

Making Connections: Adolescent Girls' Use of the Internet

Janice Irene Robbins

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Marilyn V. Lichtman, Chair
Sharon A. Brusic
Harold A. Kurstedt Jr.
Dan R. Saurino
Thomas M. Sherman

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by

Janice Irene Robbins

Committee Chair: Marilyn Lichtman

(ABSTRACT)

Women remain underrepresented in computer technology careers and university majors, and adolescent girls shy away from high school computer science courses. More information is needed about females who are attracted to computer technology. This study described the online activities of young adolescent girls ages 12-14 who are high-end users of computer technology. Three developmental tasks of adolescence (search for identity, pursuit of social connections, and desire for a sense of competence and accomplishment) were used to frame explorations of the girls' online activities. Eight girls were interviewed, the personal web sites of six girls were analyzed, and postings on a message board for young girls interested in online activities were reviewed. Patterns and themes that emerged from the data indicated that Internet technology was an effective match for the informants' developmental tasks. Specific inferences included: (1) Online technologies offered the informants multiple ways of negotiating social relationships; (2) Internet use supported the informants' engagement in personalized, self-directed, and self-initiated learning; (3) Support from parents, siblings, and peers

provided the environment for each girl to develop confidence and competence in Internet use; and (4) The informants' use of the Internet reflected women's ways of knowing.

Dedication

I dedicate this study to the memory of my mother and father. Their lives and their love are etched in my past, my present, and my future. My mother gave me the knowledge that women are strong and powerful in ways often subtle and surprising. My father gave me a fascination with new technology and an appreciation for being “different.” He taught me to treasure the moment.

Both of my parents would have eagerly embraced computer technology, but for different reasons. My father would have brought home the pieces and put the computer together. He would have been proud to introduce the first computer into the neighborhood. My mother would have used the computer to create new social circles for herself and others. No doubt they are smiling down on my accomplishments.

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List of Tables

Table 1: Research Structure Based on Developmental Tasks	13
Table 2: Data Collecting and Recording	45
Table 3: Data Sources and Methods	47
Table 4: Topics Discussed on E-girl Forum by Frequency of Response	90
Table 5: Web Site Ratings	97
Table 6: Internet Communications and Adolescent Developmental Needs	112
Table 7: Internet History and Its Match to Informants' Development	121

Contents

Abstract	ii
Dedication	iv
Acknowledgments	v
List of Tables	vii
Contents	viii
Chapter 1: A Societal Change through Computer Technology	1
Chapter 2: Review of Related Literature	16
Chapter 3: Research Methodology	35
Chapter 4: The Girls and Their Online Activities	63
Chapter 5: Emerging Themes	100
Chapter 6: Discussion, Conclusions, and Recommendations	109
Afterword: The Ninth Girl	130
Appendix A: Permission Forms, Letters	134
Appendix B: Survey	140
Appendix C: Interview Questions	142
Appendix D: Rubric for Website Assessment	144
Appendix E: Website Data Collection Form	146
Appendix F: Sample of Interview Script	149
Appendix G: Sample of E-girl Postings	151
References	156
Vita	170

Chapter 1

A Societal Change through Computer Technology

A subtle shift is occurring in our society. We are becoming a “dot com” nation. Every day we see more evidence of an electronic evolution. Newspapers, magazines, television commercials, and even our day-to-day interchanges with friends and acquaintances are becoming filled with “dot com” messages. We are encouraged to search for bargains, do our banking, develop friendships, plan a trip, find a cure for what ails us, all online. As a society, we are changing. We are inventing new ways of communicating, new ways of doing business, new ways of maintaining records, and new ways of sharing information, both personal and public. The widespread, frantic preparations for the year 2000 were concrete evidence of our dependence on computers. Computer use is no longer solely the domain of scientists and people in business. Computers are for everyone.

Computers can require more from us than simple passive use. Computers can encourage us to think, to connect, and to judge. Computers give us the capacity to see things we have never seen before, to manipulate systems, to simulate reality, and to participate in it in ways never before possible. Thus computers can be valuable tools in higher-level learning.

However, the shift to a “dot com” world is much more evident in everyday community life than it is in our schools. Families seem eager to get wired and get going.

Households with Internet access have doubled over the last year and a half (from December 1998 to August 2000). Access has increased from 26.2% to 41.5 % of the nation's households. The most dramatic increase (75%) has been in rural households (Kerrey & Isakson, 2000). Families are beginning to explore online possibilities for learning, finance, and entertainment.

In contrast to home use, most students experience a rather traditional and conservative use of computers at school. Students develop skills to use word processors, simple spreadsheets, and databases. They learn how to log on to the Internet and search for a topic, much like students of ten years ago learned how to search encyclopedias and reference books. Some students learn to create multimedia presentations of their work. Much of the work is solitary, emphasizing facts rather than offering opportunities for knowledge building and collaborative constructions of meaning.

Although basic computer skills are important, they are not rich with the possibilities of computer technology. Learning basic skills does not expose students to the unique ways of developing, inventing, managing, problem solving, and communicating that computers can offer. School projects that involve students at higher levels of thinking are the exception rather than the rule.

Many teachers are still hesitant and unskilled in computer use. Most feel inadequately prepared for teaching with the Internet. Almost two-thirds of all teachers report they are not at all prepared or only somewhat well prepared to use technology in their teaching (Kerrey & Isakson, 2000).

Many schools do not have high-end computers and some do not have any Internet access. In 1999, 5% of America's public schools lacked Internet access (U.S. Department

of Education, 2000). Of the 95% of schools with Internet connections, many do not have actual classroom access. Their Internet connectivity may be only in the administrative wing or in the library. In 1999 only 65% of the nation's classrooms actually had Internet access (U.S. Department of Education, 2000).

Inside schools, educators and school board members are debating the role of computers in schools, how much computers should be a part of the curriculum, and who should hold responsibility for this new curriculum component. Outside of schools the world is wired and moving forward.

Our Need for Future Leaders

Those who will lead our society into more effective ways of using computer technology must themselves be able to envision new possibilities for our lives. We need many people—from all backgrounds and perspectives--ready for the challenges of using computers to aid in design, development, and problem solving. Familiarity with computer technology is a necessity for all and a gateway for those who seek the power to effect change.

In adulthood, today's adolescents will be highly immersed in changes caused by computer technology. Many of them will be part of the unfolding of new ways of guiding, protecting, and improving our quality of life. Those young people who are familiar with computer systems and who are confident in their own knowledge and skills will be more likely to pursue degrees and careers in computer-related fields. They will add their own visions to those of others. As today's adolescents take their places in adult life, computer technology will be a key to their futures.

The Internet: Catalyst for Enhanced Thinking

The Internet has become a gateway to information, communications, and commerce for Americans. The Internet is a system of systems, a catalyst for thinking that enables integrated, collaborative, yet personalized intellectual activity. Users of all ages can find ways to extend their thinking and receive assistance from others in pursuing their interests. Ways of communicating with others have been redefined to encompass both synchronous and asynchronous communication. Users can choose from a variety of paths for communicating and can select different virtual names and personae depending on their communication goals.

The Internet can enable the user to explore new ideas, enter into complex systems, and/or develop new intellectual connections. The Internet's potential for enabling a creative, inventive process is as significant to a parent seeking new answers to child-rearing issues as it is to a team of scientists seeking international collaboration on space exploration. The Internet has the promise of making lifelong learning a practical reality.

Without the human connectors, the Internet is not necessarily a powerful educational tool. Dede (1997) emphasized the important point that

Access to data does not automatically expand students' knowledge; the availability of information does not intrinsically create an internal framework of ideas that learners can use to interpret reality. To be motivated to master concepts and skills, students need to see the connections between what they are learning, the rest of their lives, and the mental models they already use. (p. 1)

In a recent congressional report (2000) Senator Bob Kerrey and Representative Johnny Isakson offered these words in support of Internet learning for all children:

The Internet is enabling us to address these educational challenges, bringing learning to students instead of bringing students to learning. It is allowing for the creation of learning communities that defy the constraints of time and distance as it provides access to knowledge that was once difficult to obtain. This is true in the schoolhouse, on the college campus, and in corporate training rooms. (p. i)

Teenage Use of Computer Technology: Differences by Gender

Girls' preparation for careers in computer technology appears less effective than that for boys. Children, aware of their own gender from an early age, make conscious decisions to act according to what they understand to be the rules for their gender (American Association of University Women [AAUW], 1992). Perceiving computer activity as being more for boys than for girls, females tend to participate in fewer computer activities. Shashaani (1994) found gender differences favoring boys in computer usage, experience, and class participation. Girls exhibit less class participation in computer activities and spend fewer hours on computers at home and in community-based activities (Kirkpatrick & Cuban, 1998; Shashaani, 1994).

Subtle pressure also seems to come from educators, who tend to encourage boys more than girls to take computer classes and to strive for excellence in this area (AAUW, 2000). Researchers (Durdell, 1995; Woodrow, 1994) found the achievement gap and difference in attitude toward computers was small in the elementary grades. Adolescence seems to be a critical period in the self-perceptions of both boys and girls. As girls react to subtle cultural messages, they tend to move away from computer use at school during this time in their development (AAUW, 2000). This shift in attitude and activity prevents them from building further competence and confidence in their computer technology

abilities. Kirkpatrick and Cuban (1998) describe this as a self-perpetuating cycle: experience with computers is necessary for a more positive attitude toward computers, yet a positive attitude is necessary to engage students in working with computers.

Ayersman (1996) reported results indicating that, with age, males are increasingly more confident than are females in their ability to use computers and more positive in their attitude toward computers.

Attend any class in computer science at the high school level and you will notice the disproportionate number of males in the class. A study of course enrollments (Commission for Women Annual Review, 1999) at Thomas Jefferson High School for Math, Science, and Technology in northern Virginia revealed that, even at this highly prestigious school, enrollment in Advanced Placement computer science classes was imbalanced by gender. Only 22% of those enrolled in the school's Advanced Placement computer science course were females. Other high schools in this relatively affluent, high-achieving school district reported that the average enrollment of girls in Advanced Placement computer science represented 13% of the total number of students enrolled in the course. Nationally, girls comprised 18% of the Advanced Placement computer science enrollments in 1998-1999 (Commission for Women Annual Review, 1999).

At United States universities, females are underrepresented in computer science (National Science Foundation, 2000). A downward trend actually exists in the number of female enrollees in computer science. The number reached its peak in 1986, when women represented 36% of the total number of graduates in computer science, and fell to 26% of the graduates in 1996. Many researchers describe this imbalance as being related to gender differences in cultural expectations, confidence, and skill development. Since

the shift of females away from computers appears to become pronounced at adolescence, it seems reasonable to explore the dynamics around young females and computers during early adolescence.

Adolescent Development

Developmental Tasks

Males and females face similar developmental tasks in adolescence. Significant areas to be addressed at this stage include the exploration of personal identity and individualization, roles, and sexuality (Adams, 1992; Archer, 1989; Bosma & Jackson, 1990; Harter, 1990); the exploration of relationships with peers (Furman & Buhrmester, 1992; Ladd, 1999; Maccoby, 1990;) and the development of self-confidence and self-esteem (Csikszentmihalyi & Schneider, 2000; Freiberg, 1991).

The normal adolescent developmental process includes self-absorption, impulsivity, issues of control in relation to adults, and swings in mood and reliability (Buchanan, Eccles, & Becker, 1992). Maintaining a sense of balance while charting new social and emotional paths is not always plausible in the adolescent's day-to-day existence. Young adolescents move from concrete toward abstract thinking and begin to develop reasoning based on hypotheses or propositions rather than only on concrete objects or events (Piaget, 1965). They have strong needs for achievement and recognition of accomplishments, although they may express indifference toward these goals. Both males and females show an increased interest in values, ideas, and social issues.

In general, youngsters in early adolescence (ages 12-14) are keenly interested in personal appearance, clothes, and music. They are quite concerned about acceptance by peers and changing friends is common. Conflicts with peers and parents are one means of establishing independence.

Developmental Issues for Adolescent Girls

Three key tasks of adolescence seem particularly important to understanding girls' inclination toward or away from computer technology: the search for identity, the exploration of social relationships, and the quest for personal competence and accomplishment.

Adolescent girls' search for identity

Girls develop their personal identities as females early in life. Chodorow (1978, 1989) suggests that girls gender-identify with their mothers and mother figures in their lives. The role of women in the family is one of close attachment to others. Consequently, girls learn to value attachment and orientation to others more than they do detachment and separation (Collins, 1990; Segura & Pierce, 1993). In contrast, boys must reject their connection to the female caregiver, identifying instead with male figures who are often more distant and, consequently, foster a more impersonal sense of being (Basow & Rubin, 1999). The environment remains an important context for identity formation as girls work towards independence in relation to that environment. Klein (1975) describes this work as a course of transactions between self and others in order to form a sense of self. Such transactions continue throughout life.

Adolescent girls' social relationships

Peers play a significant role in the lives of adolescent girls. They provide emotional support and serve as a sounding board for idea testing. Collaborating with others makes learning not only more effective but also more enjoyable. Maccoby (1990) suggests that even very young children begin to develop styles of gendered interaction. It is through the peer group that one sees the emerging styles. The context of peer relationships, Maccoby argues, is most important as an element of self-development and the socialization process with peers becomes more significant during adolescence. Harris (1995) supports this idea through her writings on group socialization theory.

Social learning theorists emphasize the fact that images and expectations in the culture serve as reinforcements for gender identity, learning gender roles continues throughout life, and appropriate social responses are positively rewarded. This behaviorist orientation suggests that behavior and attitudes change as the situations and expectations in the environment change (Rotter, Chance, & Phares, 1972).

Quest for confidence and competence

Cognitive-developmental theory as described by Piaget (1965) and his followers suggests that children create schemata that are used in subsequent encounters with their environment. They accommodate and assimilate new information into their existing knowledge. Thus, the process of social development is one in which the child interacts with the social world through the mediation and active involvement of cognitive abilities.

Kohlberg (1966) used Piaget's perspective to explain the emergence of children's gender identities. As their own gender identity stabilizes, children also begin to categorize behaviors and objects in the social world as being appropriate for one sex or the other. Gender differences in certain subject areas and in career aspirations begin to

appear in adolescence. Certain academic subjects such as math and science are perceived as masculine, influencing girls' levels of interest and confidence (AAUW, 2000). When girls do not value certain areas, they are less likely to pursue them.

Research by Eccles & Wigfield (1995) provided insight into the importance of task value for motivation, particularly for girls. She found that what is important to a girl is the way in which the activity related to her personal goals and interests. Thus, external social expectations become internalized as part of self-concepts and motivation, influencing daily activities and aspirations.

The Promise of Computer Technology in Relation to Identity, Socialization, and Cognitive Growth

Personal Identity Online

Turkle (1995) provided insight into identity and the manner in which personae are developed online. The medium of computer technology becomes a way of exploring one's identity. People can make a conscious choice of when and how to reveal aspects of their personalities.

Social Relationships Online

Dede (1996) described the Internet in terms of social life through virtual communities. He indicated that online communications offer opportunities for people to support each other as they share common joys and trials:

Some people (e.g., those who are shy, reflective, and comfortable with emotional distance) even find low-bandwidth communication more 'authentic' than face-to-

face verbal exchange. They can take time before replying to compose a more elegant message and refine the emotional nuances they wish to convey. (p. 11)

In a study of life online, Markham (1998) presented the voices of online users as they shared their experiences in the virtual world. Markham's informants described their Internet communications as being a means of keeping in touch with friends, a way to avoid face-to-face contact, a way of transmitting information, or a place to meet and talk with others. Those interviewed spoke of the Internet as a medium that allowed them a sense of freedom and control. Markham concluded that, although many of her informants explored different personae, they clearly distinguished between real life and virtual experiences.

Personal Competence and Accomplishment

Papert (1993) presented the notion of children "doing serious work" on the computer. His perspective placed responsibility for learning far more in the hands of the learner and far less in the hands of the teacher as the keeper of knowledge. Papert suggested that girls have a more concrete orientation to computers than boys have. Studying children's interactions with computers, he argued that girls more than boys seemed to enjoy sound and graphics, online communication, and the functionality of computers when working with real-life problems and situations. Boys seemed to prefer programming and abstract activities.

Research Objectives and Questions

The purpose of my research was to investigate how young adolescent girls ages 12-14 who are high-end users of the Internet reflect the adolescent developmental tasks

of personal identity, social relationships, and ways to feel competent and accomplished in online activities. This study was completed within the context of the informants' online experiences as female adolescents.

Related questions that guided the study included:

1. How do the informants express their personal identities through computer technology?
2. How do the informants' online activities support their social relationships?
3. How do the informants reveal their computer technology competence and sense of accomplishment?
4. How do the informants reflect women's ways of knowing in their use of computer technology?

Using three developmental tasks of adolescence as guideposts and a feminist perspective as a lens for viewing these adolescent tasks, I developed a guiding structure for the research study as shown in Table 1.

Table 1

Research Structure Based on Developmental Tasks

Adolescent Developmental Tasks	Gender Perspective	Areas of Research Related to Online Activities
Personal Identity	Cultural expectations vs. internal interests, attitudes, beliefs	Self-expression, online personality
Social Relationships	Connections to others, community building	Peer/social interactions
Exploration of ways to feel competent, accomplished	Real-life perspective vs. abstract orientation	Confidence, competence

Through this study I sought to provide some insight into the ways in which young girls who were high-end users of computer technology reflected their personal, social, and cognitive growth at a critical period of their development. Subjects for the research were adolescent girls who, with all their normal developmental and gender-related needs, were acquiring competence and confidence in a technological world often dominated by males.

As a society we are shifting into a new era--one supported by computer technology in our everyday lives. This is the time in which women can either become partners in the shaping of the computer world for everyday existence or take a back seat because they are not in the power patterns that effect change. Because girls should be preparing themselves for the potential of leadership and power, it is essential to see them

and their world and understand what they do, who they are, and what they perceive as important about technology in their lives. In this way we can assist all young people to prepare for the possibilities in their futures.

Significance of the Study

Research studies suggest that differences in male and female attitudes, participation, and competence in computer-based activities begin around adolescence. Because females remain underrepresented in high school computer courses, college computer science departments, and careers in the area of computer science, it is essential that researchers look for ways to encourage girls to consider advanced learning in this area. A gap in the literature exists regarding ways in which adolescents of either gender describe their orientation to computer-based activities. Educators may benefit from an understanding of ways in which adolescent girls articulate and demonstrate their strengths in technology.

In the recent congressional report, The Power of the Internet for Learning: Moving from Promise to Practice (Kerrey & Isakson, 2000), a call for research in this area was sounded:

We must establish a pedagogical base for the effective use of Internet learning. We need a vastly expanded, revitalized, and reconfigured educational research, development, and innovation program, one built on a deeper understanding of how people learn, and how new tools support and assess learning gains. (p. 55)

Limitations

This study is based on a small number of participants. Consequently the results cannot be generalized to the entire population of adolescent girls. The probability that the results of this study reflect the true values in the total group remains to be confirmed through future studies. Data obtained directly from interviews with eight girls and additional data obtained indirectly from girls who participated in an Internet forum were used to support the discovery of new insights into adolescent girls who are high-end users of the Internet. An effective qualitative study uses multiple comparisons across purposefully selected cases. Although the number of participants in this study was small, each of the participants presented certain qualities that made her selection useful for the analysis. Further research with additional cases would be useful to extend the identification of patterns found within this group of informants.

Chapter 2

Review of Related Literature

This chapter provides an overview of theories and recent research in three areas: developmental issues related to adolescence, a feminist view of women's ways of knowing and computer technology use by young adolescent girls.

Today's adolescents have grown up during the time that computer technology and the Internet have emerged and become a part of daily life. Therefore, a study of adolescent girls who are developing strong skills in Internet use should be grounded in an understanding of their uniqueness among others their age as well as of their reflection of the normal tasks of all adolescents. Research studies suggest that girls' and boys' ways of learning may be somewhat different. Consequently, an overview of research on women's ways of knowing is an important component of this review of the literature.

