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# Exploring the Digital Gap between Parents and Their Adolescent Children

by

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A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Doctor of Education

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## DEDICATION

This is dedicated, with love,
to my Grandmother, Borgny Lauman,
to my Grandfather, Alphie Croteau,
and to my Daughter, Madeline Heather Lauman

*To the wisdom of the past and the dreams of the future*

## ABSTRACT

The purpose of this study is to contribute to the limited body of research which describes the manner in which youth of junior high age utilize their home computers, in addition to gleaning insight into the role of parents as their adolescent children use the home computer.

This study was conducted using paradigms from both the quantitative and qualitative traditions. Patton (1975, 1978, 1982) promoted the idea that the combination of these two, once opposing, camps could provide for a thorough investigation of various topics. From a quantitative standpoint, surveys were utilized to gather data regarding the specific activities junior high students engage in when using the computer at home. Surveys of a similar nature were administered to parents of these same children, and were then matched to determine any discrepancies that might exist between what students say they are doing in contrast to what their parents believe they are doing. This would then provide some insight into what Papert (1996) called "the digital gap." From a qualitative standpoint, focus groups were conducted with parents to share information from the surveys, as well as to get a better understanding of what they think they needed in order to feel more comfortable in how their children utilize the home computer. A brief training session was provided to parents based on this feedback.

A conceptual framework, based largely on the works of Dewey (1899, 1938) and Papert (1993a, 1993b, 1996) provides the theoretical foundation for this study.

Although some differences were found between the matched parent and child surveys, there was agreement on a significant number of items. Important points arising from the results of this study can be found in the conclusions. However, the two most

poignant issues that emerged from the data were that: a) steps must be taken to help children fully understand the consequences of divulging personal information online, and b) efforts must be made to place the computer in a more visible area within the home.

Recommendations for further study were generated from the findings of the surveys and focus groups.

## ACKNOWLEDGEMENTS

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I owe a sincere debt of gratitude to my advisor throughout my Doctoral studies, Dr. Norma Nocente. Her expertise and constructive feedback throughout the seemingly endless revisions have made this dissertation, and the entire research project, a work to be proud of.

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Without the participation of the parents and students involved in this study, this work would not have been possible. Parents who participated in the focus groups provided excellent insight into issues that could not have been brought to light through the surveys alone.

I have had the opportunity to work with tremendously gifted teachers and administrators at Parkview School and Ottewell School, many of whom have become good friends. Their support and encouragement will not be forgotten.

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# CHAPTER ONE

## INTRODUCTION

> Across the world there is a passionate love affair between children and computers. I have worked with children and computers in Africa and Asia and America, in cities, in suburbs, on farms and in jungles. I have worked with poor children and rich children; with children of bookish parents and with children from illiterate families. But these differences don't seem to matter. Everywhere, with very few exceptions, I see the same gleam in their eyes, the same desire to appropriate this thing. And more than wanting it, they seem to know that in a deep way it already belongs to them. They know they can master it more easily and more naturally than their parents. They know they are the computer generation. (Papert, 1996, p.1)

In what ways are junior high students using their home computers, and what role do parents/guardians play in this regard?

The proliferation of computers in education has been well documented (see Gregoire et al., 1996; Kulik, J., 1985; and the U.S. Department of Education, 1996, for examples). These studies have been undertaken from a diversity of standpoints describing the effectiveness of computers in education, and just as many conclusions have been postulated regarding the influence of computers on learning, problem solving, and achievement, as well as on other aspects of schooling.

NETbytes (1999) reported on a study conducted by YTV (Youth Television Network). YTV randomly surveyed 610 tween (pre-adolescent) Canadian households and found that there was a computer in seven out of ten homes and that of this 71%, 52% had

access to the Internet within the home. Average income did not appear to influence the presence of a computer in the home according to this study, as over half of the participants in the study were in households earning less than $40,000 per year.

In addition to the rising number of computers in the home, the number of computers found in classrooms has also been rising at a rapid rate. Recently, it was determined that Canada was the first country to have 100% of schools with access to the Internet (even if it is only one computer in a particular school with access) (Redhead, 2000). The prevalence of computers in homes and schools of Canadian youth presents a number of challenges for both parents and educators in addressing the issues that accompany this relatively new and rapidly evolving phenomenon.

Although the role of parents in early literacy acquisition by children has been explored in-depth (Bruner, 1986; Halliday, 1975; Harste et al., 1984; Holdaway, 1979), this does not appear to hold true for the parent role in ensuring appropriate use of the computer as a tool for learning at home, in addition to the more leisurely activities computers may have to offer. This may be attributed to a variety of factors, including but not limited to lack of knowledge, lack of time for supervision, and lack of interest. The advent of the Internet has given even greater cause for parents to take on a more active role in the home to ensure appropriate guidelines are in place for children who use a computer at home. A clear example of the importance of this is based on a particular experience of this author, which provides a focal point for the purpose of this study.

Anna (a pseudonym), a highly computer literate student of the author, enjoyed using the computer at home for a variety of purposes. As an honours student, she often used the computer to assist her with her homework, in addition to using it for other

purposes. In this case, the placement of the computer in the home had a direct impact on the types of activities Anna became involved in. Because the computer was in the den of the house, it did not take Anna long to find herself involved in synchronous (simultaneous) chats with people who were initially strangers, but soon became friends. Although her parents were somewhat aware of the activities Anna was getting involved in, it was difficult for them to adequately monitor the manner in which she utilized the computer. Anna's parents had little knowledge of the types of conversations and exchange of materials that were taking place with Anna's so-called friends, until she made the mistake of giving her real name, address, and phone number to someone she believed to be a boy similar to her in age. While her parents were at work one day, she decided to tell them that she felt ill and that she wanted to stay home from school. In reality, she was planning to meet with the friend she had met on the chat line, who turned out to be a much older male pedophile.

The details of what took place that day are unmentionable; the scars that will remain with Anna as result of that day may never heal. What is important is what can be learned from this true scenario. Our obligation as parents and teachers to monitor and educate our children regarding safe computer and Internet use has become critically important as reports of similar incidents continue to appear in the media, clarifying the importance of this study.

## Purpose/Significance of the Study

Although numerous studies have been conducted that examine the use of computers by children, very little research is available concerning the role of parents/guardians in children's use of the home computer. Of particular importance is the

role of the parent pertaining to appropriate supervision and to the education of both the parent and the child in the use of the computer within the home. This study is significant because not only will it reveal pertinent information about how students utilize the computer and the Internet in the home, but it is also intended to emphasize the importance of the parent/guardian role as children utilize the home computer. This study is also intended to help parents increase their level of awareness of how their children use the computer at home. Issues such as "productive" use of the computer and child safety will be addressed.

It is hoped that the results of the study will be used to help parents understand their role in how the home computer is used by children. Parent focus groups were held at the conclusion of the study in order to gather information of this nature. In addition, the results of this study will be used to assist other educators, technology coordinators and school administrators in their endeavours to help parents in their communities with issues addressed in this research.

## Research Hypotheses, Questions, Objectives

The research hypotheses, questions, objectives, and purposes for this study arose primarily out of the curiosity of the author and my experiences with my students and their parents. In addition to personal experience, previous studies identified in the literature review have demonstrated gaps between what parents think their children are using the home computer for, and what these same children state they are actually doing when using the computer in the home (Media Awareness Network, 2000c, 2001a, 2001b). As mentioned previously, the research related specifically to the issues described seems

sparse at best; however, the literature review that follows does provide some foundation to support and provide background to the questions being pursued.

There are three major research questions to be answered in this study, followed by several related sub-questions:

1. In what ways are junior high students using their home computers?
    a) What specific activities are students engaging in when they use their home computer?
    b) What percentage of these activities is related to academic interests, as opposed to more recreational pursuits?
    c) Are there gender differences in the ways in which children use their home computer?
    d) In what ways do students use the Internet?
    e) Do students use the Internet safely?
2. How do parental perceptions compare to what their children claim to be doing when using the home computer?
3. What do parents/guardians need in order to help their children utilize the computer in a more appropriate, safe manner?
    a) How do parents/guardians perceive their own level of computer literacy/knowledge?
    b) How much control/supervision/guidance do parents/guardians provide regarding the use of the home computer?
    c) What do parents/guardians think it means to provide supervision, control and/or guidance when children are using the home computer?

Based on the author's experience, it is suggested that although some students may utilize their computers for what might be deemed as "productive" purposes, most students use their computers primarily for more "recreational" activities. For the purposes of this study, productive activities may be considered to be those which contribute to academic pursuits, whereas recreational activities may be considered to be those where a student participates for purposes of enjoyment (although both may contribute to learning and the acquisition of skills and knowledge). It is proposed that although some parents/guardians may play a certain role in the use of the home computer, many do not have the time, awareness, or knowledge level to ensure that their child is using the home computer in a safe, appropriate manner.

The purpose of this research project, then, is to shed some light on the aforementioned issues, with a view to helping parents/guardians understand how they can play an increased role in how the home computer is used, as well as to help students become more informed as to the importance of safe, appropriate use of the computer. Although this research will examine computer use in general terms, a more focussed approach is taken pertaining to student use of the Internet, primarily because it has become such a pervasive part of children's lives. In addition, it is hoped that the results of this study will assist other teachers, technology coordinators and school administrators in implementing programs that may contribute to this end.

## Conceptual Framework

This work takes its roots from a variety of disciplines and experiences of the author. As indicated previously, it was an experience with a particular student that

inspired this particular work, however, previous experiences with children, parents, teachers, and technology have also contributed to its development.

From a research standpoint, the contributions of writers, educators, philosophers, and social critics, among others, have also provided a frame of reference, allowing those less familiar with the topic of this research to be able to understand the importance of this work from a broader, perhaps more important, perspective.

Of particular importance to this research is the well known influence of educational philosopher John Dewey (1859-1952). Dewey believed that curriculum built around the needs and interests of children would make a significant contribution to the improvement of society as a whole. This notion was in opposition to the idea that curriculum should be dictated and delivered by those who believed they knew what children needed, without the input of children themselves. Writers such as Thorndike (1913) and Bobbit (1918) espoused this view as part of the "efficiency movement", believing that society could best be improved through measured, economically and scientifically driven ideals. In contrast, Dewey's work (1899) was part of the "progressive movement", which sought to address changes in industrial society by incorporating the notion of the experience of occupational work into education. The computer has become commonplace in today's work force. As a result, we now find ourselves having to educate children in such a manner that they are prepared for the work force when they are ready to enter it.

By having children actively involved in the learning process, they would get a much better sense of participating in the democracy of community life. By understanding

the scientific and historical background of occupational endeavours, the child would be in a much better position to effect change within the larger society in later life:

> The world in which most of us live is a world in which everyone has a calling and occupation, something to do. Some are managers and others are subordinates. But the great thing for one as for the other is that each shall have had the education which enables him to see within his daily work all there is in it of large and human significance…At present, the impulses which lie at the basis of the industrial system are either practically neglected or positively distorted during the school period. Until the instincts of construction and production are systematically laid hold of in the years of childhood and youth, until they are trained in social directions, enriched by historical interpretation, controlled and illuminated by scientific methods, we certainly are in no position even to locate the source of economic evils, much less deal with them effectively. (Dewey, 1899, p. 22)

Because of the changes that were occurring in society, Dewey (1899) saw education as a vehicle for contributing to improvements as society evolved, in some cases, rather quickly:

> When the school introduces and trains each child of society into membership within such a little community, saturating him with the spirit of service, and providing him with the instruments of effective self-direction, we shall have the deepest and best guaranty of a larger society which is worthy, lovely, and harmonious. (p. 28)

With the technological changes that have been wrought upon society so quickly in the recent past, Dewey's theories regarding the education of the child could not be more relevant. Our mandate as educators and parents in preparing children for the consequences of this technological revolution has not really changed since Dewey began writing over a century ago.

Dewey (1938) espoused the view that the child's experiences must be taken into account when developing and implementing curriculum:

> ...every experience affects for better or worse the attitudes which help decide the quality of further experiences, by setting up certain preference and aversion, and making it easier or hard to act for this or that end. Moreover, every experience influences in some degree the objective conditions under which further experiences are had. (p. 37)

As children are becoming increasingly more adept at using new technologies, often surpassing the abilities of their parents and teachers, it has become critically important that we utilize the child's experiences in order for continued learning growth to occur not only within the child, but also within the lives of the child's peers, parents, and teachers. It is when we allow ourselves to learn from the experiences of children, especially where technology is concerned, that we may become better teachers and parents. From a more recent, technological perspective, Papert (1993a, 1993b, 1996) supports this view, emphasizing the power in the potential that children have, particularly where computers are concerned. He encouraged parents to use the technological fluency of their children to strengthen the family culture:

> As a mature adult you will be able to bring something to the learning table whatever the ages of your children. But they will eventually learn faster than you and know more than you do about some aspects of whatever you are doing together. What is important is to use the kids as a resource and to remember that they will be there to help if you just learn to let them – which does not mean you won't also be helping them. (p. 14)

In addition to the parent playing a significant role in the shaping of a child's educational environment, Dewey (1938) also believed that the educator had a role in providing an environment conducive to learning by drawing on children's experiences in his discussions of the "Criteria of Experience":

> A primary responsibility of educators is that they not only be aware of the general principle of the shaping of actual experience by environing conditions, but that they also recognize what concrete surroundings are conducive to having experiences that lead to growth. Above all, they should know how to utilize the surroundings, physical and social, that exist so as to extract from them all that they have to contribute to building up experiences that are worthwhile. (p. 40)

As indicated by Dewey (1938), both the child's physical and social environment can and should be utilized in the planning and implementation of curriculum. The changing types of relationships children are developing in their online experiences certainly have an effect on their development. Understanding the nature of these relationships is prudent for teachers and parents, however, it may be difficult to acquire a basic understanding unless one is familiar with the technology and the manner in which it is used by children. Having children share these types of online experiences with their parents, teachers, and

peers may offer some insight into the nature of their environments, and the ways in which children construct and negotiate relationships within this relatively new space. The fact that children often spend time alone online, with a computer in the bedroom or basement, makes it increasingly important to understand not only the social, but also the physical space where such activities take place. To do so in a positive manner, Papert (1996) suggested that children's enthusiasm for computers be embraced and seen as a way of enhancing family relationships:

> ...parents should recognize the need to build new kinds of relationships with their children and should see the computer as a vehicle for building, rather than as an obstacle to, family cohesion. Parents should spend less time worrying about what their kids are doing or not doing with computers and more time trying to find common interests or projects to do together. (p. 79)

Social control was identified by Dewey (1938) as a significant problem in education; this "problem" could also be extended to the family. Dewey described the antithesis of social control as freedom. He stated that

> [t]he only freedom that is of enduring importance is freedom of intelligence, that is to say, freedom of observation and of judgement exercised in behalf of purposes that are intrinsically worth while. (p.61)

Dewey's notion of freedom is particularly important when teaching students such as the target population participating in this study (ages 12 to 16). He refers to freedom within the context of allowing children to exercise their ability to make choices and to understand the consequences of such choices; in this way they learn the importance of responsibility:

> This remaking involves inhibition of impulse in its first estate. The alternative to externally imposed inhibition is inhibition through an individual's own reflection and judgement. The old phrase "stop and think" is sound psychology…[t]he ideal aim of education is creation of power of self-control. (1938, p. 64)

It can be very difficult, based on my own observations, for adolescent children to exercise the self-control needed to develop healthy relationships in various facets of computer use. This could be attributed to isolation resulting from a student who plays games to the exclusion of developing human relationships, or because a student has agreed to meet with a person they have met online without giving due consideration to the consequences involved in such a decision. The question of how much freedom we allow children in making such decisions, without excessive authoritative control, becomes pertinent in this research.

As educators, we are inclined to have a basic understanding and knowledge of the past in any subject area in order to be better able to function in the present and to plan for the future. Dewey (1938) emphasized this issue in his discussion of the "Progressive Organization of Subject Matter". It has particular relevance to the understanding of the evolution of technology, its impact upon society throughout the ages, and the implications for education and curriculum:

> The nature of the issues cannot be understood save as we know how they came about. The institutions and customs that exist in the present and that give rise to present social ills and dislocations did not arise overnight. They have a long history behind them. Attempt to deal with them simply on the basis of what is obvious in the present is bound to result in adoption of superficial measures which

> in the end will only render existing problems more acute and more difficult to solve. (p. 77)

When one considers the difficulties some children are now experiencing due to the infiltration of new technologies, it may be beneficial to consider an historical approach to understanding how current situations came to be. For example, the sedentary lifestyle many children lead today is not purely a result of more time spent at the computer; this originated with the unsupervised and uncontrolled use of the television as a babysitter and less emphasis being placed on diet and exercise (Gable & Lutz, 2000; Robinson & Killen, 1995). The computer certainly may have exacerbated this situation. When the amount of time spent in front of the computer screen and the television is combined, physical activity often gets displaced, which may contribute to decreased physical well being in a variety of facets (Subrahmanyam, Kraut, Greenfield, & Gross, 2000). Similarly, the changing nature of the relationships children are developing since the increase in the number of computers in the home can and should be viewed from a sociological and historical viewpoint, in addition to examining the situation as it exists today. Asking the necessary questions and planning appropriately for the future in this regard, as in planning for future consequences of other technologies, becomes crucial.

Similar to Dewey's (1938) discussion of taking history into account when planning for present and future educational scenarios, Tapscott and Caston (1993) and Tapscott (2001) shared this view in planning for the future by gaining insight into the implications of a "paradigm shift" as this relates to information technology in business, economics, and education. They believed that educators should embrace this change in the opportunities that are now available to children in the form of new technologies. They

also assert that understanding the evolution that baby-boomers experienced with television is not that different from the computer revolution children of today's world now find themselves caught up in, and can only help to shape educational experiences of children in such a way that will be beneficial to them. Dealing with the nature of this change can be difficult in educational spheres and is discussed throughout this research, but it is certainly possible with careful analysis and understanding of the change process (see Fullan, 1993).

When one considers the education of the child within the realm of evolving technologies, the role of the parent must not be dismissed; indeed, the parent role is a central focus of this study. Most children spend the first five years of their lives acquiring knowledge and skills from their parents that will be needed as they move into the routines of the formative years of schooling and beyond. Eccles and Harold (1996) highlight numerous studies identifying the link between a child's success in school and the level of parental involvement, primarily related to the parent's role in the child's intellectual and socio-emotional development. Of interest to this particular study is the fact that parental involvement in a child's formal education declines dramatically as the child moves beyond elementary school and into secondary. Although the parents identified in their study were not actively involved at the school, they stated that this was not indicative of the level of parental involvement in the child's education at home.

From within the home, Scott-Jones (1995) identified four levels of parental interactions that may contribute to a child's ability to succeed in school: "valuing, monitoring, helping, and doing" (p. 76). Valuing refers to the parents' role in conveying the value of education to their children; the second level is concerned with parents

monitoring their children's behaviour and performance; "[h]elping interactions are focused on the acquisition of basic academic skills..." (p.76); the fourth level, doing, refers to those parents who sometimes exert too much control over their child's academic activities, to the point where they are actually doing the child's schoolwork.

Each of these levels could be applied to parental involvement where the home computer is concerned. Although we can recognize and appreciate the importance of the parent role in a child's education, it begs the question of what happens when children are alone and are left to make responsible decisions on their own? Although parents may care about the activities their child may be involved in when using the computer and the Internet, it is not possible for them to monitor such activity each and every moment the child uses the computer. This is no different than when an adolescent is on the streets or at the mall with friends. Parents may have some idea of what their child is involved in, but because adolescence is such a precarious stage in the life cycle, they must trust the child has learned the importance of making appropriate decisions and accepting the consequences of those decisions; this applies to most aspects of the adolescent's (and the parent's) life.

To protect adolescents both within and outside the home, Papert (1996) suggested that a "family culture of trust and truthfulness" be established, in addition to a culture of honesty (p. 76); this is directly applicable to all areas and stages of a child's life. Parents do not need a substantial level of computer knowledge in order to protect their children from the dangers of Internet use if a mutual level of trust has been established between parent and child. Much of Papert's book *The Connected Family: Bridging the Digital Generation Gap* (1996) is devoted to helping parents understand how they can and

should be more involved in how the home computer is used by children. He directs some of his commentary to children, explaining how they should be gentle with their parents as they attempt to learn new things. Through basic computer projects, he demonstrates the importance of the sharing that can take place within the family where the home computer is concerned.

The concepts underlying this research are complex in nature; the conceptual framework described previously has identified some of the issues which are entwined throughout this study. The philosophies of Dewey (1938), particularly as these relate to the experience of children and education, are enduring; Papert (1996) provides a more current slant on Dewey's beliefs. Dewey's philosophies force us to question our roles as parents, educators, and members of the wider community in being concerned about how children are educated and as this pertains to teaching children how to use the computer. The computer has changed the manner in which children develop relationships with each other and with their elders. In addition, the computer, like other technologies, has had a tremendous impact upon other aspects of child development. As adults, we must all be involved in ensuring that our children as well as ourselves understand the consequences of a technology that is so pervasive, and sometimes intrusive, in our society. Similarly, our schools must evolve to meet the changing educative needs of children where technology now has taken on a tremendous role.

Technologies like computers can be a double-edged sword. Our freedom, as described by Dewey (1938) within the context of a democracy, can be defined, confined, and controlled by technology. Conversely, we can choose to become enlightened ourselves as we educate our children regarding the impact of computers and other

technologies, thereby contributing to the possibility that our democratic, free, way of life can be sustained and augmented.

# CHAPTER TWO

# REVIEW OF THE LITERATURE

## Introduction

Why should educators and parents/guardians be concerned with how children are using their computers at home? With the compulsory implementation of the Information and Communication Technology Outcomes in the province of Alberta in the year 2000 (Alberta Learning, 2002) both students and teachers are required to integrate and utilize technology in virtually all areas of curriculum. Rather than being taught as an isolated subject, computers are to be taught in a variety of facets, with a view to enabling students to accomplish tasks and manage data in such a way that was inconceivable prior to the advent of the software and hardware that is available today. Students who have a computer at home may have the advantage of bringing skills to the learning situation that will set them apart from others who are less fortunate, particularly if they have developed problem solving skills and the ability to utilize the computer in a productive manner. This may include activities such as utilizing the power and capabilities of the word processor, databases, spreadsheets, hypermedia programs, as well as effective searching, analyzing and synthesizing of information available on the Internet. Students may also acquire the necessary problem solving skills used in trouble-shooting hardware and software difficulties, as well as being able to effectively utilize help menus, when available, to assist when required.

Although research has not been able to demonstrate a consistent link between the use of technology and student achievement, Project Pegasus (Edmonton Public Schools, 1997), an action research-based professional development program for teachers in

Edmonton, Alberta, described four ways in which technology may contribute to an improvement in student learning:

1. Technology provides additional ways for teachers to meet a range of student learning needs.
2. Higher level thinking skills can be developed through the use of technology.
3. Using technology fosters cooperation and collaboration among students.
4. Students are motivated to learn when technology is used. (p. 2)

These assumptions are transferable to the home computer scenario, provided the technology is being used in a manner conducive to developing skills that may be utilized in the school.

Similarly, meta-analyses performed by Bangert-Drowns (1985), Kulik and Kulik (1991), and Kulik (1985) determined that although there was no significant improvement in student achievement when computers were used for teaching and learning, positive results were reported in that students demonstrated a more positive attitude toward computers, enjoyed the learning situation more when computers were used, and less instructional time was needed to teach a subject when computers were used as an instructional tool. These factors can often contribute to an increased motivation toward learning. It is important to note that at the time of these meta-analyses, computer based instruction and computer assisted instruction were the primary forms of software used in education, in addition to the drill-and-practice types of software. Software and hardware have evolved significantly since these studies were conducted, as has the manner in which technology is used.

More recently, Jonassen, Mayes, and McAleese (1993) and Jonassen (2000) have described the use of computers in education as having the potential for unlocking higher levels of thinking through constructive approaches to the design and implementation of instructional technologies. This becomes an important concept when one considers the manner in which the information age has shifted the types of knowledge and skills students are expected to acquire at all levels.

**The Influence of Media: An Historical Perspective**

Marshall McLuhan (1967) certainly was a forerunner in understanding the influence of media upon culture throughout history, in addition to describing the emergence of a cyberculture. In *Explorations: Studies in Culture and Communication* (1956), he discussed the issue of how although media has always had an impact on culture, even more important is understanding how "...any change in any medium always causes modifications in all other media or languages within the same culture. Today in our simultaneous world such changes are felt as abrupt and drastic. They always were. But now we notice" (p. 17). Turkle (1995) provided a more recent description of the emerging cyberculture in *Life on the Screen: Identity in the Age of the Internet*. She asserts that although the nature of our relationships with one another and with ourselves may be changing as a result of communication technologies such as those provided through the Internet, it may not be sufficient to view this as "good" or "bad", but rather to understand how virtual reality and real life can coexist in a reasonable manner. For her, cyberculture is what it is and we must now learn how to negotiate a different type of existence as a result.

With the impact of this relatively new medium we know as the Internet, we are being forced to take notice of how children and adults are affected by the message presented to them. McLuhan was ahead of his time in realizing that technologies like the Internet would have far-reaching consequences not only within the classroom, but also beyond the classroom: "Before print the community at large was the centre of education. Today, information-flow and educational impact outside the classroom is so far in excess of anything occurring inside the classroom that we must reconsider the educational process itself" (1956, p. 19). Education does go beyond the walls of the classroom, as it should; realizing how we as educators and parents are to grapple with this reality should give us pause.

