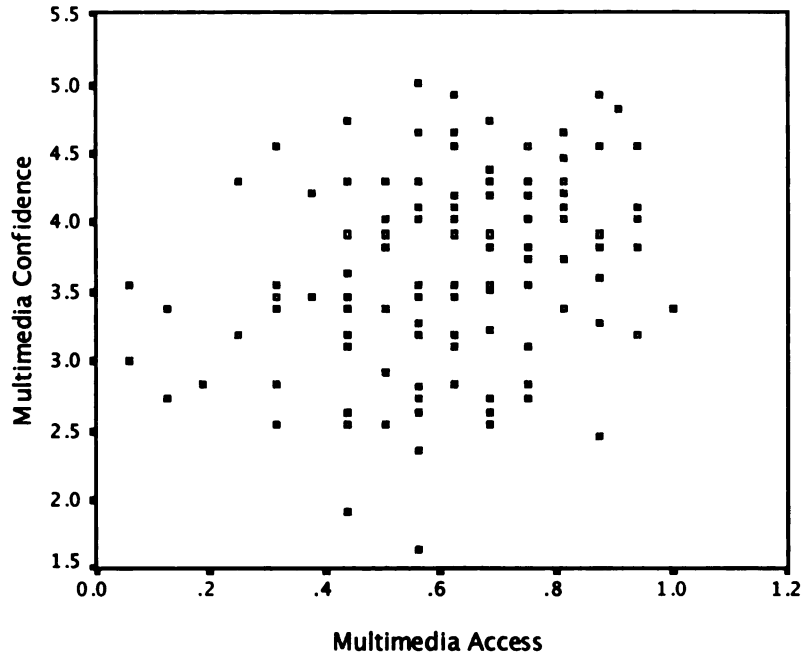

Figure 4.7 – Multimedia Confidence and Multimedia Access

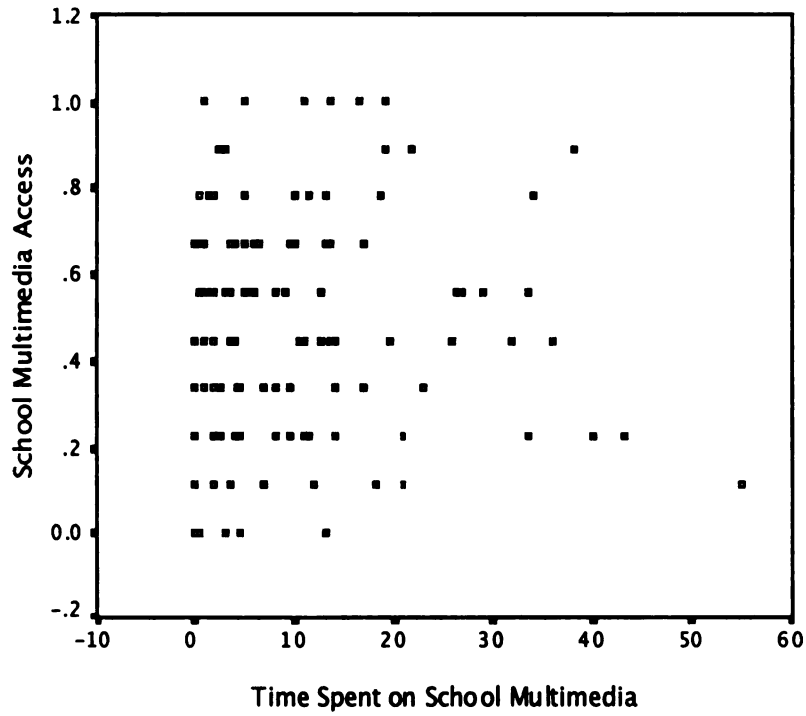

Figure 4.8 - School Multimedia Access and Time on School Multimedia

moderate correlation that was statistically significant at ($p < .01$). Figure 4.10 displays the findings.