Feminist Perspective

A study of young adolescent girls must be grounded in an understanding of the study of women. When Freud and his followers first began to develop theories of personality, they offered a perspective primarily based upon the male experience. Although early researchers offered valuable empirical research based on their theories, few of their research subjects were women. Thus, male experiences were used as a

universal standard by which both men and women were evaluated with regard to human development, motivation, learning, and social interactions.

One exception to the early dominance of males as research subjects was the pioneering work of Leta Stetter Hollingworth (1927), who wrote as early as the 1920s about the differences in human experience between boys and girls. Although best known for her works on highly gifted children (Hollingworth, 1926), she also broke new ground in terms of what is now called feminist research (Klein, 2000). She questioned previous assumptions and completed substantial research on gender differences in her search for the missing factors in experimental studies that ignored females. In particular, she sought to challenge sexist practices in hiring and the "variability" hypothesis, which speculated that women are all alike whereas men exhibit enormous ranges in their talents. Significant in her work was an emphasis on the ways social and cultural factors played out in the lives of girls and women (Klein, 2000).

Other researchers after Hollingworth have taken up the challenge of giving voice to women's development. Concern for the lack of studies and evidence within the research literature regarding the voices of women subjects contributed to a feminist movement and a research emphasis on women's ways of knowing.

In her research, Sigmund Freud (1950) explored the ways that humans adapt to social and cultural factors. She described a female personality constellation in which compliance dominated. The dialogue about women's equality and women's roles was intensified by Betty Friedan. A feminist leader and author of The Feminine Mystique (1963), Friedan challenged the notion that women's sense of self could only come through their roles as wives and mothers. She believed that the notion of the traditional female role was part of

a conspiracy to keep women from competing with men. Friedan speculated that the problem was not sexual but rather was related to identity. She believed in the importance of helping women fulfill their potentials as human beings rather than remaining defined solely by their sexual roles.

Since the 1970s many in-depth studies have provided additional perspectives on the classic psychological theories, which had either ignored women or depicted them as in some ways inferior to men. Gilligan (1982) speculated that women are not stunted in development but are merely different from men. Theorizing that patterns of development are socially constructed and based on a division of economic and family responsibilities, Gilligan saw women as using an ethic of caring rather than of absolute judgments about moral right and wrong. She hypothesized that women's moral orientation is more contextual and concrete than that of men. She suggested that future research should consider the differing voice of women to allow for a more holistic view of human behavior.

Hartsock (1983) further hypothesized that each person knows the world and speaks from a particular position or standpoint in society. Some features of reality are obscured while others become emphasized. Hartsock argued that, consequently, researchers should become aware of the different ways in which people see the world. This is the essence of feminist standpoint theory: all knowledge is situated and we make meaning in a social context. One's view of the world changes over time. Thus, social context plays an important role in the way each person perceives and knows things (Harding, 1987, 1991; Jaggar, 1989).

Belenky, Clinchy, Goldberger, and Tarule (1986) sought an epistemological reference for women's behaviors. They interviewed 135 women to discern what was important to them, what their "truth" was, and how they came to know this truth. They asked women to describe their lives as females. They presented their findings through stories of how women experienced the world differently from men. It became clear to the researchers that women's ways of knowing incorporated self and relationships within a cultural and social world. Building on the work of Perry (1970), these researchers described women's perspectives on knowing along a continuum from silence, within which women perceive themselves as being under the control of external authority, to constructed knowledge, or being in a position of recognizing all knowledge as contextual and seeing themselves as creators of knowledge.

The Adolescent Experience for Girls

Erikson (1968) described adolescence as a major life stage for identity formation. He theorized that girls and boys search and self-select, choosing commitments based on their levels of self-assurance, self-certainty, and sense of mastery. For some the sense of identity is passively created through the direction of adults in their lives. For others identity formation is deferred. Erikson stated that each child comes to understand himself or herself through inner thought processes as well as through social context. During adolescence, peers become all-important as motivators while the influence of parents is reduced.

Gilligan (1982) pointed out how, for Erikson (1968), autonomy, initiation, and industry are highly valued in the stages of development preceding adolescence, a time

when it is thought to be necessary to create a strong enough sense of self to withstand the diffusion of identity that occurs during puberty. Gilligan further explained that, for girls, the experience of attachment and connection coalesces with the formation of identity; in other words, a woman comes to know herself through her relationships with others. A young girl's understanding of self is entwined with how she chooses to relate to others. Attachment and connection are important ways of developing for a girl. This is part of the nature of her identity development. Frenkel (1990) described separation and connection as being two sides of the same coin. He saw adolescence as a time filled with imagery that encompasses both.

Identity through Relationships

The notion of self-in-relation implies that, for adolescent girls, the self and identity cannot be separated from relationships (Belenky et al., 1986; Gilligan, 1982; Surrey, 1985). According to object relations theory (Chodorow, 1989; Klein, 1975; Winnicott, 1965), as young girls approach adolescence, their quest for independence and individualization does not require separation from family, and, in particular, from the mother. Surrey (1985) suggested that a female adolescent “does not necessarily want to separate from parents, but to change the form and content of the relationship in a way that affirms her own developmental changes and allow new relationships to develop and take priority” (p. 7).

Sullivan (1953) studied the need for intimate relationships in adolescence for both males and females. He hypothesized that adolescents receive emotional support, advice, and information through the intimacy of friendship, thus increasing their self-esteem. During adolescence, friends become open to one another, disclosing personal secrets and

exchanging ideas within a secure and accepting environment (Berndt, 1989; Bigelow, 1977; Furman & Bierman, 1984). Another characteristic of friendships is personal preference. Adolescents tend to seek friendships with those who have interests and experiences similar to theirs.

The influence of peers is also important for learning. Adolescent friends as mentors were found to be preferred over adults because of the degree of comfort and trust that was present (Philip & Hendry, 1996).

Cultural Expectations

As the impact on adolescents of adults in the home decreases, the pressure of cultural expectations increases. Young teens see themselves in roles that are provided by society. Often stereotypical, the roles nevertheless offer expectations that are difficult for most teens to ignore. Piper (1994), a clinical psychologist, wrote of her experiences in therapy with adolescent girls. She took the perspective of an anthropologist and reflected on female adolescents in terms of what humans do: think, feel, and behave. She described adolescent girls as being quirky, fragile and changeable, strong, good-hearted, and insightful. She spoke of her concerns that girls stifle their creative spirit and natural impulses. She wrote that, ultimately, this results in lowered self-esteem. Piper defined the work of female adolescence as a quest to figure out ways to be independent yet emotionally connected; to achieve and still be loved; to respect oneself in a culture obsessed with looks; and to move to adulthood in a culture in which feminine is defined as docile, weak, and other-oriented. This work, based on the author's reflections on her experiences in therapy, offers one psychologist's insight into her own ways of thinking about the adolescent experience for girls today.

Another qualitative researcher, Brown (1998), brought a contemporary perspective to female adolescent life as it relates to cultural expectations. She interviewed two groups of white girls of middle school age through group conversations over the course of a year. One group of girls included poor and working-class people, while the other girls represented middle- to upper-class homes. Brown described life for many of the girls as consisting of creative resistance to idealized femininity. She presented stories of the 19 girls' anger as they confronted conflicting lifestyles and expectations. She told the tales of the early adolescents as they first encountered conflict with society and began to understand what it meant to be female in their culture. Brown conveyed a picture of an emerging woman-style of operating. Learning to feel on the outside, empowered by new models at home and in society, experiencing unfairness and reflecting on why this is the case, some girls begin to express new ways of coping, new resilience, and new patterns of behavior. Brown described girls as articulating an understanding of the demands and costs of a traditional female role. Girls in her study shared notions of being empowered by female models in their lives and in the media. Brown emphasized the clarity and strength of the girls' voices.

Confidence and the Lack Thereof

The achievements and the pursuit of life satisfaction that cause some girls to veer away from typical expectations may be accounted for by social self-esteem theory (Hollinger, 1983). This theory is the product of two self-perceptions: instrumentality and expressiveness. These self-perceptions influence the way in which youngsters develop their sense of personal worth. The perception of instrumentality relates to behaviors that are decisive, active, and risk taking. Those of expressiveness relate to caring,

communicativeness, and affiliative behaviors. When both of these self-perceptions are balanced in an individual, it is more likely that self-efficacy and confidence may be high.

Orenstein (1994) described research with eighth-grade students in two culturally diverse California schools. The theme of her work was self-esteem and the confidence gap. Orenstein revisited the work of the American Association of University Women (1991) in describing the findings of the report Shortchanging Girls, Shortchanging America. This work on self-esteem confirmed that the passage to adolescence for girls is accompanied by a loss of confidence in self and abilities, especially in the areas of math and science. The report indicated that girls emerge from the teenage years with reduced expectations for themselves and less confidence than is experienced by boys. Orenstein saw competence as a key component in building girls' confidence. Confidence is a recurring theme in writings about adolescent girls. In a sense, the notion of confidence is the linchpin that allows the sense of self to maintain authenticity and to grow toward self-sustaining maturity.

In a study by Markus and Nurius (1986) that explored the self-concept of adolescent males and females, participants revealed both what they hoped for and what they feared they might become. This "possible selves" study showed that, while the global sense of self-esteem did not differ by gender, the construct of self-concept revealed male and female differences. Young women were more highly multidimensional than were young men, indicating the ability to make distinctions among specific views about themselves. For girls, these views of a positive self included satisfaction, happiness, security, financial independence, academic competence, and success in relationships. This research was reinforced by the work of Harper and Marshall (1991),

who found that females were more likely to see high educational aspirations as related to higher self-esteem.

Other studies also support the suggestion that the components of male and female self-esteem are gender specific. Josephs, Markus, and Tafarodi (1992) found that high self-esteem in men was related to the capacity to see oneself as having superior abilities. In females high self-esteem appeared to be related to a high degree of interconnectedness with others. These results appear to hold for adolescents. Block and Robins (1993) found that adolescent girls' self-esteem was interpersonally oriented, while boys' self-esteem was more self-oriented.

Ability and Achievement

Studies of student achievement in middle school indicate that overall interest in academics is reduced for both male and female students. Researchers (Eccles & Midgley, 1989; Eccles, Midgley, Wigfield, & Buchannan, 1993) found that this decline is less a developmental stage than it is a mismatch between students' needs and the opportunities for learning provided at school. The decline is notable in light of the fact that students of this age can engage in more self-regulated learning, critical thinking, and meta-cognition (Eccles & Midgley, 1989; Piaget, 1965; Simmons & Blyth, 1987).

The general reduced interest in academics is accompanied by developmental differences in children's self-perception of competence. Researchers (Eccles, Wigfield, Harold & Blumenfeld, 1993) have consistently shown a decrease in the mean level of self-perceptions of ability as children move into adolescence. In particular, the average decrease seems to be the greatest when students move from elementary schools into

junior high schools or middle schools. Simmons and Blyth (1987) support her findings in this area. School may be a less-than-friendly place for young adolescents.

At adolescence, girls in particular begin to indicate less interest in math and science and are less likely to pursue upper-level classes in math and science (Durndell, 1995; Shashaani, 1994, 1995). Reduced interest may be due to the fact that adolescent females have lower self-perceptions of their abilities in this area than do males (Eccles, Adler, & Meece, 1984). This is particularly surprising because studies that have examined actual achievement or performance (Hedges & Friedman, 1993; Linn & Hyde, 1989) show that there are few gender differences and that in many cases females actually outperform males.

Hyde, Fennema, and Lamon (1990) and Tobias (1990) completed research that also supports previous work regarding differences between female and male achievement. Hyde et al. compared the cognitive abilities of girls and boys and found consistent but quite small differences. Tobias determined that such differences could be explained through socialization and girls' expectations of their performance.

Motivation and Self-Efficacy

Research by Bandura (1986) showed that what people know, the skills they possess, or what they have previously accomplished are not always good predictors of subsequent attainment because the beliefs they hold about their capabilities powerfully influence the ways in which they will behave. Consequently, how people behave is mediated by their beliefs about their capabilities in reference to a particular goal and can often be better predicted by these beliefs than by the results of their previous performance. Self-efficacy beliefs are critical determinants of how well knowledge and

skills are acquired in the first place. There must be harmony between self-beliefs and possessed skills and knowledge for successful achievement to occur. Bandura's (1997) research provides an understanding that self-efficacy is situational and is strengthened within a particular content or area.

Eccles (1983), building on previous research and theory on values (Atkinson, 1957, 1964; Feather, 1982, 1988; Rokeach, 1979), provided insight into the importance of task value for motivation, particularly for girls. She discovered that what was important to a girl was the way in which an activity related to her personal goals and interests as well as how practically important the activity might be.

Eccles and Wigfield (1995) stressed the importance of the attainment value of the task—defined by Deci and Ryan (1985) as the intrinsic enjoyment or interest in the task--the importance or utility of the task for future goals, and the emotional costs and effort of investing in a particular task. Expectancy value factors are the valuing of a specific goal and the expectations for attaining the goal. In addition, Eccles (1983) explored the area of cost/benefit, the “what’s in it for me” approach, as a fourth factor in motivation.

A link may be made between Eccles' expectancy value factors and the work of Csikszentmihalyi (1975, 1989) and his theory of flow. The state of flow is reached when a person is engaging in a peak experience. During the activity, the person loses track of time. She is intrinsically motivated. As a result of flow, skills improve and self-efficacy for the activity is strengthened. Consequently, growth in self-efficacy through multiple flow experiences might be made. Once someone expresses an interest in—or values--an activity, the chances are great that, given the appropriate environment, the person will continue to explore that activity. This seems to make sense in view of Csikszentmihalyi's

(1989) findings of increased self-efficacy through the skills strengthened in flow experiences.

Renninger (1992) studied interest and motivation, focusing on intrinsic self-intentionality. He hypothesized that the repetition of voluntary activity could lead to the development of interest in a particular area. This interest might encourage the exploration of more difficult tasks, resulting in the development of highly specialized competencies.

Computer Experiences for Girls

While searching for studies on gender and technology, I was struck by the lack of qualitative studies as well as by the almost total emphasis on studies comparing males and females. Study after study relies on the deficit model. Are girls less confident? Do boys use computers more? How do male and female attitudes toward computers differ? Understandably, researchers are seeking to find the factors that might make a difference in girls' achievements.

Participation by Gender

Indicative of the differences between male and female use of computer technology, a survey of thousands of software titles located only 36 titles aimed at girls, although girls' interest in computers rivals that of their male peers until age 11 (Litchman, 1998). The male population is significantly more interested in games, the dominant theme of packaged software. For males the lure of technology is often the machine itself. In contrast, females tend to buy into technology when they see how it

relates to their interests or tasks (Brunner & Bennett, 1997). Margolis, Fisher, and Miller (2000) describe this female motivation as “computing for a purpose.”

A recent report of students' computer use (U.S. Department of Education, 2000) revealed that a similar percentage of males and females in kindergarten through sixth grade use a computer at home and at school. What differed was the way in which they used computers. Females were more likely than males to use computers for word processing and graphics design.

The same study reported that, in 1984, only 30% of the girls and 36% of the boys in eighth grade reported using the computer at school. In 1996 a dramatic increase in use was noted for both males and females, but a gap widened between the sexes; 81% of the males and 72% of the females reported using a computer at school in eighth grade. Home use for these youngsters was approximately equal for both sexes (62% of males, 61% of females).

As girls enter high school, the draw to computer classes is weak. Data from the 1999 Advanced Placement computer science examinations indicate that of the total number of students who took the exam, only 14% were female (College Board, 2000). The numbers and percentages of computer science bachelor's degrees awarded to women have decreased in the last decade. Women earned 37% of the bachelor's degrees awarded in computer science in 1984 and 28% in 1996 (National Science Foundation, 2000).

The lack of growth in female computer science degrees is also reflected in the workplace. A United States Department of Labor report revealed that the number of women computer professionals in the United States work force dropped during the 1990s from 34.5% to 29.1 % (McLester, 1998). While they comprise 46% of the overall

workforce, women make up only 28% of the entire information technology workforce (U.S. Department of Labor, 2000).

Given that many studies show a lower level of computer use by females than by males (AAUW, 1992; Kirkpatrick & Cuban, 1998; Shashaani, 1994; Turkle, 1984), researchers continue to work to isolate factors that could effect positive change. These studies do not, however, discern ways in which females enjoy using computers or ways in which they positively interact with this technology. Actually, research on positive traits of adolescent girls in general is quite lacking.

Identity and the Internet

Looking beyond comparative data related to male/female use of computers, one finds a number of researchers who have begun to study the nature of human encounters with the computer. Turkle's (1995) work provides a view of the emerging world of cyberspace as an extension of life. Turkle used more than 1,000 informants in ethnographic and clinical observations. Three hundred of the informants were children. Exploring the concept of identity online, Turkle suggested that the computer offers new models of the mind, a new medium for exploration, and an opportunity to explore personae of one's own creation. In the virtual world, thought is based on simulation. Turkle suggested that this new way of thinking enables people to build new kinds of communities. She saw children leading the way while adults trail behind. Children appear comfortable with the boundaries between real and virtual, building the cultural context in their computer use just as they do in real life. In these virtual communities people build new forms of relationships that are fluid, connected, disconnected, and reconnected. Turkle suggested that the virtual communities are important for what they

do for us and to us, our relationships, and our ways of thinking about ourselves. People using the computer learn by doing. This new way of thinking is far different from the stable social worlds of the past, with their rigid gender roles, repetitive labor, and concept of keeping a job for life.

In the area of identity formation, Turkle's research made some interesting contributions. Turkle explained that the medium of computer technology becomes a way of absorbing more than one's self and choosing consciously when and how to reveal personal dimensions. Turkle speculated that, rather than creating the problem of confused personalities or delayed identity formation, this new way of being can be empowering and broadening. Whereas in the past people had to hide their "other selves" and speculate on what it might be like to try out a role foreign to their everyday existence, now they can log on and become another individual in a virtual space that welcomes whoever they are at the moment. Through this process, the self is actually changed and the distinction between a "real" self and a virtual self blurs. Through Turkle's work we can come to better understand that today's adolescents are embarking upon an adult life filled with more flexible notions of gender, self, and possibilities for personal productivity.

Computers and Learning

Seymour Papert (1993) guided many educators to envision a new world with computers. His work Mindstorms (1980) was a breakthrough in helping people to understand that working with computers was not about allowing machines to do the work of humans but rather about expanding minds so that humans could control their own worlds, explore new possibilities, and enjoy the experience. He spent many years

studying young children at work on the computer and articulated a vision of important research as human-based with acknowledgment of all the complexities of the human mind. He speculated that his research, while not passing muster with experimental control, is more revealing than much traditional research since human behaviors cannot be controlled to any great extent. His work The Children's Machine (1993) suggested that girls approach computers more for their functionality than for their abstract pleasures. Papert presented stories developed from observations of children engaging in computer activities at a Logo lab. Through his observations he found that girls enjoy learning through more concrete experiences, while boys take to programming and other abstract activities more intensely.

Computers and Communication

Computer technology offers the user new avenues for communication. Since relationships and connectedness are important factors in women's development, studies related to computer communication hold significance. Markham (1998) recently studied life online. Her work opened a door to exploring people's worlds when they are communicating electronically. A qualitative researcher, Markham provided some notions of how to observe, collect data, and become a participant in online research. Her year of research online included experiences in the simulations provided through MUDs and MOOs (multi-user, interactive role playing games). The researcher presented herself as a novice to those participating in the online simulations. Through these role-playing experiences, the researcher learned about the virtual realities of those who spend significant amounts of time pretending to be characters other than themselves.

Koehler and Trimpop (1996) reported on a study that explored the social character of text-based computer-mediated communication. Outcomes of self-esteem and self-reference were presented. Through their study they found that, for college students, computer communication tended to be different from, but not less personal than, face-to-face communication. In the study, computer users had greater self-esteem and were less dependent on the opinions and less affected by the social influences of others than were non-users. Preliminary studies on girls and telecommunications at school indicate that having telecommunications as a collaborative activity in the classroom actually heightens girls' interest in computing (Koch, 1994).