Investigating and understanding the process of change as new languages build upon previous languages is key. Both McLuhan (1967) and his colleague Robert Logan identified these languages as an important part of realizing one's full potential not just in education, but also within any society. Logan (1995) described the five languages that he asserts should form a core curriculum:

1. Rhetoric – the art of public speaking
2. Literacy – the ability to read and write
3. Numeracy – the ability to use abstract numbers and perform simple mathematical operations.
4. Scientific literacy - the ability to use scientific principles to organize knowledge and interpret information.
5. Computer literacy – the ability to use computers to communicate, store, access, organize, and process information. (pp. 244-245)

Logan (1995) built upon McLuhan's (1967) eras of communication in humankind, which begins with the oral tradition, then moved into the writing tradition, then into the present day tradition of information technology. It is important to note, however, that Logan failed to address the importance of arts and humanities in a well-rounded education. Both Logan (1995) and McLuhan (1964, 1967) as well as many others in this genre (Levinson, 1997, for example) emphasized the importance of understanding the impact that these changes in media have had, and will continue to have, upon our culture. This includes understanding the ways in which we learn, work, think, and interact with one another. Levinson (1997) summed up our role as parents, educators, and children in willfully accepting the consequences of computers and the Internet as new media: "Human choice – the capacity for rational, deliberate decision and planning regarding media – is an ever-present factor in our consideration of the impact of media" (p. 4).

## Computer and Television Research: A Comparison

It may be beneficial to elucidate the parallels between computer and television research, primarily because both technologies have evolved in a manner that has had, and will continue to have a profound impact on the lives of children.

One certain similarity between television and computer research is that both technologies reached near saturation points fairly rapidly after their introduction into the home (Chen, 1984). Whereas the television was present in 90% of American homes by the 1960s (after its introduction in the 1950s), the home computer has also experienced relatively rapid adoption rates in North America, particularly over the past decade. Although much research has taken place subsequent to these time periods, little research

was done a priori to assess the impact that these technologies might have on those who use, or are affected by the use of both media. This oversight, as it pertains to other more current technologies, could potentially result in graver circumstances, given the inevitable results of cloning, artificial intelligence, and other present/future technologies.

Chen (1984) and Salomon and Gardner (1983) critically analyzed television research and used deficiencies in previous research methodologies in an effort to improve research pertaining to children and computers. Both authors assert that the wrong questions have been posed regarding the effects of television and the computer on children. For example, "does television cause more aggressive behaviour in children?" They also criticized the treatment vs. non-treatment group in computer based instruction scenarios. The authors emphasized the importance of considering other variables such as the nature of programs being viewed, length of viewing, and family background, as well as the previous experiences of the child when designing research studies of this nature.

Other commonalties between television and computer research include issues related to the motivational nature of each medium, the emphasis on analyzing the child's cognitive processes as well as the educational potential of each, and the role of government and corporate agencies in controlling the material that exists within each medium. In addition, although some research has examined the potential of computer technology and how it can facilitate learning, it would seem that much of the research pertaining to both the computer and television has been focussed on the negative impact of each, as acknowledged by Gunter and McAleer (1997):

> Television can provide children with a breadth of experiences, not all of which can in any way be construed as bad. Indeed, television can bring to children

> knowledge and other personal benefits, which may be unavailable to them through any other source. People who dwell on the negative side of television fail to do the medium justice in terms of identifying and elaborating the role it actually plays in children's lives. (p. 218)

This statement could also be true of computers and the Internet. Although it is important to be aware of the negative effects of any medium, one must give due consideration to the benefits that can also be realized.

Both the television and the computer have had a profound impact upon culture in general, but in the culture of children more specifically. Schramm, Lyle, and Parker (1961) voiced concerns over the impact of television, which also hold true for the impact of the computer today:

> It brought the world to everyone's living room, but most particularly it gave children an earlier look at far places and adult behavior. It became the greatest and loudest salesman of goods, and sent children clamoring to their parents for box tops. It created heroes and villains, fads, fashions and stereotypes, and nowhere so successfully, apparently, as with the pliable minds of children. (pp. 11-12)

Wartella and Jennings (2000) suggested that concerns about the impact of new technologies (such as the television and the computer) exist each time a new technology is introduced into a culture; this was also true for the radio:

> The popularity of this pastime among children has increased rapidly…This new invader of the privacy of the home has brought many a disturbing influence in its wake. Parents have become aware of a puzzling change in the behavior patterns of

> their children. They are bewildered by a host of new problems, and find themselves unprepared, frightened, resentful, helpless. They cannot lock out this intruder because it has gained an invincible hold on their children. (Eisenberg, 1936, pp. 17-18)

It is interesting to note how little the types of concerns expressed about the infiltration of new technologies have changed over a relatively long period of time.

The influence of television and the computer on children is undeniable; the role of the parent as gatekeeper continues to be critically important. This brings to the fore one last similarity between research pertaining to the computer and television: the apparent limited amount of literature that is available regarding the role of the parent. This is an important aspect which requires attention.

## Student Uses of the Home Computer

It has been reported in the literature that most school-aged students, regardless of gender, use their computers for recreation-type activities, including gaming, chatting on the Internet, and "surfing the 'net'." For example, Eastman and Hollingsworth (1997) found that of 565 middle school students, 97% use their computer primarily for playing games, while only 80% of the sample used their computer for word processing or other related activities. In addition, Kirkman's study (1993) investigated gender differences in home computer use of 112 students 12 years of age. He found that 100% of the boys used their home computers for games, while only 15% used their computers for word processing. The girls demonstrated a similar pattern; 91% utilized the home computers for games, but an increased percentage (43%) used their home computers for word processing. Kirkman (1993) also found that fully 60% of the students in the study used

their home computers exclusively for games. Downes, Reddacliff, and Moont (1995) also found that the most common use of the home computer by K-6 students in their study was playing games, although some of these games were educational in nature.

Some authors state that engaging in these types of unstructured computer experiences is correlated with adolescents' attitudes toward computers (Woodrow, 1994). Others (Martin, 1991, for example) suggest that the mere presence of a computer in the home may contribute to a favourable attitude toward computers. Attitude toward computers is certainly a factor to consider, however, as aptly stated by Alberta Learning (2002):

> Since technology has an increasingly significant impact, and such broad implications for everyone—individuals, groups and entire nations—students must be prepared to understand, use and apply ICT [Information and Communication Technology] in effective, efficient and ethical ways. (http://ednet.edc.gov.ab.ca/ict/ictfront.asp)

Often, the previously identified goal of technology implementation in education can be lost. It is important to remember why funding has been provided for computers in education and it would be beneficial if this same philosophy were to be communicated and reflected in the home environment. Having a computer in the home certainly has the potential of contributing to the teaching and learning objectives prescribed by Alberta Learning, particularly those identified in the ICT Outcomes (2002).

## Benefits of Home Computer Use

Although the research has not been able to demonstrate consistently a positive correlation between technology use and achievement, many other benefits can be realized

as a result of having a functional computer in the home. In their brochure produced for parents, Alberta Learning (2001) affirmed the fact that students who have had previous experiences with technology will most certainly have an advantage in school over those who have had little or no previous experiences with technology. In the brochure, the following question was posed: "Will students who are familiar with technology have advantages in the learning environment and the community?" The answer:

> Yes. In Alberta, students are expected to develop knowledge and skills in communication, inquiry, decision making and problem solving. Technology provides improved ways to identify and gather information, classify and organize, summarize and synthesize, analyze and evaluate, speculate and predict. (p. 1)

Dugdale, Devoken, and Ju (1998) provided a more specific example. Their study investigated the effects of enrollment in a computer course and access to a home computer in how successfully high school students could apply computers as a resource in a pre-algebra mathematics class. In their sample of 50 high school students, it was found that enrollment in a computer course and ownership of a home computer were significant predictors of initial success in the mathematics program for females in particular. Although the study did not analyze how the home computer was being utilized, it may have provided students with a motivation to use their home computers to give them an academic advantage over students who did not have a computer at home.

Nichols (1992) studied the effects of in-home computer use on achievement related to programming at an elementary school. Pre- and post-tests were administered to 96 second grade students in BASIC and Logo programming; approximately 50% of the students in the study had access to a home computer, whereas the other 50% did not. The

author found that "when all data were considered together, there was a tendency for owners to outperform non-owners [on the post-test]" (p.471). The author inferred that perhaps because some games played by students on their computers at home required logical reasoning similar to that used in programming, this may have contributed to the results of the study.

Although not part of the literature, it has been the experience of this author that many students who have expressed that they utilized a computer at home demonstrate an increased level of comfort and tenacity when using the computers at school. These students often have an advantage over students who do not have or use a computer at home because they do not need to learn basic skills such as how to power up a computer, navigate with windows, open and close programs and files, as well as other skills that are needed to use a computer. Less time is spent orientating these students, allowing them to move through tasks at a faster pace. One of the main difficulties that may be experienced by the teacher in this regard, however, is keeping students on task when learning how to use more advanced features of programs such as word processing, spreadsheets and databases, as well as advanced search strategies on the Internet. Similarly, because a number of these students utilize their home computer for games, motivating them to complete assignments in a productive and timely manner using the tools previously outlined can be challenging. More often than not, they would rather be playing games than working on assignments using the technology tools available to them.

## Internet History: A Brief Overview

As in any subject area, it can be beneficial to examine the history of a phenomenon or topic in order to gain some understanding of how it came to be so that

lessons can be learned from past mistakes, and to provide context for future scenarios. The Internet has been in existence for a long time, contrary to what many might believe.

Many current technologies were born as a result of the launching of Sputnik; this is also true for the Internet. As a result of this event, in 1958 the U.S. Department of Defense created the Advanced Research Projects Agency (ARPA), an organization that would later be responsible for initiating the origins of the Internet. The primary reason for initial implementation of simple networks with no centrally controlled system was to protect military information in the event of a nuclear war or other catastrophic event. Use of the Internet from the late 1960s to the 1980s was primarily for research and communication purposes between universities. Exponential increases in the number of hosts began in the late 1980s. For example, by the end of 1987, 10,000 hosts existed; by the end of 1989, there were over 100,000 hosts (Zakon, 2000). More commercial uses of the Internet were seen as the 1990s arrived, including online banking, online radio stations, online shopping, e-trade, video-teleconferencing, streaming video, and many other advances, primarily due to the availability of increased bandwidth. By the end of January, 2000, a total of 73,400,000 hosts were calculated (Zakon, 2000), whereas the Petska-Juliussen and Juliussen (2002) estimated that the total number of Internet users (not to be confused with hosts) was over 530 million people worldwide by the end of 2001.

What does this mean? It means that like it or not, the Internet has become a pervasive part of the lives of many people around the globe, both in the home and in education, affecting and changing the ways in which people work, learn, and play. New technologies (like the Internet) "alter the structure of our interests: the things we think

about. They alter the character of our symbols, the things we think with. And they alter the nature of community: the arena in which thoughts develop" (Postman, 1992, p. 20). As with any new technology, users can choose alternative forms of tools to complete a task. Most children at some time in their lives (and it is getting earlier and earlier) will come into contact with the Internet. Because there are both negative and positive issues associated with Internet use, it is important for students, parents, and educators to become critical consumers of what it has to offer. It also means that we must help children become aware of the dangers and benefits that can be realized as a result of using the Internet. Although Neil Postman has often been accused of being "anti-technology", he has provided considerable food for thought in his insights regarding the use of new technologies like the Internet, views not unlike those espoused by Larry Cuban. Cuban (2001) provides data to support the assertion that computers in classrooms are highly underutilized, and that far too much money has been dumped into computers, only to realize little or no return:

> As for enhanced efficiency in learning and teaching, there have been no advances (measured by higher academic achievement...) over the last decade that can be confidently attributed to broader access to computers...Nor has a technological revolution in teaching and learning occurred in the vast majority of American classrooms...Teachers at all levels of schools have used the new technology basically to continue what they have always done: communicate with parents and administrators, prepare syllabi and lectures, record grades, assign research papers. (pp. 178 - 179)

Both Postman and Cuban force us to question the benefits that have been, or can be realized as a result of computers and the Internet.

The Internet has evolved so rapidly since its origins, it would have been difficult for one to imagine that it would be where it is today, as well as the consequences that have arisen and should continue to be of concern into the future: "Unforeseen consequences stand in the way of all those who think they see clearly the direction in which a new technology will take us…when we admit a new technology to the culture, we must do so with our eyes open." (Postman, 1992, pp. 7 & 15)

**Child Safety Issues**

Another reason for parents/guardians and educators to be concerned about student use of the home computer relates to the safety of the child. In addition to the violent nature of many computer games, child safety on the Internet should be of particular concern to all. Although initial intentions of the Internet were primarily to serve as a communication medium for the military and, subsequently, for communication between universities, it has taken on a far greater, and in some ways, a much darker role in the lives of the children who use it. One of the more serious concerns regarding the Internet and children's access to it is the predators who are skilled at luring children into a conversation, which sometimes can lead to dire consequences. Students essentially talk with strangers in chat rooms, and it is not uncommon to hear of students agreeing to meet with one of their "new friends" they have met in a chat room. Even after being warned of the dangers involved in this type of activity, some students still seem to adhere to the notion that "that would never happen to me", as though they were invincible; children seem to trust people they meet in chat rooms all too quickly. Unfortunately, children

(especially in the junior high age group) are most vulnerable to be coerced into meeting with someone they have met in a chat room, listserv, or newsgroup. "According to US Customs and the FBI, one adult predator travels daily to meet a victim face-to-face" (Dubois, 2000). In North America in 1999, it was estimated that 800 children were lured away from their homes by predators that children had met on the Internet (LiveWires, 2000). ICQ, (sometimes referred to as "I Seek You") is one of the more popular forms of chat; with one glance at the topics available for discussion anyone, teenagers included, can see that highly unsavoury characters lurk just waiting for the opportunity to get any vulnerable person involved in a less-than-desirable conversation. The fact that teenagers often view themselves as "invincible" or possessing a casual attitude, thinking that "it would never happen to me," makes this an even graver matter. Recent research on brain development in adolescence indicates that physiologically, teenagers may not be able to make rational decisions and engage in risk taking behaviours primarily because their brains are both immature, in addition to going through a period of rapid growth (Spinks, 2002). This could certainly explain why some adolescents are so vulnerable to the relationships pursued online.

Another concern pertains to the types of information that are posted on the Internet, which can be easily accessed by anyone, including children. Because there is no central control agency for the Internet (and it is unlikely that there ever will be one), anyone is free to post any information such as pornography (graphics included), racism, hate, propaganda, lies; anything goes. The Simon Wiesenthal Center (2002) recently released their CD titled *Digital Hate 2002,* which describes

> ...200 web sites (some Canadian) that feature animated hate games, online enrollment for suicide bombers, Neo-Nazi online identity theft and other examples of transnational hate, and promotion of terror... [the CD] exposes some of the most insidious tactics used to reach and influence an expanding online population, especially young people. These tactics include identity theft, manipulation, online hate games and mass marketing of hate music. (http://www.wiesenthal.com/social/press/pr_item.cfm?ItemID=5723)

The advertising directed toward children both on television and on the Internet should also be of concern to parents and educators. The Media Awareness Network (2000a) identified several critical differences between advertising viewed by children on television as opposed to the Internet. For example, although Canada has implemented standards regarding advertising on television, such standards have not been (and currently cannot be) implemented regarding advertising on the Internet. As well, children are usually passive consumers of the advertising viewed on television whereas on the Internet, they are often actively engaged in participating in contests and other activities that may involve them more than they realize. For example, children are often, if not usually, invited to divulge personal information about themselves in advertising-related websites, which often leads to the release of this information to other agencies who are free to use the information at their will. Without understanding why, children may begin to receive pornographic and other unwanted materials in their email as a result of signing up for contests, email accounts, etc. Another issue pertaining to the types of information children are exposed to on the Internet, as identified by the Media Awareness Network (2000a), is the importance of teaching children how to authenticate online information.

Discerning between fact and opinion, truth and fiction are critical thinking skills of discernment that have become increasingly important as a result of the uncontrolled nature of the Internet.

It has been difficult for governments worldwide to legislate policies to protect children from the types of websites mentioned previously, primarily due to freedom of speech laws. However, in the United States in 1998, the Children's Online Protection Act was signed into federal law. The primary purpose of this act is to prohibit the commercial distribution of material on the Internet that could be deemed harmful to children under the age of 17. The closest Canada has come to such an initiative is Bill C-6, the Personal Information Protection and Electronic Documents Act (Government of Canada, 2000), which is intended to provide some protection of privacy of information online. In addition, Internet filtering software programs may give parents a false sense of security. Although these may be appropriate for younger children, older children can often find ways around the security features (especially if they know more about the program than their parents) and will not protect the child when they are in situations where such software is not used. This is where education within the home and at school plays a big part in how the child may deal with inappropriate content they may come across on the Internet.

Another issue related to child safety, is the manner in which the Internet is changing how children (and adults, I would suggest) utilize their time, and the effect that this is having on their human-human and human-world relationships. Some of these issues are similar to those experienced when the television became a fixture in the home. In addition to the sedentary lifestyle and the health problems that accompany lack of

exercise, children with regular Internet access are spending countless hours chatting on the Internet and, in fact, many youths would prefer to have access to the Internet over having a telephone or television (Roper Starch, 1999). Children also use the Internet, usually in isolation, for email, playing games and listening to music. This is quite different from the days when children and young adults called up a friend and talked for hours on the phone, or set up a meeting time for play or just for "hanging out." What type of relationships are children developing with people they either don't know, may never meet, or seldom see in a face-to-face situation?

As will be discussed, it is important for parents and educators to understand and consider the aforementioned issues if and when children use the computer and the Internet.

## The Protection of Children

How are we to protect our children from the malicious material and potential predators they might meet on the Internet? There have been numerous Internet safety guides that have been developed by a variety of groups to help parents/guardians and educators understand what it is they should be looking for, and how they can best deal with potentially dangerous situations. For example, the United States' Federal Bureau of Investigation (2000) has developed a guide with specific signs that may indicate a child could be at risk on-line:

- Your child spends large amounts of time on-line, especially at night.
- You find pornography on your child's computer.
- Your child receives phone calls from men you don't know or is making calls, sometimes long distance, to numbers you don't recognize.

- Your child receives mail, gifts, or packages from someone you don't know.
- Your child turns the computer monitor off or quickly changes the screen on the monitor when you come into the room.
- Your child becomes withdrawn from the family.
- Your child is using an on-line account belonging to someone else. (http://www.fbi.gov/publications/pguide/pguidee.htm)

Although some of these signs require the parent/guardian to have a certain level of computer literacy, there are also signs that can be detected aside from the computer. Umiker-Sebeok (1997) suggests other practical initiatives parents/guardians can undertake to ensure the safety of their children. She states that "Cybersmarts are not a whole new frontier in parenting. They're just an extension of the common-sense things you've told your kids all along" (http://www.slis.indiana.edu/umikerse/Parents/parentingworkshop.html#safety). Some of the more specific advice she offers includes:

- Educate yourself about the Internet.
- Supervise your child's Internet activity.
- Talk openly and honestly with your children about what kinds of information you value, what you wish them to avoid, and why.
- Teach your child how to think critically about Internet sites.
- If you cannot be around as your children surf, and are still not sure if you can trust them to surf alone, consider restricting access to only those times when you can be present.

- Download desirable Internet resources to your hard drive for your children to use when you cannot be with them.
- If they cultivate on-line friendships, scrutinize them to the same degree you would any friends.
- Set reasonable limits on how much surfing is permissible, and when. (http://www.slis.indiana.edu/umikerse/Parents/parentingworkshop.html #safety)

Although it is possible to purchase filtering software that may prevent children from accessing certain sites, this may not teach them "responsible surfing" and may only offer a false sense of security. "The only long-term answer is to educate your children about pornography, hate literature, etc., so that when they come across it, they'll know how to react. The only software you can be sure they'll be running is the stuff you install between their ears" (Umiker-Sebeok, 1997).

Having firm rules in place regarding Internet use is one way to contribute to a child's "safe surfing". Just as many schools have an Acceptable Use Policy, it would be wise for parents/guardians to implement a similar type of policy within the home. As with other forms of child discipline, sometimes it is more effective to have the child involved in contributing the rules surrounding the use of the Internet. Examples of some suggested rules/guidelines follow parents can/should set with their children:

- Never give out personal information (including their name, home address, phone number, age, race, family income, school name or location, or friends' names) or use a credit card online without your permission.
- Never share their password[s], even with friends.

- Never arrange a face-to-face meeting with someone they meet online unless you approve of the meeting and go with them to a public place.
- Never respond to messages that make them feel confused or uncomfortable. They should ignore the sender, end the communication, and tell you or another trusted adult right away.
- Never use bad language or send mean messages online.

(http://www.ed.gov/pubs/parents/internet/tips.html)

America Links Up (2000) and Umiker-Sebeok (1997) suggest that it is always wise to spend time with children on the Internet, to "take the trip together". This suggestion is analogous to that of television over the years; spending time with kids was important in helping them to become critical consumers of information and in keeping them safe from inappropriate material.

Another aspect of the Internet that students must be aware of is online marketers. The Media Awareness Network (2000a) has developed and implemented a program for parents, educators, and librarians, with the purpose of helping students learn and understand the issues involved in 'safe surfing'. Parents can learn the various ways in which their children use the Internet. Teachers can learn to instruct their students about how online marketers target children with websites, as well as how they gather and use information about children without the knowledge of parents, or of the children themselves. This is usually done by having children complete online forms for contests or to join clubs, as well as through the use of 'cookies'. The Media Awareness Network (2000a) website also has a section designed to help students learn how to authenticate online information, and teaches children (through teacher/parent-guided activities) how to

increase their awareness and skills in discerning between authentic and false information, as well as how to protect themselves from inappropriate websites and advertising.

**Benefits of Internet Use**

Although there is a certain 'dark side' to the Internet that we would like to protect our children from, it also has many positive uses. Students have access to the most current information on virtually any topic to assist them with a variety of academic pursuits. As stated previously, it is important for parents/guardians and educators to help students to become critical of the information they find on the Internet, and to take the time to verify any information used for research purposes. In addition, it is equally important for students to learn how to take information, paraphrase and summarize, and to cite sources appropriately. Parents/guardians and educators should take the time to follow up on references, primarily because it is very easy for students to download and print off reports and hand them in as if they were their own.

There are a number of other beneficial uses of the Internet. Jaffe and Aidman (1997) found that the Internet was highly useful in connecting nuclear families, geographically dispersed families, and extended family members. Distance learning has taken on a new form and has provided the opportunity for geographically isolated students to participate in courses that were previously inaccessible due to geographic barriers. The Internet has also contributed to an increased communication link between schools, families and students (Bauch, 1997). This benefit was one of four that surfaced in a study by Blanchard (1997). Besides an increased level of communication, he found that "technology can serve the family-school connection in [these] areas: 1) learning and instruction, 2) interest and motivation and 3) resources and costs." (p.1) He goes on to

emphasize the importance of the connection in the social, moral, and educational development of children. Kristovich, Hertzo, and Klein (1997) used technology to connect the families of gifted children in an early childhood program. Technology was used for three primary purposes: 1) to present student work via the school web page, 2) a digital camera was used to capture the progress of student work for a photo-portfolio, and 3) a 'Chickscope' or MRI scanner was used by students to study the development of chick embryos. Internet technology was also used by Perry and Garber (1993) to help deliver essential services to parents who had children with developmental delays. The Telus Learning Connection (Because We Care Education Society of Alberta, 2000) and teachers involved with this project have developed numerous telecollaborative activities that are designed to engage children in unique online experiences.

Another example of the powerful potential of the Internet is the "Virtual Classroom Program" at J. Percy Page Composite High School in Edmonton, Alberta:

> J. Percy Page High School is the first school to be connected to Canada's high-speed fiberoptic network (CA*Net), operated by Industry Canada. This connection provides students and staff with the opportunity to connect to peers and experts around the globe. Students registered in the Page Virtual Classroom Program experience a new way of learning that is facilitated through leading edge information and communication technologies. (Andrews, 2000, p.1)

The Virtual Classroom project at J. Percy Page garnered much attention because of its relatively low cost of implementation and its ability to utilize high quality video transmission to facilitate a relatively sophisticated dialogue between culturally diverse groups around the world. The success of this project (which utilizes the Internet as its

modus operandi), is due in large part to the careful planning and direction of committed teachers and corporate involvement from companies such as Shaw cable. It would appear that at the time of writing, the Virtual Classroom project is setting the foundation for other schools to follow a model such as this, as more and more schools are gaining access to high speed Internet and fibre optic network capabilities. The Virtual Classroom Project does encounter its share of difficulties, which are not always easy to overcome. Technology can and does fail at the least wanted moment at various times throughout the project. Continued upgrading and maintenance of the necessary technology can be costly, as can the cost of technical support and professional development for those involved in the project.

Online communication tools such as chat rooms, MOOs, MUDs, and MUSHs (see Appendix A for definitions) can and do provide both children and adults with the opportunity to explore issues about themselves and relationships with others by taking on a persona (or personae) created based on the wishes of the user. Turkle (1995) believes that although there certainly can be a negative side to the deception that often arises as a result of participating in such activities, children and adults who are shy or have low self esteem in real life can explore aspects of themselves they might otherwise never be able to. Turkle's research provides many examples of this, such as the following:

> On MUDs, Gordon has experimented with many different characters but they all have something in common. Each has qualities that Gordon is trying to develop in himself. He describes on current character as "an avatar of me. He is like me, but more effusive, more apt to be flowery and romantic with a sort of tongue-in-cheek attitude toward the whole thing." A second character is "quiet, older, less

> involved in what other people are doing," in sum, more self-confident and self-contained than the real-life Gordon. A third character is female. Gordon compares her to himself: "She is flirtatious, more experimental, more open sexually definitely." (p. 190)

In addition to the examples highlighted, the Internet provides users with immediate access to the most current information for research purposes; the educational benefits are far-reaching, providing opportunities that were previously inconceivable. In addition to the educational benefits, children and adults alike can take advantage of the many other possibilities the Internet has to offer such as access to downloadable software, E-commerce activities (on-line banking and stock trading, for example), instant messaging, e-mail and numerous other features. As well, children are required to learn a new set of skills in research, problem solving, and critical thinking, which can certainly prove to be useful in a variety of future scenarios. The list of potential benefits of Internet uses could be extensive. This may be particularly important to know for parents who are hesitant to get their home computer online. This study focuses primarily on the online communication aspect of the Internet and how it is utilized by children.