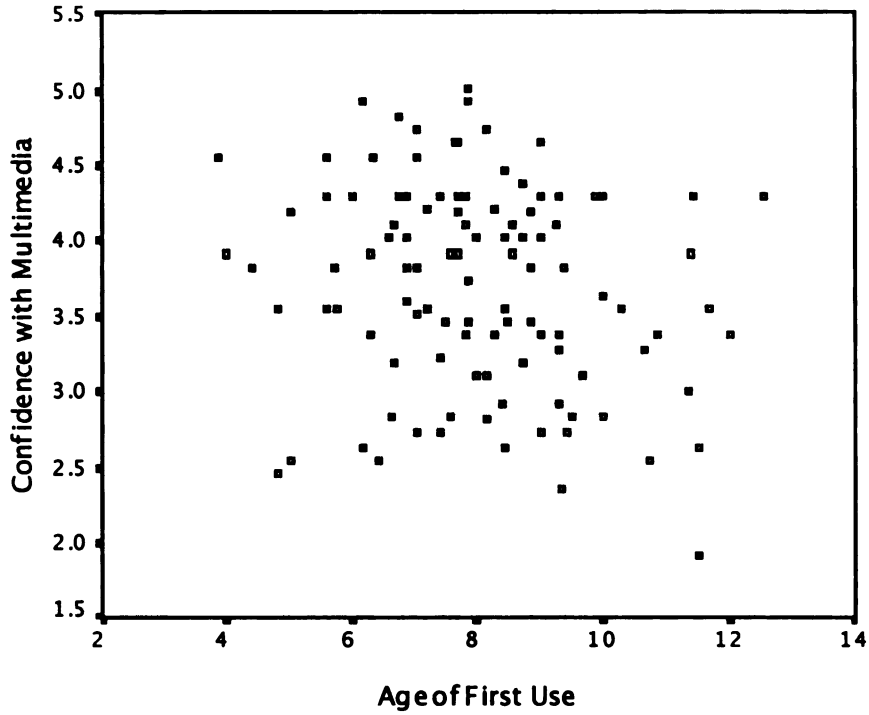

Figure 4.9 - Multimedia Confidence and Age of First Use

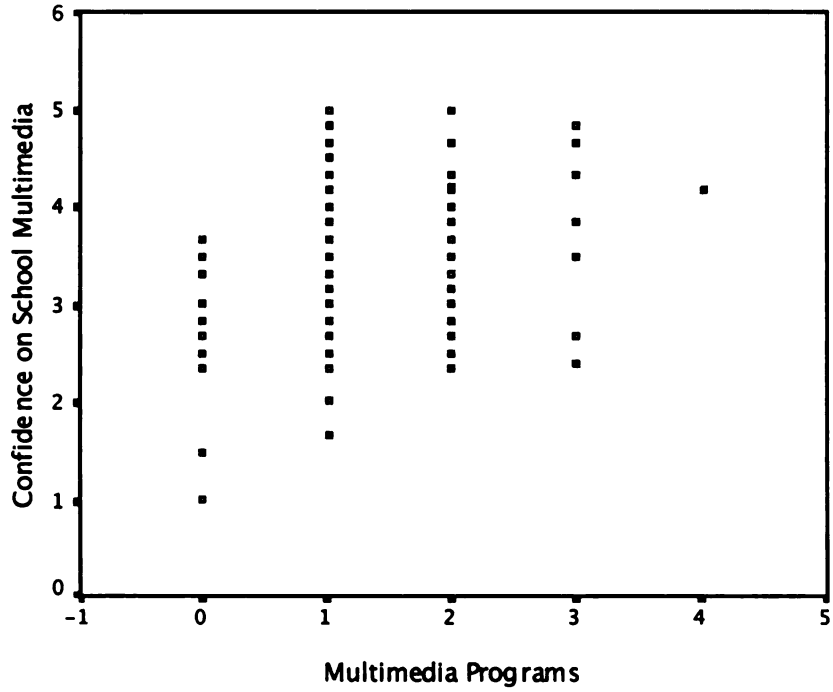

Figure 4.10 - School Multimedia Confidence and Multimedia Programs

Full Model: Confidence levels. A multiple regression model was tested which examined students' perceived confidence level with multimedia activities as predicted by multimedia access, early adoption of multimedia, time spent on multimedia activities, and social support networks. The full model was developed in two steps. First, a correlation matrix was computed for all constructs. An inspection of the matrix revealed that the constructs showed generally positive correlations (See Table 4.11 Correlation Matrix of Constructs). Next, a univariate multiple regression was computed using the four predictor variables from the major constructs and multimedia confidence as the dependent variable. Students that reported higher multimedia access, adopted multimedia at a later age relative to their peers, spent more time on multimedia activities and had a larger social support network, reported higher confidence with multimedia activities (R^2 =. 19, Beta = 3.2, F = 5.9, t=7.65, p< .01).

This multiple regression coefficient shows that the four constructs taken together provide a stronger prediction of confidence with multimedia than any single construct, supporting the importance of considering the many sources of influence on children's confidence. These findings will be discussed in the final chapter.