In summary, research on females' use of computers has found that girls tend to shy away from computers as they move through adolescence. When they do find computer use beneficial, it is for practical tasks rather than for the joy of abstract thinking, as may be the case for boys. However, research indicates that computer use can be a way for young women to increase their confidence, communication, and self-efficacy.

Connections to the Current Study

This literature review has provided a framework for interpreting adolescent girls' use of computers technology, particularly in relation to Internet use. Studies describing the feminine need for connectedness, concrete orientation, and knowledge offered a backdrop for viewing the current study. The importance of studying any group including young adolescents in the context of their personal and social lives was supported by the feminist view of standpoint theory. Issues of identity, relationships, and accomplishment

were described in the research as being important in the lives of adolescent girls and are important links between previous research and this research study.

The related literature has provided me with insight into the strength of qualitative studies in feminist research. A number of the researchers chose case studies or ethnography to capture the essence of the female experience, providing broad and in-depth views, rich stories, and clear insight into patterns of female behavior. Researchers described what it is like to be female and adolescent, and consequently, what we should look for and test for in experiments.

Researchers indicated a need to maintain a view of data collection as well as research results from multiple perspectives. Although this study provides a one-sided (female) view of adolescent use of computer technology, I understand the importance of recognizing that research studies reveal more similarities than differences among adolescent boys and girls. The female perspective presented in this review of the literature and throughout this study is intended to offer more insight into some of the elements and issues surrounding young women's use of the Internet. It is not intended to suggest that male experiences may be substantially different. Indeed, current studies may present too many attempts to discern minor differences across gender and not enough attempts to present similar experiences from different perspectives such as gender, race, culture, and/or socioeconomic views.

The social shift to a digital world has been accompanied by a few interesting research studies. These qualitative views of ways in which people use the capabilities of the computer in their everyday lives provided some understanding of the possible ways computer connections can help people meet their needs. As the computer becomes a

place for community and a context for learning, further research is needed to understand its impact on certain populations such as adolescent girls. Such explorations should include attention to how adolescents use computer time for playing with identity in the context of relationships as they satisfy their needs for sharing, openness, friendships, and the recognition of peer influence. In my research I sought to build an understanding of the possibilities for adolescent girls in computer-mediated experiences.

Chapter 3

Research Methodology

Qualitative research is an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a natural setting. (Creswell, 1998, p. 15)

A Qualitative Approach

The purpose of this study was to describe how young adolescent girls who regularly use the Internet reflect the developmental tasks of developing personal identity, social relationships, and ways to feel competent and accomplished in their online activities. To accomplish this task I employed qualitative methodology. In this sense, I began the study with few presuppositions about girls' Internet use but with general knowledge of web-based activities available to young girls and moderate personal strength in Internet use. I also brought to this study many years as an educator of adolescents and a middle school principal. Well known to me were the issues of identity, relationships, and competence present in the daily lives of adolescents. My tasks as a qualitative researcher included working through the data to know it, to understand it, and to read between its lines so that I could offer interpretations. The purpose of recording

this process was to make “contextually grounded theoretical points that are viewed as a contribution by the relevant professional community of readers” (Golden-Biddle & Locke, 1997, p. 20).

Critical to my work as a qualitative researcher was my recognition of the problems inherent in qualitative research, and, in particular, in feminist research. I recognized that my voice would be part of the interpretation of the voices of my informants, and, consequently, I would need to consider the impact of my position as teller. A feminist researcher must be careful not to use the respondents as a means to an end (Stacey, 1989). The girls in this study represented, for me, persons who might shed light on the dilemma of girls shying away from computer use in adolescence. I would need to use diligence to be sure my agenda did not drive the research activities. I recognized, however, that qualitative researchers believe this problem exists within all qualitative research (Wheatley, 1994). It was important in this study to remain close to the words of the informants, using their strength and power in the telling to guide my readings and interpretations. My power would only extend as far as the degree of stretch I brought to the activity (Stacey, 1989).

Qualitative research brings with it a degree of ambiguity within an ill-structured process. The readings and the sensing of the situation as well as the reporting must be present for effective qualitative research (Denzin, 1989). Maxwell (1992) emphasized the need for thinking of validity separately for descriptions, interpretations, and judgments. To make this an effective pattern within my qualitative research, I choose to employ methods of triangulation (Denzin, 1989; Miles & Huberman, 1994; Patton, 1990). I used multiple and different sources of information to facilitate

triangulation. Maxwell (1992) suggests redundancy of data gathering as most effective. Recognizing that observations or interpretations are not perfectly repeatable, he suggests triangulation serves to clarify meaning by identifying different ways the phenomenon is being seen (Flick, 1998; Silverman, 1993).

Another way of considering triangulation is to look both near and far at the data. Geertz (1973) discussed "thick descriptions" as one way of viewing data collection. Using a unique case, the researcher looks deeply and richly at the particular subject. In contrast, a comparison across cases (Denzin & Lincoln, 2000) offers a view of general variables noted in several instances of the phenomenon. In my research I have sought to use both "thick descriptions" and comparisons across cases in different settings to enlighten me and to add validity to my interpretations.

Research Informants

At the beginning of the study, I sought informants who represented young adolescent girls who used the Internet extensively. Participants in the study included those who participated directly through interviews and those who participated indirectly through observation of their online activities. Data came from:

- 8 girls interviewed directly
- online message board postings of 95 girls visiting a message board forum
- 2 girls from those who posted messages known only through their postings and personal websites.

Criteria I established for the interview participants' selection included:

- Middle school students, grades 7 or 8

- High-end users of the Internet
- Nominated as highly involved in computer technology

I sent 22 middle school principals a letter of introduction to the research study and an explanation of the criteria for selecting a candidate. I asked each principal to suggest one candidate for the study and to provide the selected candidate with a packet of information to be sent home. Students who chose to participate completed a survey and returned it to me along with a parent's permission for their participation in the study (Appendix A). Eight students agreed to the online interviews and visits to their websites. I classified these girls as "high-end" users for the purposes of this research.

During the course of the study, additional informants were added. This process evolved as a result of the interviews and website visits I conducted with the original group of informants. In the course of visiting sites for young girls recommended by one of the informants, I discovered the Girlsline¹ Message Board. Within this site was a forum specifically focused on girls' use of the Internet. This forum was called e-girls. Here the girls posted messages to each other sharing their websites, seeking help with the technology, or offering support or general commentary about online use. This site seemed ideal for the purposes of this research. I gathered data from the daily postings at this message board for a month. Archives provided at the site facilitated this process.

I also visited and analyzed the websites of two girls who were very active in this forum. I classified these two girls as "high-end" users for the purposes of this research.

¹ In recognition of the issues of confidentiality, I have chosen to give pseudonyms to both the Internet site and the girls who posted messages there. The website moderators posted their guidelines, indicating that anything posted was public information, but I chose to provide an additional layer of anonymity because of the age of these girls and their vulnerability.

They appeared to have met the same criteria as the original eight girls, being middle school age and frequent Internet users.

Research Setting

The setting for this study was the online world of the young adolescents. I chose to use online computer technology as the primary vehicle for data gathering. Spencer (1995) stated that the use of electronic media for collecting data enables the participants to speak in a place where concepts of race, gender, age, and sexuality do not necessarily apply. Although for the most part I was aware of my informants' gender and age, they were able to use a communication vehicle in which they had control over what they choose to reveal about their issues. Boshier (1990) suggested that electronic communications could reduce the problem of interviewer effect that might occur because of status differences between interviewers and those being interviewed. He asserted that problems related to shyness could also be overcome with electronic communications. Thus, using electronic media for my direct data collection from informants seemed likely to raise the comfort of the young participants in responding to questions from this researcher, a mature school principal.

Data Collection

Phase One

In the first phase of data collection I sought information from the girls who were nominated by the principals of their middle schools as being high-end users of computer technology. Eight girls from eight different middle schools agreed to share information about their online use. They participated in online interviews, completed brief surveys of

computer use, and communicated with me through e-mail messages. Four of the girls also provided URL's for their personal websites.

Survey data

Prior to participation, each of the eight informants completed a survey (Appendix B) concerning online activities. The survey confirmed each informant's interest in the project and conformity with the specific criteria for selection. In addition, the survey provided personal data useful in understanding each girl's general profile of computer use and interest in computer technology.

Online interviews

Each of the eight informants participated in online interviews conducted over a period of two months. Each interview session lasted approximately one hour. Several of the girls participated in more than one session in order to complete the data collection. I used a semi-structured interview protocol (Appendix C), employing a set of questions as needed to facilitate dialogue. Most of the informants shared their thoughts about computer technology and ways in which it was important in their lives with little prompting. Consequently, the set of interview questions remained more a helpful set of available prompts rather than a structured protocol.

I also incorporated into the interviews a technique of "interviewing by comment" (Snow, Zurcher, & Sjoberg, 1982). Interviewing by comment is a method that attempts to elicit information from an informant by making a statement rather than by asking a direct question. For example, as a stimulus I would say, "Someone at your school thinks you are extremely competent using computers." Most of the girls responded to the comments with specific self-perceptions about their computer technology abilities.

Conducting the interviews in the setting of the Internet provided the girls with a space that was comfortable and familiar to them. The participants seemed to be able to communicate effectively and with little self-consciousness, as might have been present in face-to-face interviews, reinforcing Turkle's (1995) notion of online empowerment. I informed the girls ahead of time that their responses would be captured, printed, and used as part of the data for the research project. The girls were free to choose a time convenient for them and their families so that the sessions would not be interrupted. Each interview was captured and stored in an individual electronic file to facilitate analysis through qualitative software.

Web pages

I visited and analyzed the personal websites of four of the eight interview informants. Although all but one of the eight interview informants had indicated experience in web page development on her initial survey, only four girls provided me with active URL's for their websites. Two of the informants seemed reluctant to share their web pages with me. They described their pages as works in progress and did not seem comfortable giving me the URL's for the pages. After pursuing the web address several times with each of them, I decided not to make additional requests.

I used a rubric (Appendix D) to assess the skill levels of each girl in terms of website development. Rubrics, similar to rating scales, provide a practical way of measuring the quality of work based on specific criteria for a specific task (Cope, 1996; Linacre, 1989; Nitko, 2000;). In addition, rubrics provide more objective measures than undefined, impressionistic scales such as Likert scales because of the capability to distinguish among levels of quality (Elay & Stecher, 1999; Linacre, 1989)

The rubric used to assess the websites incorporates a scale to measure the degree of performance across each area assessed: (1) Novice, (2) Developing, (3) Accomplished, and (4) Distinguished. For each numerical rating, I developed performance descriptors indicative of the skill continuum in the following areas: layout, navigation, communication, images, links. I also took notes (Appendix E) on each website related to content, presentation, and ways in which the informants revealed themselves and connected with others. I printed out the contents of each website to facilitate analysis.

E-mail

E-mail messages preceded each interview, as I made attempts to establish good times to schedule the interviews. In these initial e-mail messages as well as those that followed the interviews, the participants made it clear that they were participating eagerly and voluntarily in the project, which they believed to be important work. Participants revealed details of their activities as they worked with me to schedule and reschedule times for interviews, to respond to follow-up questions, and to share information about their web pages. E-mail messages were captured and saved in each informant's individual file to facilitate electronic analysis.

Phase Two

In the second phase of the research, I gathered data from the Girlsline Message Board. Two young women developed the Girlsline Message Board² site as a place that would provide information about things important to girls of this age. The site provides a forum for young girls to read about and discuss their "joys and struggles in a comfortable and safe place." More than 2000 girls are registered with the site and daily postings are available on their message boards. Because this site complies with the Children's Online

Privacy Protection Act, accepts no paid advertisements, and scrupulously provides monitoring of each message board, I felt it was an excellent medium for finding authentic dialogue and self-expressions from young girls.

The Girlsline Message Board offers eleven separate forums where girls ages 11-14 are invited to introduce a topic and then to send messages to the forum related to that topic. One of the eleven forums is called e-girls.³ This particular forum encourages the participants to develop topics related to Internet use. Other forums include those that appeal to adolescent issues such as health and body, music, movies and television, and the lounge. I chose to monitor the e-girl forum postings for one month to gain insight into the thoughts of young girls who were highly interested in computer technology.

Message board postings

Using the archives provided at the Girlsline Message Board, I printed out a month's worth of postings and proceeded to analyze them. In all I studied 696 messages posted by 95 girls. These data provided me with an additional frame for reflecting, analyzing, and interpreting the Internet activities of young adolescent girls.

Phase Three

In phase three, I used data from the Girlsline Message Board postings to identify two girls who appeared to be high-end online users. They were selected on the basis of the number of postings they had recorded during the month. Both of the girls were also moderators (mods) for one of the site's forums. In this capacity, they monitored the messages posted for appropriateness and offered support to other girls who participated in

² See Footnote 1.

³ See Footnote 1.

online postings. The messages posted by these two girls as well as their personal websites were added to the collection of data for the study.

Summary of Data Collection for Phases One, Two, and Three

In summary, data for this study included:

- Survey, e-mail, interviews, and websites of eight informants nominated by their schools
- One month's postings on the Girlsline Message Board, e-girl forum
- Websites and postings of two girls identified through the Girlsline Message Board, e-girl forum

Data Recording and Analysis

Table 2 provides details about the methods for collecting and recording data.

Table 2

Data Collecting and Recording

Informants	Data Source	Collected	Recording Method
Eight interview informants	Survey	Mail	Paper and pencil responses
Eight interview informants	Interviews	Online	Electronic files
Eight interview informants	E-Mail Messages	Online	Electronic files
Four interview informants Two e-girl informants	Web Page Reviews	Online	Electronic files/Printed copies
Ninety-five e-girl posters	Internet Forum Postings	Online	Printed transcripts

Plan for Data Collection

The plan for data collection involved searching for knowledge about the girls' use of the Internet related to adolescent developmental tasks for females including identity, social relationships, and personal expressions of competence and accomplishment. Using data from multiple sources enabled me to observe the research concepts in different ways with different data. Mason (1996) suggests that qualitative researchers

consider important factors in selecting and linking research questions, methods, and justifications for the methods. Building up an analysis using data from different sources and generated through different methods strengthened my ability to understand the informants' Internet use. Specific questions provided a framework for the data collection. These questions, data sources, and justifications are presented in Table 3.

Table 3

Data Sources and Methods

Research Question	Data Sources and Methods	Justification
1. How do girls use computer technology in terms of identity development?	<ul style="list-style-type: none"> ✓ Online interviews ✓ Web pages 	<ul style="list-style-type: none"> ▪ Interview data provided information about personalized value of computer technology for each girl ▪ Web pages provided a window into each girl's personality
2. How do girls use the Internet for building social relationships?	<ul style="list-style-type: none"> ✓ Online interviews ✓ Web pages ✓ Forum postings 	<ul style="list-style-type: none"> ▪ Interview data provided commentary about friends and online activities with friends and acquaintances ▪ Web pages revealed specific ways in which girls reach out to others online ▪ Forum postings documented dialogue among girls
3. How have the girls developed and demonstrated their computer technology competence and accomplishments?	<ul style="list-style-type: none"> ✓ Surveys ✓ Online interviews ✓ Web pages ✓ Forum postings 	<ul style="list-style-type: none"> ▪ Surveys provided information about computer skills and activities ▪ The accounts and experiences reported in the interviews revealed environmental conditions present for each girl's development of computer competence ▪ Web page analysis provided a view of

		<p>computer technology skills</p> <ul style="list-style-type: none"> ▪ Forum postings document self-reports of skills
<p>4. How do the girls reflect women's ways of knowing in their use of computer technology?</p>	<ul style="list-style-type: none"> ✓ Online interviews ✓ Web pages ✓ Forum postings 	<ul style="list-style-type: none"> ▪ Interviews provided data on key concepts related to concern, connectedness, real-life experiences ▪ Web page contents and forum postings provided data on girls' activities of importance to them

Preliminary Activities

Key to researching online activities of the informants was my ability to enter their world and understand typical ways young people use the Internet. Having come to computer use as an adult, I have an acquired outlook regarding Internet use, similar to learning a second language. My perspective is forever shaded by my lack of early immersion in the world of computers since it was unavailable to me during my youth. So that I could be an effective researcher in this setting, I improved my online skills and my familiarity with the online world of adolescent girls.

Internet research

Prior to the study I immersed myself in Internet sites generally attractive to adolescent girls. I visited chat rooms, e-zines, forums, and e-groups I located through Internet searches. I searched for websites tailored to adolescent girls and followed links from these sites. I downloaded and analyzed the scripts of online conversations among

young teens, and I visited personal websites of young adolescent girls, following the threads from these sites and visiting guestbooks to view the reactions of other teens to the sites that had been created by girls. Through these journeys I discovered a wide variety of online activities enjoyed by young adolescent girls.

Research support team

The study of the adolescent world was complex in itself; exploring and understanding it in a wired state brought further challenges. I recognized the value of collaboration in research, and consequently chose to use a team of three mentors to support me with the technical aspects of the data collection. My mentors included Bill, a network engineer; Anne, a systems engineer; and Meg, an information technology specialist. All three were recent college graduates and young professionals in the technology field. My team guided me through the intricacies of online data collection. They helped me to select the patterns for online communications, the management of files, and the process of using the computer to analyze data. They worked with me from the beginning of the study, helping me understand what was possible and practical in terms of online data collection. For example, I initially selected Internet Relay Chat (IRC) as the vehicle for Internet chats and data recording. This was a tool I had read about in my review of the literature and one that I had discussed with another researcher who had used it in her study. Bill quickly helped me to see that this software was already outdated. He guided me to new software applications for Internet chats that were more user friendly, including America Online Instant Messaging (AIM) and Microsoft Chat. He helped me to analyze these two communication vehicles and weigh them against the criteria imposed by my study. Because one of the tools was more intrusive in nature,

including using online banners that were geared toward adult audiences, I selected AIM as the vehicle of choice for online interviews and chats.

Anne, the systems engineer, helped me learn how to connect with AIM via the Internet rather than having to access IM directly through a provider. This method allowed all the girls to use the same vehicle whether or not they subscribed to AOL as their service provider. It also allowed me to use a single IM format rather than having to adjust to several different chat windows and styles.

Key to successful interviewing was my ability to work smoothly with the storage and retrieval of files. Meg assisted me in this process, facilitating file management that was secure and easy to use and formatted for importing into qualitative software. Meg also helped me to test surveys, questions, and e-mail messages. As the youngest member of my research team, Meg often served as a translator for terms the informants used that were unfamiliar to me.

Data Collection Activities

Surveys

The girls' responses to the surveys gave me a window on their web use. A question about their survey responses was an effective place to begin interview discussions about their favorite online activities and their priorities related to computer use. For several of the girls, their uses had changed in the two months between the surveys and the interviews. The dynamic nature of adolescent girls combined with the rapid changes in computer technology made this inevitable.

Interviews

The interviews were conducted at the convenience of the participants. For most of the girls this was a very complex matter. Interviews were in competition with family trips, band concerts, picnics, visits with friends, work, camp, birthdays, and plenty of “sorry, I forgot” situations. Although the difficulties with scheduling did not surprise me, they did make the period of interviewing much longer than I had anticipated.

All of the girls seemed eager for the interview as evidenced in their e-mail communications. One girl even sent a personal letter by regular mail thanking me for the great opportunity to be part of the research study. In spite of their interest in the interviews, the girls were often late or failed to show up for a scheduled interview. I learned to adjust my schedule to the patterns they seemed to present in terms of online time. Most of the girls go online in the early evening. At times I was able to spontaneously reschedule an interview because I could see that a girl was online. I would send an IM and immediately get a response indicating that the time was good for an interview or that I could come back at a given time that evening. I tried to keep interviews to no more than one hour and in most cases that was what occurred. In those cases in which I felt more time was needed, I invited the subject to continue the discussion in a session the next day.

During most of the interviews I maintained a reflective journal while we were conversing. I opened a second window on my computer screen where I recorded brief thoughts and comments about the girl's responses or the interview in general. A few interviews required my constant interaction because of the speed of the girl's responses. In these cases I recorded reflective notes after the interview. I maintained comments

about my perceptions of the interviewee and the situation as it unfolded. I noted unusual circumstances such as losing the Internet connection (which occurred only once) and interruptions on my end. Because of the medium of Instant Messaging, I was able to assimilate each girl's words in print before responding. I was also able to read my response and reflect upon it prior to sending it to the informant.