## Parental Concerns

The research is relatively sparse regarding how parents feel about getting their home computer on the Internet. Although this researcher has found, through informal conversations, that some parents hesitate to get the Internet in their homes because of apparent dangers, Grimm (1998) found that most parents in her study were realistic about their expectations regarding the Internet. She found that they appreciated the information that was readily available on the Internet, but were concerned about how analytical/

critical their child would have to be to understand the plethora of information, as well as the time that might be wasted while on the Internet. They believed that skills learned while using the Internet would be important for future workplaces, but were concerned about "protecting children from inappropriate materials and from strangers." More recently, the NPR/Kaiser/Kennedy School Technology survey (2000) found that American adults expressed major concerns about the possibility of their children meeting a dangerous stranger online, having access to pornography and having access to information on how to make a bomb. Similarly, a study conducted by the Annenburg Public Policy Center (Turow, 2000) revealed that the major concerns expressed by parents regarding their children's use of the Internet were primarily related to issues of children revealing personal information about themselves, viewing sexually explicit material, and the potentially isolating effects over-use of the Internet could have on their children.

Recently, there has been increasing attention paid to a new disorder the American Psychological Association (1996) calls "Internet addiction". Although much of the research has used adults as the basis for investigation, some of the criteria for this disorder can also be applied to children and teens. The symptoms/effects would be similar: staying online longer than intended, hiding online activities from family members, using the Internet for increasing amounts of time, and other symptoms. Green (1999) found that in treating people of all ages with internet addiction, the patients of one professor were typically "lonely, bored, and generally in need of human contact. Because of their low self-esteem, they find it easier to create an online identity than risk a relationship in the flesh" (http://www.victoriapoint.com/internet%20addiction.htm). The

Center For On-Line Addiction (2000) provides a Parent-Child Internet Addiction Test, which can provide parents with a clearer picture of whether or not their child is addicted to the Internet.

Orleans and Laney (1997) believed that "parents would be well advised to allow their children the opportunity to enjoy the computer without dread of its putative dangers. Reasonable caveats and age-appropriate limits, along with wise selection of software, is likely to provide sufficient safeguards" (p. 199). They also assessed adult anxiety regarding the potentially damaging effects of computers on their children, particularly as this relates to social isolation. They found that the use of the computer often increased a child's ability to socialize with peers, particularly during online experiences, and that decreased parent supervision contributed to an increased level of social activity when the child used the computer. This occurred primarily because the child felt safer to take more liberties in online conversations when parents were not present. Generally speaking, with appropriate rules in place, parents/guardians may want to allow their children a certain degree of freedom and responsibility, just as they would in other areas of the child's life. When the responsibility is misused, logical consequences may follow.

Since its infiltration into homes in the 1950s, television has served as the dominant media to which children are exposed. Current studies (The American Academy of Pediatrics, 2001; The Center for Media Education, 1997; Kaiser Family Foundation, 1999; Theilheimer and Eisner, 1995) estimate that children typically watch anywhere between three and six hours of television per day. When one considers this statistic, in addition to the fact that many children are spending increased amounts of time on the computer at home and at school (Angus Reid Group, 1998, and NPR/Kaiser/Kennedy

School, 2000), it becomes clear that children may be spending more time with these technologies than they do in school or interacting with peers and family within and outside the home. Why should this be a concern? The following is a brief list of potential problems that can present as a result of extended use, overuse, and abuse of television and computer technologies (in no particular order):

- Obesity and other health-related issues, due to the sedentary nature of both activities.
- Exposure to violence, hate, and sexually explicit material.
- Vulnerability to advertising targeted to children.
- Social isolation, delayed development of appropriate social skills.

For these reasons, it is important for parents and guardians to be aware of these issues, and to make every effort to take an active involvement in the extent to which and methods of how their children utilize these technologies, as addressed in the subsequent section.

## Parental Involvement

There is no denying that parental involvement is often associated with the level of success children experience in school (Gallup, 1981; Lareau, 1989; Henderson, 1987; Macbeth, 1990; McAllister-Swap, 1987; Ziegler, 1987). Ninety-six percent of those participating in the 1981 Gallup Poll indicated that they believed that parent involvement was "Very Important" in the education of children, and regarding the results of the poll, Gallup (1981) stated:

> A careful examination of survey findings for the past ten-year period leads to this conclusion: Many of the problems of the schools can be solved only if parents

> become more involved than they presently are in the educational process. Parents must, in fact, be regarded as part of the teaching team. A joint effort by parents and teachers is essential to deal more successfully with problems of discipline, motivation, and the development of good work habits at home and in school. (p. 31)

A longitudinal study conducted by Johnson and Walker (1991) found that the children of parents who had participated in the Houston Parent-Child Development Center program performed significantly better in grades two through five than those parents and children who were part of a control group in the study. Factors such as the level of stimulation in the home environment and positive parent-child interactions were also found to contribute to the level of success achieved in school.

It has been suggested that success in school and later in life can be attributed to a child's ability to read. To this end, parents can and must assume a tremendous responsibility to ensure that their children are well prepared for school and for life. Buck (1999) stated that

> [a]lthough schools seem to have students for much of their waking hours, in fact their home life accounts for much more, including summer holidays. So, I would think that what happens, or does not happen at home has considerable bearing on achievement and performance in school. This would include computers. (G. Buck, personal communication, November, 1999)

Wright and Church (1986) further endorse this sentiment: "Parents have always played a part in the education of their children. Unfortunately, many parents do not realize that they are their child's first and perhaps most important teacher" (p. 67). They

go on to describe the numerous roles that parents fill as 'educator', and conclude by stating that much of a child's most important education takes place before they enter grade one. Macbeth (1990) further endorses the notion of the parent being the child's first (and perhaps most important) educator: "...a great deal of learning – especially with regard to attitudes and motivation – happens outside the school, much of it in the home, particularly in the early years" (p. 3).

Although some parents/guardians believe that it is the role of the school to prepare the child academically, Giaquinta and Lane (1990) found that students were not utilizing the home computer for academic pursuits, primarily because there was little influence or support from parents in this regard (possible reasons for this were not provided). They believed that social and technological innovations, both in the home and at school, must reflect the importance of academic home computing in order for students to be empowered technologically.

Many of the reasons for lack of parental involvement in the education of children could also explain why some parents are not more involved with how children use their home computers. Some of these reasons may be understandable, as indicated by Vopat (1994):

> School has changed dramatically since many parents were there and, if the goal of parent involvement is to strengthen the link between home and school, parents need to be introduced to the revitalized classroom...We can't really expect parents to nurture and support [new] learning strategies if they don't understand what those strategies are or how they can be supported. (p. 2)

Schools can certainly take on a role in assisting parents to become more involved with the use of the home computer. Although it is true that many parents working outside of the home may be exposed to computers, children may be engaging in activities very different from those in the workplace. Schools can form parent focus groups or offer computer instruction to those parents who might be interested, which is one of the proposed outcomes of this study.

Social class has been linked to the level of involvement parents commit to their child's education (Lareau, 1989). Although not a direct causal factor, this may also play a role in how much attention is given to the child as they use the home computer (for example, is it being used as a babysitter just as the television has been used in the past?). This may also be related to the lack of time that parents have available to devote to their children outside of school time. Double-income families are commonplace in society today and people are working longer hours (Charette, 1995; Pold, 1995; Shields, 2000). If there is one parent home, quite often there is more than one child to tend to. This may result in less supervision of children who might be utilizing the computer in the home.

Giving this issue a higher priority in the household is a wise first step to addressing potential problems, even if the parent is not very comfortable with computer usage. Markham (1995) proposed that parents: a) "do their homework" by learning and playing with all forms of technology when possible, b) "learn with [the] child" by spending time with him or her when they use the computer, c) "be a good guide and mentor" by talking with children when using the computer, d) shift television time to computer time, and e) place the computer in a family-type room rather than the child's room. He also offered a reality check for parents, suggesting that "[c]omputer and online

time alone can't make your child an honor student" and that "[c]omputers alone won't make your child a well-rounded, successful adult" (p.11). Because of their diverse learning and life styles, children must be taught using a variety of teaching methods as well as being exposed to a variety of activities outside of computer time.

Haughland (1997) described five areas that parents should concern themselves with regarding the use of the home computer by their child: "... software selection, computer time, the Internet, family interaction, and supervision" (p. 133). She offered six suggestions regarding software selection, and regarding computer time she stated that the issue is not how much time children spend using the computer, but it is what they are doing when they use the computer. She stated that if children are utilizing developmentally appropriate software, generally they can regulate their own time. Parents should become concerned when children begin to spend more time with non-developmental software and/or violent games, as these may reduce "children's creativity and may have an addictive effect" (p. 134). Haughland also believed that the home computer could provide families with opportunities for group interaction, and that it should not be used as a babysitter.

Taking the first step is often the most difficult stage of the process. The best thing a parent can do to get involved is to start spending time with the child while he or she is using the computer, and to ensure that the computer is in an open family area rather than a bedroom (America Links Up, 2000). Children are usually more than happy to "show off" what they know; parents may want to take the time to take advantage of this. Parents may also want to take some very basic computer courses, either formally or from a friend, in taking the first step towards developing computer literacy. Community agencies

(such as the local library or school) offer basic courses for a nominal fee or for free. Again, just spending time with the child on the computer is the easiest and best way to begin.

## Role of the Educator

Although it may seem that this is just "one more thing" to add to the teacher's plate, it is critical that teachers and school administrators understand how vitally important it has become for students to be aware of and understand the issues related to how the computer and the Internet are used. Teachers must take responsibility for their own learning and professional development in this regard, particularly with the compulsory implementation of Alberta Learning's Information and Communication Technology (ICT) outcomes (2002).

It has been challenging for many teachers to grapple with rapidly changing technologies as these relate to their own personal work, as has been the case with the adoption of email technologies. This has now shifted to having teachers learn and understand how to incorporate the use of technology for their own teaching purposes, as well as to help students learn how to use these technologies. This also applies to the use of the Internet. Although strong support mechanisms may not exist in every school, resources have been and are available to support teachers throughout the province of Alberta. Two examples include the We're Web Wise conference (Edmonton Public School Board, 2000), as well as the Teaching and Learning with Technology program (Alberta Regional Consortia, 2002), developed and implemented by the six regional consortia in Alberta in conjunction with Shaw Communications. Educators, not unlike parents and guardians, must take responsibility for their own learning to ensure that

students become critical consumers of new technologies, including the Internet. The broader goals of education also become important within this context, in helping to develop responsible citizens in a democratic society.

## Summary

The research pertaining to student use of home computers has brought some important issues to the fore; many students use the home computer for recreational-type activities and safety issues are a concern for parents and educators alike. Although there is not much information regarding the nature of parental involvement in how children use home computers, the importance of this issue was highlighted and a parallel was drawn to parental involvement in the education of children.

From this perspective, this study may be beneficial in highlighting these issues within the school district under study, and may contribute to a more current state of knowledge as the use of technology within the home and within education continues to evolve.

# CHAPTER 3

# RESEARCH METHODOLOGY

## Introduction

Both quantitative and qualitative research methods were used in this study, primarily because these two types of research can and do complement each other in this type of project. Patton's research (1975, 1978, 1982) supports the notion that these two once opposing camps of research and evaluation, and the models within each, cannot easily be separated, particularly in educational research. Patton (1975) denounced the stringent approach of statistical analysis in research to the exclusion of consideration of other approaches, and suggested an "alternative paradigm" that would invite both qualitative and quantitative approaches to work together in an effort to get at the core issues in research. He aptly summarized his alternative paradigm by stating that "...different kinds of problems require different types of research methodology" (p. 13).

From a quantitative standpoint, a survey instrument was utilized as the primary tool for gathering data. Statistical analyses were performed to determine the relationship between some variables, as well as to give an overall picture of the descriptive data. From a qualitative standpoint, parent focus groups were planned and three sessions took place at a local junior high school. Results from the student and parent surveys contributed to the formation of guiding questions for the parent focus groups. The primary reason for the development and implementation of the focus groups was to determine what parents and guardians believed they needed in order to play a more informed role in how their children used the computer and Internet at home, as well as to provide information and basic training to parents based on their feedback during the sessions.

## Survey Research

Although there are a variety of methods that can be utilized in conducting research, a survey was chosen for a part of this study because it was deemed to be the most logical method available to acquire some of the desired information. A reiteration of the main research questions is warranted in this regard:

1. In what ways are junior high students using their home computers?
2. How do parental perceptions compare to what their children claim to be doing when using the home computer?
3. What do parents/guardians need in order to help their children utilize the computer in a more appropriate, safe manner?

As indicated by Weisberg, Krosnick and Bowen (1996):

> Surveys are used to answer four broad classes of questions: (a) the prevalence of attitudes, beliefs, and behavior; (b) changes in them over time; (c) differences between groups of people in their attitudes, beliefs and behavior; and (d) causal propositions about these attitudes, beliefs, and behavior. (p. 15)

A survey was used as data gathering instrument in this study primarily to answer questions that are of type (a) above. In addition, Fink and Kosecoff (1985, p. 14) provided three main reasons for choosing a survey as a data gathering tool:

1. Policy needs to be set or a program must be planned.
2. You want to evaluate the effectiveness of programs to change people's knowledge, attitudes, health or welfare.
3. You are a researcher and a survey is used to assist you.

Reasons one and three support the choice of survey for this project. Fowler (1988, pp. 11-12) provided similar reasons as well as survey attributes in conducting survey research:

- Probability sampling enables one to have confidence that the sample is not a biased one and to estimate how precise the data are likely to be.
- Standardized measurement that is consistent across all respondents ensures that one has comparable information about everyone involved in the survey.
- Although record data can be used for some research purposes, a main reason for surveys is to collect information that is available from no other source.
- Analysis requirements may dictate a special-purpose survey. Even if there is information about some set of events, it may not be paired with other characteristics needed to carry out a desired analysis.

In evaluating the quality of sample designs in research, Wang and Fan (1998) provided six criteria that should be addressed:

1. A clearly specified target population and survey population.
2. A specification of a desired sample size.
3. An informative description of the selection procedures.
4. A description of response rate with information about nonrespondence situation.

5. Demonstration of appropriate data analysis according to the selection strategies used, including the treatment of possible non-response bias problem and generalization of findings.

Each of these items will be addressed in the sections that follow. When these criteria are addressed appropriately, generalization of the data to the larger population is more viable; this is the primary goal of survey research (Wang & McNamara, 1997).

It is important to note that surveys should be used to describe the relationship between variables in the study, and not to explain the causal nature of such a relationship (Moser & Kalton, 1971). Many problems can arise from attempts to explain relationships between variables, particularly when such interpretation is usually far more complex than the researcher may realize. Other research methods, both qualitative and quantitative, can contribute to the level of analysis that takes place; in this instance, focus groups will be utilized to substantiate data arising from the surveys.

The choice of the most appropriate tool for gathering data contributes to the validity and reliability of the data collected, as well as the analysis and synthesis of such data. Demonstrated awareness of the limitations of such an instrument, like the survey, can also impact upon the soundness of the data. Johanson, Green, and Williams (1998) described five errors that regularly occur in the design of surveys used in education:

1. Missed opportunities in attitude scale planning.
2. Blunders in item construction.
3. Missed opportunities in item construction.
4. Blunders in scale revision.
5. Missed opportunities in scale revision.

'Missed opportunities' refers to oversights in the choices made regarding the planning, construction, and revision of survey items and scales. For example, an understanding of when to use 'don't know' as a response on a survey is important as it may be appropriate in some circumstances but not in others. Missed opportunities can be addressed through the use of well-planned pilot studies. 'Blunders' in item construction and scale revision occur when data have been gathered using an instrument that is flawed, or when it comes time for data analysis and items have been dropped because of poor design, along with the corresponding data, resulting in data that may be 'cooked' or incorrect.

In addition to potential problems with the design and implementation of the survey itself, Katz (1993) identified several problems associated with the return of surveys. These include:

1. Consideration of sample size, particularly when a certain subgroup of the sample has a higher return rate than the remainder of the sample.
2. Topic saliency – a lower return rate may be experienced if the topic is not pertinent or is uninteresting to the respondents.
3. Method of distribution and collection – more personalized involvement on behalf of the researcher can increase response rates.
4. Instrument length – "Too short of a survey may send the message that it is really not important. Too long of a survey may intimidate the respondent into non-response." (p. 5)
5. Response bias – characteristics of the sample should be considered in the

construction, analysis and synthesis of the data related to response bias. This becomes evident when a respondent chooses the same response to each question, becomes inflammatory in comments, or answers a question item without sufficient knowledge to answer it appropriately.

6. Socially desirable responding – respondents may choose a response that they feel would most appeal to the researcher.
7. Leniency bias – if a respondent has a high level of self esteem, this may influence their responses regarding questions where self reporting is solicited about a skill or attitude.

Although the survey presents certain limitations, an understanding of such limitations as well as the basic characteristics of survey design, implementation and analysis can contribute to an increased generalization of the research study results. The survey for this study was designed with these principles in mind, and was piloted with a group of 30 junior high students and parents to test for the appropriateness of the survey items. Questions were originally developed from a variety of sources, including surveys used in previous studies of a similar nature (Downes et al., 1995; Eastman & Hollingsworth, 1997), and were also based on information that the researcher wished to uncover, based on her experiences in the classroom. As a result of the pilot phase of the survey instrument, a number of questions were either dropped from the survey, as they did not appear to adequately address the research questions, or were revised based on feedback from participants. Some questions were revised to better facilitate statistical analyses, and some questions were actually added to the survey to provide further clarification of issues related to the study. An example of a question that was dropped

pertained to the type of computer(s) that existed in the home; this question did not seem relevant to the study. A question regarding the rules about computer use was broken down into specific categories to allow for easier statistical analysis, as were other questions that needed to be broken down. A number of questions were added to allow for a more in-depth comparison between parent perceptions and children's computer activities. For example, a question asked of students was "are your parents familiar with the activities you participate in on the Internet?" Numerous other revisions were incorporated into the survey after further research and thought went into the instrument and the research questions themselves.

Some of the questions were developed based on the research questions identified in this study, in addition to those sources identified previously. The surveys have been reviewed and edited by experts in the field of parametric statistics as well as by experts in technology in education. There are four specific initiatives that were undertaken in an attempt to address some of the limitations of survey research:

1. The results from the pilot study have been incorporated into the survey instrument and can be found in Appendices E and G.
2. Incentives, such as the possibility of winning gift certificates, were offered to reduce the level of non- response bias.
3. Only students with home computers completed the survey. It was hoped that a heightened level of interest in the topic of this research project would also contribute to a reduced level of non-response bias.
4. A letter of support from school district administration to principals of schools participating in the project was provided and may have

contributed to an increased level of cooperation from school staff and students involved.

Although it is difficult to control all limitations of survey research, it was hoped that these initiatives would contribute to the level of success regarding this choice of data gathering instrument.

## Sample Selection and Procedures

The school district chosen for this research project serves approximately 80,500 students in total. Of this number, approximately 16,000 are registered at the junior high level. Cluster random sampling was utilized to choose ten junior high schools within this school district to participate in the study. Junior high schools were decided upon as the target audience because this is the age group that the researcher is currently teaching and, as highlighted in the literature review, this age group presents with unique characteristics pertaining to the issues addressed in this research. Once the ten schools were chosen, they were contacted to arrange for a meeting with the school administration. Contact with the principal was made for consent for school participation. In some cases, the principal chose to be the main contact person in arranging for meetings with selected classes. Other principals chose to designate the role of intermediary to another member of the administration or to a teacher. The administrator at one school decided that they did not want their school participating in the study for unspecified reasons and although another school was contacted for possible participation, it became too late into the study to allow adequate time for consent form distribution, survey distribution and survey collection. As a result, only nine schools participated.

From each of the nine schools, three classes were selected for possible participation; one class from each of grades seven, eight and nine. The selection of classes within each school was random; the second grouping from within each grade was approached for potential participation, for example 7B, 8B, and 9B or 7-2, 8-2, and 9-2. From each class, the school administrator or teacher coordinator determined how many and which students had a computer in the home. The research project coordinator arranged for a meeting with these students from the three grades at each school. At that meeting, the research project was explained in detail, and students were invited to participate in the project. The incentive of gift certificates was described to the students, and they were told that the awarding of these certificates would be based on their ability to return consent forms and surveys in a timely manner. Those students indicating that they had a computer at home were given an information letter to take home that explained the study and also included the parental consent form. Students and parents were informed that they should return the consent form within one week in order to continue with the dissemination of the surveys. All students who returned the consent forms, many well beyond the one week deadline, were included as initial participants in the research project, along with their parents/guardians. Consent of both the parent/guardian and the student was provided before the student was permitted to participate in the study. Parents provided their consent by completing and returning the parent survey. The information letter and consent form can be found in Appendix B.

A second meeting took place with the students who returned their consent forms. At this meeting, students were given verbal and written information and instructions about the survey. The importance of honesty and candour in completion of the survey

was conveyed, and students were given 15 to 20 minutes to complete the survey and to ask any questions that arose during that time. Students were reminded that the survey was anonymous and confidential, and a code would be used to match their responses with their parents' for data analysis purposes only. They were then asked to take the parent survey home for their parent or guardian to complete, and to return both within two weeks. The teacher/administrative person was asked to coordinate and track collection of the surveys. Toward the end of the two-week period, the project coordinator checked with the designated person to see if more rigorous follow-up (such as verbal reminders, phone calls) was necessary. In most instances, this was the case. This procedure worked well in the pilot phase of the study and resulted in a 95% return rate (although with a much smaller group), and it was hoped that this would contribute to a relatively high return rate with the participants involved in this phase of the study. As stated previously, it was hoped that incentives such as gift certificates would also contribute to a higher return rate.

It was planned that, in total, approximately 400 surveys would be distributed to students and 400 surveys would be distributed to the parents/guardian of these students. 400 surveys represent 2.5 % of the junior high population within this school district. A return rate of 70% or 280 of the surveys was optimistically projected, which is approximately 2.1% of the total junior high school student population in the school district.

The survey was administered (with permission) both to the parents and students involved in the study, once they agreed to participate and their consent forms were signed and received. The survey asked questions that were intended to provide an overall picture

of how junior high students use their home computers, as well as what role parents and guardians play (if any) in this process. Table 1 indicates the number of students in each grade, the number of students who indicated they had a computer(s) at home, the number of students who took the survey home and returned it, and the number of students who completed the student survey, took the parent survey home and returned the parent survey. As indicated in Table 1, numbers decreased dramatically at each stage of the process. Possible reasons for this will be discussed in the limitations section. Although verbal and written instructions were provided to the principal or teacher coordinator regarding data to be gathered (such as the number of students in each participating class), some did not record this data and were not able to provide it at a later date. These missing data (blanks in Table 1) did not affect the calculation of any statistics in later sections.

Table 1

*School Frequencies: Participation, Consent Form Distribution and Gathering, Survey Distribution and Gathering*

| School # | Grade | Total # Students | # Students Having Computer(s) at Home | # Consent Forms Returned | Total # Student and Parent Surveys Returned |
|---|---|---|---|---|---|
| 1 | 7 | 24 | 24 | 12 | 19 |
| | 8 | 23 | 23 | 6 | |
| | 9 | 30 | 30 | 5 | |
| 2 | 7 | 24 | 20 | 8 | 13 |
| | 8 | 26 | 19 | 5 | |
| | 9 | 22 | 21 | 4 | |
| 3 | 7 | 17 | 10 | 0 | 3 |
| | 8 | 20 | 3 | 1 | |
| | 9 | 25 | 19 | 2 | |
| 4 | 7 | | 5 | 4 | 6 |
| | 8 | | 7 | 4 | |
| | 9 | | 8 | 2 | |
| 5 | 7 | 28 | 25 | 10 | 10 |
| | 8 | 23 | 20 | 3 | |
| | 9 | DID NOT PARTICIPATE | | | |
| 6 | 7 | | 21 | 5 | 10 |
| | 8 | | 14 | 5 | |
| | 9 | | 12 | 8 | |
| 7 | 7 (X2) | 49 | 42 | 3 | 7 |
| | 8 | 28 | 20 | 3 | |
| | 9 | 25 | 22 | 3 | |
| 8 | 7 | 28 | | 20 | 11 |
| | 8 | 26 | | 20 | |
| | 9 | 24 | | 23 | |
| 9 | 7 | 27 | 27 | 9 | 5 |
| | 8 | 29 | 29 | | |
| | 9 | 20 | 20 | | |

## Measures

Initially, descriptive statistics are provided to explain how both students and parents viewed uses of the computer at home. These are provided in terms of percentages: for example, 30% of the students who returned their surveys stated that they use the computer at home for more than ten hours per week. Simple frequency tables are used to display the responses for some questions, and will be discussed in detail in the results section.

A more quantitative approach was used to analyze some questions in determining the statistical significance of the results. Measures of central tendency were calculated and used to compare some parent and child responses; t-tests for independent samples was used to determine whether or not there is a statistical difference between male and female responses. Because one of the sub-questions pertains to gender differences in computer use, cross-tabulations and t-tests were used to identify whether or not differences exist.

Although one of the main research questions asks "what do parents/guardians need in order to help their children utilize the computer in a more appropriate, safe manner?", no specific survey question addresses this question directly. Focus groups inviting parental responses to the data were used to answer to this question, as well as to validate the information found in the literature review.