Table 4.11 Full Regression Model to Predict Multimedia Confidence

	B	*SE*	*β*	t
Predictor Variable				
Age of Multimedia Adoption	-.04	.04	-.11	-1.10
Physical Access to Multimedia*	.84	.34	.25	2.44
Time Spent on Multimedia Activities*	.01	.00	.24	2.63
Social Support Networks for Multimedia	.01	.04	.03	.34

*df=4, R^2= .19,F=5.88***

**Significance at p< .05, ***Significance at p<.001*

CHAPTER V

QUALITATIVE RESULTS

> "It is not a matter of starting from certain theoretical or methodological problems: it is a matter of starting from what we want to do, and then seeing which methods and theories will best help us achieve these ends " (Eagleton, 1996, p. 183).

Throughout the year, students participated in several major activities that required them to use hardware such as computers, video camcorders and, digital cameras, and software such as Apple imovie and Adobe Photoshop. Based upon their observations, students and teachers were asked to identify students who showed exceptional performance in using the multimedia tools. Given their recommendations, ten students were asked to participate in semi-structured group interviews. These ten students were referred to as the "local experts". Their interviews were the source for the qualitative data in this study.

The purpose of this qualitative data was to present a more complete picture of students' experience with multimedia by providing further insights into students' multimedia technology experiences than could be portrayed by only quantitative analyses. Their voices and ideas help elucidate the social and contextual factors that may have contributed to the "local expert's" development with multimedia technology.

The interview sessions were viewed not as traditional interviews, rather as a form of collaborative, interpretive practice, involving respondents and interviewer as "meaning-makers" rather than "ask, asker and tellers" (Segall, 1983). Because children were interviewed, it was important that the interviewer did not impose any views or bias on the students. The interviewer's goal was to

become "a listener and tolerator inside of children's society" (Bogdan & Biklen, 1992, p. 88).

From a preliminary analysis of the qualitative results, it was unclear how social and contextual factors such as early adoption of multimedia, time spent on multimedia activities or physical access contributed to students' confidence with multimedia technology. However, student responses demonstrated the link between social support networks from home and school with confidence with multimedia. For example, six students reported a family member as responsible for assisting them with multimedia technology activities and seven students cited teachers as introducing them to new software and hardware. These findings supported the quantitative data, which showed a positive relationship between multimedia confidence and social support networks. Students' use of school projects to master new concepts emerged as a finding in the qualitative data that was not apparent from the quantitative data. For example, five out of ten students reported using software to school projects.

Examples of Parental Influences

The following are excerpts from the interviews selected as examples of how students cite the influences of family in their use of multimedia. Pseudonyms are used for all examples.

Brandon, an eighth grader with a red Mohawk style haircut, domineering presence, and engaging manner, does not reflect the cultural profile of what many would consider the typical technology nerd. Nonetheless, teachers at the school relied on his expertise with multimedia technology to assist others and his

classmates with school and classroom-related multimedia projects. One of his classmates noted that, "Brandon can do most anything with software and hardware problems.... he is like an expert".

When Carrington, an energetic, extroverted seventh grader was asked about people responsible for his knowledge about computers, he responded with the following comment: "My mom works as a secretary and uses computers all the time at work. She is always bringing stuff home for me to work on. She is always showing me stuff in Word." He also asserted: "My dad is computer illiterate. He doesn't know anything about computers. But my mom use to take classes at a local community college and that's why she got DSL, so she could take her test and stuff without it cutting out with dial up. She surfs the Internet. She works all day on the computer. She takes some of her work home. She uses the computer a lot more than I do."

Quincy, adorned in baggy jeans and an oversized sweatshirt, was somewhat withdrawn and unapproachable during the early part of our conversation. He was known throughout the school as someone with strong multimedia ability and confidence. His friends referred to him as the "kid with mad skills" in web design. Similar to Carrington, he described a parent as influential for his multimedia technology ability. When asked about how he came to understand the principles of good web design, he not only cited a few of the principles of good web design, but added the following: "My step dad, he teaches at a community. He teaches web design. So it is kind of a necessity that I use computers. He {dad} uses a lot of Flash. And he collaborates with a lot of

different programs. He designed movies sometimes, new very complicated expensive programs. Really hard to learn, I've tried. He helps me and my sister all the time."

Robin an eighth grader with dark brown hair and bright eyes was soft spoken and had a gentle smile. Her responses were so quiet that it was often necessary to repeat the questions and to ask her to repeat her answers. The other students noted her artistic creativity with software such as Adobe Photoshop and Macromedia Dreamweaver. She credited her mother as a source of inspiration for creatively using computers. Robin stated: "She {mother} knows how to use it okay. She um, works for -----, which is an advertising agency, and they do certain stuff there. Make stuff for commercials and billboards." She continued: "Me and my mom were going to make a website that was just like selling T-shirts. We were just going to go to my dad's shop and make them. It was going to be like I ---.com. Just like make a bunch of I Heart T-shirts and saddle bags. We think that would be kinda cool."