The interview process seemed to work smoothly for both interviewer and interviewees. Initially I had expected the time to move slowly, since I assumed that the young girls would likely be slow typists. I did not find this the case at all. Their typing speeds were moderate to downright speedy. In the case of one participant, I could barely keep up!

One methodological issue that arose during the interviews was the dilemma of knowing when an interviewee had finished a thought. The text on the screen is often delivered in segments, as the writer types a response and then hits the "return" key to send that part of the message. At times there is more to be said, and without verbal and visual cues the receiver often thinks the thought is ended upon receipt of the visual response. This was the case in my first interviews.

I often assumed that a girl had finished her thoughts because she had sent the words when, in fact, she had more to type. When I typed and sent another question or comment, I sometimes found that I had jumped the gun, intruding on the rest of the participant's ideas by providing a new prompt. After the first two interviews I provided the girls with a mechanism to let me know that they might have more to say on the topic. I asked them to type "... " when they were going to say more or thought they might have more to say.

This technique worked very well and gave us a way of keeping conversation flowing smoothly without the benefit of face-to-face cues.

The girls seemed to be quite familiar with emoticons⁴ and other symbols. Those who were simulation game players also used words as descriptors for their movements or emotions such as “*encouraging*,” “*evil laugh*,” “*waves hand in the air*.” A number of the girls had created their own symbols and short cuts for communication. Shortened words were quite common in their conversations (u, msg, mods) as were deliberate misspellings (confusin,rox, lubb, gyrl). Whenever they used a graphic or word with which I was unfamiliar, I asked for a translation. The participants were eager to help, often specifying the context as well as the meanings in their conversations.

For each interview I created a file containing the transcript of the conversation. After completing the first two interviews I read the narratives to analyze the content of the responses for comprehensiveness. I highlighted my questions and comments to check for leading questions, biases, and unclear questions/comments. I made note of these areas to facilitate the remainder of the interviews. I also noted areas that I wanted to clarify with certain girls in follow-up e-mail messages and chats.

Web pages

Web design seemed to be one of the interesting online activities that fascinated some of the girls and bored others. I visited the girls’ web pages and printed out the sites for further analysis. I initially used an open-ended analysis of the pages to discern patterns in the content, using a form for recording notes. To analyze the skills of the web page developers, I designed a rubric (Appendix D) for analysis of computer technology

⁴ “Emoticon,” a term derived from the words “emotion” and “icon,” refers to a symbol of facial expression, such as happiness or sadness, created with keyboard characters.

skills. The content, themes, and forms of expression found at each website were recorded in notes on a form developed for this purpose(Appendix E).

E-mail

The girls seemed to enjoy keeping in touch through informal e-mail messages. Although the major function of the e-mail messages was to schedule interviews, I found the contents of each message revealing of the communication styles of each participant as well as the daily lives of the girls. At times, e-mail served as a follow-up method for continuing the conversation from the interviews. I asked several girls to provide clarification or more details about interview responses, using e-mail as a more expedient way of collecting the data than scheduling another interview.

Forum postings

My visits to the e-girl postings were an exercise in “lurking.” Since the girls were not aware of my presence, I had the opportunity to view their activities from a distance, without the potential intrusiveness of my presence. Although I had no assurance that each person who posted a topic or provided a response was in reality a female adolescent, I processed the data with the assumption that this was true for the most part. The messages seemed sincere and fairly mundane. It is not likely that anyone with motives different from those associated with being a young girl seeking connections with other young girls would have any interest in these e-girl postings. The communications followed patterns of speech and styles of communicating that appeared in the interviews I conducted with the girls known to me as a researcher. Consequently, I used the data from the forum postings with a moderate level of confidence in their authenticity.

Data Analysis

Theoretical Framework

The words of the informants, survey results, e-mail contents, website contents, and forum postings presented me with an array of data. The analysis of these data required a methodology that would enable me to maintain the essence of each girl's experiences and ideas while seeking to discern patterns, suggest themes, and draw some conclusions from the data.

I selected qualitative research hermeneutics as an approach that would assist me in the inquiry. This theoretical approach, promoted by Wilhelm Dilthey (1976) and other German philosophers, is the study of interpretive understanding with special attention to the original purpose and context. Using a hermeneutics approach, the researcher seeks to discern the conditions under which the product was produced or the actions took place so that an appropriate interpretation of its meanings is possible. The researcher also uses "empathetic understanding," projecting self into the author's space.

Hermeneutics is derived from the Greek *hermeneuo*, meaning to interpret or translate. Initially this process was used for the interpretation of religious texts. The theory and practice of interpretation is the hermeneutic cycle, which incorporates the process of returning to the text or the activity and deriving a new interpretation every time or with every different interpreter. The strength of the interpretation is the cyclical refinement derived from multiple analyses of the same data. The progressive analysis of the data is always built upon the wholeness of the data rather than a deconstructed view of the data. The integrity of the original text or activity is always maintained. Through the analytic cycle one can understand a little bit more every time the data is examined.

To facilitate the use of the hermeneutic process, I used ATLAS.ti, a qualitative software program built upon the hermeneutic philosophy. ATLAS.ti was developed to help support an exploratory approach to the data. The main strategic modes of the software operation include visualization, allowing the full text to be visible and accessible on the screen; integration, allowing the user to develop hyperlinks within and across documents and notes; serendipity, allowing the user to move between thoughts across all aspects of the data and coding in order to “notice” new possibilities in patterns and interpretations; and exploration, encouraging the user to use sophisticated queries to separate, combine, and visually manipulate data elements, codes, notes, and emerging themes. This software enabled me to use an interpretive approach supported by a tool that facilitated the analysis of data in context while facilitating greater and greater breadth to the scope of the analysis and depth of interpretation. Davies (1991) spoke of the power of computers in allowing the researcher to explore multiple organization of the same data by generating multiple maps as well as encouraging more than one mapping for each piece of data. Such was the case with ATLAS.ti.

For all data in the study my approach to data analysis incorporated the hermeneutic approach. This approach is aligned with Creswell’s (1998) notion of a spiraling process. Rather than the linear activities of selecting, collecting, and analyzing data, Creswell suggests an engagement that moves in analytical circles. Entering the spiral with some initial data, the researcher cycles through several facts of collection and analysis. With each loop in the spiral, the researcher works with the data, circling around it with ever-increasing complexity.

I used ATLAS.ti for assistance in interpreting the interview data. This software program maintained my original interviews of informants while allowing free and linked note-taking, free and linked coding, and visual displays of data from the narratives. Conceptually, the software honors the hermeneutic philosophy of cycling through the data multiple times but always from the original, holistic view.

Approaching the data, I began with a holistic reading of each interview transcript. Recognizing that interpretations in context would be essential to my work, I sought to immerse myself in each girl's story to the extent that I owned the data and could recall the interview throughout future analyses. I read each girl's interview and e-mail messages several times, allowing my mind to become very familiar with the girls and what they were saying.

Using Scientific Software for Analysis

Taking notes

After I read and re-read the interviews, e-mail messages, and recorded summaries of each girl's responses, I was ready to use the ATLAS.ti computer software to assist me with the analysis of the data. I imported each interview and related e-mail messages as a separate file into the software. Using the software tools, I made brief notes linked to the interviews whenever something a participant said or did caused me to pause and reflect. I found myself making quite specific comments in my notes.

The second time I engaged in note-taking, I began to develop reflective notes. These notes were driven by my personal thoughts about what the girls had said. I often included my ideas about the girl's emotional tone or point of view.

Coding

After the two rounds of notes I was ready for coding. I approached the coding process with some hesitation. Should I code according to my research question outline? Should I code according to my question prompts? Should I code according to spur of the moment thoughts that seemed to emerge from reading my notes? In the end, I did a combination of all of these. First, I returned to my research questions and coded several interviews using key concepts from the questions. I did not find this very satisfactory, feeling that I was leading the data interpretation artificially. Next I tried using my research questions as guides for the coding. This method suffered the same fate as the first, and I abandoned it because of its overbearing guidance for my thoughts.

Finally, I decided to return to my notes and re-read them. In the process, I began to see categories emerging from the girls' comments. Of course these were reminiscent of the ideas I had in mind when I developed my research design. But this time I was able to use the girls' words to guide my thinking about what they were saying. I did not do any further coding or note-taking at this point. I did, however, collapse and clean up codes.

The computer software enabled me to read my notes both in a free-form fashion, as they evolved during the reading of the interviews, and via the codes I had developed. Thus for each code I was able to read the cluster of quotations I had marked. I was beginning to see the threads of commonality and dissimilarity in the girls' comments. Next I decided to go to my girls' summary sheet comments for another reading. It was during this reading that I was able to begin to understand the data. As I was rereading the

summaries, notions began to emerge that told me I was on to something. Now I knew what real coding was supposed to be.

At this point, I reloaded a fresh version of the girls' interviews and read them again. Next I began my new coding. With two sets of the same data, I was able to refer to the progression of my thoughts. With the new set of data, I coded what the girls said according to emerging constructs. I saw similarities and differences between their responses. I was able to concentrate on what the girls had told me without the trappings of preconceived outlines and codes.

Progressive analysis

Thus, I employed methods to reduce the data, to display it, and to draw conclusions and verify my findings. Since the world of the young adolescent girl is changeable and vulnerable to outside influences, I employed a fluid, multi-faceted approach to data collection. I engaged in ongoing review and analysis of the data as well as the data collection methods throughout the duration of the research. For example, I provided the girls with the survey questions approximately one month prior to the initial interviews. During this time I visited available websites and reviewed the survey data. When I began interviewing the girls, it became clear that some of their uses had changed. They were engaging differently in their Internet use by the time of their interviews than they had been at the time of the initial surveys; their responses to interview questions demonstrated this fact. Some were now developing websites while others' sites had been abandoned. Most were much more significantly involved in Instant Messaging (IM) than they had been initially.

At this point, I began to speculate on the meanings of the data for the informants and for me. Continuing, I analyzed the data looking for themes and patterns. At every one of these stages, I sought to incorporate the voices of the participants as validating their own stories. I interpreted my findings in relation to accepted theories of adolescence and motivation as well as framed in current research on computer use by females. At this stage I paused and circled the data once more. Following this review and reflection, I prepared my findings.

Analysis of Web Pages

Using the same hermeneutic approach, I engaged in cycles of analysis of the web pages. Having prepared notes on the content of each website as well as a rubric to assess web page development skills, I began with an initial reading of my notes as well as a revisit to each of the sites. I next read through the notes again, becoming very familiar with each website and the actual screen shots of each. Common themes for web pages became evident through this analysis.

Analysis of Survey Information

The survey included ten items related to use of the Internet. Each respondent indicated her involvement in various Internet activities. Survey results were tabulated according to preferences indicated by the informants.

Analysis of Forum Postings

Data from the forum postings were provided in a much more linear fashion than that of the other data sources. Consequently, my approach to the data analysis was somewhat different. I initially completed frequency tables on the postings, indicating the total number of topics, the number of postings for each topic, the number of topics each

girls initiated, and the number of times each girl responded with postings to topics during the month. Following this numeric analysis, I read through each topic and its corresponding responses. In the second reading, I highlighted interesting and intensive commentaries within the messages. Next I developed an analysis of the patterns of the messages. I categorized the topics and determined the number of topics within each category. Following this activity, I engaged in an analysis of the informants themselves. I determined who posted the topics and who responded, analyzing their levels of participation in the forum. I tabulated the results by topic number, topic type, number of responses, and number of postings by each participant in the forum. I compiled notes about the nature of the postings, the level of computer technology skills inherent in the messages, and the degrees of girls' participation indicated by the postings.

Summary of Methods

The use of the Internet is an area of teenage life that incorporates personal, cognitive, and social aspects. Understanding any one aspect in the world of young adolescent girls requires intensive listening, viewing, reflection, and analysis. A qualitative approach enabled me to use a spiraling approach to view actions, listen for thoughts and feelings, report the words and activities of the informants, and draw inferences related to the informants' Internet use. As a middle school principal and educational computer technology specialist, I brought to the study my understanding of the natural world of adolescent girls as well as personal familiarity with computer technology. I sought to integrate data from multiple sources, capturing descriptions of

the day-to-day cyberlife of young girls. My analysis of the data and my interpretations of the findings are presented in chapters 4 and 5.

Chapter 4

The Girls and Their Online Activities

This chapter provides an description of findings from the data. The first section of the chapter considers data for each of the eight girls who participated in online interviews. A thematic profile of each girl is presented, incorporating information from interviews, surveys, e-mail messages, and web pages. The second section of the chapter offers an analysis of the Internet Girlsline Message Board forum postings. This section also includes a discussion of data for the two indirect informants, considered high-end Internet users, who were located via their Girlsline Message Board postings. The third section provides an analysis of the girls' web pages.

Views of the Interview Participants

This section contains the stories of eight young girls as online users of computer technology. Their experiences with computers are reflective of their generation and their environmental conditions. Each of them lives in a family where access to a computer is readily available, where support of computer use is present both at home and at school, and where the greater world encourages everyone to get connected. Data reflects information from interviews, e-mail, and available web pages of the interview

participants. The information presented here focuses on the way in which each girl sees herself as a user of computer technology, how each expresses herself through everyday use of the computer, and how each has acquired knowledge and skills in computer technology. The teenage girls who responded to my request for information about their use of computer technology willingly revealed their thoughts and feelings about what they do on their own terms when they sit at a computer. Each girl provided a glimpse into her virtual world. The girls told their stories without hesitation and with a desire to be helpful to the research study. When the girls “arrived” for their interviews, each of them was highly focused and extremely thoughtful in response to my prompts. Having prepared a set of questions and practiced online interviewing, I was ready to guide the interviews to the extent that each informant needed guidance. I had established a split-screen format for the interviews with plans to maintain a log and reflective notes online during each interview. I assumed that I would have plenty of time during the interviews for note-taking since I expected that the girls would be relatively slow in forming responses and typing them onto the screen. Was I surprised! To a girl, they not only responded to questions and prompts with ease, but their responses did not seem to be slowed by the typing process. It was also clear that most of the participants had had plenty of practice with online chatting. When I was not able to maintain my notes during the interview, I recorded them immediately afterwards.

Megan

Megan is a multi-dimensional young woman. Comfortable with sports including baseball and basketball, she also enjoys singing, dancing, reading, drawing, writing, painting, laughing, and partying! Online experiences are only one part of her very

complex world. Megan loves to talk about anything and, at times, annoys her friends with her elaborate conversations.

Self-expression

My first impression of Megan was of a person who enjoyed expressing herself. Her online conversation appeared on the screen in a large, fancy, colorful font. It was obvious that Megan cared about how her communications looked. She wanted to be sure her “voice” was distinctive. This sense of expressiveness was also apparent in Megan’s online conversations and e-mail messages. From the start she responded to my questions and prompts with ease and confidence.

Megan’s interest in computers began with playing games, although that focus has since shifted to chatting with friends (her most frequent online activity). An online activity that Megan discussed at some length was developing and maintaining her web page. When she decided it would be fun to make a web page, she went to a website provider on the Internet. There she found step-by-step instructions for developing a personal website.

My impressions of Megan’s interest in self-expression were reinforced when I had the opportunity to visit her web page. Megan’s website had a distinct visual effect. She presented a pleasing yet detailed personal view through multiple graphics and links. Each picture was purposefully chosen to represent one of Megan’s strong interests. A number of the links offered the reader a connection to some of Megan’s favorite teams and bands. Megan had worked on her web page extensively, experimenting with various ways of expressing herself online. Three different versions were available, each a little different from the others. Her first version revealed more personal information (for

example, the name of her school) than did later versions. As she progressed in the development of web pages, she was able to shift from an almost totally text-based version to one with strong graphic and interactive effects.

Megan's website offered the visitor a window into her personality. Megan seemed to be intent on using the Internet for self-expression, whereas she sees that her friends use it differently. "Most of my friends just have the Internet to talk to people, but I spend time making my profile look good, and making my website look nice."

Social connections

Megan enjoyed using e-mail and Instant Messaging as vehicles for communicating with friends. When she first began using the Internet she visited chat rooms to meet people. That activity stopped when some "bad things" happened. She changed her screen name and now she only talks to people she actually knows in person. This sense of self-protection is also reflected in the changes Megan made to remove personally identifying information from her web page.

Megan has a large number of friends with whom she chats, as evidenced by the ninety-five names she provided on her web page as "shoutouts." The "shoutouts" are a way of personally recognizing all one's friends somewhere on one's web page by listing their names. It often includes an apology to those who might have been forgotten. Megan's web page offered a link for e-mail, one for live chatting, and a guestbook for signing and entering commentary.

Megan actually enjoys talking on the phone with close friends more than through Instant Messaging. Online chatting is used more for friends she never sees outside of

school or sports. The combination of the two methods of communicating is evidence of Megan's desire to connect with peers on a daily basis.

Megan's explorations of her social world have been enhanced through her use of the Internet. She seems to have a strong interest in connecting with close friends and developing a broadened circle emerging from those connections.

Competence

Megan has confidence in her computer technology abilities. From an early age she showed her interest in independent learning. She enjoyed games that encouraged exploration. She contrasted this type of game with educational games, saying that she never played many educational games. Megan focused her use of the web on communicating with friends and learning new skills for web design.

Megan believed that the more you use the Internet for experimenting and learning new skills, the better you get. She was matter-of-fact in declaring web page development as easy and something you can get help with at the web provider site. Taking advantage of these opportunities to learn, Megan has become significantly more sophisticated in her ability to design a website and to incorporate content that was pleasing to her and interesting to those who visited her site. Megan herself recognized that not many of her friends were able to do what she was doing in terms of web development. Megan thinks she is more skilled than are most of her friends, although she says that a number of them also have web pages.

Support from others

Megan mentioned her mom as the person who helped her to get started on computers when she was about seven, mostly playing games. She also talked about

friends and online help sites that have provided her information she has needed to improve her computer technology skills.

Megan did not feel she learned many computer skills at school, finding class computer activities boring. It appears that Megan is a self-taught young computer expert. She enjoys using the computer for fun, as a diversion from other typical activities of those her age. In the process of using the computer she has discovered that she is competent and capable of becoming more adept in the use of computers. She does not hesitate to try new things on the computer and is willing to spend significant time getting better.

Julie

Julie is a young woman whose use of the Internet reflects her strong personal and family values. Julie has the typical interests of many young teenagers including sports, reading, and getting together with friends. Her use of computer technology is balanced with family fun, schoolwork, and personal interests.

Reflection of values

Julie's purposeful use of the Internet is guided by strong family values. For example, she says that she will use Instant Messaging less during this school year than she did during the last year to allow for more attention to her school work. Julie also spoke about family restrictions against visiting chat rooms on the Internet.

Julie talked about a bad experience she had on the Internet. "I went to a website that was very anti-Christian and it really shook me up that people would say such horrible things." Her reaction to this experience was to immediately leave the site. She said that

she has had no other similar experiences. Julie seems to use her experiences as tools for personal learning.

Julie believes that it is important for teens to balance computer use with other activities in their lives. Julie's comments reveal a young woman who is thoughtful about family expectations and personal choices. She seems to have developed a respect for family members, others her age, and herself as she confronts situations in which decision-making and opportunities for personal reflection are important by-products of online computer use.

Social connections

Julie uses the Internet to connect with friends. She seems to recognize that conversing online is different from conversations on the telephone, preferring the interaction possible on the telephone when speaking with close friends. But Julie appreciates the ability to carry on conversations with several people at once using IM. Julie takes the parental restrictions against chat rooms in stride. Julie also seems to know how to balance social activities with other interests, turning off IM when she wants to concentrate on another task.