## Focus Groups

On the bottom portion of the information letter attached to the consent form parents/guardians were provided with the opportunity to indicate their interest in participating in a focus group in order to address many of the issues outlined in this

document. An information letter explaining the nature of the proposed focus group sessions, as well as a consent form regarding participation in the focus groups (Appendix C) were sent to parents who had indicated an interest in participating. Doxy (1996) defined a focus group as a carefully planned discussion designed to obtain participant perceptions about an area of interest in a non-threatening, encouraging environment. Similarly, the Family Advocacy Program (1996) defined focus groups as a group of people who are similar in some way, who are interviewed in order to

> ...gather information about a single topic or narrow range of topics guided by a set of open discussion questions...The intent of focus groups is to develop a broad and deep understanding of the topic of interest rather than a quantitative summary. The emphasis is on insights, responses, and opinions rather than specific facts.
>
> (http://child.cornell.edu/child.cornell.edu/army/focus.html#anchor781573)

Originally, focus groups were used to provide the structure needed in marketing research. As Einsiedel, Brown, and Ross (1996, p. 10) indicate, focus groups can be beneficial when they:

- reveal patterns of how people perceive things
- encourage synergy resulting from the interaction among participants
- allow a topic to be explored more fully, resulting in unusual ideas and suggestions
- can be set up in a fairly short time
- can give the researchers a good return for their research dollars
- can be enjoyable experiences for participants

**Focus Groups as Planned**

It was planned that interested participants would be invited to share their concerns and insights related to how their children and how they themselves use the computer in the home, in addition to hearing the results from this research project and learning some basic skills arising from these two aspects. It was hoped that through this experience, participants would increase their level of understanding and skill pertaining to the issues surrounding how the computer in the home is used.

From those parents who expressed an interest in participating in the focus groups on the consent form, 30 were to be randomly selected and split into two groups of 15. If fewer than 30 parents indicated an interest in participating, flexibility would allow any number less than this to participate, even if it was a very small number. It was suggested that if this project was able to follow the timelines proposed, those parents indicating an interest in participating in the focus groups would have a choice of meeting times: each Saturday for two months; three hours in the morning for group one and three hours in the afternoon for group two, or two evenings per week at 1.5 hours per session for two months. However, the initial focus group meeting would be used to determine if this length of time would be appropriate for the interested participants, and would be adjusted based on feedback received during the initial meeting.

The focus groups were planned to take place at a local school in the school district described in the study. The first meeting would be an audio-taped, semi-structured interview session, and would be used to plan the content for the training sessions that were to follow. Guiding questions (Appendix D) would be used to provide some structure to the interview. However, participants would determine the primary course of the

interview, which may have included discussion of the surveys, concerns, questions, needs, and wants for the proposed training sessions. The audio-tape would then be transcribed and utilized for planning and analysis purposes. It was anticipated that certain themes would emerge which would then contribute to the formulation of the training sessions to follow. It was expected that some of the training sessions would take a lecture-based format, however, it was planned that most would provide hands-on activities that would be developed based on the expressed needs of the group. If there were two groups, these would be reshuffled based on the needs and timelines indicated/preferred by those involved.

Initially, it was planned that participants would be asked to keep a journal of their activities, thoughts and "ah-ha" moments during and after the initial focus group session, as well as for the duration of the training program. Although not all participants may have agreed to this request, it would have been useful to have at least a few journals kept in order to evaluate the learning and change that took place over the course of the focus and training group sessions. It was hoped that if the journal was used for the duration of the focus/training program, this would provide information about the changes that these participants implemented in the home as well as providing some indication of the impact of the training groups. At the end of the two months, a follow-up audio-taped session was to be scheduled to determine the effectiveness of the focus/training groups. The journals were also to be used (with participant consent) in order to assess the effectiveness of the focus groups, as well as to provide further recommendations.

**Focus Groups as Executed**

Unfortunately, due to the poor response of the originally planned focus groups, the format of the sessions was changed to accommodate the few parents who eventually expressed an interest and committed to participating. A total of three sessions were held; two parents attended the first session, three attended the second, and three attended the third.

Each session began with a presentation of newspaper headlines highlighting issues pertaining to children's use of computers including physical well-being and issues related to Internet safety. Data from the current research project were then presented, throughout which parents were invited to share their thoughts and concerns. Data from the Media Awareness Network project (2000b, 2000c, 2001a, 2001b) were also presented in order to provide an overview of related national data for comparison purposes. Parents were then provided with an opportunity to review the website designed for this research project titled "Internet Safety: A Guide for Parents" (Lauman, 2002). This website provides basic information about topics discussed throughout this dissertation, in addition to simple Internet tutorials, tips, and resources. The main purpose for the design and implementation of this website was to provide parents with an opportunity to refer to the site long after the focus group session had taken place. Discussion took place while parents perused the site during the session, after which time some basic training on Internet tracking was provided for parents, as they had indicated a specific interest in this area. The sessions wrapped up with some basic interview questions, which are attached as Appendix D. These questions were intended to uncover any questions and concerns parents had regarding information presented in the session, as well as to determine what

other knowledge and skills parents thought they needed. Each session lasted approximately 1.5 hours, with parents expressing interest and gratitude for the information and skills they had acquired during the session.

## Ethics Review

Both the pilot phase and the second phase of this research project were subjected to an ethics review by the Faculty of Education Research Ethics Board. In addition, a review was conducted by the Cooperative Activities Program, which required approval from the Faculty of Education at the University of Alberta as well as the involved school district. This project received approval from these interested groups, and was conducted to ensure that those participating in the project would in no way be harmed as a result of their participation.

## Ethical Issues

As is the case with most studies involving human participants, ethical issues will often exist. For example, the nature of the data extracted could be considered sensitive, especially information relating to the types of activities children partake of when using the Internet. It was important to guarantee all participants anonymity regarding their completion of the surveys in this regard. In addition, it was anticipated that other sensitive information could arise out of the planned parent focus groups. It was important to deal with this information in a professional and confidential manner in order to secure full disclosure and participation in that phase of the project. An information letter and consent form were provided to and signed by those participating in the focus groups in order to ensure confidentiality and anonymity of their participation.

## Limitations

Research studies of this nature often have certain limitations, primarily because of the involvement of human participants. One such limitation is the background of those participating in the survey completion; both parents and students may bring some subjectivity to the manner in which they answer questions found on the survey. In addition, the information participants reported on the survey may or may not be a true reflection of what actually takes place regarding the questions posed. A third issue related to the background of those completing the survey is that the students and parents who participated in the study may not be representative of the school district population.

A second limitation is the supporting school personnel. Each person assisting in the gathering of the surveys may do so in a different manner, thereby potentially affecting the return rate (as well as the promptness of return) of the surveys.

A third limitation of this study is the level of cooperation and support provided by school administration of those schools involved in the study. Some schools provided a tremendous amount of support and diligence in consent form and survey distribution as well as gathering required data. Others were less than enthusiastic about the study to begin with; this was reflected in the manner in which consent forms and surveys were distributed and gathered.

As a teacher and a researcher, a certain level of tension was present throughout this study resulting from this dual role. It was difficult, at times, to discard my role as an advocate with a mission, becoming involved with those participating in the study and those who may be affected by it, to then become the researcher who is required to report the results of the study in a scientific fashion. The tension between these roles may be

evident in my writing, and the biases resulting from this tension may be considered a limitation of this study.

Another limitation pertains to the nature of survey research, which has been discussed previously. Subjective reading and response to survey questions can pose a problem, particularly when junior high students are the subjects involved in the research. This may be less of a concern where the participating parents are concerned. To minimize such an effect, the research coordinator was present during the distribution of the surveys and provided detailed instructions regarding the importance of the study, in addition to specific instructions regarding the completion of the survey. Time was provided during the initial distribution for students to begin completing the survey so that they had the opportunity to pose questions regarding the nature and completion of the survey. This also proved to be an effective measure during the pilot phase of the study.

The use of surveys poses another limitation related to the distribution and gathering process. Restrictions imposed by university guidelines, in addition to the various stages of consent form and survey distribution and gathering, most certainly had an effect on the number of surveys that are returned.

The sampling process used in this study posed a limitation in that the random selection of schools resulted in the majority of schools being concentrated in a particular area of the city. These schools have a relatively high percentage of students who are funded for English as a Second Language, learning disabilities, and, behavioural disabilities, in addition to being from within neighbourhoods that are considered to be of lower socioeconomic status.

Lastly, parents indicating that they would like to volunteer for the focus groups may not have been representative of the general population. Although every effort was made to accommodate parent schedules in attempting to entice parents to attend focus groups, it was difficult to get a large number of parents who were willing to participate in this phase of the study. In addition, it would seem that the parents most in need of receiving the training and information provided at the sessions did not express an interest in attending.

## Delimitations

It was necessary to impose certain delimitations in order to make the study manageable, particularly given the size of the school district involved. One such delimitation was the sample selection of those to participate in the study. Although an attempt was made to obtain a relatively representative sample of junior high school students in the district, the number of participants who took part in the study is not large enough to deem it representative of the entire junior high population. The size of this study in contrast to the size of the population of junior high students would make it difficult to include all students in the study.

It was decided that a target sample of junior high school students attending public schools within the city involved would be most appropriate and manageable, as opposed to all kindergarten to grade 12 students. This excluded rural junior high students and those attending separate and private schools. The author's experience has primarily dealt with junior high students and, as indicated in the review of the literature, the nature of adolescence makes this population especially vulnerable to some of the issues discussed. Again, junior high students within the city limits were chosen primarily because this is

the target group of interest, as well as for issues relating to manageability. Admittedly, junior high students in rural areas and catholic/private schools may present with another set of unique characteristics

A third delimitation is the inclusion of parents and guardians in the follow-up focus groups, to the exclusion of the children involved. One of the main objectives of this study was to help parents become more aware, comfortable, and involved with how the home computer is used, which is why they were targetted for the focus groups. The inclusion of children in such focus groups could be warranted in subsequent studies of this nature.

# CHAPTER FOUR

# FINDINGS AND DISCUSSION OF FINDINGS

## Introduction

The purpose of this study was to contribute to the limited body of research which describes the manner in which students of junior high age utilize their home computers. To this end, the study had the following three main objectives:

- to determine the nature of activities students at the junior high level engage in when they utilize their home computers
- to elucidate the difference in parental perceptions compared to what their children claim to be doing when using the home computer
- to get a sense of the knowledge and skills parents/guardians think they need in order to play more of a role in how the home computer is used by their children

It is hoped that the results and discussion of these results that follow will help parents, educators and technology coordinators as they attempt to develop strategies that will assist students, particularly of junior high age, to become knowledgeable, safe users of their home computers in general, and of the Internet in particular.

## Survey Results

The survey results, as indicated previously, are based on a total of 84 student responses and 83 parent responses from those participating at the nine randomly selected schools. One student did not have a matching parent survey, thus this student's results were deleted from the data sets where parent responses were analyzed. Each subsection that follows is organized based on the sub-question being posed. The survey questions

used to answer the sub-questions are indicated. Some questions will be analyzed and answered based on descriptive statistics such as frequency tables. Others, such as those questions comparing male and female responses, are better answered using inferential statistics. T-test for independent samples is a statistical technique that tests whether or not two population means are equal, based on the results observed in two independent samples where the dependent variable is continuous. Chi-square is also an inferential statistical technique. It is utilized to test the null hypothesis that two variables are independent of one another when the data are dichotomous (assuming counts are large enough for comparison; the minimum expected cell count in a chi-square calculation is five). It is for these reasons that these techniques were used to analyze the data for male and female differences and for parent-child differences. Some questions will combine both descriptive and inferential statistical data analysis techniques.

The answers to the three main research questions "In what ways are junior high students using their home computers?", "How do parental perceptions compare to what their children are actually doing when using the computer?", and "What do parents/guardians need in order to help their children utilize the computer in a more appropriate, safe manner?" will be synthesized in the subsequent section "Discussion of Survey Results".

**Specific Activities Students Engage In When Using the Home Computer**

The first sub-question to be answered in this section is "What specific activities are students engaging in when they use their home computer?" Several questions from the student survey were posed in an attempt to answer this question, including survey

questions 11, 13, 14, 16, 17, 21, 25, and 26 (Appendix E). Results of survey question number 11 are found in Table 2.

Table 2

*Student Weekly Computer Use (Student Survey Question #11)*

| Activity | Don't Use | Less than 1 hour | 1 to 5 hours | 5 to 10 hours | 10 to 20 hours | > than 20 hours |
|---|---|---|---|---|---|---|
| a) Word Processing | 5% (4) | 41% (34) | 42% (35) | 11% (9) | 2% (2) | 0 |
| b) Spreadsheets | 73% (61) | 24% (20) | 2% (2) | 1% (1) | 0 | 0 |
| c) Databases | 74% (62) | 18% (15) | 6% (5) | 2% (2) | 0 | 0 |
| d) Programming | 51% (43) | 29% (24) | 13% (11) | 5% (3) | 2% (2) | 1% (1) |
| e) Desktop Publishing | 57% (48) | 21% (18) | 14% (12) | 6% (5) | 1% (1) | 0 |
| f) Presentations | 45% (37) | 29% (24) | 21% (17) | 2% (2) | 4% (3) | 0 |
| g) Internet | 13% (11) | 6% (5) | 32% (27) | 25% (21) | 14% (12) | 10% (8) |
| h) School-related software programs | 47% (34) | 30% (22) | 15% (11) | 7% (5) | 1% (1) | 13% (10) |
| i) Games | 11% (8) | 43% (31) | 30% (2) | 8% (6) | 6% (4) | 3% (2) |
| j) Other | 53% (34) | 12% (2) | 24% (4) | 12% (2) | 0 0 | |

*Note*: The values indicated in brackets are the actual number of students responding in a category. Those participants who did not answer are excluded from these results.

The results from Table 2 indicate that the Internet seems to be the most popular activity across the higher usage time categories, followed by word processing. Students also utilize the computer for playing games more than for other activities.

Because the Internet can be used for a variety of purposes, breaking down the specific activities students engage in when using the Internet seems to be a logical endeavour. Table 3 lists the activities students participate in when using the Internet.

Table 3

*Student Weekly Internet Use (Student Survey Question #13)*

| Activity | Don't have/use | Less than 1 hour | 1 to 5 hours | 5 to 10 hours | 10 to 20 hours | > than 20 hours |
|---|---|---|---|---|---|---|
| a) Email | 15% (11) | 27% (20) | 43% (32) | 9% (7) | 5% (4) | 1% (1) |
| b) Chat Rooms | 55% (41) | 19% (14) | 17% (13) | 4% (3) | 3% (2) | 3% (2) |
| c) ICQ/Instant Messaging | 35% (26) | 7% (5) | 39% (29) | 10% (7) | 3% (2) | 7% (5) |
| d) Research | 8% (6) | 39% (29) | 37% (28) | 11% (8) | 3% (2) | 3% (2) |
| e) Shopping | 89% (67) | 8% (7) | 1% (1) | 1% (1) | 0 | 0 |
| f) Music/Videos | 32% (24) | 28% (21) | 25% (19) | 7% (5) | 4% (3) | 4% (3) |
| g) Website Design | 67% (50) | 19% (14) | 9% (7) | 1% (1) | 3% (2) | 1% (1) |
| h) Contests | 67% (50) | 27% (20) | 4% (3) | 3% (2) | 0 | 0 |
| i) Newsgroups/Listservs | 85% (63) | 10% (7) | 4% (3) | 0 | 1% (1) | 0 |
| j) General browsing/ surfing | 12% (9) | 37% (27) | 37% (27) | 11% (8) | 0 | 4% (3) |
| k) Other: | 14% (3) | 36% (8) | 36% (8) | 5% (1) | 9% (2) | 0 |

*Note*: The values indicated in brackets are the actual number of students responding in a category. Those participants who did not have Internet access at home (not applicable) or who did not answer this question are excluded from these results (these caveats also apply to subsequent tables).

Regarding Internet use (Table 3), email, instant messaging, research, and general browsing were the most popular activities in the one to five hour range of weekly use, as well as in the five to ten hour range (student survey question number 13). The most popular websites visited by students (student survey question number 14) in this study were: email (62%), search engines (50%), general interest (50%), gaming (32%), music downloads (26%), and teen/kid-related (26%) sites. For the most part, children are not downloading programs without their parent's knowledge (student survey question number 16: never: 39% and hardly ever: 27%). Only 16% of students indicated that there are sites they visit without their parents present (student survey #17), and of those that indicated they do or sometimes do, most of the sites seem to be related to teen privacy issues such as email and chats, not unlike the privacy teenagers seek when talking on the telephone with their friends.

Many students willingly divulge personal information about themselves when completing online forms and when using chat rooms, as indicated in Table 4 (student survey #21).

Table 4

*Personal Information Students Divulge in Online Forms and Chat Rooms (Student Survey #21)*

| | ONLINE FORM | | STRANGER/CHAT ROOM | |
|---|---|---|---|---|
| | YES | NO | YES | NO |
| a) Name(s) | 55% (41) | 45% (33) | 22% (15) | 78% (52) |
| b) Nickname/False name | 70% (52) | 30% (22) | 56% (38) | 44% (30) |
| c) Email address | 71% (52) | 29% (21) | 32% (22) | 68% (46) |
| d) Home address | 27% (19) | 73% (52) | 2% (1) | 98% (67) |
| e) Phone number | 28% (20) | 72% (52) | 3% (2) | 97% (65) |
| f) Gender | 81% (60) | 19% (14) | 57% (39) | 43% (29) |
| g) Age | 66% (48) | 34% (25) | 40% (27) | 60% (41) |
| h) Interests | 58% (42) | 43% (31) | 54% (37) | 46% (31) |

The main reason provided for giving out such information is when students wanted to sign up for something (40%: student survey #22). It is encouraging to note that some students indicated that they do check with their parents before providing personal information (30% always check, 27% sometimes, 20% seldom, and 23% never do: student survey #24). Five percent (or four out of 74) of students surveyed have agreed to meet with someone they have met on the Internet (student survey #25). Regarding policy statements found on websites, 31% of students indicated that they are aware of, or habitually read policy statements, and 29% say they sometimes do (student survey #26).

**Productive Activities Related to Computer Use**

The second sub-question asked is "What percentage of these activities could be considered 'productive?' This can be a difficult question to answer, primarily because the line between those activities that may be considered to be productive or academic compared to those that are more recreational can be difficult to ascertain. Nonetheless, student survey questions 11, 13, and 30 were utilized to answer this question.

Data from Tables 2 and 3 provide some insight into how much time students are spending on productive and/or recreational activities. However, question 30 gives a better picture of how students indicated they are spending their time on the computer. This question asked: "What percentage of time best describes your computer and/or Internet use?" The bar graph in Figure 1 best illustrates this use:

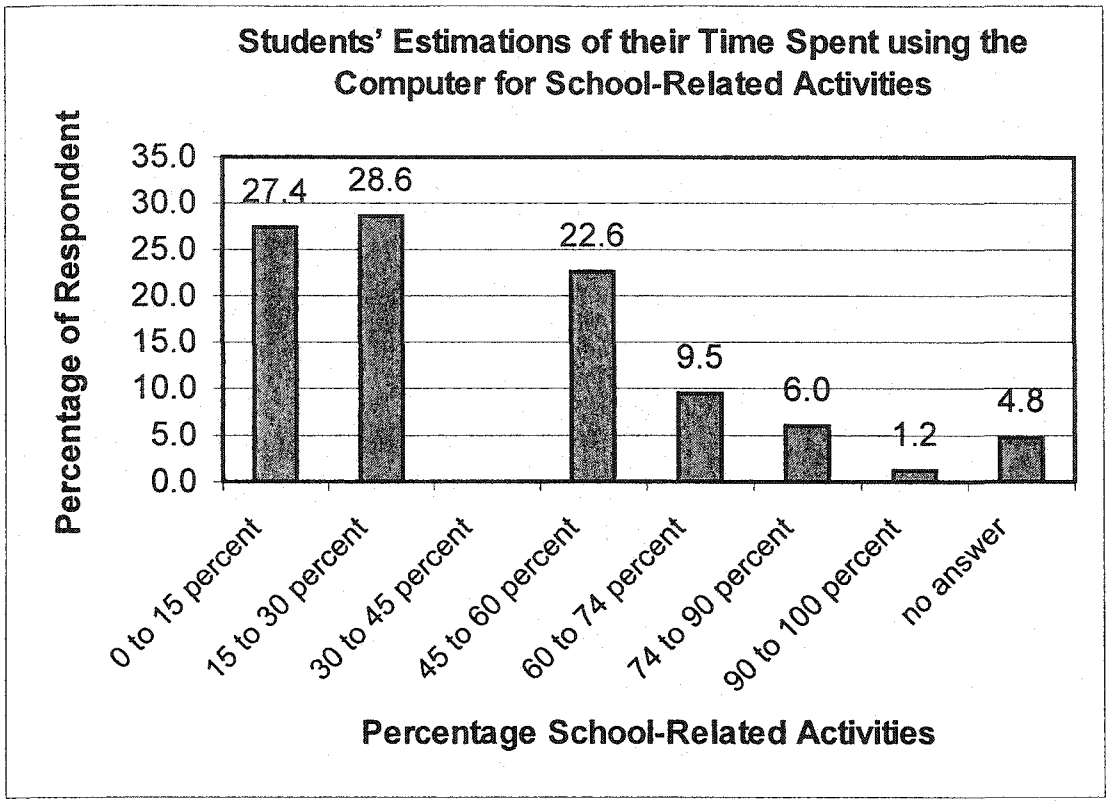


*Figure 1.* Percentage of productive/academic-related activities students engage in when using the home computer.

*Note:* The category of 30 to 45 percent was omitted (in error) from the survey choices. See Appendix F for interpolation.

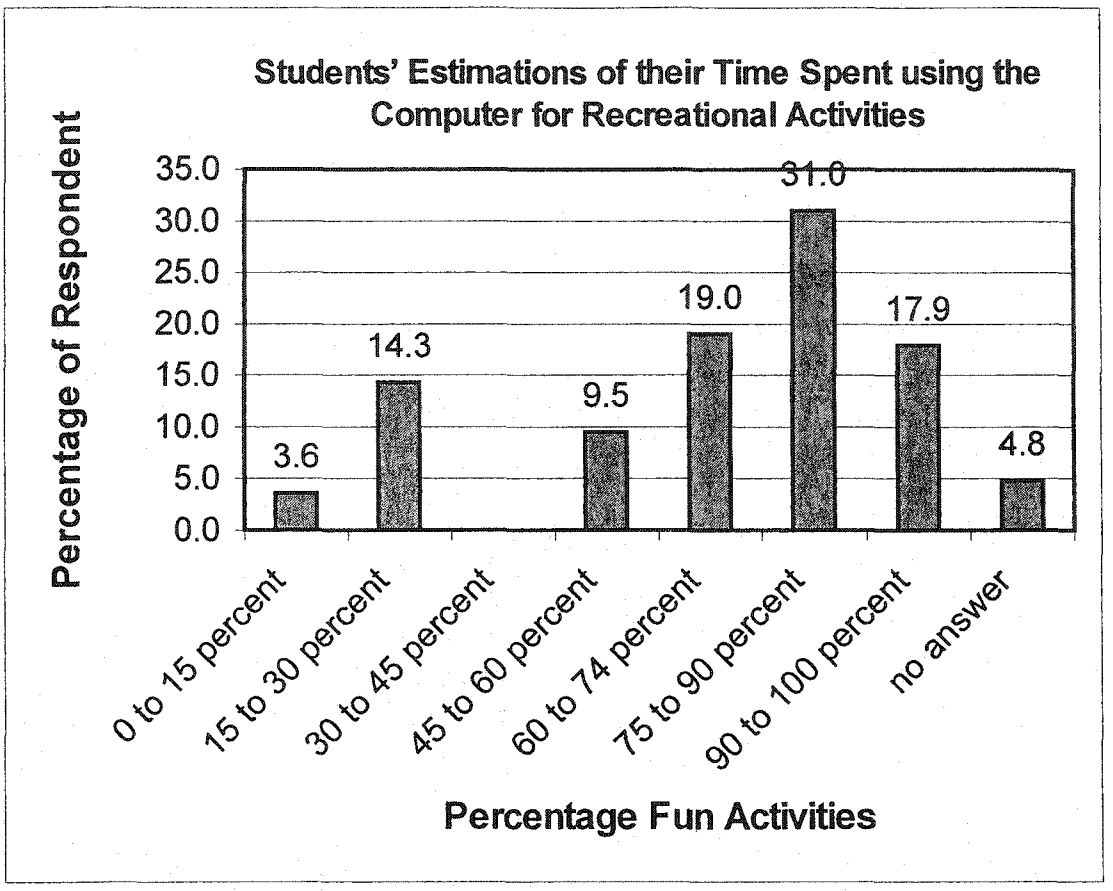


*Figure 2.* Percentage of recreational/non-academic related activities students engage in when using the home computer.

*Note:* The category of 30 to 45 percent was omitted (in error) from the survey choices. See Appendix F for interpolation.

**Gender Differences Related to Home Computer Use**

The sub-question "Are there gender differences in the ways children use their home computer?" was answered using student survey questions 1, 5, 6, 11, 13, 14, 21, 30 (Appendix E). In this study, 58% of the respondents (n=48) were female and 42% (n=35) were male. A t-test for independent samples was utilized to determine if significant

differences existed in this area. Using this statistical technique, no significant differences were found between genders regarding weekly hours of computer use. In understanding the difference between the males and females regarding this variable, it is important to note that students did not provide an actual amount of time but endorsed a category of time (e.g. 5 to 10 hours per week). Each category was assigned a value in calculating the means (0=no time, 1=0 to 1 hours, 2=1 to 5 hours, 3=5 to 10 hours, 4=10 to 20 hours, and 5=20+ hours). Although not statistically significant, one can state that based on the means calculated from these categories, males do spend more time on the computer in a week than do females.