Derrick was tall, with broad shoulders and wore his hair in braids. He was a seventh grader who was similar to Carrington in stature and size. He pointed to his mother with influencing his use of multimedia technology: "She {mother} doesn't use it that much, but I watch her do a few things on it. She emails people and things cause she has a lot of long distant friends cause she travels a lot to Europe and things. And she pays bills over the Internet. And she uses Quicken just to keep track of her checkbook and things. That is about all she uses it for." Derrick's discussion of his mother's use of email to communicate with friends

supported social network theories, which posit expanded social networks as an explanation for Internet use.

Examples of Sibling Influences

While the previous discussions linked students to parents in the home, the following respondents credited a brother or a sister for aiding in their multimedia use. For example, Lorne, grade seven, asserted: "Me and my brother were talking about how cool it was and then I got bored one day and after my friend came went home and my brother said okay let's figure out how to do this. So first we sat there for a couple of hours trying to figure out how to do it. Then we started figuring out a few things and thought, ok this is awesome. So, we were up all night just making animations."

Omandre, a seventh grader, indirectly credited his brother as influencing his multimedia use. He asserted: "He {his brother} always liked that. When he went into college, he had more of a business mindset and computer science. He always talked about computers to me." He followed up with: "I plan most likely to do computers, cause I'd like to start a couple, of if not at least one, business of my own. But even if I don't know that skill, it will always come in handy no matter what you do ...it is always business in trying to market whatever you do to the public. So, whether I do or don't go into that, computers, it will benefit me anyway because I can work with my brother."

Examples of Teacher Influences Via Projects

In addition to home influences, school influences were another major construct linked to students' multimedia use. Five out of the ten students

reported an experience with a project or with a teacher as instrumental in their multimedia use. The following were respondents' reflection of school influences.

Marcel, sixth grade, was somewhat soft spoken when he first began to talk about the nature of his use with multimedia. However, over time he began to open up more and to discuss his multimedia experiences. Marcel was the one student who clearly pointed to a school project as the impetus for sparking his interest. He asserted: "Last year I was working on a project...I learned how to do some Photoshop. Our final project was to make like a picture but you were suppose to add your own things to it. So since I like graffiti, I made like my own graffiti thing. I got images of bricks and layered it and made it one big page. I took graffiti from the Internet and posted it on and made it look to the point like it was actually graffiti on the wall. I used different type of filters from the program to make it look like that."

Similar to Marcel, both Dustin and Lorne mentioned their experiences with a school project. Marcel described: "Um, we just made a film because Ms. --- had us do it for a project. Okay, sounds cool. We get to do something funny. So we just decided that we wanted to make a Kung Fu movie. We just said, "What should we make? Then all of our cast dropped out so we just decided to take us two and make our own. And um, we end up entering it into the contest and we won second place. It was really cool." Lorne continued: " I learned it in Language Arts cause we had to use it for like presentations. We had to make a movie in 7th grade. And inside of Social Studies we had to do a report on a country with that. So we used it a lot. When I was in Art we had to use that to do

our cartoons. Cause we went into Photoshop, cause she took a picture of it and then we drew over the lines and colored it in and we made a cartoon and recorded our voices. It was fun."

While some focused their remarks on the projects, others like Helen (grade 7) and Pamela (grade 7) emphasized the influences of individual teachers. Helen mentioned her teachers: "Ms. ---, Ms. ---, and Ms. --- taught me how to use multimedia. 'Cause I had to take computers otherwise I wouldn't get my credit." She further commented: "Yeah, she let us do a lot on our laptops. Ms. ---- taught me how to do a lot and so did Ms. ----. And Ms. --- had us do a lot of projects on the computer. So did Ms. ---- she had us do us work on our math album was on our laptop."

Similar to Helen, Pamela also credited a teacher with introducing her to new multimedia. She shared: "Last year, I did stuff with Ms. ----. We made movies with Mac's. Um, well also, we had to do math albums; we had to do a lot of stuff. Like, I was in Ms. ----' class, and we had to do digital poetry where we had to take pictures off of the Internet. Inside Photoshop, we redrew them, so that we wouldn't be copying them."