Support from others

Julie said she owes her computer savvy to her father "I got it all from my dad who taught me all about computers." She started at about age 3 or 4, at first playing games and then learning to install and use other software. Julie's perception of support from school was not as positive: "At school they did not have very good computers and I do not really remember anything they taught me now that strikes me as something important." When asked if she remembers any uses in her classes last year, Julie does

recall using a spreadsheet in algebra, an Internet site in Spanish, word processing in English, and an interactive CD in science to help understand the lesson better. Although Julie can reveal uses of technology within her school classes, she does not seem to connect these uses to learning that is of personal importance to her.

Julie has received adult support for considering a technical career in her future. Julie says she will definitely select computer classes in high school or college but has not decided on a career. When asked what classes she might take, she only mentions typing. She will not go into programming because she is more interested in fashion and design or engineering for electives.

Competence and confidence

The skills Julie learned from her father enabled her to progress in knowledge and skills. Particularly valuable were his lessons in “how to be reliable enough on the computer so that he wouldn’t have to always watch me.” This early push toward independence supported Julie’s growing self-confidence and competence. Julie perceived herself to be a stronger user of computer technology than most of her friends.

Integrated use

Julie sees her use of the computer as an integral part of her life. Her family has three computers and is about to purchase another one. Consequently, Julie has easy access for the six or more hours she spends on the Internet each week.

Julie reported that her most frequent online activity at the moment was surfing the Internet. This may have some connection to the time of year, since schoolwork was not infringing on her options for online activity at the time of the interviews.

Julie sees the computer as an essential part of her life. She thinks if she had no computer access she would probably spend more time reading, playing sports, and talking on the phone. Julie thinks that a computer is definitely a good thing to have because “it does a lot of menial work faster and it helps you organize and has just endless possibilities.” Julie is an online user who looks for the good things to do with the computer that match the needs and values of her life.

Kursten

An avid computer user, Kursten’s intensive online activities reflect the complexity of her personality. She treasures both her “real world life” and her virtual existence in an online simulation game. Quick-witted and full of stories, Kursten conveyed a strong sense of confidence and self-absorption in her daily activities.

Kursten started playing video games at age 2 with her older brother. She got her own computer when she was about 11 and has been experimenting with it ever since. She taught herself some HTML and tried to build a web page when she was in sixth grade, but her brother would not let her use the computer programs to upload her HTML scripts. So she found a site to help her create a web page without a great deal of HTML and finished a fine web page on her own.

Online game player

Kursten is an intense gamer. Her older brother introduced her to video games when she was 2 years old and she has been hooked ever since. Online two to six hours a day, Kursten often gets lost in the simulation game, Nexus. She found the game when she was in sixth grade and has yet to tire of it. In this game she has met and become friends with many others. She met a “man” and married him online. She has adopted children.

She is skilled with a sword online and takes fencing lessons offline. She shows her vulnerability, having been tricked online. In the game she is at level 20. Kursten described in detail significant experiences she has had as her character Iridiene.

Kursten's life as a game player is full of experimentation. She seems to relish trying out the dimensions of her character. When male characters pursued her, she played games and flirted as a teenager might do in real life. She described her adventures in the relationship with the samurai warrior and her eventual marriage.

Online life

Kursten went into extensive detail about her life online and how the development of her online skills was intertwined with her game experiences. She talked about how she developed the use of emoticons, whispering online, accessing chat rooms and downloading games, and understanding how to deal with issues that might occur in online use such as cyber stalkers. Since a bad experience with an offensive chatter, Kursten no longer visits chat rooms except through the game Nexus.

Is she live or is she memorex? I was reminded of a commercial for recording tapes, which indicated that the tapes were so good that you could not tell the taped version from the reality. So it was with Kursten. At times I was not sure which Kursten was speaking: the "live" one or the virtual one. Were they different? Kursten demonstrates complexity within her real life as well as the life in the virtual world she has built for herself.

Interviewing Kursten was exhausting. She caught me off guard and appeared online for the interview fifteen minutes early. That should have been a clue to her incredible energy and mystique. Kursten immediately began the interview with veiled

windows into her existence. She talked about “emulators,” “Nexus, kingdom of the winds,” “ancient Korea,” “green tea and caffeine highs,” “fencing,” and “sneaking on the computer late at night” in her commentary during the first two minutes of conversation. I knew I was in for a unique experience and a lot of learning. Even after many readings of her interviews, I found myself with questions about her real and virtual lives. Sometimes a comment from her would seem to come out of the blue. I wondered if Kursten was commenting just for effect or if she was revealing the true complexities of her thinking. In spite of the fact that some of the things Kursten shared may have been embellishments, she clearly revealed herself as a very adept user of computer technology who was able to find adventure in almost every aspect of her life.

Confidence

Kursten’s life outside of the online game Nexus is no less exciting than her online experiences. Kursten is teaching herself Japanese. She says that she is not able to converse in Japanese, but that she can sing in Japanese pretty well. In contrast, in English she can talk well but can’t sing at all. In addition, Kursten takes fencing lessons; participates in a training program at a local veterinarian’s office; enjoys playing PlayStation games, riding her bicycle, and drawing; drinks green tea; and loves animals.

Her personality seems to be that of an extremely independent, confident young woman. We had two extensive interviews during which Kursten never seemed to run out of things to share.

Denise

Denise exhibits strong moral values and a desire to make a difference in the world. She continually struggles to balance her playful, experimental self with her

steady, sincere, goal-oriented self. She eagerly shares her personal reflections and feelings with others.

Social connections

Denise is very purposeful in her use of the Internet for communications. She wrote about how even shy people can find friendship comfortably through the Internet. She appears to be quite a sophisticated user, having learned to maneuver chat rooms and Instant Messaging and use them for positive interactions with strangers. She is able to manage up to ten online conversations simultaneously.

In sharing her thoughts about the value of online communications, Denise reveals a young woman who is quite sensitive to her own emotional needs and those of others. She feels that you have a sense of control in online conversations that is less present in face-to-face communications. Denise thinks her friends feel the same way she does about being comfortable communicating on the Internet.

Making friends is important to Denise. On the Internet she has found new friends through chat rooms, which she finds by surfing websites and accessing AOL chat rooms and IM chat rooms. Denise's website is another way for her to meet new friends. Although she is careful not to share revealing information about herself, she uses the guestbook on her website to communicate with others who may have her same interests. Guests often include their e-mail addresses for her response.

Love for music

Denise has an intense interest in music. She is quite active in the school band and spent time this past summer at band camp. Starting at age five when she was using the computer word processor to write her own songs, Denise has come to know that music

will always be important in her life. She seems to be pondering how to combine a career in music with one that involves computers. On her website, Denise reveals the depth of her interest in music, first listing and describing her favorite groups. On another page she continues by discussing her interest in music, which includes playing keyboards on her own as well as percussion in the school band.

Competence

Denise started using the computer at age 5. Her dad brought home games, which she loved to play. She enjoyed writing her own songs on the word processor. Denise now feels comfortable pursuing new learning on her own. "My dad helps me sometimes but a majority of the skills I've learnt myself, just naturally. When I get stuck I use the skills I know to find a way. Like find an answer on the net or ask somebody who knows. It works out all the time!" She says she is a lot more skilled than are most of her friends. Many of them come to her for help with Internet activities.

I had the opportunity to watch Denise face-to-face at the computer. When I was beginning to develop my proposal for this research study, Denise was a student at the middle school where I was principal. One day I asked some students in the hall if anyone could help me design a certificate for recognizing volunteers. Denise and three boys offered to help. I left the students alone at my office computer while I worked at a nearby table. I noticed that Denise immediately took charge, opening the word processing software and completing the basics for the certificate while the boys watched. She next went to the Internet and selected graphics to insert into the certificate. While these activities were occurring, the young teenagers began to engage in a discussion about their use of the computer, and, in particular, developing web pages. Denise showed everyone

her web page. None of the boys had developed a personal page, but they were quite interested in doing so. Denise began to show them some of the available sites for web development. After about twenty minutes, the boys seemed to lose interest and left the room for other pursuits. Denise stayed behind and talked to me about what else she could do. She wanted to have a project and was eager to make a web page for the school. When I told her that a committee of parents and teachers was working on the school's website, she suggested that she could help out. The next day she arrived at the school with the shell of a website developed for the school. Denise worked with the school's website curator and the school website committee during the spring semester of that year.

Observing Denise in action at the computer confirmed my opinion that she is highly competent in computer technology. When asked for information about sites appropriate for teenage girls, she was quick to respond by demonstrating her search skills. She was able to access sites she had previously visited as well as to locate additional possibilities. She used an Internet site to locate and download graphics suitable for a certificate I had requested. She had no difficulty demonstrating effective methods for importing and adjusting graphics to suit the use. She was able to give me a quick lesson in HTML and web page design. We also visited her extensive website. She had imported personal photographs onto her web page and incorporated animation and other advanced computer techniques.

Self-expression

Denise's website is a true study in self-expression. The initial entre into the site's contents reveals her reflective nature. Speaking of the website's theme, Blue Jello, she writes,

Blue Jello? Some of you might be wondering what the heck is Blue Jello and what's it supposed to mean? Well first, I decided to have a new change in attitude to this page and to give it a theme that everyone can relate to. I feel that Blue symbolizes the color of happiness, sadness, or even funkiness. And everyone has their own emotions. I think blue is the color for it. Blue Jello also represents the kids today, in my world. The people I meet, myself, and those who have stuck by me. We all mush together to create a "jello Family." Call me crazy, but this is why I called it Memories of Blue Jello. Our memories are filled with Total Kaos (yes I spell it with a K) and also sad memories (like leaving middle school friends). So I hope you enjoy this webbie, and remember, Blue Jello!

Within the pages of Denise's website she reveals the depths of her feelings and her competence at using technology as a vehicle for expression. For example she wrote a poem, "Two Worlds Apart," and accompanied it with a graphic she designed for this purpose. As a footnote to the graphic, which contained images of two people, one superimposed upon the other, Denise wrote an explanation of it. The graphic contains images of two of Denise's friends, which she has combined using her graphics skills into an image representative of the poem, "Two Worlds Apart."

Denise included five different original poems on her website. Four of them deal with girl/boy relationships. The last is a study of death and its beauty in releasing the real person, the soul. While addressing issues of identity and relationships common to adolescents, Denise reveals a depth and sophistication that set her apart as a talented writer and a highly introspective person.

Geri

Geri sees computer technology from a practical perspective. The daughter of a computer-savvy mom, Geri seems to have been directed toward computer use by example but does not seem to be inwardly driven to pursue it in depth.

Moderate online user

Geri was the quietest participant in the online interviews. She required more prompting, generally responding with only a sentence or two. Because Geri did not have a web page to share and appeared reticent in her responses, I am left with data that leaves me puzzled. Not only did Geri reveal little to indicate depth in her use of computer technology, she also conveyed a picture of a limited online user. I can only assume that either Geri was reluctant to share her expertise or she was not a significantly strong user of computer technology. The question remains as to why she might have been nominated by her school principal as a high-end user of computer technology.

Access may be part of the puzzle of Geri. She did not seem to have had home access to a computer prior to the age of eight, and even now her Internet access is restricted. She shares a family computer, which does not appear to have Instant Messaging capabilities. She got permission to use her mother's work computer to access Instant Messaging for our interview, although she is not typically allowed to use it. This lack of access to Instant Messaging sets Geri apart from the other interview participants.

Lack of confidence

Geri has a limited sense of self-efficacy when it comes to computers. "I think I am about average. My friends and I know about the same amount of information where the computer is concerned." Either Geri is very modest or she is just an average

computer user. Throughout the interview she expressed an interest in computers but did not reveal the excitement and exploratory nature of the other informants. When asked what new skills she would like to acquire on the computer, she could not list any. In spite of Geri's somewhat moderate use of computers, she wrote of her appreciation of their practical applications.

Computer technology skills

Geri's computer use at home began at around age eight, when her family purchased a computer. Her parents provided educational games like Math Blaster and Carmen San Diego and Magic School Bus. At her house, the computer is shared. This fact allows Geri time for about three hours a week on the Internet and several hours doing other computer activities such as preparing school reports.

Geri is capable of installing software both in packaged form and from the Internet. Installations she mentioned included Real Player and Real Audio. She is comfortable accessing sites to listen to music and other places on the Internet that are of interest to her. In spite of her lack of experience with Instant Messaging, she seemed quite capable of downloading the software and installing it and setting up an online account to use for our interview. She does not surf the Internet; rather, she searches for particular things for personal interests. Geri has had no experience with web page development and expressed no interest in doing so.

Social connections

Since Geri does not have access to Instant Messaging, she does not engage in online chatting. Consequently, her use of computer technology for social purposes is not significant. She sends e-mail once or twice a week. She does, however, use the telephone

for communicating with friends. Since Geri's interest in communicating with friends seems quite typical for a young adolescent, I assume that she would likely pursue extensive use of Instant Messaging if she had the ability to access the technology.

Support

Geri was the only informant who felt very positive about her computer learning at school. "They taught me a lot about computers." Geri was also the only informant who did not have early learning experiences on the computer at home. "We got a computer in 1995 (at age eight). I mostly used it to play games." It was about the same time that her in-school experiences with computers began. Geri did reveal that her mom and dad helped her to install games in the beginning and even now she can ask her mom for help if she gets stuck with something. "She works with ocomputers, that is her job."

Career goals

Geri says she won't enroll in any computer classes in high school or college because, although she loves computers, she would not like having a job where she worked at a computer all day. It appears that Geri's perception of careers with computer technology is a literal view of someone sitting at the screen all day, a job that does not seem to be appealing to her. Perhaps this is natural for a young teen who expresses a great love for sports, including lacrosse and basketball.

Geri did not appear to be a particularly high-end user of computer technology. I am left wondering if access is the issue. Geri seems content with the degree of her computer use. She does not seem particularly imaginative in her computer use or motivated to explore the world of the Internet. She is practical in her orientation. Would things be different if she had had more access at an earlier age? Would access to

communications online make her more eager to explore the technology? These questions remain.

Lynne

Lynne is a writer and a talker. She wrote me a letter prior to our initial interview, thanking me for allowing her to be a part of the research. She wanted to be helpful “without babbling during the interviews.”

Social connections

Lynne’s use of the Internet for chatting with friends takes up quite a bit of her online time. Adept at handling multiple conversations simultaneously, Lynne chooses when to keep conversations one-on-one and when to set up a chat room. She opts for the chat room when all of the parties online are friends. Lynne seems to have developed her personal set of rules for conversations that are compatible with her family restriction against talking to strangers. Online chats with casual friends are different from talking with a real close friend, says Lynne. For having a specific conversation with a close friend, Lynne sees the telephone as the mode of choice. She understands the dangers in chatting with strangers and will only go so far as to chat with a friend of a friend and only when her friend happens to be at her house or online at the same time.

Confidence

Lynne was modest in her expression of computer self-efficacy. She said, “I think my tech teacher was just saying that [she was quite computer savvy] because my mom's employers held a workshop on girls and technology in his lab in October and my mom helped and I was there.” Lynne did, however, acknowledge some expertise but mentioned that she needed help when doing something for the first time. Sometimes she

asks for help from a boy “who was really good with computers” or the teacher or her mom, or she visits a help site. It appears that Lynne knows how to use her resources to accomplish what she wants to do. Lynne says that if she had no computer access at all, she would probably do more writing with a pen, visiting friends, and calling people. She says she might read a bit more, too. Lynne thinks that computers are very important in people’s lives, particularly for those pursuing higher education or even completing a GED. She pointed out the benefits of having e-mail access and online research capabilities at home.

Support

Lynne started using computers at home at about age 4 with help from her mom and dad. She also remembers playing computer games at school in kindergarten, followed by the introduction of other skills in successive grades. She says that most of her school learning revolved around word processing. Outside of school, Lynne added to her computer skills as she grew older through home support as well as information from friends.

Lynne’s mom seems to be involved with computer technology both at work and in the school community, as evidenced by her participation in the school’s workshop on girls and computers. Lynne’s parents support computer use for their children. She and her 10-year-old brother have worked out a pattern of use that allows them to share the computer according to their needs. Priority is given to the person who has school work to complete. Lynne’s mom and dad use the computer at times when the children do not seek access. This arrangement allows Lynne at least two hours of access each day.

Patti

Patti has fun on the computer. An avid game player, she is part of a close-knit, game-playing family. An experimenter, Patti is willing to try new things and teach herself new skills on the computer.

Family fun

Patti is quite close to her family. Watching television is not allowed, but playing computer games seems to fill this void as a family affair. She, her older sister, and her dad often play a game for hours, particularly Diablo II. Patti recognizes that she is somewhat different from her friends, who don't enjoy games as much. Patti started playing games with help from her dad when she was about 3 years old.

Problem solving

In addition to enjoying complicated games online, Patti enjoys figuring out how to do other things with computer technology. However, she is not interested in the details of the technology. "I know how to install software and stuff, I can't tell you how much space it is taking up or anything like that, but I can make the program run and find it." Her approach is practical and concrete.

Patti shared her frustration with trying to build a web page. She said she accessed homestead.com, where "they have it so its like gluing it together." She got the information from a friend and thought it would be fun to try. But she "made one website and that was enough, because I didn't know what to put on it. My site is just some writing and then all the animations they had at the site." It appears that Patti enjoys a challenge, but needs a specific purpose and satisfying results for her efforts.

When Patti goes to the Internet, she is more likely to go for something specific rather than to surf. She expressed an interest in shopping online, but cannot buy stuff online without her parents' permission. She is interested in music and would like to learn to download songs better. Her older sister showed her how to download MP3's using Napster (an Internet site that allows users to download music files). Music is important to her and she would like to have a collection through Napster downloads.

She also spends much of her time sending and receiving e-mail, looking at the Amazon.com site, and going to Neopets.com, a site where you can see and adopt virtual pets. She frequently does school research online, but tends to search only when she is looking for something particular. Patti also chats with friends from school and uses IM quite a bit. If Patti did not have computer access, she says she would read more; in her family the children are not allowed to watch television shows.

Support

Patti was not very positive about her experiences at school. She said that it has only been in the past school year that she really learned anything new about computers at school. This learning occurred in a mandatory technology education class. In the class she studied various aspects of computer applications in technology such as flight and robotics. Patti's favorite module was robotics.

Patti appears to be a person who would pursue learning with computers even if she did not have adult support. She feels she is more comfortable with computers than are most of her friends.

Brianna

Brianna enjoys “big picture” thinking. She talked about the possibilities inherent in computer technology for helping scientists draw conclusions about the past. Brianna understands programming and can envision the development of software to support this scientific effort.

Programming

Brianna has a fascination with programming. She writes,

My dad uses QBasic a lot in his work. So he has a book lying around. One night, I came home with a math problem that required me flipping a coin 100 times. I went to my dad, cause he had written a bunch of programs with me when I was little so I could use the computer w.o much assistance (this was when windows wasn't opened automatically at startup; there was DOS!). So I went to him, and he handed me this book and said, “This is really easy to write a program for!”

And ever since I've been making little things.

She gets great personal satisfaction from the success of her programming.

Problem solving

Brianna sees programming as a vehicle to support human problem solving. She writes of her desire to create a program to capture and organize data concerning archaeological research. Her understanding of new technologies as evidence of human progress as well as the possibilities in computer technology as a vehicle for supporting collaborative research is unusual for her age. She shared her excitement with an example:

If someone finds a comb in Egypt that is from 1000 BCE. It has some certain style, and was found in a certain looking structure. Then someone in England

excavates a structure much like it and finds one from roughly the same period.

He could say “WHOA! That technology sure traveled!” That sorta thing.

She is very practical in her opinions of why computer technology is important, expressing disbelief in any field of study that does not take advantage of it.

Confidence and competence

Brianna is quite confident in her computer abilities. She started at the age of 3, sitting in her dad’s lap watching him play his games. When I asked her about her computer skills, she said, “I’m on all the time. Been using a PC since before I can remember. . . . I do just about everything except build them (but my dad has volunteered to teach me!).”

When Brianna was discussing the network of computers present in her family basement, she remarked that she felt she could complete the networking with a HUB. “Well, I haven’t been taught yet . . . but if I read a bit about it, I’m sure I could [network].” She definitely sees computer technology in her future. “I think this is gonna be my job someday. I love the computer and technology.”