Table 5

*Gender Comparison: Hours of Computer Use Per Week (Student Survey #5)*

| Gender | *n* | *M* | *SD* | *Mdiff* | *df* | *t* |
|---|---|---|---|---|---|---|
| Male | 35 | 2.94 | 1.19 | 0.40 | 81 | 1.61 |
| Female | 48 | 2.54 | 1.07 | | | |

Although both males and females primarily use the computer alone, as Table 6 indicates, there is some difference regarding computer use with friends:

Table 6

*Gender Comparison: Computer Use Alone vs. With Other People (Student Survey Question #6)*

| Variable | Yes | No | *df* | $\chi^2$ |
|---|---|---|---|---|
| Alone | | | 1 | 3.45 |
| Male | 27 | 8 | | |
| Female | 44 | 4 | | |
| With Parents (N/A) | | | | |
| Male | | | | |
| Female | | | | |
| With Siblings | | | 1 | 0.74 |
| Male | 5 | 30 | | |
| Female | 4 | 44 | | |
| With Friends | | | 1 | 5.27* |
| Male | 3 | 32 | | |
| Female | 14 | 34 | | |

N/A=Not applicable: Insufficient expected counts to conduct analysis
* $p \leq .05$
*Note:* Some students chose more than one response to this survey question.

Using the chi-square statistical technique ($p \leq .05$), there is a significant difference between the number of males and females who use the computer with their friends; more females (29%) than males (9%) used the computer with their friends. Otherwise, values in this table are proportionally similar for males and females.

Table 7 illustrates gender differences in general computer use.

Table 7

*Gender Comparison: Weekly Computer Use (Student Survey Question #11)*

| Activity | *n* | *M* | *SD* | *MDiff* | *df* | *t* |
|---|---|---|---|---|---|---|
| a) Word Processing | | | | 0.06 | 56.60 | -0.30 |
| Male | 35 | 2.63 | 1.00 | | | |
| Female | 48 | 2.69 | 0.69 | | | |
| b) Spreadsheets (N/A) | | | | | | |
| Male | | | | | | |
| Female | | | | | | |
| c) Databases (N/A) | | | | | | |
| Male | | | | | | |
| Female | | | | | | |
| d) Programming | | | | 0.66 | 49.02 | 2.62* |
| Male | 35 | 2.20 | 1.35 | | | |
| Female | 48 | 1.54 | 0.74 | | | |
| e) Desktop Publishing | | | | 0.28 | 81 | 1.27 |
| Male | 35 | 1.89 | 1.13 | | | |
| Female | 48 | 1.60 | 0.89 | | | |
| f) Presentations | | | | 0.19 | 80 | -0.79 |
| Male | 34 | 1.79 | 0.98 | | | |
| Female | 48 | 1.98 | 1.08 | | | |
| g) Internet | | | | 0.36 | 81 | 1.31 |
| Male | 35 | 3.71 | 1.62 | | | |
| Female | 48 | 3.35 | 1.28 | | | |
| h) Academic software | | | | 0.35 | 70 | -1.38 |
| Male | 31 | 1.68 | 0.95 | | | |
| Female | 41 | 2.02 | 1.13 | | | |
| i) Games | | | | 0.75 | 49.66 | 2.79* |
| Male | 33 | 3.03 | 1.36 | | | |
| Female | 39 | 2.28 | 0.79 | | | |
| j) Other (N/A) | | | | | | |
| Male | | | | | | |
| Female | | | | | | |

N/A=Not applicable: Insufficient counts to conduct analysis

* $p \leq .05$

Based on the results in Table 7, independent samples t-tests indicate that there is a significant difference in the overall use of programming and game playing by males and females. That is, males engage in programming and game playing more often than females. Otherwise, the results in this table indicate that there is no significant difference in the amount of time that males and females use the other computer applications in a week. Again, it is important to note that participants endorsed a particular category of time (e.g. 5 to 10 hours) and each category was assigned a value (0=no time, 1=0 to 1 hours, 2=1 to 5 hours, 3=5 to 10 hours, 4=10 to 20 hours, and 5=20+ hours). Means were calculated based on the value assigned to each category. Gender differences related to Internet use are illustrated in Table 8, with t-test results indicated.

Table 8

*Gender Comparison: Weekly Internet Use (Student Survey Question #13)*

| Activity | *n* | *M* | *SD* | *MDiff* | *df* | *t* |
|---|---|---|---|---|---|---|
| a) Email | | | | 0.06 | 43.95 | -0.27 |
| Male | 30 | 2.67 | 1.37 | | | |
| Female | 44 | 2.73 | 0.85 | | | |
| b) Chat Rooms | | | | 0.23 | 72 | -0.79 |
| Male | 30 | 1.77 | 1.33 | | | |
| Female | 44 | 2.00 | 1.20 | | | |
| c) ICQ/Instant Messaging | | | | 0.06 | 49.44 | -0.17 |
| Male | 30 | 2.57 | 1.74 | | | |
| Female | 43 | 2.63 | 1.25 | | | |
| d) Research | | | | 0.00 | 41.41 | -0.02 |
| Male | 30 | 2.70 | 1.37 | | | |
| Female | 44 | 2.70 | 0.77 | | | |
| e) Shopping (N/A) | | | | | | |
| Male | | | | | | |
| Female | | | | | | |
| f) Music/Videos | | | | 0.73 | 45.29 | 2.23* |
| Male | 30 | 2.80 | 1.58 | | | |
| Female | 44 | 2.07 | 1.02 | | | |
| g) Website Design | | | | 0.79 | 34.92 | 2.93* |
| Male | 30 | 2.07 | 1.41 | | | |
| Female | 44 | 1.27 | 0.54 | | | |
| h) Contests | | | | 0.11 | 72 | 0.68 |
| Male | 30 | 1.50 | 0.82 | | | |
| Female | 44 | 1.39 | 0.62 | | | |
| i) Newsgroups/Listservs (N/A) | | | | | | |
| Male | | | | | | |
| Female | | | | | | |
| j) Browsing/surfing | | | | 0.29 | 40.36 | 1.0 |
| Male | 29 | 2.79 | 1.42 | | | |
| Female | 44 | 2.50 | 0.82 | | | |
| k) Other | | | | 1.00 | 20 | 2.31 |
| Male | 13 | 3.00 | 1.16 | | | |
| Female | 9 | 2.00 | 0.71 | | | |

N/A=Not applicable: Not enough data to warrant appropriate analysis

* $p \leq .05$

*Note:* Those participants who did not have Internet access at home (not applicable) or who did not answer are excluded from these results. (This caveat applies to subsequent Internet-related questions.)

Independent samples t-tests determined that there were significant differences in Internet use related to music and video-type sites, as well as website design. Males visited music/video sites more than females, and engaged in website design activities more than females. Means were calculated based on values assigned to each category of time, as per the explanation for Tables 5 and 7. Email, chats, search engines, music downloads, gaming, and teen/kid-related sites were the five most popular sites among participating students (others were listed, but numbers were too few for application of any statistical techniques). Table 9 indicates the differences between males and females visiting these sites.

Table 9

*Gender Comparison: Internet Sites Visited (Student Survey Question #14)*

| Site | Yes | No | *df* | $\chi^2$ |
|---|---|---|---|---|
| Email | | | 1 | 4.82* |
| Male | 14 | 15 | | |
| Female | 31 | 11 | | |
| Chats | | | 1 | 4.98* |
| Male | 3 | 26 | | |
| Female | 14 | 28 | | |
| Search engines | | | 1 | 0.02 |
| Male | 15 | 14 | | |
| Female | 21 | 21 | | |
| Music downloads | | | 1 | 0.17 |
| Male | 7 | 22 | | |
| Female | 12 | 30 | | |
| Gaming | | | | |
| Male | 16 | 13 | 1 | 11.61* |
| Female | 7 | 35 | | |
| Teen/kid-related | | | 1 | 1.70 |
| Male | 5 | 24 | | |
| Female | 13 | 29 | | |

*Note:* Based on those participants indicating these types of sites in their top five choices.
* $p \leq .05$

There were significant differences in the some of the sites visited between males and females. For example, for emailing, the numbers of males who did (48%) and did not visit this site (52%) were approximately equal, whereas there were more females that visited the site (74%) than did not visit the site (26%). Similarly, the numbers of males who did (10%) visit chat rooms is less than those that did not (90%), whereas the difference between those females that visit chat rooms (33%) and those that do not (67%) is less than that of males. More males indicated that they visited gaming sites (55%) than those males indicating they did not (45%), whereas fewer females indicated they visited gaming sites (17%) than those indicating they did not (83%).

Table 10 illustrates gender differences in the types of information participants divulge when completing online forms or when utilizing chat rooms.

Table 10

*Gender Comparison: Personal Information Students Divulge in Online Forms and Chat Rooms (Student Survey #21)*

| | ONLINE FORM | | | | STRANGER/CHAT ROOM | | | |
|---|---|---|---|---|---|---|---|---|
| | YES | NO | *df* | $\chi^2$ | YES | NO | *df* | $\chi^2$ |
| a) Name(s) | | | 1 | 1.06 | | | 1 | 1.24 |
| Male | 19 | 11 | | | 8 | 19 | | |
| Female | 22 | 21 | | | 7 | 32 | | |
| b) Nickname/False name | | | 1 | 0.04 | | | 1 | 0.44 |
| Male | 21 | 9 | | | 14 | 13 | | |
| Female | 31 | 12 | | | 24 | 16 | | |
| c) Email address | | | 1 | 0.001 | | | 1 | 0.36 |
| Male | 21 | 8 | | | 10 | 17 | | |
| Female | 31 | 12 | | | 12 | 28 | | |
| d) Home address | | | 1 | 0.46 | | | | N/A |
| Male | 9 | 20 | | | 1 | 26 | | |
| Female | 10 | 32 | | | 0 | 40 | | |
| e) Phone number | | | 1 | 0.79 | | | | N/A |
| Male | 10 | 20 | | | 1 | 26 | | |
| Female | 10 | 32 | | | 1 | 38 | | |
| f) Gender | | | 1 | 0.17 | | | 1 | 1.88 |
| Male | 24 | 6 | | | 13 | 14 | | |
| Female | 36 | 7 | | | 26 | 14 | | |
| g) Age | | | 1 | 0.26 | | | 1 | 0.004 |
| Male | 21 | 9 | | | 11 | 16 | | |
| Female | 27 | 15 | | | 16 | 24 | | |
| h) Interests | | | 1 | 0.06 | | | 1 | 0.002 |
| Male | 18 | 12 | | | 15 | 12 | | |
| Female | 24 | 18 | | | 22 | 18 | | |

N/A=Not applicable (too few counts for analysis)

Again, although there appears to be some difference between the types of information males and females divulge when on the Internet, chi-square analyses indicate that there is no significant difference between males and females in this regard in the values found in this table.

Table 11 illustrates the gender differences in productive and recreational use of the home computer, taken from question 30 on the student survey.

Table 11

*Gender Comparison: Productive vs. Recreational Computer Use*

| Gender | *n* | *M* | *SD* | *Mdiff* | *df* | *t* |
|---|---|---|---|---|---|---|
| | | | Productive/School-related Use | | | |
| Male | 33 | 2.21 | 1.39 | 0.33 | 77 | -1.17 |
| Female | 46 | 2.54 | 1.13 | | | |
| | | | Recreational/Non-Academic Use | | | |
| Male | 33 | 4.33 | 1.61 | 0.27 | 77 | 0.81 |
| Female | 46 | 4.07 | 1.34 | | | |

There appears to be little difference between genders related to this question. Generally, both males and females appear to be utilizing the computer for more recreational pursuits than for productive or academic purposes. This is confirmed by running independent samples t-tests, which indicate no significant difference between these two groups in either category, when $p \leq .05$.

**Student Internet Use**

Student survey questions 13 to 22 and 24 to 27 (Appendix E) are intended to answer the sub-question "In what way do students use the Internet?" Of these student survey

questions, 13, 14, 16, 17, 21, 22, 24, 25, and 26 were addressed in the previous section, "Specific Activities Students Engage In When Using the Home Computer", and do not need to be repeated here. Students indicated that they believe that their parents do have some idea of the activities that they participate in when using the Internet (yes: 57% (43), no: 3% (2), somewhat: 40% (30)) based on their responses to student survey question number 15. Some students prefer to visit some sites when their parents are not present. Although the numbers are small, these sites are mostly related to typical teen privacy issues involved in email and chat rooms (student survey question number 18). Students expressed that they were concerned about the types of information they may be exposed to when using the Internet (student survey questions 19 and 20): yes: 29% (22), no: 44% (33), somewhat: 27% (20). Their main concerns were that they were afraid of accidentally seeing pornography: 40% (16), and other inappropriate websites that exist on the Internet: 25% (10). Most students were not familiar with the use of cookies on the Internet (student survey question 27): yes: 28% (20), no: 61% (46), somewhat: 11% (8).

**Safe Use of Internet**

The sub-question "Do students use the Internet safely?" was addressed using student survey questions 21, 22, 24, 25, 26, 28, 29 (Appendix E). Question 21 asked students to indicate the types of information they provide in online forms and to strangers and others in chat rooms; this information was summarized previously in Table 4. The main reasons students indicated they divulged personal information (student survey question number 22) were when they were signing up for something: 51% (30), when they trusted the site/person: 19% (11), and when chatting: 20% (12). Students do not routinely check with their parents before providing personal information on the Internet (student

survey question number 24): always: 30% (22), sometimes: 27% (20), seldom: 20% (15), never: 23% (17). Only four students (5%) have agreed to meet with someone they have met on the Internet (95% or 70 students indicated that they had not – student survey question number 25). Over half of the students are familiar with or read privacy policy statements found on websites (student survey question number 26): yes: 31% (23), no: 40% (30), sometimes: 29% (22). Most students believe that they are safe users of the computer and/or Internet (student survey question number 28): yes: 87% (72), no: 2% (2), somewhat: 11% (9), and most students believe that it is important to be safe users of the computer and/or Internet: yes: 91% (76), no: 4% (3), somewhat: 5% (4).

**Parent and Child Perception Differences**

Numerous questions from both the student (5, 9, 10, 11, 13, 14, 16, 19, 21, and 30, Appendix E), and parent surveys (6, 12, 13, 14, 16, 17, 18, 19, 21, and 28, Appendix G) were utilized to answer the question "Is there a difference in perceptions between parents/guardians and children regarding the use of the computers in the home?"

Rather than addressing each survey question separately, clusters have been arranged and a statistical measurement of central tendency was utilized to compare parent and student perceptions for some survey items. To calculate these statistics, parent and student survey items were matched and means calculated for all participants on each item by assigning a value to the responses for each item. For example, for a question with five possible responses, response #1 would be assigned a value of 0, response #2 would be assigned a value of 1, etc., similar to the assignment of values to categories in tables 5, 7, and 8. Negative values were then removed to calculate the mean absolute deviation. A

sample calculation for the first cluster "General Computer Use: Hours Per Week" can be found in Appendix H.

Table 12 identifies each cluster as well as the parent and student survey questions that comprise each cluster. Where a mean cluster difference (identified in brackets following the name of the cluster) of less than one appears, this indicates that there is an increased level agreement between the parent and student responses to items within that cluster. The closer the number is to zero, the greater the agreement between parent and student. The number in brackets is the mean of all the mean absolute deviations within the cluster.

Table 12

*Parent and Child Perception Differences*

| Survey Question(s) | Mean Student Response | Mean Parent Response | Mean Absolute Deviation |
|---|---|---|---|
| | General Computer Use: Hours Per Week (0.66) | | |
| SS 5/ PS 6 | 2.71 | 2.67 | 0.66 |

SS = Student Survey question number, PS = Parent Survey question number

| Survey Question(s) | Mean Student Response | Mean Parent Response | Mean Absolute Deviation |
|---|---|---|---|
| General Computer Use: Productivity Tools (0.75) | | | |
| SS 11a/PS 14a | 2.66 | 2.48 | 0.68 |
| SS 11b/PS 14b | 1.28 | 1.17 | 0.31 |
| SS 11c/PS 14c | 1.30 | 1.19 | 0.47 |
| SS 11d/PS 14d | 1.79 | 1.32 | 0.58 |
| SS 11e/PS 14e | 1.69 | 1.52 | 0.79 |
| SS 11f/PS 14f | 1.87 | 2.03 | 0.84 |
| SS 11h/PS 14h | 1.80 | 1.39 | 0.69 |
| SS 30a/PS 28a | 2.42 | 2.41 | 0.94 |
| General Computer Use: Recreation (1.19*) | | | |
| SS 11i/PS 14i | 2.69 | 2.47 | 0.92 |
| SS 30b/PS 28b | 4.25 | 3.10 | 1.45 |
| General Computer Use: Internet (0.54) | | | |
| SS 11g/PS 14g | 3.57 | 3.03 | 0.89 |

| Survey Question(s) | Mean Student Response | Mean Parent Response | Mean Absolute Deviation |
|---|---|---|---|
| | Internet Use: Productivity/Information Tools (0.53) | | |
| SS 13d/PS 16d | 2.64 | 2.44 | 0.75 |
| SS 13g/PS 16g | 1.81 | 1.33 | 0.52 |
| SS 13i/PS 13i | 1.13 | 1.18 | 0.31 |
| | Internet Use: Communication Tools (0.83) | | |
| SS 13a/PS 16a | 2.69 | 2.47 | 0.83 |
| SS 13b/PS 16b | 1.91 | 1.82 | 0.85 |
| SS 13c/PS 13c | 2.62 | 2.24 | 0.82 |
| | Internet Use: Recreation (0.61) | | |
| SS 13h/PS 16h | 1.41 | 1.19 | 0.32 |
| SS 13j/PS 16j | 2.61 | 2.30 | 0.91 |
| | Internet Use: Downloads files without parent knowledge (1.03*) | | |
| SS 16/PS 18 | 2.29 | 2.00 | 1.03 |
| | Internet Use: Child Safe Internet User (0.23) | | |
| SS 28/PS 27 | 1.16 | 1.12 | 0.23 |

* Important difference between parent and student responses

As can be seen, there is agreement between parents and children on most items in the clusters identified. The greatest differences between parental and student perceptions are noted in the clusters of "general computer use: recreation" and "internet use: downloads files without parent knowledge." These appear to be the two areas where there is a difference between what the parents think their children are doing on the computer and what the students indicated they are doing when they use the home computer.

The chi-square statistical technique was utilized to compare parent and student responses to those questions that offered the choices of "yes" or "no" for a response. Chi-square was utilized to analyze the following pairs: SS 9/PS 12 (are there rules for computer use?), SS 10/PS 12 (specific rules for computer use), SS14/PS 17 (top five sites visited), SS 19/PS 19 (concerns about information exposure on Internet). When $p \leq .05$, significant differences between parent and student responses were noted in the pair SS 9/PS 12. There is a difference in opinion as to whether or not rules existed pertaining to computer use in the home, with fewer students than parents indicating that rules existed pertaining to home computer use. There was no significant difference in the pair relating to specific rules for computer use (SS 10/PS 12). However, differences were noted in sections of the pair pertaining to the top five sites students indicated they visited, compared to the sites parents thought their children visited. These included e-mail: $\chi^2$ (1, n=54) = 8.84, $p \leq .05$, and search engines: $\chi^2$(1, n=54) = 12.41, $p \leq .05$. Students and parents appear to be in agreement regarding whether or not they have concerns about the types of information that children may be exposed to on the internet (SS 19/PS 19).

The chi-square statistical technique was also utilized to determine the level of agreement between parents and students regarding SS 21/PS 21, pertaining to the types of

information students divulge when they are online. When $p \leq .05$, differences were noted on the following survey items:

- entering email address in an online form $\chi^2(1, N=60) = 12.05$
- providing an email address to a stranger or someone in a chat room $\chi^2(1, N=55) = 8.69$
- entering a phone number on an online form $\chi^2(1, N=63) = 5.87$
- entering gender in an online form $\chi^2(1, N=61) = 4.48$
- providing gender to a stranger or someone in a chat room $\chi^2(1, N=57) = 5.34$
- providing age to a stranger or someone in a chat room $\chi^2(1, N=57) = 9.62$
- entering interests in an online form $\chi^2(1, N=58) = 7.63$
- providing interests to a stranger or someone in a chat room $\chi^2(1, N=54) = 4.06$

Of all of the survey items, it would seem that this would be an extremely important one to note, primarily because of the potentially harmful situations children can find themselves in as a result of divulging such pertinent personal information.

**Parent Computer Literacy/Knowledge**

The sub-question "How do parents/guardians perceive their own level of computer literacy/knowledge?" was answered using parent survey questions 3, 4, 5, 10, and 29 (Appendix G). Most of the parents participating in this study had used the computer for an extended period of time; 80% indicated they had used the computer for five or more years (parent survey question number 3). Many parents used the computer at work: 64% (53) as well as at home: 84% (70) (parent survey question numbers 4 and 5). Only 24% (20) saw themselves as the computer expert in the home (parent survey question number 10). Most parents rated their level of expertise as average (parent survey question number 29):

excellent: 7% (6), above average: 24% (20), average: 48% (40), little experience: 15% (12), no experience: 6% (5).

**Parental Supervision**

Questions 7, 8, 9, 23, 24, 25, 26 from the parent survey (Appendix G) were used to answer the sub-question "How much control/supervision/guidance do parents/ guardians provide regarding the use of the home computer?" Fifty-two percent (43) of parents indicated that they spent some time with their children on the computer (parent survey question number 7). Of those parents who indicated that they do spend time with their children on the computer, the amount of time parents indicated they spent with their children on the computer on a weekly basis was: less than 1 hour: 50% (22), 1 to 5 hours: 48% (21), and 5 to 10 hours: 2% (1) (parent survey question number 8). Most parents indicated that their children do spend time unsupervised on the Internet (parent survey question number 9): yes: 94% (78), no: 6% (5). Only 7% (5) of the parents indicated they had content filtering software on their computers at home (parent survey question number 23), and most parents do monitor the websites their children visit in some fashion: yes: 68% (50), no: 32% (24) (parent survey question number 24). Of those parents who do supervise the websites that their children visit, 69% (35) do so by checking the history, 20% (10) check the cache, 43% (22) look at the bookmarks, 43% (22) check the temporary Internet files, and 18% (9) provide direct supervision (parent survey question number 25). The types of supervision parents provide when their children use the computer and/or Internet varies: monitoring websites: 28% (22), spending time on the computer with child: 32% (25), discussing, designing and implementing rules/guidelines for computer use with child: 58% (45), looking over child's shoulder periodically: 78% (61).

Discussion of the survey results, combined with feedback from the parent information groups follows.

## Discussion of Results

The discussion of the results of this study is in the form of a synthesis from three primary sources: the student survey, the parent survey, and the parent focus groups. Subsequent to background information being provided based on the surveys, results will be organized based on the research sub-questions and will conclude with a discussion of the three primary research questions.

### Background Information

An understanding of the parent and student participants' backgrounds can provide insight and a deeper understanding into the results that arose from the study.

Most of the participants in this study designated the mother as the primary care giver; 78% of the parent participants completing the survey indicated that they were the mother. Although further questions regarding the mother's role were not within the scope of the study, it is important to keep this in mind when one examines questions relating to the level of supervision provided, what type of rules, if any, were provided regarding computer use, as well as other related questions.

Many of the parent participants had used a computer for an extended period of time; 45% indicated they had used a computer for five to ten years, 35% indicated that they had used a computer for more than ten years. As well, 64% used a computer at work and 84% used the computer at home, indicating that most of the parents participating in this study are reasonably familiar with computer technology. Dewey (1938) suggested that based on their own knowledge and experiences, parents and educators are in a position to structure

children's learning environments in such a way that it is safe and conducive to learning. Based on the survey results, it would appear that the parents in this study are in a position to do so. Most parents rated themselves in the average (48%) to above average (24%) category when asked about their level of computer expertise/ experience which, although bias may be somewhat of a factor, contributes to the level of comfort the parent feels regarding their own computer abilities. This may, in turn, play a role in the level of awareness parents have about their children's home computer use, which is one of the primary research questions in the study. Although parents may feel reasonably comfortable utilizing the computer themselves, children and adults tended to use computers for different purposes.

Papert (1993a, 1993b, 1996) emphasized the importance of adults (parents and teachers alike) taking a fresh look at notions of learning with a view to becoming more capable of understanding how it is that children are able to grapple with new technologies so quickly and easily:

> Only rarely does some exceptional event lead people to reorganize their intellectual self-image in such a way as to open up new perspectives on what is learnable. (1993a, p. ix)

By re-shaping the manner in which adults think about learning, it only becomes easier to understand new ideas and to learn new things. This not only pertains to computers, but to various other aspects of life and learning. In addition, if adults are able to think about learning in a new way, perhaps this will put them in a better position to learn from, and subsequently, better assist their children in how the home computer is used.

Much of the child's background related to computer use will become evident as the study results are described. Most of the student participants (64%) indicated that they had been using a computer for five to ten years. Many students (47%) indicated that they had taught themselves how to use the computer and 86% used the computer alone most of the time, which is comparable to the results identified in the Media Awareness Network study (2000b, 2000c, 2001a, 2001b). This becomes an important factor when one begins to look at the types of activities these students engaged in when they used the computer at home. In addition, of all of the background questions perhaps the most important relates to the placement of the computer in the home, particularly if children are using it alone. Only 24% of students indicated that the computer was placed in a visible area such as the family room; more often than not, they indicated that the computer was in a less visible area such as the bedroom, basement, den or study. A higher percentage of parents (35%) indicated that the computer was in an area such as the family room. However, numerous parents indicated the computer was located in other less visible areas. Parents who participated in the focus groups also substantiated this finding; many parents indicated that the computer was located in the basement, a bedroom, or a study. Other studies (Subrahmanyam, et al., 2000; Wartella & Jennings, 2000) have indicated that in approximately 70% of homes, the computer was located in less-than-visible areas, such as the bedroom or study. It would seem logical to deduce that this would have a significant bearing on the types of activities students might engage in, although other variables would also have an impact. This will be discussed further on.