Conclusion from Interviews

The interviews provided a deep, rich window on the contexts in which these middle school students acquired their multimedia skills. Their voices conveyed how it was not just any father, but a father who teaches web design. It was not just any mother, but a mother who uses Quicken. Research on home and school influences of multimedia needs to explore the depth of contextual

influences. Findings in this section support research on the importance of project-based learning in using multimedia. Based upon observations and informal discussions with teachers and students, many of the "local experts" were students who were marginal students academically. Comments from teachers were that these were students who excelled only in their multimedia use. Teachers would comment that a student was brilliant with multimedia, but is "a handful in class." This suggests the potential of multimedia in engaging some students who are otherwise disengaged in traditional school academic activities. Understanding how social support networks at home and at school work together to support students' use of multimedia is a complex interactive contextual process that is necessary to improve multimedia technology use among diverse student populations.

What was it for Helen when looking over her mother's shoulder when surfing the Internet that inspired her to use the Internet for more advanced uses? Was it Carrington's observation of his dad hooking up the DSL line? These qualitative findings have helped present some insight into the social and contextual factors that influence students' patterns of multimedia use. It is clear that understanding these complex sociocultural processes is worthy of further detailed qualitative and quantitative research.

CHAPTER VI

DISCUSSION AND CONCLUSIONS

Major Findings

In this chapter, the findings are discussed in relation to the proposed hypotheses. Next the implications are discussed. Finally, the future directions for research are proposed.

Multimedia Confidence and Social and Environmental Factors

Hypothesis One. The first hypothesis examined the relationship between how students spend their time on various multimedia activities and confidence levels. Results revealed a small correlation. Similarly, the time spent on entertainment construct and school-related multimedia construct showed a moderately correlation with confidence. The school-related multimedia and entertainment multimedia were not correlated.

The findings are important because they suggest that both entertainment and school related multimedia use were important in increasing students' multimedia confidence levels. Students who spent more time on entertainment related multimedia activities also spent more time on school related multimedia activities. These findings can perhaps support the recent work of scholars who are interested in entertainment video multimedia and its potential adaptation for learning in classrooms (Gee, 2002).

There have been concerns raised about the amount of time students spend on non-school activities. With the emergence of video games and online games, the study was designed to measure their impact on school-related

activities with multimedia. The results showed that time spent on entertainment activities and time spent on school activities were positively correlated. Students who spent considerable amounts of time on school related activities also spent similarly higher amounts on entertainment related multimedia. These findings support the work of researchers such as Mackey (2003) who examined the amount of time students spend on non-entertainment literacies and entertainment literacies, only to discover that the two were not positively correlated or related.

Hypothesis Two. Hypothesis two examined the relationship between social support networks and confidence levels. There was a small correlation between social support networks and multimedia confidence. Parents and teachers were cited the most often as influential for students' use of multimedia. The findings are interesting for several reasons. First the small relationship between the two constructs contradicts the literature, which discusses the positive relationship between computer and Internet use with social networks among. Secondly, the small correlations could represent differences in social networks for children versus adults. Adults are often part of large social networks that extend beyond their home to places such as their place of employment or place of worship. Young adults are part of social support networks that are often limited to home and school. Given the high percentage of respondents who reported parents and teachers as influential, it speaks to the fact that it is perhaps more important that they have a single individual at home or in school who encourages their interest with multimedia.

The qualitative findings offer further insight into this discussion. In the interviews students identified parents or teachers as important in shaping their experiences with multimedia. Additionally, students appeared to form these informal groups around multimedia inside and outside of school. They all knew each other and referred to each other as sort of "local experts". This finding did not come out in the quantitative findings. More importantly it supports research on the importance of peers for adolescents' social development. Also, it also provides evidence of how children are able to create their own communities of practice around multimedia and share ideas about the activities. Additionally, their interest in multimedia was the impetus for coming together around multimedia. Many of the students stated that their friendships did not exist beyond their activities with multimedia.

Hypothesis Three. Hypothesis three explored the relationship between early adoption of multimedia and confidence levels. Students' average age of early adoption was negatively correlated with confidence levels, which suggests that early adopters have higher confidence levels than late adopters. These findings support similar findings from Internet studies, which reports higher efficacy for more experienced users (Brancheau & Wetherbe, 1990). These findings clearly support the importance of early adoption of new technologies in order to increase confidence. Therefore, we must continue to find ways to provide for students to engage in multimedia as early as possible. These findings also are similar to a national study that examined the adoption patterns of children and adolescents (Brancheau & Wetherbe, 1990). Early adopters

increased confidence levels could be linked to their opportunities to gain important experience over a longer period of time.