Support

Brianna’s dad has been the strongest influence in supporting her computer skills. From the early days in his lap to the guidance he provides for programming and networking computers, her dad has been a constant resource. When she has a problem her strategy in searching for a solution is to first seek answers in the help section of the software, then try a book or website, then ask her father. Brianna did not find much support at school. Rather than learning computer skills, she says she spent her time in class helping the teacher and playing with desktop setting.

At home, Brianna spends the most time on word processing and using IM to talk with friends while she is writing a program or creating a PowerPoint presentation. She calls it “multi-tasking.” But playing games is her favorite thing to do on the computer. She can chat online while she is playing games. Writing programs is a close second.

Values and self-expression

In Brianna’s discussion of the “Left Behind” books and the corresponding online discussion groups, she revealed her belief in a higher power that should influence humans’ use of technology. She shares concern that “a lot of people that deal with technology are really losing touch with religion. I am not saying every computer nerd and chemist should go around spouting verses for the Bible, just that everyone should believe in something. We shouldn’t just be self centered people because we can talk to anyone (almost) around the globe.”

Analysis of Girlsline Message Boards Data

A link from one of my interview informants took me to the Girlsline Message Boards. The site is a popular place for girls ages 11-14, the target audience. Founded in 1998 and directed by two young women, the site is intended to give girls a place to be themselves and to speak out about things of interest to them. The popularity of the 11 forums on the Message Boards was evident in the rapid growth in the number of registered members. As of January 2001, there were 2,000 registered members representing 45 states and 36 countries.

The site complies with COPPA (Children’s Online Privacy Protection Act). In addition, no paid advertisements are accepted at the site. The founders of the site seek to maintain a safe place for young girls to get information and to share with each other.

Consequently, they maintain a watchful eye on all messages and immediately ban anyone who posts any questionable material. One forum that seemed to attract many more users was the e-girl forum. This forum became the place for my data collection about young Internet users.⁵

The e-girl forum appeals to girls who are experts in web use or who are interested in becoming more skilled in computer technology skills that support web use. I selected the e-girl forum as a place to become better informed about the extent of adolescent girls' Internet skills and their specific online activities. I monitored the site for one month.

The postings on e-girl reflected a variety of interests in online technology.

Specific skills mentioned in the girls' postings included:

- Creating websites, online diaries, message boards, and cliques
- Web hosting and moderating message boards
- Participating in simulations and playing games
- Surfing, navigating, linking, and researching topics of interest
- Forming and participating in e-groups
- Sending and receiving e-mail
- Programming with HTML and Java
- Developing webzines and critiquing sites
- Downloading and uploading files and learning FTP protocols
- Creating and editing graphics

A total of 696 response messages were recorded by 95 different girls representing about 5% of all registered site members. Only 16 of the girls recorded more than eleven

⁵. See Footnote 1.

responses. The most frequent number of responses was one. Four girls recorded more than 35 responses each.

The major topics discussed by the girls in order of frequency of response are provided in Table 4.

Table 4

Topics Discussed on E-Girl Forum by Frequency of Response

Topic	Number of Requests	Number of Responses
Please visit my site	22	105
I need mods for my message board	13	98
I recommend this website	14	91
Please visit my diary	10	55
I need help with website development	12	47
Name your favorite site	6	46
Other commentary/various topics	6	39
Please contribute to my site	5	23
Please link to my site	2	23
I had a bad experience	3	18
I need help with programming	3	10
I need help with files	2	20
I need help with graphics	3	9
Please critique my site	3	9
How to be a mod	1	3
Please be my e-pal	2	2

Most of the participants were interested getting visitors to their web sites and help in how to create websites or message boards. The girls seemed eager to be able to present themselves to others via the Internet. When girls did not have the desired skills,

they sought help from each other and quickly received guidance to develop the necessary skills. Every girl's posting of a request for assistance received a response within one day of posting. Most girls received several responses to their requests. Often these responses included recommendations of websites where girls could go to receive more help.

The girls who contributed to the Girlsline Message Boards seemed to have evolved into a community of users. Although I visited mainly the e-girl postings, my brief visits to other forums at Girlsline revealed that the same girls seemed to post to multiple forums. Within the postings the girls made personal references to each other, indicating a level of collegiality. This was particularly true for the most frequent users. Some girls seemed to know each other quite well through the Internet, although they gave no indication that they had ever met face-to-face. The heavy users often called each other by their real names, and one girl actually requested that this occur.

High-End Users

Only a few girls were high-end users of the e-girl forum. The top three girls in frequency of postings and responses were selected as representative of high-end users of the Internet. All of the three girls were moderators at one or more of the forums on Girlsline. These girls appeared to be very skilled with computer technology. Because one of the three girls did not have a website to share and her messages would offer little personal information, she was not selected as a high-end user for the purpose of this study. Although her messages revealed a strong knowledge of the Internet and web design, she seemed reluctant to post a website.

Examples of Postings from High-End Users

Selected postings and message responses from the two girls selected as high-end users of the Internet are included here.

Birdsong

Birdsong was a moderator of two different forums at Girlsline Message Boards, Music, Books, Movies, and T.V.; and Polls, Quizzes, Jokes, and Games. In addition to these responsibilities, she spent a considerable amount of time at the e-girl forum. During the month of data collection, Birdsong posted six topics and generated 66 responses to other girls' topics.

Birdsong's topics invited people to visit her site to see her new layout, offered readers a cute kitties graphic, begged others to be mods (moderators) for her site, sought "sisters" to have mutual links from their respective websites, posted a picture of herself for others to see, and asked others to sign her guestbook.

Birdsong's frequent responses to topics posted by other girls revealed her Internet skills, particularly with HTML. The responses Birdsong provided to other girls' topics included these areas:

- Using HTML
- Creating and improving an online diary
- Losing unsaved files due to a computer crash
- Locating and using graphics
- Seeking visitors to a new website
- Seeking visitors to a message board
- Offering to share a picture of herself with others

- Responding to a request to contribute to a webzine
- Dealing with explicit material on the Internet
- Congratulating another girl on her domain name

Cllover

Cllover was one of two moderators for the e-girl forum. During the data collection month she posted five topics and 57 responses. Topics she posted included a request to visit her new site, a request for members for her clique, a request for comments on a new layout, a request to visit her online diary, and a request to be linked to others' sites.

Cllover's responses included the following areas:

- Offering technical assistance with HTML
- Responding to a girl who accidentally visited an offensive site
- Expressing congratulations for another girl's site
- Giving assistance on how to post graphics
- Offering constructive criticism
- Requesting others to join her online clique
- Asking others to be kind in their criticism

Eagerness to Learn

Girls on the e-girl forum loved to learn new skills. The number of postings requesting help with website design was second only to the number of postings requesting visitors to their sites. Most of the girls asked for critiquing along with visitors. They wanted to know what other girls thought of their sites and they were willing to learn and to change based upon the advice of others. The criticism of websites was gentle and positive. Most of the respondents not only offered praise and helpful criticism but also

suggested specific ideas for changes or provided a helpful website for learning. When the girls improved their sites they were quickly recognized by members of the forum.

Girls new to the forum were especially encouraged.

Community Support

The e-girl forum offered a supportive environment. Although most girls only posted a single message, it was likely that many more came and read without posting. Of those who were active participants, most kept close touch with the group, as evidenced by the span of time from post to post. Among the frequent users, some seemed to be regular posters and within this group there was a familiarity with each other that came across in their messages. They referred to each other by name and often followed up on each other's messages to other girls. They were quick to support each other and often were found linked to each other's sites. Several of the frequent users were moderators on various forums at the Girlsline site. Some were moderators for other sites and also for message boards created by the girls themselves. The sense of support was strong among the frequent users. The girls did not seem to need personal messaging for the things they discussed at e-girls. This public forum seemed to be preferred over e-mail or private chats for their learning.

Caring, Protective Attitudes

The girls who posted at e-girl were protective of each other. When one girl was nervous because she accidentally visited a bad site, the other girls told her how to get rid of the site's remnants on her computer. When another girl seemed about to post a link to a nasty site, she was admonished by several of the girls not to share bad links. Another time a girl started to share some bad language and pictures, and the moderator

immediately warned and then banned her. On occasion, a girl would offer completely negative criticism of a girl's site. Others would come to the rescue and share some positive comments while also reminding all the girls to be kind to each other. One young woman who posted to the site was a 20-year-old mother of three, asking for the girls' help with her web design. The girls matter-of-factly offered their support and criticism. Mentions of labels for groups of people brought quick negative reactions from e-girl members.

Personalized Communications

The e-girls seemed to maintain their individuality within the network of common users. Although they shared common goals of building Internet skills, their websites and forms of communication were quite varied. The younger girls' website designs with cute and simple graphics selected from clip art were valued as much as the sophisticated splash designs of some of the experts. Those who chose to develop message boards for their communications with others were just as important as those building elaborate websites. Diaries were popular forms of websites developed by some of the e-girls, who promptly formed a network of diary builders. The girls all seemed to have two goals: build a better site, and share themselves with the world.

Analysis of Websites

Website Ratings

This section provides a description and overall ratings for each of the six websites visited for this study. Four sites in the study were developed by girls who participated in online interviews. The remaining two sites were developed by girls who

were discovered at the Girlsline Message Boards. Ratings of the quality of the web design and components of the sites are presented in Table 5. The ratings were based on a rubric (see Appendix D) developed for this purpose. The rubric provided ratings for each girl in areas of website development generally considered important in overall web design. Areas included layout, navigation, communication, images, and links. The data in this section convey the skills each girl demonstrated in each of these areas of website development.

Table 5

Website Ratings

Area	Denise	Megan	Kursten	Lynne	Clover	Birdsong
Layout <i>How effective is the overall design of the website?</i>	4	2	2	3	4	4
Navigation <i>How well can the user follow the logic of the website?</i>	4	3	3	4	4	4
Communication <i>How effective has the developer conveyed the messages she intended?</i>	4	2	2	3	4	4
Images <i>How sophisticated is the use of visual images and animation at the site?</i>	4	2	4	2	4	4
Links <i>How effective are the internal and external links included in the site?</i>	4	3	4	3	3	3

6 Ratings correspond to the following: 4 - Distinguished; 3,- Accomplished; 2 -Developing; 1 -Novice (See Appendix D for Rubric).

Skills

All of the girls with websites were committed to improvement. Several of them had multiple versions of sites or had sites under construction. Although a range of strengths in web development was seen, all of the girls were capable of writing for a website. Each of them had located a web host and uploaded to a server. Most of the girls were quite familiar with HTML and two were able to use JAVA.

The girls developed their skills at home. Only one of the girls spoke of web development at school in terms of contributing to a Web Quest. This school project was not comparable to creating a personal web page. All of the girls were able to create and activate both external and internal links at their websites. From hearing of their web work it was evident that all of them were aware of the importance of web design but not all of them were able to use a consistent design. In several cases the navigation across the site was spotty and links were sometimes ineffective.

In spite of the shortcomings of the websites, overall the girls showed strength in web development and promise of continued growth.

Personal Messages

The contents of the girls' websites were quite personal. Each of them conveyed information about herself. Such information often included family data, personal interests and accomplishments, and physical descriptions, sometimes accompanied by personal photos. All but one of the websites contained significant amounts of writings about personal feelings, goals, beliefs, and values. The girls seemed to find their websites a place for offering their thoughts to others. Poetry was the most common mode of communication of feelings, but diary entries, journals, and other narratives were also

used. The topics of their reflective pieces included love, hate, relationships, death, friendship, and causes such as environmental concerns.

Connections

The girls recognized their websites as personal forums. Eager for connections to others, they used their guestbooks as their main vehicle for feedback and communication. Most girls also posted their e-mail addresses. Some included their Instant Messaging or MSM screen names. The girls often linked their sites to those of their friends, forming a “sisterhood.”

Transiency

The changes in the girls’ young lives at adolescence were mirrored in their commitments to their websites. A number of them started out with great ambitions and plans for the sites. Months later, many sites languished. Discarding the old, most of the girls created new versions that reflected changes in their thoughts and in their interests. A favorite music group, for example, would not likely find its way to the fav list at a later site. Shoutouts to friends changed as the friendships themselves came and went.

Part of the website changes had to do with the girls’ skill development. For many of these high-end users, the process of increasing the sophistication of the web design was just as important as the personal contents of the website. For some, the design seemed even more significant than the contents.

Chapter 5

Emerging Themes

Emerging Themes across Interviews

The analysis of data from the eight informants who participated in online interviews revealed several emergent themes.

Access and support

Each of the girls interviewed for this study had access to computers at home as well as at school. Most of the girls were able to access the Internet to the extent that they desired. The participants averaged two hours a day online. One of the girls engaged in online activities approximately four hours a day, often sneaking online after bedtime. One of the girls had quite limited access to the Internet. Parents provided the most significant support for computer use. In all cases but one, parents introduced their girls to computer use prior to age 4. Several of the girls shared fond memories of using the computer while sitting on a parent's lap. This early use of computers under the watchful eye of parents seemed to provide the girls not only with good computer skills, but also with a healthy and cautious view of online use.

Confidence and Accomplishments through Independent Learning

All of the girls except one indicated a high degree of confidence in her abilities in relation to Internet use. Most of them were quick to mention independent use of online help as a means of learning new skills. Many also mentioned their own inventiveness and building upon prior skills in their search for new learning. The girls spent hours

online, trying out new skills and testing their powers. Tasks ranged from relatively simple things such as accessing Instant Messaging to very complex skills such as downloading or importing images, editing them, and uploading them to a web page. The complexity of the girls' websites and the descriptions of the girls' Internet use were clear evidence of strong accomplishments in computer technology.

Communication through Instant Messaging

Instant Messaging played a significant role in the daily lives of the participants. All but one of the girls used it, and for most of the girls, this was their most frequent use of the Internet. The participants spoke of the distinctions they made in using the telephone versus Instant Messaging. They reserved the telephone for conversations with close friends and used Instant Messaging for more casual conversations. Most of the participants were able to conduct multiple yet separate conversations simultaneously. Several of the girls set up chat rooms so that their friends could converse as a group. Each of the girls spoke of her personal way of controlling how communications would be established and maintained as person-to-person, person-to-people, or people-to-people.

E-mail seemed to play a lesser role in the lives of the girls and was often used for sharing interesting things they received or found on the Internet. None of the girls indicated that e-mail was her most frequent use of the Internet.

Social connections

The participants all used the Internet as a vehicle for connecting with others. They seemed to enjoy including each other in their online activities through such vehicles as Instant Messaging, chat rooms, guestbook entries, shoutouts on web pages, links to friends' websites, photo journals, diary entries, and postings received from friends.

Perceptions of computer technology at school

Only one of the interview participants believed that she learned significant computer technology skills at school. All of the others had negative views of computer use at school. Several commented that there were no challenges in the tasks presented there, and one indicated that she spent time helping the teacher.

A few of the girls spoke of a technology class they had taken as part of the study of technology. The particular course was called Synergistics. The course offered a number of modules such as flight simulation, video technology, audio lab, and robotics. The girls seemed to enjoy these computer activities, but none of them seemed to connect this learning with their independent computer use.

Personalized Computer Technology Use

Each of the participants in the interviews seemed to have a particular online use that was dominant. For Megan, it was expressing herself; for Julie it was using the computer for everyday activities; for Kursten, it was escaping everyday life. For Denise, the online world was a place for meeting new friends and sharing herself with others; for Geri, the computer supported her school work. Lynne found a place to chat with friends and to try out her writing skills; Patti used the computer for family fun. Brianna envisions future problems she can help solve in adulthood using computers. Whatever the individual goals, each of the girls conveyed a strong interest in computer technology and, for the most part, a positive sense of self-efficacy.

Emerging Themes across All Data

The analysis of data from all sources revealed four emergent themes: personalized use of the Internet, people-to-people connections, Internet use as a learning process, and support systems for learning. Girls who participated in interviews as well as those who posted messages at the e-girls forum had much in common because of their Internet use.

Personalized Use of the Internet

Each of the participants seemed to use the Internet in a very personal way. The girls who were interviewed found multiple ways to satisfy their academic, personal, and social needs. Some enjoyed the challenge of web page development, while others were more intent on interpersonal connections. Two of the girls were highly involved in online gaming, and several dabbled in programming. In spite of the variety of uses, each had a clear vision of her personal need for computers and the expectation that Internet use would satisfy some of her goals.

Similarly, the girls who posted messages on the e-girl forum were goal oriented. They seemed to convey a variety of uses for the Internet. Most of the girls were in the process of developing a website, but each selected from an array of formats, including standard website design, online journals and diaries, cliques, and message boards. One girl was committed to splashy graphics design, while another shared daily diary entries at her website. E-girls also spoke of other Internet activities such as visiting sites for downloading music and sites for adopting virtual pets.

The level of intensity of use also varied across the group of high-end Internet users. Some girls spent hours each day online, totally immersed in one activity. Others seemed to dabble in several areas during their time using the Internet.

People-to-People Connections

The girls recognized the Internet as a way to reach out to friends and to others with similar interests. Cliques were common among e-girls. Cliques were sites developed by one girl as a space for her to link to her friends or those who had a like interest. This format is somewhat comparable to traditional adolescent face-to-face cliques. Steinberg (1993) described the most important influence on the membership within cliques as similarity, with factors such as personal interests, age, and gender dominating. His descriptions certainly matched the e-girl cliques.

Instant Messaging was a significant medium for communications among interview participants. The girls seemed to find pleasure in the manner in which they could choose from various forms of person-to-person and person-to-people communications. They spoke of ways in which they made decisions about their control of the conversations online. Turkle (1995) also found this notion of control in her research. E-mail seemed to play a smaller role in the lives of the girls, often used for forwarding interesting information they received or found on the Internet. None of the girls interviewed indicated that e-mail was her most frequent use of the Internet. E-mail addresses were generally included on websites but it is not known the degree of e-mail activity that was generated in this way.

Some girls communicated through their personal websites and message boards. Diaries were popular forms of websites developed by some of the e-girls, who promptly formed a network of diary builders. The web designers all seemed to have two goals: build a better site, and share themselves with the world.

Shoutouts were very popular on personal websites, enabling the girls to recognize their friends with a web hello. A shoutout was a list of friends displayed in a prominent place at the homepage of the website. It seemed important to the girls not to forget anyone, and so they usually included a disclaimer for recognizing anyone they might have missed.

Eager to hear the thoughts of others, girls used their guestbooks as a vehicle for feedback. People who visited their sites signed their name, often posted their e-mail, website, and/or Instant Messaging addresses. They also included commentary on the site, often focusing on things they liked and had in common.

Internet Use as a Learning Process

Computer technology learning was an independent if not solitary activity. Each of the girls seemed genuinely eager to learn on her own. A little help from her friends was welcomed, but basically each girl used the resources found within herself and available through the Internet (including the forum) to fashion her own plan for learning, to seek personal motivation, and to devote the time necessary to practice her new skills until success was achieved. When a girl was successful, she was eager to let others know about it.

The range of computer technology skills shared by the girls was definitely at the high end of the spectrum. Most of the girls had already dabbled in programming and/or

web design and were searching for more knowledge. Among the membership in e-girl there seemed to be a pool of information and skills that would provide help from the apprentice to the master levels. At least two of the e-girls could be regarded as experts in web development. The range of skills among the interview participants mirrored those of the e-girls.

All of the girls with websites were able to create and activate both external and internal links to their websites. As I visited the websites I recognized that all of the girls were aware of the importance of web design but not all of them were able to maintain a consistent design. In several cases the navigation across the site was spotty and links were often ineffective. In spite of the shortcomings of the websites, overall the girls showed strength in web development and promise of continued growth.

Support Systems for Learning

The e-girl forum was a community of learners, as envisioned by Dede (1996). E-girls spent considerable time seeking out each other and generating responses that indicated kindness, caring, and an interest in the growth of all participants. Regular posters seemed to have a familiarity with each other and often interjected personal comments related to each others' patterns of use or personalities. A number of girls were found linked to each others' sites. Support was strong at the e-girl forum because of the ease of connections and communication.