**What specific activities are students engaging in when they use their home computer?**

As indicated in Table 2 in the previous section, students used their home computers primarily for Internet purposes, word processing and. This demonstrates a shift from studies of a decade or more ago; the Internet now serves a wide range of purposes that have been targeted toward this age group, whereas previously it was primarily used as a business and information medium by adults (Cummings & Kraut, 2002). This becomes evident when one looks at the specific types of activities students participated in when using the Internet, such as email, instant messaging, research, and general browsing. The most popular use is that of a communication tool, which may also relate to the fact that 58% of the student participants in this study were female. Dewey would hope that we take children's experiences with these tools and use them to contribute to the process of education. This could be a difficult proposition due to the ill-equipped nature of the computer skills currently held by some teachers and parents. Rather than using children's experience as educative processes, some teachers opt to eliminate the use of these tools altogether, as demonstrated in a study by Couture and Dobson (1997). A rethinking of the potential use of such tools in education, as in the home lives of these children, is required.

Because children using the Internet can be enticed to divulge personal information about themselves, whether by online marketers, websites, or by people they meet in chat rooms, it is important to know what kinds of information children are giving out in these circumstances. Table 4 illustrates the types of information students are providing on the Internet; this relates directly to the question of whether or not they understand the consequences of giving out such information. This issue brings to light the research in the area of brain development in teenagers, and whether teens are capable of making rational

decisions at the adolescent stage of life (PBS, 2002). Of particular importance is the fact that most students willingly provide personal information about themselves when completing an online form. Often this is the case when they want to sign up for something such as an email account or contests.

Do students understand what happens when they enter such information into online forms? It is important for educators and parents to draw attention to the policy statements on websites (where they exist) in order to help students understand what can be and is done with their personal information when they provide it to others via online forms (31% of students indicated that they are aware of or read privacy policy statements). Fewer students provide such information to people they meet in chat rooms, but nonetheless the fact that even 22% would give their name, 32% their email address, and 40% their age should be a cause for concern. It is encouraging to note that only 2% have provided their home address and 3% have provided their phone numbers to people they have met in chat rooms, and that a number of students do check with their parents before providing personal information about themselves. Unfortunately, 5% of the students have agreed to meet with someone they have met on the Internet.

The Media Awareness Network (2000b, 2001a, 2001b) confirms that adolescents across Canada are divulging personal information online and that this issue should be a focus of educational processes as children learn to utilize the Internet; this should be reemphasized throughout the formative years of schooling. This issue is becoming more frequently apparent in the media headlines, and requires educators and parents to reach a better understanding and awareness of how and why our children are arriving at that stage. Because we know that children are providing personal information, what do we as parents

and educators do when we discover that our children have done so? Perhaps this brings us back to Dewey's (1938) suggestion once again that rather than reacting in a negative manner, we should be drawing upon the experiences (both positive and negative) of children who have divulged such information, with a view to educating children based on these experiences. Having students as guest speakers and utilizing television programs that children are familiar with to emphasize potential consequences may be a logical step in this regard. This approach would support Dewey's (1899) notion of having children contribute to the larger community in a positive manner.

**What percentage of these activities could be considered "productive"?**

The grouping of items in Tables 2 and 3, based on productive vs. recreational activities, indicates that students are certainly involved in both types of activities. From a "productive" standpoint, word processing and Internet-based research tend to be utilized the most, particularly in the one to five hour range of weekly use. From a "recreational" standpoint, more students are involved in gaming, instant messaging, music/videos and general browsing-type activities in the one to five hour and five to ten hour range of weekly use. In looking at this issue more holistically, the bar graphs Figures 1 and 2 clearly illustrate the differences in the types of use. Based on this data, students are utilizing their home computers for recreational activities far more than for more academic-type activities, confirming previous research studies investigating computer use by children (Downes et al., 1995; Giaquinta & Lane, 1990; Kirkman, 1993). As stated previously, this is not to say that they are not learning while engaged in such activities, however, the type of structure provided regarding this type of use may become an issue of concern, particularly given the health issues involved in heavy computer use and overuse. Subrahmanyam et al. (2000)

identified health concerns related to media (television and computer) overuse as obesity, seizures, tendonitis, and other potential injuries to the back, eyes, and wrists. These concerns warrant parents putting a limit on the number of hours children spend with such media each day.

**Are there gender differences in the ways that children use their home computer?**

The survey revealed that there are both similarities and differences in the manner in which males and females utilize the home computer. Bearing in mind that 58 % of the student respondents in this sample were female and 42 % were male, statistical differences (utilizing the chi-square and t-test for independent samples statistical techniques) were found in the following areas:

- Females use the home computer with friends more often than males do
- Males utilize the computer for programming, game playing, and website design more than females do, and visit music/video websites more than females do
- Females visit email and chat room websites more than males do

Although frequencies varied, no statistical differences were found in the following areas:

- Hours of computer use per week (Table 5)
- Use of computer applications such as word processing, spreadsheets, and others listed in Table 7 (with the exception of programming)
- Weekly internet usage in all areas (Table 8)
- Information divulged in online forms and chat rooms (Table 10)
- Recreational vs. productive computer use (Table 11)

What begins to emerge from these data is that males and females demonstrate similar uses of the home computer and Internet, except in a few areas. While there may have been a time when boys were more inclined than girls to utilize the computer for a variety of purposes (Martin, 1991; Rocheleau, 1995; Sanders, 1985), with the advent of the Internet and tools such as chat and email, girls are now utilizing the computer for comparable periods of time and purposes as boys. Subrahmanyam et al. (2000) confirm that the gender gap related to computer use has narrowed to a negligible margin in the recent past. Because the computer has become such a fixture both in the home and in the school, it may be that girls do not feel the anxiety that perhaps they once did toward the computer, now that it offers far more in the way of uses that appeal to the female population.

**In what way do students use the Internet?**

Much of this question was addressed in the previous sections under survey results and under the discussion question "What specific activities are students engaging in when they use their home computer?" Of the issues not previously discussed under this sub-question, the following may be considered important points that have emerged from the data:

- Students believe that their parents do have some awareness of the activities they participate in when using the Internet
- A relatively small number of students prefer to visit some sites (such as chat and email) when their parents are not present
- Some students had concerns about the types of information they may be exposed to on the Internet, mainly pornographic and other inappropriate sites

- Most students are not familiar with the use of cookies on the Internet

The information gleaned from these questions indicates that for the most part, a certain level of communication is occurring between parents and children regarding Internet use. Perhaps more education in the area of the role of cookies may be necessary so that both students and parents understand the types of information that can be acquired from users at websites, as well as how this information can be and is used. Familiarity with privacy policy statements would make a significant contribution in this regard. The Media Awareness Network (2000a) provides information and activities for parents, children, and teachers, which can contribute to an understanding of these aspects of Internet use.

**Do students use the Internet safely?**

As stated previously, many students are divulging personal information when using the Internet, on online forms and in chat rooms. This should be of particular concern to parents and educators. The data from student survey question number 21 conflicts with question 28; most students indicated that they believed they were safe users of the Internet, but this appears to be contradictory when one looks at the types of information they willingly provide on the Internet. This is compounded by the fact that most students do not routinely check with their parents before providing such information on online forms or in chat rooms. The fact that four students in this study have agreed to meet in person with someone they have met in a chat room is disturbing, especially given the kidnapping cases that have been reported in the media of late. Because this issue is of such concern, effective strategies must be found that will help children understand the consequences of their actions in this regard. Parents in the focus groups provided some excellent ideas:

> Maybe by sharing a story about one of those kids or having them come in themselves to discuss what happened to them – fear sometimes seems to work with kids, especially those who are inclined to meet with someone they have talked to on the Internet. (Parent Focus group #1, p. 17)

This idea is well aligned with Dewey's (1938) suggestion of using children's experiences as building blocks in the education process.

One parent shared information about an episode of "Degrassi, the Next Generation" wherein a young girl ended up being stalked by someone she had conversed with over the Internet. This parent indicated that the show had a tremendous impact on both her and her daughter and it lent itself well to a discussion between the two regarding the issues brought out in the show. The parent indicated that this episode was effective because it is a show to which children at the junior high age relate well, as many watch it. The example provided by this parent supports both Dewey's (1938) and Papert's (1996) beliefs that building upon the experiences of the child can provide for an excellent learning situation, primarily because the child is able to relate concepts they are familiar with to new understandings.

Of all of the data that came from this study, the issue of children and Internet safety would seem to be the most important in acknowledging that there is a need to further educate our children regarding the safe use of the Internet.

**Is there a difference in perceptions between parents/guardians and children regarding the use of the computer in the home?**

Understanding the differences and commonalties between parent perceptions and the child's activities when using the computer is a major focal point of this study, and relates back to one of the core issues of this research: To what extent is there a digital gap

between parents and their adolescent children? It has already been established that the parents involved in this study have a reasonable background of knowledge and experience when it comes to using the computer. Whether or not this transfers into an ability to understand how their children use the computer and the Internet is an important issue.

Based on the survey results, the parents do in fact have a reasonable understanding of how the home computer is used by their children. Some discrepancies do exist in the following areas, however:

- Children are using the computer for recreational purposes considerably more than parents believed
- Children are downloading files from the Internet without their parents' knowledge
- Internet use by children is substantially higher than believed by parents
- Use of the Internet as a communication tool (for e-mail and chatting) is higher than parents believed
- There appears to be a misunderstanding or miscommunication between parents and their children as to whether or not rules for computer use exist in the home
- Discrepancies were noted between the websites students indicated they visited, as opposed to the sites that parents believed their children visited, the biggest differences being in email and search engine sites.

Of critical importance under this research question, however, is the issue brought to the fore previously; parents are not aware of the types of information their children are divulging when online. This issue emerged in the survey results as well as in the parent

focus groups and may be attributed to the fact that parents may not use the computer/ Internet in a manner similar to their children. The need to fill in online forms to enter contests, or the desire to meet with friends and colleagues in chat rooms may not exist for parents. They may therefore not have a clear understanding of how their children are getting caught up in scenarios that pose potential harm to them (although this gap between parent and child uses of the Internet may be narrowing). From this study, it is clear that not only do children need to be educated as to the dangers of giving out personal information, but parents also require some education in this area in order for them to understand how their children are being encouraged to willingly provide such personal information on the Internet. A deeper understanding of adolescent psychology may assist parents in this regard. As has been suggested throughout this research and by Papert (1996), parents need to continue doing what has worked well for them all along in raising their children. Spending time with them doing things together goes a long way in any arena, and most especially where computers are concerned.

**How do parents/guardians perceive their own level of computer literacy/knowledge?**

Much of this question was answered in the section entitled "Background Information." This question is important because it helps to provide insight into whether or not the parents involved in this study have the technical background that may be necessary in order to assist their children in the safe and effective use of the computer. As indicated previously, most of the parents in this study did have some computer knowledge and expertise. However, more in-depth probing would be required to determine the specific nature of this knowledge and experience, as a number of the parents in the focus groups indicated that their children knew more than they did when it came to using the computer

and the Internet. This is most likely due to the fact that children are spending far more time on the computer on a weekly basis than their parents and that parental activity may be relegated to the productivity tools the computer has to offer. It is important to re-emphasize that although having some semblance of technological fluency would be beneficial, it is by no means a prerequisite to being able to help children utilize the computer in a safe, appropriate manner. The parent of the child identified in the introduction of this work was very proficient in the use of computers and the Internet, but was unable to protect the child from the dangers that existed when the child used the Internet. Common sense, such as having the computer in a more visible area, may have prevented this event from ever happening.

**How much control/supervision/guidance do parents/guardians provide regarding the use of the home computer?**

As the survey results indicate, although some parents are spending time with their children on the computer, most children are certainly spending some time alone when they use the computer at home. This does not seem unrealistic as indicated by parents in the focus groups, as it would be impossible for a parent to spend every moment with the child whenever they are on the computer:

> That question "do you spend time?" is difficult because although we might spend some time, we certainly wouldn't spend 100% of the time with them – inevitably there will be many times when they will be alone. (Parent Focus group #1, p. 6)

This is not unlike trying to watch the child for every moment in every single activity they may choose to engage in. This points again to the importance of

educating our children and students so that they will be equipped with the knowledge and skills necessary to make informed and that they understand the consequences of the decisions they make when they use the computer (the Internet, specifically). Dewey's (1938) notions of freedom and structuring the child's physical and social environments to further learning hold relevance at this juncture. Providing children with the freedom they need to make choices, and mistakes, is part of the growing and learning process, particularly in adolescence. Placing the computer in a visible area and discussing the child's experiences will contribute to providing them with the structure they need to be safe and to learn while using the computer.

Having rules in place regarding computer use may be beneficial in some homes in this regard. However, perhaps such rules should be based on need rather than the parent dictating rules that may be difficult to enforce, as discussed in a parent focus group:

> Parent: Yes, and you know, it's uncomfortable for a parent laying rules down when you do want to have their trust – you want to trust that they aren't into something that perhaps they shouldn't be.
>
> Researcher: Have you ever caught them doing something they shouldn't be?
>
> Parent: No, generally our kids have been really good.
>
> Researcher: Well maybe that's why you haven't had to lay down any rules thus far. (Parent Focus group #1, p. 9)

This sentiment was a common theme in all of the parent focus groups. For the most part, these parents trusted their children and thus far have not been given

any reason not to trust them. They believed it was important to give their teenage children the space they needed until such a time that intervention became necessary.

Establishing rules with children is one method of contributing to the level of parental guidance. However, there are other more sophisticated strategies parents are aware of and are using in order to understand their children's use. As indicated in the survey, many parents are using strategies such as checking the cache, bookmarks, and temporary Internet files in order to track where their children have been on the Internet. Although parents are not able to spend every moment with their child when they use the computer, many do check periodically and discuss issues with their children.

Papert (1996) offered some technical answers to help develop a system of protection against harm to children who use the Internet. However, he suggested that

> ...a more fundamental approach is needed: the protection that comes from a family culture of trust and truthfulness. Without that, all the technical methods that will ever be invented will have leaks. Ingenious children or ingenious psycho-marauders, will find a way through. (p. 76)

Developing a family culture of honesty offers a highly effective method of protecting children from potential Internet hazards.

**What do parents/guardians think it means to provide supervision, control and/or guidance when children are using the home computer?**

For the most part, parents participating in the focus groups had a good sense of what constituted appropriate supervision related to computer use. Most used strategies such

as periodically checking up on the child, sitting and having the child show them things on the computer, and having the computer in a visible area. These, along with other routine parenting skills, seemed to provide a reasonable method of supervision. At the conclusion of the sessions, some parents became aware of the fact that a high level of technical expertise was not required to have an understanding of whether or not their children were using the computer appropriately; parental instinct and common sense can go long way in this regard, which is well aligned with Papert's (1996) notions of parental support and supervision. Results from the parent focus groups, combined with the survey results indicate that for the most part, parents (at least the parents in this study) understand what it means to provide effective guidance and supervision when it comes to their children's computer use.

**What do parents/guardians need in order to help their children utilize the home computer in a more appropriate, safe manner?**

Based on information gleaned from the parent focus groups, parents are aware that they do need to learn more about the computer and the Internet in order to get a better grasp of the issues related to their children's use of the computer. The parents who attended the focus groups believed that this was a big step for them, that they had really learned a lot that would help them in their role as they work with their children, and that the handouts and website shared at the focus group would continue to serve as useful tools. The most interesting points shared in the focus groups were that parents:

- felt that their children knew more than they did when it comes to the computer

- were most interested in learning how to track where their children have been when they use the Internet
- were surprised to learn that girls are now using the computer as much as boys
- did not realize how easy it was to access chat rooms and email
- for the most part, felt that they could trust their children with the use of the computer
- were shocked to learn how much personal information children were providing online
- were grateful for the information shared at the sessions and planned to use it at home

A follow-up session would certainly have contributed to investigating the extent to which parents had an opportunity to implement the strategies they had learned at these sessions. A brief letter was sent home to solicit information in this regard. However, this primarily served as a reminder to parents to act upon some of the strategies, as some parents asked for further information. Parents who were unable to attend the sessions were provided with handouts and information that was covered at the sessions.

## A Comparison of Similar Studies

### The Media Awareness Network Study (http://www.media-awareness.ca/eng/webaware/netsurvey/index.htm)

In 2000 and 2001, with funding from the Government of Canada, the Media Awareness Network (MNet) conducted a study titled *Young Canadians in a Wired World,* which surveyed 6,000 Canadian youth and 1,000 Canadian parents. The primary purpose of

the study was to explore "what young people do online, how they perceive the Internet and what they know about it" (http://www.media-awareness.ca/eng/webaware/netsurvey/index.htm). Data gathered from the 6,000 youths were also compared to information gathered from parents previously. The study had three main components from which it derived its data: a student survey (pen and paper), a parent survey (telephone), and focus groups. Although the current research project examined various aspects of home computer use, the MNet study focussed on the manner in which youths use the Internet. From this perspective, the study's objectives and research methodology are well aligned with a number of those in this research project.

The author of the current study has had opportunity to participate as an expert, along with other educators, researchers, administrators and government officials across Canada, in the review and release of the findings from the MNet study. This experience has provided insight into the development of the current research project, and therefore lends itself well to a comparison of the results from both studies. Similarities and differences between the two studies related to Internet use will be highlighted.

**Similarities.** A number of similarities were noted in these two studies, contributing to the reliability of the findings discovered in each (although the MNet study had a significantly higher participation rate). The following is a list of those items where similarities were noted, although different units of measure may have been utilized in obtaining results (weekly Internet use as opposed to daily Internet use, for example):

- A significant number of students have Internet access at home (MNet: 79%, current study: 89%).

- Students often learn how to use the computer and the Internet through self-exploration.
- Students spend most of their time on the computer and Internet alone (MNet: 50%, current study: 86%).
- Most students are not regularly supervised when using the computer/Internet, although parents do periodically check on their children when using the computer/Internet.
- A small number of youths have agreed to meet in person with someone they have met on the Internet (MNet: 15%, current study: 5%).
- Parents believe that their children use the computer/Internet primarily for educational-related activities, whereas children indicated that it is used primarily for reasons that may not be considered school-related.
- Many students have their own email accounts, often unbeknownst to their parents.
- Many students use instant messaging services.
- Students divulge personal information when online.
- Rules pertaining to computer/Internet use do exist in the home, however the current study indicates that there are some differences in these rules when parent and child responses are compared.

**Differences.** Although many similarities were noted between the MNet study and the current study, a few differences did surface:

- In the MNet study, parents indicated that the computer was in a common area of the home (75%). The current study contradicts this, with only 35% of parents and 24% of students indicating that this was the case.
- More parents in the MNet study indicated that they used blocking or filtering software on their home computers than those in the current study did.
- The MNet study gives the impression that parents believe that they know what their children are doing when they use the computer/Internet, however, their children indicate this is not the case. For the most part, the current study indicates that parents actually have a pretty good sense of how their children use the computer/Internet, from a broader perspective.

It is important to note that one major difference between the two studies is that the current study matched parent and student surveys. This was not the case in the MNet study. The significant number of similarities between the two studies confirms that fact that further education initiatives for educators, parents and government officials related to computer and Internet use is warranted. The Media Awareness Network has certainly paved the way in this regard with their informative website (http://www.media-awareness.ca/eng/webaware/home.htm) which provides numerous resources for all concerned parties , as well as their efforts contributing to the Government of Canada's initiative entitled *Illegal and Offensive Content on the Internet* (http://www.connect.gc.ca/cyberwise/). Steps are being taken to increase awareness of the issues related to Internet safety as emphasized in the MNet study and the current study.

**The Pew Internet and American Life Study**

**(http://www.pewinternet.org/reports/toc.asp?Report=36)**

The Pew Research Center for the People and the Press is an "an independent opinion research group that studies attitudes toward the press, politics and public policy issues" (http://www.people-press.org/moreabout.htm), and is sponsored by the Pew Charitable Trusts (http://www.pewtrusts.com/about/index.cfm?image=img2). The Pew Internet project report titled *Teenage life online: The rise of the instant-message generation and the Internet's impact on friendships and family relationships* was released in June 2001 and detailed the results of their study which was intended to discover how American youth and their parents have integrated the Internet into their daily lives. For this study, 764 youths aged 12 through 17 and their parents were surveyed by telephone. Not unlike the Media Awareness Network study (2000a, 2000b, 2000c, 2001a, & 2001b), similarities and differences were noted in the data which emerged from the Pew study and the current study.

**Similarities.**

- Large numbers of teenagers use instant messaging as a communication tool.
- In both studies, parents and children agree that the child knows more than the parent when it comes to Internet/computer use.
- Children are providing personal information such as their name and email address to strangers they have met online.
- Children are mostly self-taught about how to use the Internet/computer.
- One of parents' biggest concerns regarding Internet use is that their child may come across inappropriate content.

- Rules such as time limits exist pertaining to computer/Internet use.
- Parents utilize a variety of strategies in supervising their children when using the Internet such as implementing rules, checking up, and spending time with the child on the computer.
- Youth in both studies utilize the Internet for similar purposes.
- Differences between genders in certain online activities were noted (such as game playing and using the Internet as a communication tool).

**Differences.**

- Discrepancies exist in the Pew study between parents and children regarding the existence of rules pertaining to computer/Internet use. Agreement on this issue was found in the current study.
- In the Pew study, the computer was often located in a visible are of the home (70%). This number was significantly lower in the current study.
- Forty-one percent of families in the Pew study have content filters or other site-restricting software on the computers. This number is considerably higher than in the current study (only 7% according to parents, and 5% according to student responses).

Although all three studies examined somewhat different aspects of computer and Internet use, it would appear that the three certainly have some common threads that were investigated and common themes that subsequently emerged. Large-scale studies like those conducted by MNet (2000, 2001) and Pew (2001) have contributed to raising awareness of issues related to computer and Internet safety. The current study was consistent with many of the findings from both studies, but also challenges some of data arising from the two

studies. It is important to note that it does not appear that rigorous statistical analysis was undertaken in either of the two large-scale studies; only frequency data are reported in those studies. This does not lend itself well to determining levels of significance in the data. Also, an important difference between the two major studies is that while the MNet study (2000, 2001) collected and reported data for the primary purposes of raising awareness and implementing major objectives, the Pew study appears to be reporting data for information purposes only. Both studies were written at a level for the general public to understand.

# CHAPTER FIVE

# SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

## Introduction

The purpose of this study was to gather data that would provide an overall impression of the manner in which junior high students utilize the home computer that would contribute to an understanding of the issues involved in this process. As well, an understanding of the differences between parent perceptions and their children's activities related to home computer use was sought. The study posed the following primary research questions:

1. In what ways are junior high students using their home computers?
2. How do parental perceptions compare to what their children claim to be doing when using the home computer?
3. What do parents/guardians need in order to help their children utilize the computer in a more appropriate, safe manner?

A number of specific sub-questions were posed in an effort to facilitate the process of answering the main questions:

a. What specific activities are students engaging in when they use their home computer?

b. What percentage of these activities is related to academic interests, as opposed to more recreational pursuits?

c. Are there gender differences in the ways in which children use their home computer?

d. In what ways do students use the Internet?

e. Do students use the Internet safely?

f. How do parents/guardians perceive their own level of computer literacy/knowledge?

g. How much control/supervision/guidance do parents/guardians provide regarding the use of the home computer?

h. What do parents/guardians think it means to provide supervision, control and/or guidance when children are using the home computer?

i. Is there a difference in perceptions between parents/guardians and children regarding the use of the computer in the home?

j. What do parents/guardians need in order to help their children utilize the home computer in a more appropriate, safe manner?

Chapter One provides the introduction to this study, including the purpose and significance, the research hypotheses, questions, and objectives, as well as the conceptual framework used as a foundation for this project.

Chapter Two is a review of the literature relating to children and technology use from an historical perspective. Current studies are described, and issues and information pertaining to the role of the parent and educator in the use of technology are highlighted.

Chapter Three describes the research methodologies utilized in this study. This includes a description of the quantitative and qualitative methods used, such as surveys and focus groups. Sample selection and procedures are provided, in addition to information about the ethics review and the ethical issues that emerged in the study. The limitations and delimitations of this study are also included in Chapter Three.

The findings and discussion of the findings that arose in this study are described in Chapter Four. Specific data from the surveys are provided in tabular and descriptive formats, based on the research questions posed. The survey results are subsequently discussed; data from the focus group sessions are incorporated into the discussion section. A comparison of this study to two similar, larger studies is also provided in Chapter Four.

In Chapter Five, the summary, conclusions, and recommendations for further study are presented.

## Summary

In the recent past, there has been a marked increase in the number of computers found in Canadian homes. Along with this increase, the number of homes gaining access to the Internet has also risen sharply, bringing with it new challenges that we as educators and parents must now face. Where once the computer was viewed primarily as a tool for word processing in education, it now serves a variety of purposes. This is also true of computer use in homes.

The conceptual framework for this study provided a foundation for understanding the role of education in helping children to deal with the changes that have accompanied the infiltration of the computer and the Internet into the home. When we speak of education in this regard, we are referring to the education of the child as an entity both within the classroom and in larger society, including the informal education they receive at home. The emphasis for Dewey (1938) was not on the rote memorization of material and the dictation of curriculum from so-called authorities:

> Because the studies of the traditional school consisted of subject-matter that was selected and arranged on the basis of the judgment of adults as to what would be

> useful for the young sometime in the future, the material to be learned was settled upon outside the present-life experience of the learner. (p. 76)

Rather, a child's education must be based upon the manner in which a child learns best, and that is through their own experiences. In considering the development and implementation of curriculum not only pertaining to technology, but also in other respects, benefits can be realized only by having adults take the initiative to truly understand the experience of the child. This requires time and dedication on the part of the adult. The data from this study demonstrated that children can be, and are, self-taught where technology is concerned. Perhaps we need to arrive at an understanding of how the experiences of children can lead to their being able to learn on their own, as this may help us to educate them better to become lifelong learners. We need to arrive at a new understanding of learning in order to benefit our children and ourselves.