Hypothesis Four. Hypothesis four examined the relationship between physical access to hardware and confidence levels. Overall physical access was abundant. This finding reflects the declining costs of physical hardware and the wide availability. Increased physical access showed no correlation with multimedia confidence. Additionally, the two sub-constructs related to school and entertainment showed no correlation. These findings are encouraging because they suggest that even if there are socioeconomic barriers that affect physical access, students can still have high confidence levels with multimedia, which may be essential for their future success.

Hypothesis Five. Hypothesis five examined the confined relationship between the four constructs time spent, early adoption, access and social support networks and confidence levels using a multiple regression model. The combined prediction (R=. 44) was moderately strong and shows the importance of studying multiple sources of influences.

The model has several implications for considering multimedia use in schools. First, the quantitative data and qualitative data make it clear that teachers are important for fostering positive uses of multimedia beyond entertainment. Therefore, more research is needed to explore the specific ways in which teachers impact various uses of multimedia. Secondly, project-based learning appears to be one way that teachers' can engage students with multimedia in the classroom. Further research is needed to design methods to

make problem based learning more effective in introducing students to productive uses of multimedia.

Thirdly, there have been ongoing discussions over the digital divide as it relates to physical access to hardware and the Internet. However, this study supports the need to look beyond physical access and focus efforts on focusing on patterns of use such as early adoption. Early adoption of new multimedia provides users more time to learn complex uses. Therefore, we need to develop programs and to promote policies that provide opportunities for early adoption of multimedia tools.

Future Research

This study narrowly defined high end users as students who were using the multimedia tools most closely related to school technologies—computers and activities such as spreadsheets, publishing, and other software. Scholars such as Gee (2003) have examined the uses of video games and literacy and critical thinking. In the future, scholars should build upon a growing body of research that looks at literacy practices, informal learning spaces and multimedia activities. Also, rather than looking at four broad constructs, perhaps a more defined examination of a single construct will provide greater depth of understanding how one contextual factor impacts patterns of multimedia confidence. For example, exploring the only the relationship between early adoption and multimedia confidence could yield interesting information on variations in patterns of use.

Additionally, the qualitative interviews provided some evidence to support the quantitative findings. However, a longer ethnographic study could provide

even more insight into the lives of students' multimedia patters. An interesting study would be to follow the local experts for a long period of time and collect field notes on their experiences with multimedia across multiple contexts in home school and other places.

Conclusions

Recently, after attending a sporting event within the community of the study, I began to reflect on the social dynamics of the sporting event and its relationship to the context in which it was played. In attendance at the event were large numbers of parents, both mothers and fathers. The children enthusiastically engaged in the sporting event as both participants and observers. The motivation to succeed was apparent in the enthusiasm that was expressed physically by the children and verbally by the parents. I asked one of the children how often they practiced. He responded "four times a week, two hours a day, and twice a day during first month of the season in the summer". I thought, "That is some dedication!"

I began to reflect and imagine a different scenario in which each day, children within this urban community began attending multimedia workshops for two hours a day, and four days a week where they practiced individual skills and worked collaboratively toward a single goal of understanding complex uses of multimedia. They were involved in a sort of apprenticeship that introduced multimedia to using multimedia in school and home. At the end of each week, parents, siblings and friends of parents attended a showcasing of students products.

This scenario is linked closely to what I sought to discover within the dissertation. How do environmental factors influence children uses of multimedia? Which activities do children choose to embrace while ignoring others? Who within this community might share the same enthusiasm for developing expertise with sophisticated multimedia? How can we use that understanding to help others with move in that direction? These are questions I wish to pursue in future research to enhance our knowledge of multimedia technology among diverse students and inform future educational policy and practice.

APPENDICES

Appendix A

Parent Consent Form

The purpose of this study is to explore the multimedia activities of middle school students and understand how those related to educational competencies. I am interested in understanding how student's use of various multimedia activities can influence their education.

Your signature on this form indicates that you have agreed to allow your child to participate in a 20 minute survey and if selected a 20 minute interview. This process will be done during school hours. This form outlines your child rights as a participant.

Participation includes the following:

- Your child will be voluntarily participating in a doctoral dissertation research project that will explore their multimedia activities.

- You or your child can withdraw participation from this survey or interview at any time. Your child can refuse to answer a question. If your child withdraws during the survey or interview, their survey or audiotape will be destroyed.

- You or your child can ask questions of the surveyor or interviewer at any time during the process.

- Your child's identity will be confidential. Pseudonyms (made up names) will be used in all written papers in order to protect individual identification.