Each of the girls interviewed also conveyed strong support systems for their computer technology learning. They each had access to computers at home as well as at school. Growing up in homes where a parent, a sister or brother, or friends supported their attempts at learning new computer skills allowed the girls to have a safety net when their

independent attempts at learning fell short of their goals. In addition to home support, most of the girls mentioned assistance with computer skills from friends and through help sites available online.

Only one of the interview participants believed that she learned significant computer technology skills at school. All of the others had negative views of computer use at school. Several commented that there were no challenges in the tasks presented there, and one indicated that she spent most of her time in the class helping the teacher.

A few of the girls spoke of a technology class they had taken as part of the study of technology. The particular course was called Synergistics, and offered a number of modules such as flight simulation, video technology, audio lab, and robotics. The girls seemed to enjoy these computer activities, but none of them seemed to connect this learning with their independent computer use.

In summary, the girls perceived their school experiences with computer technology to be non-supportive of their personal growth.

Summary of Patterns and Themes

The informants in this study have come to count on the Internet as a personal place for helping them to deal with some of the developmental tasks of adolescence. They used the Internet as a vehicle for self-expression. They showed their individuality as they tested ideas, tried out new personae, shared their deepest thoughts, and established personal goals. They used the Internet as a vehicle for connecting with others. They found new friends and revealed themselves to old friends with a sense of intimacy and a level of comfort. They were able to locate people with like interests and

draw support from each other. They used the Internet as a means of growing intellectually. Design and development of websites called for creative problem-solving skills. Management of files and manipulation of information required growth in the degree of their competence with a wide array of computer technology skills. The informants conveyed their competence as well as their strong sense of accomplishment. They expressed a growing self-efficacy with regard to computer technology. They used the Internet as well as home support to grow in confidence and competence in computer technology skills.

Chapter 6

Discussion, Conclusions, and Recommendations

This research was designed to open the window on young adolescent girls' day-to-day use of the Internet. The research questions described in chapter 1 were:

- 1) How do informants express their personal identities through computer technology?
- 2) What aspects of the informants' social lives are supported by their online use of computers?
- 3) In what ways have informants acquired knowledge and skills in computer technology?
- 4) How do informants reveal their computer technology competence and sense of accomplishment?

The data provided rich descriptions of the participants and their Internet experiences. An analysis of the data revealed several recurring themes related to the girls' Internet use. Themes included personalized use of the Internet, people-to-people connections, Internet use as a learning process, and support systems for learning. In this chapter, I will support the following five inferences related to these themes:

- 1) Online technologies offered the informants multiple ways of negotiating social relationships.
- 2) Internet use supported the informants' engagement in personalized, self-directed, and self-initiated learning.
- 3) Support from parents, siblings, and peers provided the environment for each girl to develop confidence and competence in the use of computers, and, more specifically, Internet use.
- 4) The informants' developmental needs were an effective match for the technology that emerged during their lifetimes.
- 5) The informants' use of the Internet reflected women's ways of knowing.

Discussion

Inference 1: Online technologies offered the informants multiple ways of negotiating social relationships.

Through use of the Internet, the participants in this study were able to use for social purposes communications technologies unavailable to former generations. These technologies included Instant Messaging, chat rooms, e-mail, and online bulletin boards and forums. Links from the girls' personal websites were additional pathways to these forms of communication.

Talking with friends is a natural activity for adolescents. Girls, in particular, enjoy sharing their thoughts and feelings with friends (Savin-Williams & Berndt, 1990). One of the particular tasks of adolescence is to discover self in relation to others (Harris,

1995; Resnik et al., 1997). The context of the peer group is significant in this self-discovery (Harris, 1995).

Prior to the development of current online computer technology, adolescents generally enjoyed telephone use as the preferred mode of communication. They often monopolized the family phone and were known to speak for hours. Aside from the telephone, other channels of communication used included face-to-face interactions and written messages sent in person or by mail. The new technologies offered through the Internet not only opened new ways to send and receive messages but also offered new ways to convey one's thoughts and feelings in a variety of social settings. Using online forums and message boards gave the participants a place to meet people like themselves and receive personal assistance or to collaborate on cognitive tasks such as web page development.

In addition to using new vehicles for communicating, the participants developed new styles of speech, incorporating graphic symbols and visualizations of actions through verbal cues. The graphic symbols (emoticons) were the most frequently used enhancements to the printed word, but the use of verbal cues for actions (e.g., “*runs to open door*”) were also noted in the girls' writings.

Table 6 provides a summary of the variety of communication technologies and their match to adolescent developmental needs.

Table 6

Internet Communications and Adolescent Developmental Needs

Communication	Format	Style	Adolescent Needs
Instant Messaging (IM)	Synchronous	Person-to-person	Interacting with others, exploring close relationships
Chatting	Synchronous	Persons-to-persons	Testing personal ideas, identity
Multiple Instant Messaging	Synchronous	Person-to-persons	Actively controlling communications
E-Mail	Asynchronous	Person-to-person Private	Passively controlling communications
E-Mail Group/Forward	Asynchronous	Person-to-persons Semi-private	Participating in interest groups
Guestbook	Asynchronous	Person-to-person Public	Receiving feedback
Diaries	Asynchronous	Person-to-self Person-to-persons Private/Public	Expressing feelings, testing thoughts and ideas
Message boards/forums	Asynchronous	Persons-to-persons Public	Sharing personal interests and ideas

Through Instant Messaging participants engaged in real-time conversations online. Each person's words appeared on the screen and could be edited before being sent to the other person. In addition, the words remained on the screen, available to the participants during the remainder of the conversation.

Instant Messaging also allowed another type of new communication, that of multiple simultaneous conversations. The user of Instant Messaging could choose to converse with several people at the same time, but keeping each conversation separate and apart from the others. In this way, the user had a vehicle for selectively sharing and receiving thoughts and information with more than one person. Several of the girls reported the ability to carry on more than four simultaneous conversations, each appearing in a separate text box on the computer screen. The phenomenon of multiple conversations allowed the initiator to control the flow as well as the information shared. Telephone conversations became reserved for very close friends in situations in which more intimate and sustained discussions might occur with the added benefit of voice tone.

Chat rooms enabled the girls to conduct group conversations in which all participants could see each other's messages. This group talk was somewhat comparable to a telephone conference call. The added dimension of the visual messages on the screen provided the participants with the reinforcing power of their written words. It also allowed the girls to edit their words prior to sending them. The capabilities of IM for one-on-one and multiple yet separate conversations, as well as the capabilities of chat rooms for conversations with several people at once, provided the informants with communication options not available a few years ago.

The research participants were daily users of the technology, often opting for IM and chat rooms instead of telephone conversations. Several of the informants shared their reasons for selecting voice versus online conversations, seeing the voice communications as more intimate and often reserved for best friends.

The ability to conduct several simultaneous conversations online appealed to the adolescent girl's need to test out thoughts and ideas with many people. Having control over several conversations at once was a bonus for these young girls. In former generations, girls were unable to test the pulse of several people at one. Instead, they had to resort to a series of phone or in-person conversations, much like the game "whisper." They could now explore the opinions of one or more friends, individually or in a group, all together or in a set of simultaneous conversations.

Public forums for one's ideas were available to the girls through the information they chose to post on their websites. The girls in this study freely conveyed their ideas and revealed information about themselves. Forums allowed the girls to communicate and explore personal ideas about self in a space in which they could remain anonymous. The participants were quite willing to hear criticisms of their work. Often positive comments were given along with technical assistance provided for improvement.

Some websites were actual journal/diary entries where the participants chose to express their thoughts, feelings, and activities with others, often on a daily basis. Guestbooks were important vehicles for feedback from others and for gathering personal information from the respondents.

Participants used e-mail less frequently than they did other forms of online communication. These young girls may have enjoyed the spontaneity of Instant

Messaging and chatting more than the slower pace of e-mail. In addition, the asynchronous nature of e-mail may be less interesting than the real time nature of Instant Messaging. An interesting phenomenon occurred during the course of this research. The use of Instant Messaging became progressively more prevalent in the daily lives of the participants. When the girls who were interviewed completed their initial surveys for the research study, four of them did not list online communications via Instant Messaging as a significant pastime. However, by the time the interviews were completed (three months later), all the girls except one had adopted the technology and were using it more frequently than they used the telephone. This phenomenon may have been due to a general increase in the use of IM among all computer users during the time of the research. However, it might also be linked to the girls' necessity to use IM in order to be interviewed. By conducting interviews by way of Instant Messaging, this researcher may have helped increase the subjects' skills in using this technology.

Inference 2: Internet use supported the girls' engagement in personalized, self-directed, and self-initiated learning.

The literature reports that individuals use online technology for two main purposes. The first purpose is that of using technology as a place for storing information. The second purpose (Dede, 1997) is that technology actually encourages a paradigm shift so that it becomes the environment for learning. The findings of my study show that technology supported very personalized, self-directed learning for the participants, who used the Internet as their learning environment.

Personalized Use

What did informants do online? Each girl in this study seemed to have a very unique blend of computer uses. For some, playing games took up almost all of their online time. For others, using IM and chatting were their most frequent activities. Many of the girls seemed to enjoy the challenges of programming and web page development. Two of the girls were highly involved in online simulations. One participant spent the majority of her online time researching topics of interest. Regardless of the type of Internet activity, the girls were testing their ability to be in charge of their learning and to discover what they wanted to find and who they were.

The technology provided the young adolescents with ideal conditions for independent, self-paced learning. The participants described their at-home computer activities as being highly important and highly satisfying. In contrast, school activities on computers seemed to be of little value or a waste of their time in terms of new learning. At home, the study participants were able to identify personal goals for learning, to attempt to use their prior knowledge to access new knowledge, and to use personal resources to get needed skills and information.

The pursuit of independent activities was central to all of the positive online activities the girls discussed and demonstrated. They saw their use of computers as playing, living, being who they are. They seemed to have a sense of what was possible for them. They did not perceive computer use as work. A strong sense of self-efficacy was noted in their comfort and enthusiasm for their online activities.

The girls in this study were willing to do whatever it took to satisfy their interest in computer learning. Often engaged at the computer for hours at a time, the participants

reflected the notion of “flow” (Csikszentmihalyi, 1990) in their experiences.

Csikszentmihalyi described the state of flow as a time when activities are enjoyed because of a match between abilities and opportunities for action. The relaxed state seemed to be accompanied by a clarity of goals, an immediacy of feedback, and a sense of confidence. Csikszentmihalyi’s (1975) initial research in this area included studies of individuals rock climbing, playing chess, and performing surgery. In one recent study, Csikszentmihalyi (2000) demonstrated that flow most likely occurred when challenges and skills were in balance and were relatively high. In an earlier study, he found that people with a tendency to become involved in activities for their own sake seemed to be more capable of flow (Csikszentmihalyi, 1975) than those doing an activity for some outside purpose.

When subjects were in flow, they reported “levels above their own average for concentration, enjoyment, happiness, strength, motivation, and self-esteem, as well as the feeling that the activities in which they are engaged are important to their futures” (Csikszentmihalyi, 2000, p. 100). This balance of challenge and skill was reported in interaction with computers in several studies (Trevino & Webster, 1992; Webster & Martocchio, 1993; Webster, Trevino, & Ryan, 1993).

The online social world was a supportive factor in each girl's growing competence with computer technology. Postings on the e-girls forum revealed the girls’ high level of sophistication in computer technology skills. Data from e-girls revealed how participants helped each other with their learning goals. Messages between and among the girls provided knowledge and support for the emerging skills. This cycle of feedback was an essential element in helping the girls maintain their sense of flow.

The girls built upon prior knowledge to move forward in their learning. Making effective use of several vehicles for assistance, they seemed to practice “just-in-time” learning as they pursued technical skills to match their personal goals. The informants' level of learning was advanced and complex, encompassing problem-solving behaviors. The girls were interested not only in communicating but also in improving their ways of expressing themselves as individuals through their websites, their writings, and their message boards. The girls seemed to want to take charge of their learning and to pursue paths that were personally rewarding to them. The conditions for flow seemed to be available.

The participants described themselves along a continuum from comfortable to advanced in terms of computer technology skills. Evidence from visits to their websites as well as from the dialogue among the girls when providing peer assistance confirmed this. As they gained new skills, their sense of competence and feelings of accomplishment were strengthened.

Inference 3: Support from parents, siblings, and others provided the environment for each girl to develop confidence and competence in the use of computers, and, more specifically, Internet use.

The participants in this study had computer access at home. They also had parents, siblings, or friends to support their growth in computer technology skills. Several of the girls lived in homes with more than one computer.

The amount of time the participants spent online was extensive, resulting in strong skill development in computer technology. Coupled with the human support, the girls seemed to have the right combination of skills for building computer technology competence.

Supported by online and off-line friends, the informants learned more about themselves and about computer technology. The importance of friendships in adolescence is well documented in terms of meeting social needs for companionship and intimacy (Sullivan, 1953). Shared interests and attitudes are crucial in this regard. The online world, particularly as found through websites and forums, helped the girls to find others who shared their interests. Joining an online group with similar interests not only reinforced social skills but also offered the girls a place to carry on constructive conversations about their computer learning. Because the girls experienced anonymity online, they were able to take risks and ask questions or discuss things they might not talk about in their face-to-face lives. The environmental conditions of support they found or fashioned at home and on Internet space seemed to be the “just right” combination for most of the girls to grow.

Inference 4: The informants’ developmental needs were an effective match for the technology emerging during their lifetimes.

As these young women were growing up, new forms of computer technology were emerging each year. Interestingly, the pace of the popular use of Internet

technology over the past 14 years was a match for the informants' particular developmental stages.

For the girls in this study, their very natural use of computer technology emerged at the same time as did the technology itself. Table 7 defines their developmental readiness for the emerging technologies. These girls seemed to be in the right place at the right time.

Table 7

Internet History and Its Match to Informants' Development

Informants' Approximate Age	Year	Technology Advancement	Informants' Readiness for Computer Technology
1	1987	Birth of the Internet	First year of life
2	1988	Desktops become popular	Pre-computer learning
3	1989	E-mail at universities	Simple computer experiences with parents
4	1990	First Internet dial-up access HTML developed	Early game playing with educational software
5	1991	World Wide Web released E-mail becomes popular	Video games popular
6	1992	Veronica, a search tool, released; surfing begins	School experiences with learning games
7	1993	AOL for windows was developed	Home experiences with Internet
8	1994	Efforts to wire every school became a national initiative Scanners and CD-Rom readily available	School activities with Internet, mostly in the library Home games/simulations
9	1995	JAVA launched; Real Audio released; Web Quests developed	Basic skills of word processing

10	1996	Internet age begins; home use becomes strong; touch screens used	Internet searches Personal web pages popular
11	1997	Domain names become critical	E-mail used with friends
12	1998	E-commerce and E-auctions begin; virtual animation on the web 87% of schools wired	Internet chats and message boards discovered Neopets popular
13	1999	MP3; Free computers with long-term net service contract; Neopets	Neopets Web Quests Personal websites developed
14	2000	Napster; Y2K; Web surpasses one billion indexable pages; E-books	Instant Messaging MP3 Use

Inference 5: The informants' use of the Internet reflected women's ways of knowing.

In particular, the informants' Internet use indicated a need to build connections, a preference for concrete applications, an interest in self-expression, and a strong tendency to offer support to others.

The informants' activities on the Internet were representative of a pattern of connectedness, caring, practical applications of knowledge, and expressiveness documented in the literature as being important for women. Speaking about university computer science students' experiences, Margolis, Fisher, and Miller said, "While most of the male students describe an early and persistent magnetic attraction between themselves and computers, women much more frequently link their computer science interest to a larger societal framework" (2000, p. 13). The female students spoke of helping to solve real-world problems for the benefit of society while encouraging and promoting the transformation of the computing culture as means of solving pressing social problems.

Socialized to support each other in relationships, young girls seek help from their "sisters." This generalization was strongly documented in the conversations of young girls on the e-girls forum. Indeed, the underlying premise of the forum was that girls need help to develop their Internet skills and other girls are ready, willing, and able to provide it. In addition to the support for new knowledge and skills, the girls seemed to genuinely care about each other's feelings. Comments made were generally positive and constructive. No indications of a competitive nature, often documented in research studies as a masculine trait, were found in the girls' conversations.

Websites created by the informants offered evidence of the importance of connectedness. Shoutouts, a list of names placed on the website to recognize friends,

were a basic recognition of the girls' need for community, and links to other girls' pages were a dominant feature. The informants sought practical uses for their Internet knowledge. Not content to learn only programming, the participants were interested in creating worthwhile products. They wanted websites that looked good and got better. When they learned new graphics techniques, for example, they sought finished products that were improvements over their last attempts. They were eager for other girls' critiques of their progress.

Self-expression was a dominant theme across the Internet users in this study. Writing and publishing were important activities. Sharing physical descriptions of self seemed less important than sharing feelings and interests. Writing poetry, diary entries, and journal notes were vehicles for expressing thoughts and dealing with strong feelings. The girls conveyed a willingness to share intimate thoughts and feelings.

As Internet users, the girls in this study were strong and caring learners, connected and supportive "techies." As adolescents with a decidedly feminine approach to using the Internet, the informants were articulate, bright, and powerful users of the technology.

Conclusions

Research data suggest that many girls and women have discovered the Internet and have chosen to get involved in the technology. EMarketer (Thompson, 2000) estimated that women accounted for 49% of the active adult Internet users. Girls in the United States represented 52% of online users between the ages of five and eighteen. In spite of the fact that Internet use is now fairly balanced by gender, few research studies have addressed what girls and women actually do when they engage in online activities.

For the informants in this study, the computer and online activities were part of their daily lives. Having grown up during society's transition to Internet use, they were maturing at the magical time of transition, ready for more sophisticated use of computer technology at the same time it became available. Consequently, they have not had to adjust or change previous patterns of learning and communicating. Their ability to access the technology and to choose their forms and styles of use provided for them a measure of control in a world in which there were many uncertainties.

Adolescence is a time of change. A study of adolescent girls on the Internet cannot be a closed, defined arena. Every time I have tried to tighten definitions on this study, I have been seduced into another arena of exploration and, consequently, another arena of thought. The Web is like that. Even over the course of data collection for this study, I became aware of subtle shifts in the girls' uses of computers. Web pages were begun and abandoned and then revisited. Technology changed, and the girls were quick to use new options as they became available. They embraced IM and MP3's during the course of this research. The dynamic nature of the technology was likely a factor in increasing the complexity and the acknowledged transiency of the interpretations.

Implications for Educators

Those who work with middle school youngsters know all too well the challenges of helping students maintain interest and focus in their learning. Although this study offers no clear solutions, it does suggest that several areas of success for girls on the Internet at home may have implications for learning at school.

Search for a sense of accomplishment

Both directly and indirectly, the girls in this study suggested that what was happening at school for them with technology was, for the most part, irrelevant to their personal growth. In expressing their love for computer technology, they nonetheless dismissed school as a place for technology learning.

Girls who had developed skills beyond those being presented in class seemed to have no options for enhancing their own learning. Since the computer is such a flexible and powerful vehicle for thinking and learning, educators may want to consider ways to offer growth experiences for those who have already mastered the technology curriculum. Csikszentmihalyi's work on the theory of flow indicated that those with high skills and low challenge are in the state of "boredom." Educational goals should seek to help each student attain "flow" experiences. If girls are to be encouraged to consider careers in computer science and information technology, they need support through the school curriculum.

Peer support and collaboration

Work on the Internet often seemed to be a collaborative process for the girls in the study. They used the communication media available to them to share and to learn together. Instant Messaging allowed them to talk things out. Website guestbooks were great for feedback, websites functioned as their canvases, and the online message boards were powerful spaces for seeking and receiving help.

Since a number of the e-girl forum participants were able to develop the skills to create their own message boards, it seems logical to think that this medium could be adapted as a vehicle for collaborative learning at school. Adolescents are quite interested

in feedback but are reluctant to seek it face-to-face, either from peers or adults. The message board offers potential for a new way of offering critiques and support. Use of message board moderators (mod) enhanced the experience for all participants and assured that trust and caring remained operating principles for the forum.