The nature of child development is changing as a result of technology. This is particularly true regarding the types of relationships children are developing as a result of their use of the computer and the Internet. In order to educate children in this regard, we too must become conversant in the language and experience of this arena.

The role of the parent cannot be ignored; the research has consistently demonstrated the importance of parental involvement in the child's holistic education. It is not uncommon for children to start using the computer prior to entering their formative school years. Just as reading to children at a young age is important, so too is educating them regarding the safe and appropriate use of the computer. If this is accomplished at a young age and maintained as the child moves through school, the parent may feel that they are in a better position to assist the child, rather than waiting until the child has surpassed them

regarding their computer expertise. Although this is the position in which many parents now find themselves in, the results of this study have demonstrated that technical expertise does not necessarily outweigh the importance of the strong parenting skills that can be found in common sense approaches to raising children. Many of the issues arise out of children using computers can be addressed in a manner no different than other issues that inevitably surface when raising an adolescent.

Embracing change seems to be a key element in understanding the child's experience related to computer and Internet use. Where technology is concerned, it would seem that embracing change has been a daunting task for adults, compared to the ease with which children have adapted to rapidly changing technologies. It also becomes important to understand how technology has evolved to the point where it has the potential to exact such a tremendous impact upon our children, so that we can effectively plan for issues we will all face as technology continues to change the manner in which we work, play, and live.

## Conclusions

There is no doubt that technology has played and will continue to play a role in the home, in the school, and in society. Although we are just now starting to appreciate the impact of technologies such as the Internet, particularly in the lives of our children, our roles as educators and parents really haven't changed that much, just as Cuban (2001) contends. We continue to be responsible for imparting the wisdom and skills that are necessary in order for our children to be successful in school and in life. We know that highly structured lessons where children are passive consumers of information are not an effective method for imparting this wisdom; Papert (1993a, 1993b, 1996) was critical of education in this regard. As originally proposed by Dewey (1938), understanding and

capitalizing upon the experiences of the child have now become critical components in ensuring that children appreciate the consequences of any technology. This is especially true where the use of the computer and the Internet are concerned. From both an historical and sociological perspective, Postman (1992), Cuban (2000), and Turkle (1995) emphasize the importance of learning from lessons and mistakes of the past so that issues pertaining to the rapidly evolving cyberculture can serve to assist us as we help to educate children in the appropriate and safe use of new technologies.

This study has provided the opportunity to gain some insight into the issues surrounding the manner in which junior high students utilize home computers. Some of the more critical points arising from this research, many substantiated by larger research projects of a similar nature and perhaps warranting increased attention from parents and educators, are as follows:

- A significant number of homes with children of junior high age have both a computer and an Internet connection.
- Students of junior high age use the home computer and the Internet for a wide variety of purposes that are dominated by more recreational-type activities.
- Many parents have a reasonable level of computer expertise. However, they believe that their children know more than they do when it comes to the Internet.
- Although there is somewhat of a communication gap between parents and their children regarding computer and Internet use, many of the parents in

this study have a good sense of how their children are using the home computer.

- Males and females use the home computer for similar amounts of time and for similar purposes (exceptions: males engage in programming, game playing and website design more than females, in addition to visiting music/video websites more than females).
- For the most part, junior high students use the Internet safely, although many students are divulging personal information online.
- Although parents are providing certain levels of supervision and guidance when their children use the home computer, children are spending most of their time alone on the computer and the computer is not typically located in a visible area of the home.
- Parents believe that they need more training and information in order to help their children utilize the home computer and Internet in a safe, appropriate manner.

Of the points listed above, two seem to be the most important for parents and educators: steps must be taken to help children fully understand the consequences of divulging personal information online; and efforts must be made to place the computer in a more visible area within the home. Neither one of these initiatives requires a great deal of technical expertise or knowledge, but both can make a significant contribution to keeping our children safer when they use the computer and Internet at home. There are numerous educational programs that can further extend both the parent's and the child's knowledge in the area of computer and Internet safety, such as those efforts coordinated by the Media

Awareness Network (2000, 2001) and the Government of Canada (2002). That these are Canadian initiatives makes them even more appropriate for use by educators and parents. Research in this area must also continue in order to explore the issues that will continue to change and affect the lives of children, as described in the next section.

**Recommendations for Further Study**

Although this study was rather narrow in its focus, I would suggest that it has contributed in a variety of ways to the existing body of knowledge regarding home computer use. Larger studies, such as those conducted by the Media Awareness Network (2000, 2001) and Pew (2001) have also made significant contributions in this area. Funding from various agencies permitted these organizations to take on a much larger scope in the approach to their studies. Whereas the Media Awareness Network (2000, 2001) and Pew (2001) studies focussed on Internet use, the current study examined both computer and Internet use by junior high students, as these are separate but yet strongly related technologies. As well, the intent of the current study was to generate data that would give a representation of related issues at a local level, as opposed to a nation-wide study.

If a study similar in nature were to be undertaken at a later date, the first recommendation would be to examine computer and Internet use at three age levels: elementary, junior high, and senior high. Each of these age groups presents with unique characteristics and would provide further insight into some of the issues examined within this study.

This study randomly selected students and parents from within a large, urban, public school district. A cross section of school districts/boards, public, separate, and

private, from both urban and rural areas, would increase the ability of the data to be generalized in subsequent studies.

A third recommendation for further study is the inclusion of children in follow-up focus groups. This study targetted parents for the focus groups for specific reasons. However, having children participate with their parents may lead to a decrease in the communication gap between parents and children that was identified in the current study.

One final recommendation for further research pertains to the education programmes related to computer and Internet safety that currently exist in schools. It would be interesting to investigate the strategies, if any, that educators are currently utilizing to help ensure that students are being educated about the issues that have arisen in this study.

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# APPENDIX A

# DEFINITIONS

## DEFINITIONS

The following definitions are provided to assist those who may not be familiar with some of the terms used throughout the dissertation:

Asynchronous communication – Data that can be sent from one computer at any time, and received by another computer at a later date. Examples include email and listservs.

Bandwidth – The "amount" of data that can be transferred over a network at one time, usually measured in bits per second or megabits per second.

Computer – An electronic device used to process and store information. For the purposes of this paper, this excludes gaming machines such as Nintendo and Sega.

Cookies – A cookie is a file that can be sent from a website and stored on a user's computer. A cookie file "remembers" information about a user such as passwords, sites that they visit on the Internet, etc., and are often used to increase the speed at which a page reloads after it has been visited.

Host – A computer not unlike a hub in a larger network, providing services such as email, bulletin boards, data storage, etc.

ICQ - ("I Seek You"). "A popular chat program that can be used to find other users and to alert others when a user goes online.

Internet – A worldwide network of computers, connected together for the purpose of sharing information.

Listerv – An automated email discussion list on a topic of interest. When a user "subscribes" to a listserv, they receive all messages that are posted to the listserv; the user

can also post messages so that everyone who is subscribed to listserv will receive a copy of that message. Similar to a mailing list.

MOO – Object Oriented MUD (see MUD). An object-oriented programming language is used to participate in a virtual reality-type setting, as opposed to typing in text-based commands.

MUD – Multi-user Dungeon, Multi-user Domain, or Multi-user Dimension. A text based online environment that allows users to interact with one another in a virtual reality-type setting.

MUSH - Multi-User Shared Hallucination. Another type of MUD. Players participate in role playing games where they can construct rooms and interact with one another.

Newsgroup – Similar to a listserv, however, users post messages to a specific site on the World Wide Web so that everyone who has subscribed to the newsgroup can read and post follow-up messages. Similar to a bulletin board.

Surfing – Visiting various sites, usually with no specific purpose, often just for fun.

Synchronous communication – Blocks of data sent and received between computers simultaneously. ICQ chat and video teleconferencing are examples of synchronous communication.

World Wide Web – An area on the Internet where web pages and other information can be found.

# APPENDIX B

# INFORMATION LETTER AND CONSENT FORM

Dear Parent/Guardian:

My name is Daylene Lauman and I am a teacher and Curriculum Coordinator, Instructional Technology at Ottewell Junior High School in Edmonton. I am also a Doctoral student in the Faculty of Education at the University of Alberta. My area of research interest centres around how students use computers, both at home and at school.

For this particular research project, I am interested in learning how students use their home computers. I am interested in this topic because I believe that the home computer plays a role in the types of technology skills students acquire, but I also believe it plays a part in the moral, social, and emotional development of children; this is particularly important where the use of the Internet is concerned. In addition to the types of activities they use the home computer for, I am also interested in learning what role the parent plays in the use of the home computer. The main purpose of this study is to help empower parents to play a greater role in how children use the home computer. This means that both your child and you will be involved in this study, if you choose to participate.

When the research study is complete, I plan to develop a brochure or website that may assist parents/guardians in their attempts to become more empowered in relation to how the computer is used in the home. If there is enough interest generated, I also plan to implement a parent information session/training group that will allow parents to come together to discuss issues relating to their children and the use of the home computer, as well as to learn new skills that may help them feel more comfortable in using the computer.

Your participation and that of your child will involve the completion of a brief survey. Completion of the survey will take approximately 15 minutes of your time. Parents will complete the survey at home and students will complete a similar survey in class. You are guaranteed that the results of the survey will remain completely confidential and anonymous. It will not be necessary for you to include your name, your child's name or any other identifiable information on the survey. The survey will be submitted and returned to me in a plain sealed envelope, with only a code on the envelope to match your survey with your child's for data analysis purposes. It is asked that the surveys be returned at your earliest convenience; all students and parents who return their surveys within the two week deadline will be entered into a draw for a variety of gift certificates (a teacher at your child's school will keep track of names for this purpose only – surveys will remain in the anonymous, sealed envelopes until received by the research coordinator). Since participation in this study is voluntary, you and/or your child may withdraw from the study at any time, without penalty of any kind being imposed. Results of this study will be used for academic purposes only. I would be happy to share the results of this study with you, at your request.

To assure anonymity, the survey will be administered after the enclosed consent form has been returned. Your signature on the consent form is to give approval for your child to participate in the study; by completing the survey you are providing consent for your own participation. A student signature is also requested to provide your child with the opportunity to give consent for their own participation. If you require further information about this research project, or if you have any questions at all, please feel free to contact me at (780) 426-5486 (H) or at (780) 466-7331 (W) or by email at dlauman@compusmart.ab.ca. You may also contact my supervisor, Dr. Norma Nocente, at the University of Alberta: (780) 492-3676, or norma.nocente@ualberta.ca. Please complete the consent form attached to this letter, then return to your child's teacher in the envelope provided.

If you would be interested in participating in an information session/training focus group intended to help increase your knowledge and skills using the computer, please complete, detach, and return the bottom portion of this letter with the consent form. Thank you.

Sincerely,

Daylene J. Lauman, M.Ed.

---

☐ I would be interested in participating in an information session/training group at the conclusion of this study.

☐ I am not interested in participating in an information session/training group at the conclusion of this study.

First and Last Name (please print) _____ Phone Number _____

**University of Alberta**

**Research Consent Form**

I, _____, hereby consent for my child
(print name of parent/legal guardian)

_____ to be surveyed with a questionnaire by
(print name of student)

Daylene Lauman.

I understand that:

- my child and I may withdraw from the research at any time without penalty
- all information gathered will be treated confidentially and discussed only with Daylene Lauman's supervisor
- any information that identifies my child or myself will be destroyed upon completion of this research
- neither my child nor myself will be identifiable in any documents resulting from this research

I also understand that the results of this research will be used only in the following:

- research thesis
- presentations and written articles for other educators
- subsequent parent information and training sessions

_____ _____
(signature of parent/legal guardian) (signature of student)

Date signed: _____ Date signed: _____

For further information concerning the completion of this form or for any other information, please contact Daylene Lauman, Ottewell School, 9435 - 73 Street, Edmonton, AB T6B 2A9, Phone: (780) 466-7331, email: dlauman@compusmart.ab.ca or Dr. Norma Nocente, University of Alberta, Phone: (780) 492-3676, email: norma.nocente@ualberta.ca

# APPENDIX C

# INFORMATION LETTER AND CONSENT FORM:

# PARENT FOCUS GROUP

Dear Participant:

My name is Daylene Lauman and I am a teacher and Curriculum Coordinator, Instructional Technology at Ottewell Junior High School in Edmonton. I am also a Doctoral student in the Faculty of Education at the University of Alberta. My area of research interest centres around how students use computers, both at home and at school.

First, I would like to thank you for taking the time not only to complete the survey as part of this research project, but also for expressing an interest in participating in the information session and training group referred to on the consent form you had signed or on the survey itself.

The main purpose of this phase of the study is to help you to become more comfortable, knowledgeable, and skilled in the use of the computer for two main reasons: 1) for your own personal education, and 2) so that you may increase your ability to help your child use the computer in a manner that is both safe and appropriate.

It is intended that first meeting will be of a sharing and discussion format. This will provide the opportunity for you to discuss any questions or concerns that may have arisen out of the survey as well as any other questions you may have regarding the use of the computer and other technologies. This meeting will also serve the purpose of designing subsequent training sessions to address specific needs you may identify initially. The information session will be audio-taped for this reason, as well as to provide useful data regarding your progress over the duration of the information sessions and training groups. The transcripts of the audio-taped sessions will be shared with you for your approval and/or editing.

Two separate training groups are planned, based on the needs and skill/knowledge levels expressed at the first meeting. It is planned that the information groups and training sessions will take place every Saturday, one group session in the morning for approximately three hours, and the second group session in the afternoon for three hours, however, this is flexible and will depend on the expressed need and interest of those participating in the groups. In addition to the audio-taped sessions, participants will be asked to volunteer to keep a journal which will reflect their progress over the duration of the information sessions and training groups. The journal may also be used for data analysis purposes in this study.

Your participation in this phase of the research study is completely voluntary. You are guaranteed that the results of the focus groups and training sessions will remain completely confidential and anonymous. It will not be necessary for you to include your names or any other identifiable information on the survey. Since participation in this phase of the study is voluntary, you may withdraw your participation at any time, without penalty of any kind being imposed. Results of this study will be used for academic purposes only, and will be used primarily as a contribution to my thesis and may also be shared with other educators for information purposes. I would be happy to share the results of this study with you, at your request.

If you require further information about this phase of the research project, or if you have any questions at all, please feel free to contact me at (780) 426-5486 (H) or at (780) 466-7331 (W), or by email at dlauman@compusmart.ab.ca. You may also contact my advisor, Dr. Norma Nocente at the University of Alberta at (780) 492-3676 or by email at norma.nocente@ualberta.ca

Please complete the consent form attached to this letter and return to the project coordinator (Daylene Lauman) as soon as possible. Thank you again for your interest in participating in this project.

Sincerely,

Daylene J. Lauman, M.Ed.

**University of Alberta**

**Research Consent Form**

I, _____, hereby give consent for my participation
(print name)

in the information session and training groups to be provided by Daylene Lauman.

I understand that:

- I may withdraw from the research at any time without penalty
- all information gathered will be treated confidentially and discussed only with your supervisor
- any information that identifies me will be destroyed upon completion of this research
- I will not be identifiable in any documents resulting from this research

I also understand that the results of this research will be used only in the following:

- research thesis
- presentations and written articles for other educators

_____ _____
(Signature) (Date signed)

For further information concerning the completion of this form, please contact Daylene Lauman, Ottewell School, 9435 - 73 Street, Edmonton, AB T6B 2A9, Phone: (780) 466-7331, email: dlauman@compusmart.ab.ca or Dr. Norma Nocente, University of Alberta, (780) 492-3676, email: norma.nocente@ualberta.ca

# APPENDIX D

# FOCUS GROUPS:

# GUIDANCE QUESTIONS FOR

# SEMI-STRUCTURED INTERVIEWS

**GUIDING QUESTIONS**
**for**
**SEMI-STRUCTURED, AUDIO-TAPED INTERVIEWS**
**with**
**PARENTS/GUARDIANS**

Introduction to interview:
As you know, I am seeking your thoughts, opinions, and concerns regarding student use of the home computer. I would like to begin by asking you about your own background relating to the use of the computer (please comment).

1. What are your thoughts on the results of the study presented?

2. As a parent, do you have any general thoughts or concerns regarding how your child/children use the computer at home?

3. What do you believe your role should be in educating your child/children about how the computer is used at home?

4. Are there specific strategies you are using with your child/children to teach them about
appropriate and safe use of the computer? If so, please describe.

5. What do you think might be the most effective measure that could be used to ensure that
children understand the importance of safe and appropriate use of the computer, whether at home or at school?

6. What do you think it means to provide supervision or guidance to your child/children when they use the computer?

7. Are there specific skills/knowledge you would like to acquire that you think may help you in your role regarding your child's use of the home computer?

8. Please feel free to discuss any other issues and ask any questions regarding your participation in this and subsequent sessions.

# APPENDIX E

# STUDENT SURVEY QUESTIONS AND RESPONSES

## COMPUTER USE SURVEY: STUDENTS' RESPONSES

For each question below, please fill in only the circle that most applies:

1. Gender: O Male: 42% (35) O Female 58% (49)

2. Who spends most of the time at home taking care of you and/or you siblings?
   O Mother: 63% (52) O Father: 7% (5) O Male guardian: 0 O Female guardian: 1% (1)
   (mother and father: 29% [24], no answer=1 [1%])

3. How long have you used a computer?
   O I do not use a computer: 0
   O less than a year: 1% (1)
   O about a year: 19% (16)
   O 5 to 10 years: 64% (54)
   O 10+ years: 10% (8)
   (1 to 5 years [omitted from survey]): 6% (5)

4. When you first started using a computer, how did you learn to use it?
   O Parents taught me: 37% (31)
   O Self-taught: 47% (39)
   O Friends taught me: 10% (8)
   O Learned at school: 34% (28)
   O Don't remember: 6% (5)

5. Approximately how many **hours per week** do you use your computer at home?
   O Less than 1 hour: 12% (10)
   O 1 to 5 hours: 38% (32)
   O 5 to 10 hours: 26% (22)
   O 10 to 20 hours: 16% (13)
   O More than 20 hours: 8% (7)

6. Do you **usually** use your home computer alone or with other people?
   O Alone: 86% (71)
   O With parents: 5% (4)
   O With friends: 21% (17)
   O With siblings: 11% (9)
   O Other (please specify): _____: 0

7. Who is considered the computer 'expert' in your home?
   O You: 48% (40)
   O Mother/female guardian: 16% (13)
   O Father/male guardian: 25% (21)
   O Brother or sister: 28% (23)
   O Other (please specify): _____: 6% (5)

8. Where is the computer(s) located in your home (check all that apply)?
   O Family Room/Dining Room: 24% (20)
   O Bedroom(s): 35% (29)
   O Basement: 28% (23)
   O Den/Study: 36% (30)
   O Other: _____: 5% (4)

9. Are there rules in your home about using computers (for example, time limits, Internet usage, types of use?)
   O Yes: 79% (66)
   O No: 23% (19)

10. If you answered 'yes' to #9, please indicate which of the following best describes the categories of rules in your home regarding computer use (check all that apply):
   O Types of sites you are permitted to visit: 55% (36 of 66)
   O Time limits: 62% (41 of 66)
   O Types of use (games, school work, internet): 33% (22 of 66)
   O Time of day computer may be used: 30% (20 of 66)
   O Other: _____: 6% (6 of 66)

11. **COMPUTER USE:**
Please choose the response that best indicates your **weekly** use of your computer at home:

| | DON'T USE | < THAN 1 HOUR | 1 TO 5 HOURS | 5 TO 10 HOURS | 10 TO 20 HOURS | > THAN 20 HOURS | NO ANS. |
|---|---|---|---|---|---|---|---|
| a) Word Processing | 5% (4) | 41% (34) | 42% (35) | 11% (9) | 2% (2) | 0 | |
| b) Spreadsheets | 73% (61) | 24% (20) | 2% (2) | 1% (1) | 0 | 0 | |
| c) Databases | 74% (62) | 18% (15) | 6% (5) | 2% (2) | 0 | 0 | |
| d) Programming | 51% (43) | 29% (24) | 13% (11) | 5% (3) | 2% (2) | 1% (1) | |
| e) Desktop Publishing | 57% (48) | 21% (18) | 14% (12) | 6% (5) | 1% (1) | 0 | |
| f) Presentations | 45% (37) | 29% (24) | 21% (17) | 2% (2) | 4% (3) | 0 | (1) |
| g) Internet | 13% (11) | 6% (5) | 32% (27) | 25% (21) | 14% (12) | 10% (8) | |
| h) School-related software programs (list top 5): | 47% (34) | 30% (22) | 15% (11) | 7% (5) | 0 | 1% (1) | (10) |
| i) Games (list top 5): | 11% (8) | 43% (31) | 30% (2) | 8% (6) | 6% (4) | 3% (2) | (11) |
| j) Other (specify): | 53% (34) | 12% (2) | 24% (4) | 12% (2) | 0 | 0 | (67) |

(Percentages based on those answering the question)

12. Do you have Internet access at home? (If you answer no, go to question 28)
   O Yes: 89% (75) O No 11% (9)

13. **INTERNET USE:**
Please choose the response that best indicates your **weekly** use of the Internet at home:

| | DON'T HAVE/ DON'T USE | < THAN 1 HOUR | 1 TO 5 HOURS | 5 TO 10 HOURS | 10 TO 20 HOURS | > THAN 20 HOURS | NO ANS. |
|---|---|---|---|---|---|---|---|
| a) Email | 15% (11) | 27% (20) | 43% (32) | 9% (7) | 5% (4) | 1% (1) | |
| b) Chat Rooms | 55% (41) | 19% (14) | 17% (13) | 4% (3) | 3% (2) | 3% (2) | |
| c) ICQ/Instant Messaging | 35% (26) | 7% (5) | 39% (29) | 10% (7) | 3% (2) | 7% (5) | (1) |
| d) Research | 8% (6) | 39% (29) | 37% (28) | 11% (8) | 3% (2) | 3% (2) | |
| e) Shopping | 89% (67) | 8% (7) | 1% (1) | 1% (1) | 0 | 0 | |
| f) Music/Videos | 32% (24) | 28% (21) | 25% (19) | 7% (5) | 4% (3) | 4% (3) | |
| g) Website Design | 67% (50) | 19% (14) | 9% (7) | 1% (1) | 3% (2) | 1% (1) | |
| h) Contests | 67% (50) | 27% (20) | 4% (3) | 3% (2) | 0 | 0 | |
| i) Newsgroups/Listservs | 85% (63) | 10% (7) | 4% (3) | 0 | 1% (1) | 0 | (1) |
| j) General browsing/surfing | 12% (9) | 37% (27) | 37% (27) | 11% (8) | 0 | 4% (3) | (1) |
| k) Other (specify): | 14% (3) | 36% (8) | 36% (8) | 5% (1) | 9% (2) | 0 | (53) |

Based on 75 respondents indicating they had internet access.
Percentages are based on those answering the question

14. List the five websites you visit most often:

a) Email: Yes: 62% (45)
b) MSN/Chats: Yes: 24%
c) Search Engines: Yes: 50% (36)
d) Music downloads: Yes: 26% (19)
e) Music/movie/TV stars: Yes: 6% (4)
f) Gaming: Yes: 32% (23)
g) Sports (incl. WWF): Yes: 7%
h) Traditional cartoons: Yes: 4% (3)
i) Violent cartoons: Yes: 6% (4)
j) Radio stations: Yes: 6% (4)
k) Teen/kid-related: Yes: 26% (19)
l) Hobbies: Yes: 15% (11)
m) General interest (other): Yes: 50% (36)

Based on 75 respondents indicating they had internet access: not applicable=10
Percentages are based on those answering the question: no answer=2, Total=72

15. Are your parents familiar with the activities you participate in on the Internet?
O Yes: 57% (43) O No: 3% (2) O Somewhat: 40% (30) (not applicable: [9])

16. How often do you download programs from the Internet without your parents' knowledge/permission?
O Never: 39% (29) O Hardly ever: 27% (20) O Sometimes: 13% (10)
O Quite often: 12% (9) O All the time 9% (7) (not applicable: [9])

17. Are there websites you might visit when you are using the computer alone or with friends, as opposed to when your parents are present?
O Yes: 16% (12) O No: 63% (47) O Sometimes: 21% (16)
(not applicable: [9])

18. If you answered "yes" or "sometimes" to question #17, please specify:

a) Email: (4)
b) Chats/Instant Messaging: (7)
c) General interest: (7)
d) Email & chat (checked both): (11)
(not applicable: [56], no answer: [5])
(Insignificant)

19. Do you have concerns about some of the information you may be exposed to on when you are on the Internet?
O Yes: 29%(22) O No 44%(33) O Somewhat 27%(20)
(not applicable: [9])

20. If you answered "yes" or "somewhat" to #19, please specify any concerns you may have in this regard:
    a) Accidentally getting pornography: 40% (16)
    b) Afraid of buying something accidentally: 3% (1)
    c) Getting false/unwanted information 8% (3)
    d) Inappropriate websites: 25% (10)
    e) Information privacy: 8% (3)
    f) Spamming (especially pornographic): 5% (2)
    g) Viruses: 5% (2)
    h) Other: 3% (1)
    i) Pedophiles: 3% (1)
    Not applicable: (42), No answer: (2)

21. When using the Internet, have you ever filled out any forms or given information to someone you did not know, that asked you for your:

| | ONLINE FORM | | | STRANGER/CHAT ROOM | | |
|---|---|---|---|---|---|---|
| | YES | NO | NO ANS. | YES | NO | NO ANS. |
| a) Name(s) | 55%(41) | 45%(33) | (1) | 22%(15) | 78%(52) | (8) |
| b) Nickname/False name | 70%(52) | 30%(22) | (1) | 56%(38) | 44%(30) | (7) |
| c) Email address | 71%(52) | 29%(21) | (2) | 32%(22) | 68%(46) | (7) |
| d) Home address | 27%(19) | 73%(52) | (3) | 2%(1) | 98%(67) | (7) |
| e) Phone number | 28%(20) | 72%(52) | (2) | 3%(2) | 97%(65) | (8) |
| f) Gender | 81%(60) | 19%(14) | (1) | 57%(39) | 43%(29) | (7) |
| g) Age | 66%(48) | 34%(25) | (2) | 40%(27) | 60%(41) | (7) |
| h) Interests | 58%(42) | 43%(31) | (2) | 54%(37) | 46%(31) | (7) |

Based on 75 respondents
Unanswered questions excluded from results

22. If you answered "yes" to any of the items in question #21, in what situations would you release this information?

    a) Knows person: 12% (7)
    b) Signing up for something: 51% (30)
    c) Trusts site/person: 19% (11)
    d) When chatting: 20% (12)
    e) Anytime: 5% (3)
    f) Gives false information: 5% (3)
    g) Not applicable: (23)
    h) No answer: (1)
    i)

23. Are any Internet website filters or programs (such as NetNanny or Cybersitter) used on your home computer?
    O Yes: 5%(4) O No: 71%(53) O Don't Know: 24%(18)
    (not applicable: [8], no answer: [1])

24. Do you check with your parents before providing information about yourself or your family on the Internet?
O Always: 30% (22) O Sometimes: 27% (20) O Seldom: 20% (15)
O Never: 23% (17) (not applicable: [8], no answer: [2])

25. Have you ever agreed to meet with someone you have met on the Internet?
O Yes: 5% (4) O No: 95% (70)
(not applicable: [8], no answer: [2])

26. Are you aware of, or do you ever read the privacy policy statements on websites?
O Yes: 31% (23) O No: 40% (30) O Sometimes: 29% (22)
(not applicable: [8], no answer: [1])

27. Are you familiar with 'cookies' on the Internet?
O Yes: 28% (20) O No: 61% (46) O Somewhat: 11% (8)
(not applicable: [8], no answer: [1])

28. Do you feel confident that you are a safe, responsible user of the computer and/or Internet at home?
O Yes: 87% (72) O No: 2% (2) O Somewhat: 11% (9)
(no answer: [1])

29. Do you think it is important to be a safe, responsible user of the computer and/or Internet at home?
O Yes: 91% (76) O No: 4% (3) O Somewhat: 5% (4)
(no answer: [1])

Why or why not? (please explain): _____
_____

30. What percentage of time best describes your computer and/or Internet use:

**SCHOOL-RELATED ACTIVITES:**
O 0 to 15 percent: 29% (23)
O 15 to 30 percent: 30% (24)
O 45 to 60 percent: 24% (19)
O 60 to 75 percent: 10% (8)
O 75 to 90 percent: 6% (5)
O 90 to 100 percent: 1% (1)
(no answer: [4])

**RECREATIONAL/FUN ACTIVITIES**
O 0 to 15 percent: 4% (3)
O 15 to 30 percent: 15% (12)
O 45 to 60 percent: 10% (8)
O 60 to 75 percent: 20% (16)
O 75 to 90 percent: 33% (26)
O 90 to 100 percent: 19% (15)
(no answer: [4])

Your comments are encouraged! Please feel free to comment on any of the questions throughout the survey.