- You know that the interviews will be audiotaped. All tapes will be destroyed or erased after the transcription is complete. The researcher will retain the transcript of the audiotape and will delete any reference, which may identify your child as an individual. If you would prefer for your child not to be audiotaped, the interviewer will take written notes during the interview.

- You consent to the publication parts of the transcript and accept that any information will be anonymous in order to prevent any identification.

If you have questions or concerns regarding the study you may contact the investigator Dr. Patrick Dickson, phone: (517) 355-4737, 509E Erickson Hall E. Lansing, MI 48823, email: pdickson@msu.edu. You may also contact the researcher, Ted Hall, phone: (517) 355-6041, 1211 H University Village, E. Lansing, MI 48823, email: halldarr@msu.edu.

If you have any questions or concerns regarding your rights as a parent, or are dissatisfied at any time with any aspect of the study, you may contact, anonymously, if you wish, Dr.Ashir Kumar, Ph.D., Chair, University Committee on Research Involving Human Subjects, by phone (517) 355-2180, email: ucrihs@msu.edu, or regular mail: 202 Olds Hall, East Lansing, MI 48824

Please check the following:

__You voluntarily agree to participate in this study.
__You agree to be audiotaped

Signature of
Parent or Guardian_____Date_____

Signature of Interviewer_____Date_____

Appendix B

Student Consent Form

The purpose of this study is to examine the multimedia activities of middle school students. I want to understand whether students' multimedia activities have any relevance to education.

Your signature on this form indicates that you have agreed to participate in a 20 minute survey and if selected a 20 minute interview. This process will be done during school hours in coordination. This form outlines your rights as an interview participant.

Participation includes the following:

- You will be voluntarily participating in a doctoral dissertation research project that will explore your multimedia activities.

- You can withdraw participation from the survey or interview at any time. You can refuse to answer any question. If you withdraw during the survey or interview, your survey or audiotape will be destroyed.

- You can ask questions of the interviewer at any time during the process.

- Your identity will be confidential. Pseudonyms (made up names) will be used in all written papers in order to protect individual identification.

- You know that the interviews will be audio taped. All tapes will be destroyed or erased after the transcription is complete. The researcher will retain the transcript of the audiotape and will delete any reference, which may identify you as an individual. If you would prefer not to be audio taped, the interviewer will take written notes during the interview.

- You consent to the publication of parts of the transcript and accept that any information will be anonymous in order to prevent any identification.

If you have questions or concerns regarding the study you may contact the lead investigator, Dr. Patrick Dickson, phone: (517) 355-4737, 509E Erickson Hall E. Lansing, MI 48823, email: pdickson@msu.edu. You may also contact the lead researcher, Ted Hall, phone: (517) 355-6041, 1211 H University Village, E. Lansing, MI 48823, email: halldarr@msu.edu.

If you have any questions or concerns regarding your rights as a study participant, or are dissatisfied at any time with any aspect of the study, you may contact, anonymously, if you wish, Dr. Ashir Kumar, Ph.D., Chair, University

Committee on Research Involving Human Subjects, by phone (517) 355-2180, email: ucrihs@msu.edu, or regular mail: 202 Olds Hall, East Lansing, MI 48824.

Please check the following:

__You voluntarily agree to participate in this study.
__You agree to be audio taped.

Signature of
Participant_____Date_____

Signature of Interviewer_____Date_____

Appendix C

Survey on Multimedia Technology

Section A: Accessing Technology **Case #**

Basic information about how, when, and where you access technology is the cornerstone of this survey. The purpose of this survey is to examine various uses of multimedia by middle school students.

Gender: O 1. Male O 2. Female

1. Do you have your own computer or computers at home?
(Mark all that apply)
O 1. Yes, desktop O 2. Yes, laptop O 3. No

2. Try to Remember: How old you were the first time you used the following multimedia? *(Just make your best guess as to the age. If you really have no idea, just put a question mark. If you've never used it, put '0'.)*

Your:
( ) 1. Age when you first used word processing on a computer
(Word, PowerPoint.)
( ) 2. Age when you first used electronic mail
( ) 3. Age when you first used the Web
( ) 4. Age when you or your family had a computer at home
( ) 5. Age when you first used a computer in school.
( ) 6. Age when you first used instant messaging
( ) 7. Age when you first used software

3. Who has supported your use of multimedia? (Mark all that apply)
O 1. Father O 2. Mother O 3. Grandfather
O 4. Grandmother O 5. Mentor O 6. Teacher
O 7. Youth Counselor O 8. School Counselor
O 9. Friend O 10. Other, please indicate_____

4. Where was the first place you became involved in working with computers?

O 1. Home O 2. School O 3. Community Center

O 4. Friend's house O 5. Relative's house

O 6. Religious center O 7. Other_____

5. Where do you most often use a computer?

O 1. Home O 2. School O 3. Community center

O 4. Friend's house O 5. Relative's house O 6. Religious center

6. Other, indicate_____

6. Have you ever been involved in any of the following programs with technology?

O 1. After school program O 2. School program

O 3. Community program O 4. Technology camp

O 5. Other, please indicate_____

7. Which of these describes the kind of access you have to the Internet from home:

O 1. Dial-in modem

O 2. Cable modem

O 3. DSL

O 4. Do not know

8. Please mark all the following that you have easy access outside of school:

('Easy access' means you can use it pretty much whenever you choose.)

O A. Desktop computer

O B. Laptop computer

O C.CD recorder ("burner") with computer

O D. DVD recorder ("burner") with computer

O E. Printer

O F. Scanner

O G. Digital camera

- O H. Cell phone
- O I. Regular Phone
- O J. PDA (personal digital assistant such as a Palm)
- O K. TV
- O L. Sound system (speakers, CD player, etc.)
- O M. Portable CD player
- O N. DVD player
- O O. MP3 player
- O P. Video game player (Playstation, Xbox, or Nintendo)

Section B: How You Spend Your Time

In this section, I am interested in how you spend your time. I will use this information to build a better understanding of how different activities are influenced by the use of technology.

9. In the last 7 days, how many hours per week did you spend time doing the following activities? Please circle the closest answer.

Activity	Hours Per Week
a. Watching Television	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12
b. Talking on home phone	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12
c. Talking on cell phone	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12
d. Using cell phone to send text messages	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more
d. Playing video games (Playstation, Xbox, etc.)	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more
e. Using instant messaging or chat (Yahoo, Aol)	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more
f. Using the Internet to play games	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more
g. Using your computer to play video games	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more
h. Sending Emails	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more
i. Receiving Emails	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more
j. Using the Internet for school related work	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more
k. Using instant messaging for school related work	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more

l. Using the Internet for school related work	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more
m. Using the Internet to read an article	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more
n. Using the Internet to post a comment on a website	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more
o. Using the computer to write a paper	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more
p. Using educational software (i.e. math blaster, Oregon Trail)	0 1/2 1 2 3 4 5 6 7 8 9 10 11 12 more

Section C: Confidence on Multimedia Tasks

Please place a check under the column that best indicates the extent to which you agree with each of the following statements.

10. To what extent do you agree or disagree with the following statements? Please circle the number between 1 and 5 best indicates your level of agreement with each statement

	Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree
a.I am very skilled at using computers.					
b.I do not know much about using computers.					
c. I am confident using the Internet to look up information.					
d. I am confident using the Internet to do homework.					
e. I am confident publishing to the Internet.					
f. I am confident using PowerPoint.					
g. I am confident creating a spreadsheet.					
h. I am confident creating a concept map.					
i.I am confident creating video editing software.					
j. I am confident instant messaging.					
k. I am confident downloading music					

and burn cd's.					

11. How many people have you met online that you did not know before _____ if no one, please skip to question 13, If yes, go to question 12.

12. Of those people you first met online, how many would you consider friends? _____

13. How many of your friends from school do you instant message? _____

14. With how many of your friends do you share videos, music, or video
15. games? ____

Appendix D

Qualitative Interview Protocol

Hello, My name is Darryl Hall. I am a graduate student at Michigan State University. I am interested in learning more about your experiences with multimedia. The reason I am examining multimedia activities is to understand how students use it and to see whether they use it for educational purposes. I am going to ask you some questions to get a more complete story of your experiences with multimedia activities. Do you have any questions?

As a researcher, I have a responsibility to keep whatever you tell me confidential. Confidential means that your name will not appear on any transcript-I will code this meeting as a number only. I have an obligation to destroy all tape recordings after transcribing them. At anytime you may choose not to answer any question.

Again, do you have any questions before we begin?

1. Can you tell me a story about the first time you used a computer?

   1a. How old were you then, tell me a little more about that experience?

2. What activities do you and your friends like to do most with computers?

   2a. Who started those activities, you, a friend, or family member?

   2b. What about educational activities with multimedia?

3. When you think about computer activities such as, im chat, email, search engines, and software, do you see any value in their use for educational purposes?

3a. Why do you see it that way?

4. Why do you think some students use computers more than others?

5. Do you believe in the importance of using computers for school related work?

6. Have computers helped you become a better student? If so, how?

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