# APPENDIX F

# INTERPOLATIONS FOR FIGURES 1 AND 2

## INTERPOLATIONS OF FIGURES 1 AND 2

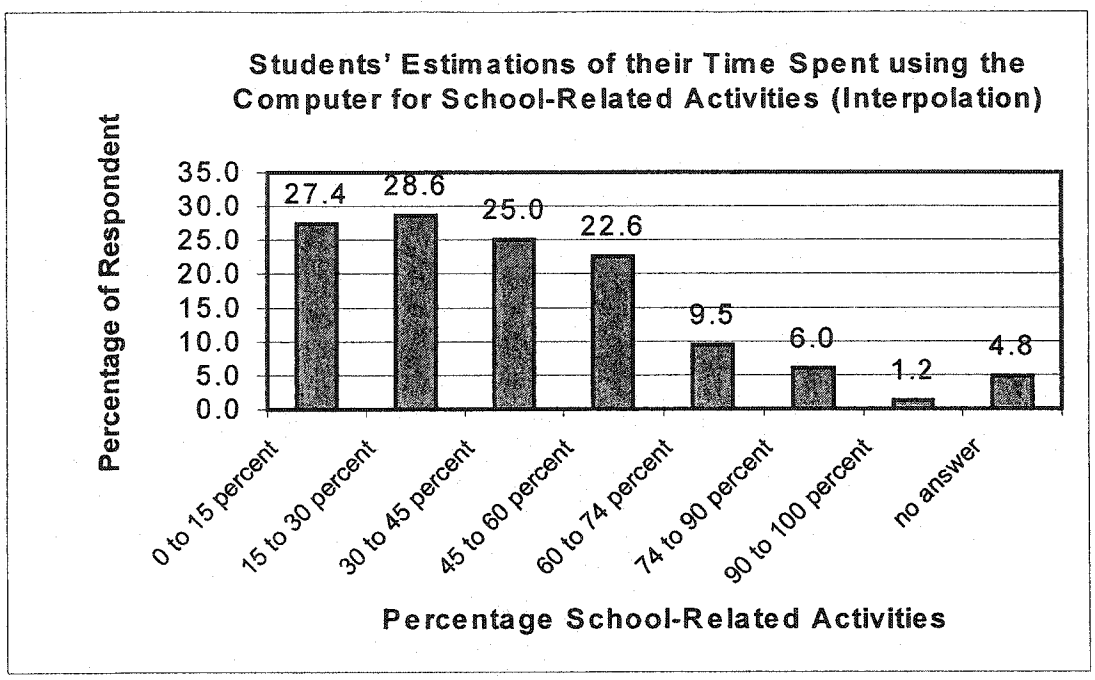


*Figure 1:* Percentage of productive/academic-related activities students engage in when using the home computer

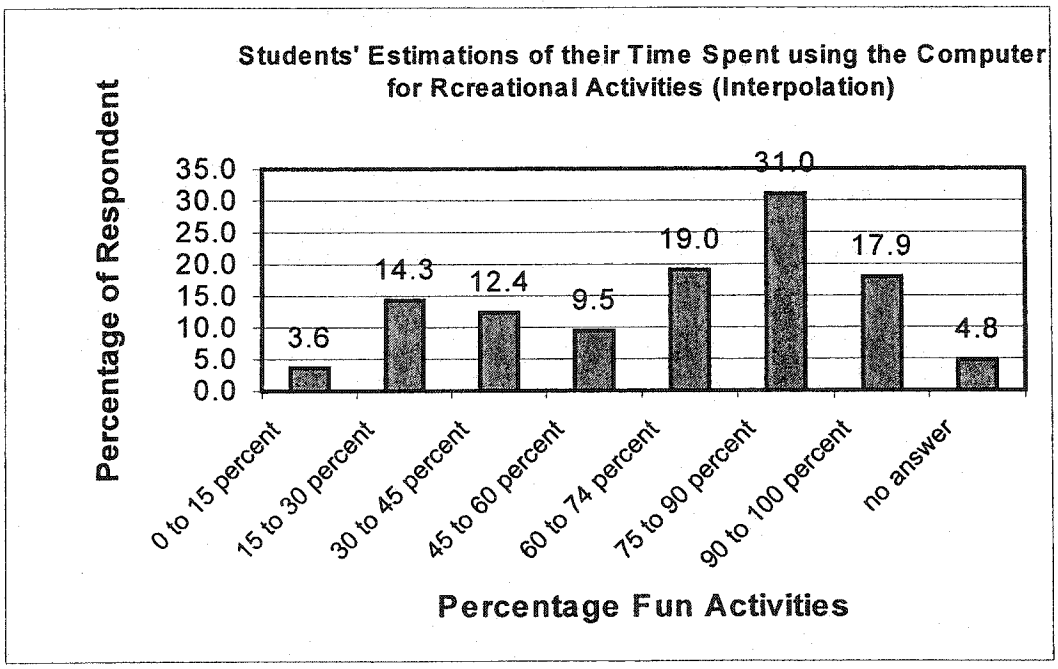


*Figure 2:* Percentage of recreational/non-academic related activities students engage in when using the home computer

# APPENDIX G

## PARENT/GUARDIAN SURVEY QUESTIONS AND RESPONSES

## COMPUTER USE SURVEY: PARENT/GUARDIAN RESPONSES

For each question below, please fill in only the circle that most applies:

1. Are you the mother, father, male, or female guardian of the child who is completing this survey?
   O Mother: 78% (65) O Father: 21% (17) O Male guardian: 0 O Female guardian: 1 (1%)

3. Who is the primary care giver (who spends most of the time at home taking care of the child/children)?
   O Mother: 84% (66) O Father: 6% (5) O Male guardian: 0 O Female guardian: 1 (1%)
   (mother and father=9% [7], no answer=4)

3. How long have you used a computer?
   O I do not use a computer: 6% (5)
   O less than a year: 6% (5)
   O about a year: 8% (7)
   O 5 to 10 years: 45% (37)
   O 10+ years: 35% (29)

4. Do you use a computer at work?
   O Yes: 64% (53)
   O No: 36% (30)

5. Do you use a computer at home?
   O Yes: 84% (70)
   O No: 16% (13)

6. Approximately how much time do you think your child spends on the computer **on a weekly basis?**
   O Less than 1 hour: 6% (5)
   O 1 to 5 hours: 47% (39)
   O 5 to 10 hours: 27% (22)
   O 10 to 20 hours: 15% (12)
   O More than 20 hours: 6% (5)

7. Do you spend time with your child/children on the computer?
   O Yes: 52% (44)
   O No: 48% (39)

8. If so, about how much time per week?
   O Less than 1 hour: 50% (22 of 44)
   O 1 to 5 hours: 48% (21 of 44)
   O 5 to 10 hours: 2% (1 of 44)
   O 10 to 20 hours: 0
   O More than 20 hours: 0
   (no answer=2)

9. Does your child spend time on the computer unsupervised?
   - O Yes: 94% (78)
   - O No: 6% (5)

10. Who is considered the computer 'expert' in your home?
   - O You: 24% (20)
   - O Spouse/Partner: 24% (20)
   - O Son: 38% (31)
   - O Daughter: 22% (18)
   - O Other: _____: 4% (3)

11. Where is the computer(s) located in your home (check all that apply)?
   - O Family Room: 35% (29)
   - O Bedroom(s): 21% (17)
   - O Basement: 30% (25)
   - O Den/Study: 33% (27)
   - O Other: _____: 10% (8)

12. Are there rules in your home about using computers (for example, time limits, Internet usage, types of use?)
   - O Yes: 86% (71)
   - O No: 14% (12)

13. If you answered 'yes' to #12, please indicate which of the following best describes the categories of rules in your home regarding computer use (please check all that apply):
   - O Types of sites that are considered permissible to visit: 78% (55 of 71)
   - O Time limits: 80% (57 of 71)
   - O Types of use (games, school work, internet): 68% (48 of 71)
   - O Time of day computer may be used: 38% (27 of 71)
   - O Other: _____: 10% (7 of 71)

14. **COMPUTER USE:**

Please choose the response that best indicates **what you believe your child's weekly** use of the computer at home is (please do not consult with your child, we would like to know what you think!):

| | DOESN'T USE | < THAN 1 HOUR | 1 TO 5 HOURS | 5 TO 10 HOURS | 10 TO 20 HOURS | > THAN 20 HRS | DON'T KNOW | NO ANS. |
|---|---|---|---|---|---|---|---|---|
| a) Word Processing | 14% (11) | 28% (22) | 51% (41) | 3% (2) | 1% (1) | 0 | 4% (3) | (3) |
| b) Spreadsheets | 79% (61) | 13% (10) | 1% (1) | 0 | 0 | 0 | 7% (5) | (6) |
| c) Databases | 77% (58) | 12% (9) | 3% (2) | 0 | 0 | 0 | 8% (6) | (8) |
| d) Programming | 71% (53) | 17% (13) | 7% (5) | 0 | 0 | 0 | 5% (4) | (8) |
| e) Desktop Publishing | 54% (41) | 30% (23) | 9% (7) | 0 | 0 | 0 | 7% (5) | (7) |
| f) Presentations | 28% (20) | 40% (29) | 25% (18) | 1% (1) | 1% (1) | 0 | 4% (3) | (11) |
| g) Internet | 12% (9) | 16% (12) | 41% (31) | 23% (17) | 4%(3) | 4%(3) | 0 | (8) |
| h) School-related software programs (list top 5): | 61% (38) | 29% (18) | 5% (3) | 0 | 0 | 0 | 5% (3) | (21) |
| i) Non-school related games (list top 5): | 21% (13) | 24% (15) | 40%(25) | 5% (3) | 2% (1) | 2% (1) | 7% (4) | (21) |
| j) Other (specify): | 63% (5) | 25% (2) | 0 | 12%(1) | 0 | 0 | 0 | (75) |

15. Do you have Internet access at home? (If you answer "no", go to question 26).
O Yes: 88% (71)
O No: 12% (10)
(no answer= [2])

16. **INTERNET USE:**
Please choose the response that best indicates **what you think your child's weekly** use of the Internet at home is (please do not consult with your child – we would like to know what you think!):

| | DOESN'T USE | < THAN 1 HOUR | 1 TO 5 HOURS | 5 TO 10 HOURS | 10 - 20 HOURS | > THAN 20 HOURS | DON'T KNOW | NO ANS. |
|---|---|---|---|---|---|---|---|---|
| a) Email | 14% (10) | 35% (25) | 46% (33) | 3% (2) | 1% (1) | 1% (1) | 0 | (1) |
| b) Chat Rooms | 60% (38) | 16% (11) | 18% (12) | 6% (5) | 0 | 1% (1) | 1% (1) | (5) |
| c) ICQ/Instant Mess. | 44% (30) | 9% (6) | 29% (20) | 12% (8) | 3% (2) | 1% (1) | 3% (2) | (4) |
| d) Research | 6% (4) | 51% (36) | 38% (27) | 3% (2) | 0 | 1% (1) | 1% (1) | (2) |
| e) Shopping | 90% (61) | 7% (5) | 0 | 2% (1) | 0 | 0 | 2% (1) | (5) |
| f) Music/Videos | 42% (29) | 25% (17) | 20% (14) | 10% (7) | 0 | 1% (1) | 1% (1) | (4) |
| g) Website Design | 23% (16) | 4% (3) | 3% (2) | NO CHOICE: 67% (46) | | | 2% (2) | (4) |
| h) Contests | 79% (51) | 19% (12) | 0 | 0 | 0 | 0 | 3% (2) | (8) |
| i) Newsgroups/Listservs | 84% (52) | 11% (7) | 0 | 2% (1) | 0 | 0 | 2% (2) | (9) |
| j) Browsing/surfing | 19% (13) | 38% (26) | 37% (25) | 3% (2) | 0 | 2% (1) | 2% (1) | (5) |
| k) Other (specify): | 43% (3) | 29% (2) | 0 | 14% (1) | 0 | 0 | 14% (1) | (65) |

Based on 73 Respondents
Not applicable = 9
Unanswered questions excluded

17. List the five websites you think your child visits most often:

n) Email: 31% (17)
o) MSN/Chats: 26% (14)
p) Search Engines: 36% (20)
q) Music downloads: 15% (8)
r) Music/Movie/TV Stars: 11% (6)
s) Gaming: 22% (12)
t) Sports (incl. WWF): 9% (5)
u) Traditional cartoons: 6% (3)
v) Violent cartoons: 4% (2)
w) Radio stations: 4% (2)
x) Teen/kid-related: 7% (4)
y) Hobbies: 7% (4)
z) General interest (other): 33% (18)

18. How often do you think your child downloads programs from the Internet without your knowledge/permission?
O Never: 43% (31) O Hardly ever: 30% (22) O Sometimes: 16% (12)
O Quite often: 7% (5) O All the time: 4% (3) (not applicable: [9])

19. Do you have concerns about your child's activities on the Internet?
O Yes 18% (13) O No 62% (45) O Somewhat 21% (15) (not applicable: [9])

20. If you answered "yes" or "somewhat" to question #19, please specify any concerns you may have in this regard:

a) Accidentally getting pornography: 27% (7)
b) Going to inappropriate websites: 19% (5)
c) Amount of time spent on computer: 8% (2)
d) Types of programs downloaded: 4% (1)
e) Chats: 12% (3)
f) Going to educational sites only: 4% (1)
g) Inappropriate email: 4% (1)
h) Chatting while doing homework: 4% (1)
i) Disclosing personal information: 4% (1)

Various combinations of above: 16% (4)
Not applicable: (55)

21. When using the Internet, do you think your child has filled out any forms or has given information to someone they did not know, that asked them for their:

| | ONLINE FORM | | | | STRANGER/CHAT ROOM | | | |
|---|---|---|---|---|---|---|---|---|
| | YES | NO | DON'T KNOW | NO ANS. | YES | NO | DON'T KNOW | NO ANS. |
| a) Name(s) | 25%(18) | 68%(48) | 7%(5) | (3) | 9%(6) | 80%(57) | 11%(8) | (3) |
| b) Nickname/ False name | 39%(27) | 53% (37) | 9%(6) | (4) | 30%(21) | 59%(42) | 11%(8) | (3) |
| c) Email address | 43%(31) | 42%(30) | 14%(10) | (3) | 18%(13) | 68%(48) | 14%(10) | (3) |
| d) Home address | 10%(7) | 82%(58) | 9%(6) | (3) | 0 | 97%(68) | 3%(2) | (4) |
| e) Phone number | 11%(8) | 81%(58) | 8%(6) | (2) | 4%(3) | 91%(63) | 4%(3) | (5) |
| f) Gender | 35%(25) | 51%(37) | 14%(10) | (2) | 25%(18) | 63%(45) | 11%(8) | (3) |
| g) Age | 31%(22) | 56%(39) | 13%(9) | (4) | 17%(12) | 72%(51) | 11%(8) | (3) |
| h) Interests | 27%(19) | 56%(40) | 19%(12) | (3) | 20%(14) | 65%(46) | 16%(11) | (3) |

Based on 70 respondents
Not applicable = 9
Unanswered questions excluded

22. If you answered "yes" to any of the items in question #21, in what situations do you think your child might release this information?

_____

_____

23. Are any Internet website filters or programs (such as Netnanny or CyberSitter) used on your home computer?

O Yes: 7%(5) O No: 89%(65) O Don't Know: 5%(4)
(not applicable: [9])

24. Do you monitor the websites your child visits?

O Yes: 68% (50) O No: 32% (24)
(not applicable: [9])

25. If you answered "yes" or "somewhat" to #24, please indicate how:
    - O Viewing the history: 69% (35)
    - O Checking the cache: 20% (10)
    - O Looking at the bookmarks: 43% (22)
    - O Looking at temporary Internet files: 45% (23)
    - O Other (specify): 8% (4)

    Supervising: 18% (9)
    (not applicable: [14], no answer: [18])

26. Please describe the type of supervision (if any) provided to your child when they use the computer and/or the Internet at home (check all that apply):
    - O Monitoring websites: 28% (22)
    - O Spending time on the computer with child: 32% (25)
    - O Discussing, designing and implementing rules/guidelines for computer use with child: 58% (45)
    - O Looking over child's shoulder periodically: 78% (61)
    - O Other: _____: 3% (2)

27. Do you feel confident that your child is a safe, responsible user of the computer and/or Internet at home?
    O Yes: 88% (73) O No: 0 O Somewhat: 12% (10)

28. What percentage of time do you think best describes your child's use of the computer and/or Internet:

| SCHOOL-RELATED ACTIVITES: | RECREATIONAL/FUN ACTIVITIES |
|---|---|
| O 0 to 15 percent: 27% (22) | O 0 to 15 percent: 12% (10) |
| O 15 to 30 percent: 29% (24) | O 15 to 30 percent: 24% (19) |
| O 45 to 60 percent: 28% (23) | O 45 to 60 percent: 27% (22) |
| O 60 to 75 percent: 9% (7) | O 60 to 75 percent: 19% (15) |
| O 75 to 90 percent: 5% (4) | O 75 to 90 percent: 15% (12) |
| O 90 to 100 percent: 2% (2) | O 90 to 100 percent: 4% (3) |
| (no answer: [1]) | (no answer: 2% [2]) |

29. Please rate your level of computer expertise/experience:
    O Excellent: 7% (6) O Above average: 24% (20) O Average: 48% (40)
    O Little experience: 15% (12) O No Experience: 6% (5)

30. Would you like to play a more informed role in how your home computer and/or the Internet is used?
    O Yes : 57% (46) O No: 43% (35)
    (no answer: [2])

31. Please specify any skills you think you may need to feel more comfortable using your home computer/Internet:

    _____

    _____

32. Would you be interested in participating in an information session/training group to this effect?
O Yes: 31% (25) O No: 69% (55)
(not applicable: [1], no answer: [2])

If you chose 'yes' for question #32, but did not indicate this on the consent form, please feel free to contact the research project coordinator, Daylene Lauman, by phone at (780) 426-5486, or by email: dlauman@compusmart.ab.ca to express your interest in participation. Please feel free to comment on any of the questions on the reverse of this page.

# APPENDIX H

## SAMPLE CALCULATIONS FOR TABLE 12

| ID# | SS5 | PS6 | Difference | Mean Absolute Deviation |
|---|---|---|---|---|
| 1 | 4 | 3 | 1 | 1 |
| 2 | 4 | 5 | -1 | 1 |
| 3 | 5 | 4 | 1 | 1 |
| 4 | 2 | 2 | 0 | 0 |
| 5 | 1 | 2 | -1 | 1 |
| 6 | 5 | 5 | 0 | 0 |
| 7 | 2 | 2 | 0 | 0 |
| 9 | 4 | 3 | 1 | 1 |
| 10 | 2 | 2 | 0 | 0 |
| 11 | 2 | 2 | 0 | 0 |
| 12 | 3 | 3 | 0 | 0 |
| 13 | 3 | 1 | 2 | 2 |
| 14 | 3 | 2 | 1 | 1 |
| 15 | 4 | 5 | -1 | 1 |
| 16 | 1 | 2 | -1 | 1 |
| 17 | 2 | 3 | -1 | 1 |
| 18 | 2 | 2 | 0 | 0 |
| 19 | 3 | 3 | 0 | 0 |
| 20 | 1 | 2 | -1 | 1 |
| 21 | 1 | 2 | -1 | 1 |
| 22 | 2 | 2 | 0 | 0 |
| 23 | 4 | 4 | 0 | 0 |
| 24 | 3 | 2 | 1 | 1 |
| 25 | 1 | 2 | -1 | 1 |
| 26 | 3 | 4 | -1 | 1 |
| 27 | 3 | 3 | 0 | 0 |
| 28 | 2 | 2 | 0 | 0 |
| 29 | 1 | 2 | -1 | 1 |
| 30 | 1 | 1 | 0 | 0 |
| 31 | 2 | 3 | -1 | 1 |
| 32 | 2 | 3 | -1 | 1 |
| 33 | 1 | 2 | -1 | 1 |
| 34 | 2 | 2 | 0 | 0 |
| 35 | 5 | 4 | 1 | 1 |
| 36 | 3 | 2 | 1 | 1 |
| 37 | 2 | 2 | 0 | 0 |
| 38 | 2 | 2 | 0 | 0 |
| 39 | 2 | 1 | 1 | 1 |
| 40 | 4 | 2 | 2 | 2 |
| 41 | 3 | 2 | 1 | 1 |
| 42 | 3 | 4 | -1 | 1 |

| | | | | |
|---|---|---|---|---|
| 43 | 3 | 3 | 0 | 0 |
| 44 | 3 | 4 | -1 | 1 |
| 45 | 2 | 2 | 0 | 0 |
| 46 | 3 | 4 | -1 | 1 |
| 47 | 2 | 2 | 0 | 0 |
| 48 | 5 | 4 | 1 | 1 |
| 49 | 2 | 2 | 0 | 0 |
| 50 | 2 | 2 | 0 | 0 |
| 51 | 2 | 2 | 0 | 0 |
| 52 | 2 | 1 | 1 | 1 |
| 53 | 3 | 2 | 1 | 1 |
| 54 | 2 | 2 | 0 | 0 |
| 55 | 1 | 2 | -1 | 1 |
| 56 | 5 | 3 | 2 | 2 |
| 57 | 2 | 3 | -1 | 1 |
| 58 | 3 | 3 | 0 | 0 |
| 59 | 5 | 3 | 2 | 2 |
| 60 | 4 | 2 | 2 | 2 |
| 61 | 3 | 2 | 1 | 1 |
| 62 | 3 | 2 | 1 | 1 |
| 63 | 2 | 4 | -2 | 2 |
| 64 | 1 | 1 | 0 | 0 |
| 65 | 3 | 2 | 1 | 1 |
| 66 | 5 | 5 | 0 | 0 |
| 67 | 4 | 3 | 1 | 1 |
| 68 | 2 | 3 | -1 | 1 |
| 69 | 4 | 2 | 2 | 2 |
| 70 | 3 | 3 | 0 | 0 |
| 71 | 2 | 3 | -1 | 1 |
| 72 | 2 | 2 | 0 | 0 |
| 73 | 3 | 3 | 0 | 0 |
| 74 | 2 | 2 | 0 | 0 |
| 75 | 3 | 3 | 0 | 0 |
| 76 | 4 | 4 | 0 | 0 |
| 77 | 4 | 4 | 0 | 0 |
| 78 | 2 | 3 | -1 | 1 |
| 79 | 4 | 3 | 1 | 1 |
| 80 | 2 | 3 | -1 | 1 |
| 81 | 2 | 2 | 0 | 0 |
| 82 | 4 | 5 | -1 | 1 |
| 83 | 3 | 4 | -1 | 1 |
| 84 | 2 | 2 | 0 | 0 |
| **SUM** | 225 | 222 | 3 | 55 |
| **MEAN** | 2.710843 | 2.674699 | 0.036145 | 0.662651 |
| N= | 83 | | | |