Personal websites often seemed to be used by the girls like a white board, a place for writing down and testing out thoughts. Their writings often received commentary from visitors through the guestbooks. Having an electronic record of one's work and others' comments on it could be a powerful learning tool, the equivalent of an electronic portfolio.

Personalization

The Internet technology facilitated ease with personalization of learning. Those girls ready for advanced knowledge and assistance were able to locate and use it with little or no adult assistance. When they got stuck, they used personal problem-solving skills, calling on prior knowledge and trying things out until they worked. If they were not sure how to proceed, they used available resources for face-to-face or online help. Students across the continuum of success might benefit from having more options available through technology. Links to a variety of websites at various levels related to a study would facilitate this process.

The girls used the Internet as a ready-made forum for self-expression. It was a great tool, a place to try out their poetry and their art, their expressions of beliefs, and their presentation skills. Using the concept of a personal space on the web as a place for capturing student ideas in the formative stage as well as the final product would allow for a more fluid process than the present paper and pencil variety. Drafts for school projects

with indications of changes in the process toward final product could be facilitated through the use of computer technology.

Girls' ways of knowing

The girls in the study conveyed a need for learning experiences with technology that were connected, meaningful, and specific. They wanted to accomplish something specific rather than just know how to develop a program or complete a search. They wanted to make e-zines, consider web-based improvements for scientists' work, add graphic elements that conveyed a message, adopt a pet to be cared for online, or get involved with helping others. They saw the computer and their Internet skills as vehicles for making things happen. Connecting learning at school to real world problems and experiences may open a window for more girls to see technology in their future careers.

Girls seemed to thrive on thinking and speaking with each other. The findings in this study offered support for research that indicates the importance for women of connections with others. I found some additional evidence of this while completing a simple Internet search. I entered the words "sites for girls." Of the first 15 hits, 10 were viable, suitable web places for young girls to connect with each other. Next I typed in "sites for boys." Of the first 15 hits, none were designed for boys interacting with other boys. Does this mean that the boys would not be interested in connecting with age peers online? I do not think so, but the number of sites available to young women does seem to indicate that they have a strong need and interest in connecting. The sites available to girls are not only vehicles for connecting with others. They also include links to career explorations and role models who may help more girls move toward computer technology in their future.

Recommendations

This study explored the nature of Internet activities engaged in by young adolescent girls. Their voices and stories have provided a rich description of their current activities. The study participants used computer technology to enrich their daily lives in ways that were satisfying and productive.

The data, however, provide more than an interesting glimpse into girls' use of the Internet. New insights into the infusion of technology into everyday lives and the personalized learning of the girls have emerged. Each of the five inferences in this study could direct new research to deepen our understanding of the nature of girls on the Internet. Recognizing the Internet as a repository for information as well as a dynamic vehicle for learning, future researchers may be able to contribute to our understanding of personalized learning and its role in building confidence and competence.

Afterword

The Ninth Girl

Her name is Erin. I know her very well. Actually, we see each other every evening. She is fourteen now, a year older than when we first met. Erin just finished middle school. She is finding high school pretty easy. She often writes poetry during math class. It's always been this way, her being able to do several things at once. "Multitasking" is what one of her friends told me it is called.

Erin loves being on the Internet. She spends at least three hours a night there, even on school nights. Lots of people think she is quite the "techie." Her school principal told me she is someone I should get to know if I want to understand girls online. Her friend let me know this, too. She said I should visit her web site because it was "really cool."

I notice Erin again this evening. She's in her room and I am in mine. I'll bet she wonders what I am doing, running in and out of my room. She knows I am writing. Does she wonder what it is about? Might she knock on my door? I get very impatient waiting for her to notice me. She said she'd send a note. It hasn't come. Maybe I'll just holler into her room and see if she is busy.

Me: Hi, Erin, Remember me?

Erin: Oh, yeah!

Me: How busy are you tonight? Can you chat for a little bit?

Erin: Uh, well, I'm pretty busy tonight. Maybe sometime this week.

Me: Oh, o.k. Could you send me a note and tell me a good time for you?

Erin: Sure. I can do that.

Me: Thanks

I think about how I'll approach her when she comes. I want to make her comfortable. I know she's busy, but I think it is more than that. She may be reluctant to talk to me. She probably doesn't really trust me. Or maybe she feels uncomfortable talking about what she does on the computer. Or maybe she is just shy.

I think I need to find out more. I know just the place to look. There is this book where people write about Erin's work and send her little notes. I think I'll read it now. She left it out for all of us to look at. She even wants me to sign it!

It is another evening in my room. And there is Erin in hers. Again. I guess I'll just sit and watch and wait. Maybe I will get to know more about her just by watching and listening. I know she likes music. I will listen to her music. Erin loves music, not just the sound, but also the lyrics. She finds special meaning in certain songs and posts them on her web site. No wonder she is so good on the computer. They say that people who are strong in music are often good with computer technology.

Oh, what's this? Look where Erin is today! She 's stepped out of her room and is visiting Kursten. Oh, that's great! I am glad they are getting to know each other. I think they will be good friends. They both love to get online and have fun, especially with role playing simulations and anime. I'll bet they will have a lot to say to each other about

their personal interests and opinions. They are both quite outspoken. They are a good match.

* * *

Erin is my online friend. She has told me so much about herself and her friends, her school activities, her thoughts, and her quirkiness. She was scheduled to be interviewed for this research study, but she never seemed to have the time for the interview. After many attempts to schedule, I gave up. But Erin never went away. She is still with me every night. When I log on to my computer, there she is in my buddy list for Instant Messaging. Her name, bluestar, shows up, indicating that she is online. It stays there for hours. I just can't bring myself to remove it. Her invisible presence somehow encourages me to continue thinking about all the young girls online, connected to so many different worlds. I am so tempted to invite her to chat, and, once, I did. We only talked for a minute. She said she really wanted to be part of the study, but she was so busy.

One day I was visiting Kursten's web site, reading her guestbook. All of a sudden came the connection! Erin had written in Kursten's guestbook, more than once. And Kursten had linked Erin's web site to hers. Somehow these two girls had met online. Two like minds discovered each other and found support in their somewhat unusual passions and online activities. For me as a researcher, the best connection was the link to Erin's web site. I could visit! What a find!

Now I know so much more about Erin. She is a cheerleader at her school. She loves to write poetry. She is pretty skilled at graphics and animation, and she spends time

as the character Linyan in an online fantasy simulation. Erin has many friends both online and off-line.

Erin is the ninth girl. We never really met.

Appendix A

Permission Forms

Letters

Internet Project

PLEASE RETURN THIS FORM WHETHER OR NOT YOU CHOOSE TO PARTICIPATE! Thank you.

School I attend _____

_____ **I have read the enclosed information and I choose not to participate.**
(*Just place this form in the envelope and mail.*)

_____ **I have read the enclosed information and I choose to participate.**
(*Please place this form, the survey, and the permission slip in the envelope and mail.*)

The following information is requested from participants.

Name _____ **Age** _____

Address _____

Phone Number _____

Parents Name/s _____

E-mail (optional) _____

Title of Project: Adolescent Girls' Use of the Internet

Investigator: Janice I. Robbins

Faculty Advisor: Dr. Marilyn Lichtman

Purpose: Females are underrepresented in university majors in computer science, engineering, and other technical fields. Career decision-making paths start at early ages, when girls begin to explore different

personal possibilities. This project looks at how girls use technology in early adolescence, and how they develop computer skills and confidence. The goal of the research is to describe and explore the high-end use of the Internet by adolescent girls.

Procedures: If you choose to participate, I would like to interview you at least once, with the interview lasting approximately 45 minutes. One or two additional follow-up interviews may be requested. The interviews will be set up at times convenient to you, and will be conducted online. These interviews will deal mainly with what activities you engage in on the Internet and how you developed your skills to use the Internet. The questions will be open-ended; that is, you can answer them in as much detail as you like. You can refuse to answer any question you don't want to answer. Please feel free to ask me if you're uncertain about the meaning or purpose of a question. The interview transcripts will be printed and kept secure in a notebook.

Benefits and Risks: This study will provide you with no specific benefits as an individual other than, perhaps, your personal satisfaction in contributing to the study. Your participation in this research might help us improve ways in which we encourage students, particularly girls, to get involved with computer technology education. No risks to participants are anticipated in this study.

Extent of Anonymity and Confidentiality: You will use a screen name for the e-mail and on-line interviews. Special e-mail accounts will be available to participants for use only for this project. You will not be identified by name in the data logs of online interviews. I will have the only copy of the match between screen names and real names. I promise confidentiality and will not divulge this information. Printed logs of the interview conversations will be secured and stored under my supervision.

Freedom to Withdraw: You are free to withdraw from the study at any time without penalty. You are free not to answer any questions you choose.

Permission: By signing below, you indicate that you have read and understand the informed consent and conditions of this project, that you have had all your questions answered, and that you give your voluntary consent for participation in this project. You will be sent a copy of this form with your signatures.

Signatures:

_____	Parent/Guardian
_____	Date
_____	Participant
_____	Date

*Janice I. Robbins
P.O. Box 1606
Centreville, VA 20122*

Dear Principal,

I am writing to ask your help with my dissertation research at Virginia Tech. I am looking for middle school girls as subjects for my study on ways young girls use the Internet. My research involves the girls' home activities with the Internet. I am asking only that you help me locate likely subjects.

Would you please give the enclosed invitation packets to 1 or 2 girls in your school who are "high end" computer users? Perhaps your PTTS teacher can help identify girls who may be suitable subjects. The invitation packets include letters to the girls and their parents explaining the study and asking their permission to participate. All interviews will be conducted only with parent permission and in accordance with Virginia Tech's requirements for research involving human subjects. Packets should be given to the girls as soon as possible.

Thanks for your consideration. I am eager to begin collecting data, hoping that my research will help us understand what factors contribute to girls' interest in technology. Currently only 17% of all computer science college majors are female! Feel free to call or write to me if you have questions about this project.

Take care of yourself!

Sincerely,

Janice (Szabos) Robbins

Janice I. Robbins
P.O. Box 1606
Centreville, VA 20122

Dear Parents,

Your daughter has been recommended by her school as a potential participant in a research study. As part of the requirements for my doctorate at Virginia Tech, I am completing a dissertation related to ways middle school girls use the Internet. I hope your daughter can be one of my subjects.

Participation in the study will involve online interviews. In this way I can talk with your daughter at her convenience and can maintain a printed script of our conversation. The interview data is what I will use in my research in addition to information from the brief survey enclosed with this letter. If your daughter has a personal web page, I will ask to visit the site and discuss with her how she learned the skills of web page development.

As an educator, I am aware of your concerns for keeping your daughter safe with regard to the Internet. To assure confidentiality in this study, I have arranged for special e-mail accounts for the study and the use of special screen names (pseudonyms). Your daughter will not be asked to use her "regular" e-mail account, unless you so choose. Your daughter's name and her web address (if available) will be kept in strict confidence.

I hope you will give your daughter permission and encouragement to participate in this study. My purpose in completing this project is to recognize ways in which girls are positive users of the Internet. Ultimately, I hope that information about young girls who use computers extensively will help educators understand how to encourage more female participation in technical fields including computer science, so that they are more adequately represented in high school courses and college majors in computer science, engineering, and other related fields.

Thank you for the time you took to read this letter. I am asking you and your daughter to reply to me by < > , whether or not she will participate. In this way I can identify a sufficient number of subjects for my research.

Sincerely,

Janice Robbins
Virginia Tech Doctoral Candidate
Sobazs@aol.com

Janice I. Robbins
P.O. Box 1606
Centreville, VA 20122

Dear Student,

You have been recommended as someone who knows a good deal about computers. I am doing a research study and I am hoping you can help me. My study is about teenage girls and how they use the Internet.

If you decide to be part of my study, you will be one of the middle school girls I will interview. With your parents' permission and yours, I will chat with you via the Internet and ask you questions about ways in which you use the Internet. We may need to chat more than once to be sure I have time to ask you all my questions. Besides the online interview, there is a brief survey for you to complete. It is enclosed with this letter. If you have a web page, I would like to visit it, too.

Your participation in this study will be completely anonymous. I will never use your name or web address. What you say in the interview will be confidential information, only to be used in the research. When I finish my research, I will write what is called a *dissertation*. This is a written report about what I found through my interviews with all the girls. I may use brief quotes from what you say, but none of it will be directly connected to you. You will also have the right to withdraw from the study at any time, if you choose.

In my study I am trying to describe Internet activities of typical teenage girls who use the computer a lot. I am interested in learning more about things girls do outside of school when on computers, and how they learned how to use the technology. Please talk this over with your parents and decide whether or not you want to participate.

Please complete the yellow form enclosed with this letter and send it back to me in the stamped envelope by < >. I need to know **whether or not** you would like to participate. If you choose to work with me, you should also return the permission slip and the brief survey form.

If you are not going to participate, I thank you, anyway, for the time you took to read this information and for returning the yellow form. If you are going to participate, I will send you a screen name for the project and, if you wish, a special e-mail account to use for the interview/s. In this way, you don't even have to use your own e-mail account.

I am very interested in your participation. I hope you will decide to part of the study. I expect the interviews to be completed between June and August at a time convenient to you. Do you have any questions? Just send me an e-mail message to sobazs@aol.com and I will write back.

Thank you for considering your participation in this project.

Sincerely,

Janice Robbins
Virginia Tech Doctoral Candidate

Appendix B

Survey

Number _____ (leave blank)

Research Study Survey

Please respond to each of the survey questions and return the survey in the enclosed envelope.

Check the appropriate response to the following:

1. I have my own computer at home. _____
I share a computer at home. _____
2. I have developed a web page. _____
Yes _____
No _____

Check as many responses as appropriate to the following:

3. I learned my computer skills
At home _____
At school _____
At camp _____
At after-school/summer classes _____
Online _____
Other _____

4. *Specify the ways you use computers in order of time spent. Use 1 for the activity you do the most, 2 for the second most, etc. Leave blanks for any activities you don't do.*

- Word Processing** _____
- E-mail _____
 - Chats/ Instant Messaging _____
 - Developing web page/s _____
 - Graphic/photo designing _____
 - Internet research _____
 - Internet surfing _____
 - Shopping online _____
 - Games _____
 - Other _____

Appendix C

Interview Questions

Interview Questions

1. Can you remember when you first started using computers?
2. What do you remember about learning/using computers at school?
3. Tell me about your family and computers.
4. Tell me about things you do online.
5. About how much time do you spend on the computer?
6. How do you learn to do new things using the computer online?
7. What do you use for communicating online?
8. Do you have a web site?
9. What would you like to learn next about computers online?
10. Have you given any thought to learning more about computers in high school?
College?
11. Who helped you learn about using the Internet?
12. What do you think about the use of computers/the Internet in people's lives?

Appendix D

Rubric for Website Assessment

WEB DEVELOPMENT SKILLS

Rubric

Criteria	Novice (1)	Developing (2)	Accomplished (3)	Distinguished (4)
LAYOUT	No organization evident	Text broken into paragraphs and/or sections No overall design	Text, images presented with consistently labeled headings	Text, images, and links flow together Overall design evident
NAVIGATION	One page, no headings	One page with headings to guide the reading	Multiple pages with consistent structure and logical paths	Tile page with other pages branching off in logical paths
COMMUNICATION	Difficult to understand messages	Some inconsistency in clarity of messages	Messages are clearly presented	Messages are clear and attentive to audience
IMAGES	No images	Images unrelated to text	Images related to text	Advanced imaging techniques used and related to text
LINKS	No links	Internal or external links; some not working	Both internal and external links. Some not working	Internal and external links are present and working

Appendix E

Website Contents
Sample Form for Data Collection

Other	<p>Includes four pages of anime pictures. Many guest book entries refer to her connections to online games and anime interests.</p>
-------	---

Appendix F

Samples of Interview Script

Sample Interview Script

Vaeducator: when you want to do something with a computer and you don't know how, what do you do?

tumbleweed: I look in the help menu

tumbleweed: maeb get a book, or look on the net

tumbleweed: when all else fails, I ask my dad;))

tumbleweed: I wanna learn more about programming...I've been fooling around with QBasic, but i dont have a C++ Program, or VisualBasic....

tumbleweed: so nething major is harder

tumbleweed: I can make simple games with Basic, but nething visual is too hard

Vaeducator: How do you know about these languages? Where did you learn programming, e.g. basic

tumbleweed: Well, my dad uses QBasic a lot in his work, so he has a book lying around. One night, I came home with a math problem that required me flipping a coin 100 times. I went to my dad, cause he had written a bunch of programs wiht me when I was little so I could use the computer w.o much assistance(htis was when windows wasnt opened automatically at startup; there was DOS!). So I went to him, and he handed me this book and said "This is really easy to write a program for! I can make it flip 1000 times in seconds and print it out for you!" So he showed me how, and ever since I've been making little things...

tumbleweed: sry, I always seem to end up with the most roundabout way of saying things:-P

Appendix G

Samples of E-Girl Postings

E-Girl Forum

TOPIC: html help?

Posted March 1, 2001 03:42 PM

Sarsar: anyone need it?!?? i'm bored. and i know i'm not exactly an expert, but i think i could answer a few questions. and hopefully other people that i know are good at html will come in and help me.

Posted March 1, 2001 06:00 PM

Tweety: I will need it soon

Posted March 1, 2001 11:02 PM

Kicker: I still need to **start** my site

Posted March 2, 2001 01:25 PM

Justme: Liz is (obviously) a lot better than me at html, as you can see from her layouts
but I can help also.

Posted March 3, 2001 11:22 PM

Lazilee: Yes, I have a question. I'm working on a site, and the links have strikethrough,
but they also have underlines. I don't know how to get rid of the underline.
This is the code I used...Does anyone know how to get rid of the underline? Thanks

```
<style type="text/css">
```

```
<!--
```

```
A:link { text-decoration: line-through; color="#6633CC" }
```

```
A:visited { text-decoration: line-through; color:"#000000" }
```

```
A:hover { text-decoration: none; font-size:16 }
-->
</style>
```

Posted March 5, 2001 01:15 PM

Justme:

```
<style type="text/css">
<!--
A:link { text-decoration: line-through; color="#6633CC" }
A:visited { text-decoration: line-through; color:"#000000" }
A:active {color:000000;text-decoration:none}
A:hover { text-decoration: none; font-size:16 }
-->
</STYLE>
```

That code should be right. Change the bold text to your own.

Posted March 5, 2001 05:52 PM

Lazilee: It didn't work ???

Posted March 6, 2001 02:09 PM

Flowergirl:

```
Here you go:
<style type="text/css">
<!--
A:link { text-decoration: none; color:"#YourColor" }
A:visited { text-decoration: none; color:"#YourColor" }
A:hover { text-decoration: line-through; color:"#YourColor" }
-->
</style>
that should work for you
```

Posted March 6, 2001 02:11 PM

Flowergirl:

If you want to get rid of the underline on links, use the following code:
<style type="text/css">
<!--
A:link {text-decoration:none}
A:visited {text-decoration:none}
--> </style>

Posted March 6, 2001 05:48 PM

Lazilee: but I want to have the line through the links all the time, just with no underline.

The codes you gave me will take the line-through off.

Posted March 7, 2001 03:38 PM

Flowergirl:

so :
<style type="text/css">
<!--
A:link { text-decoration: line-through; color:"#YourColor" }
A:visited { text-decoration: line-through; color:"#YourColor" }
A:hover { text-decoration: line-through; color:"#YourColor" }
-->
</style>

Doesn't work for you?

Well, I'll go fiddle around with a test page until I get the code right, then give it to you

Posted March 8, 2001 12:19 AM

Lazilee:

^that code still has the underlines. Thanks.

Posted March 8, 2001 06:47 AM

Justme:

I'VE GOT IT!

```
<style type="text/css">
```

```
<!--
```

```
A:link { text-decoration: line-through; color="#6633CC" }
```

```
A:visited { text-decoration: line-through; color:"#000000" }
```

```
A:hover { text-decoration: line-through; font-size:16 }
```

```
-->
```

```
</style>
```

That can't be wrong because it works perfectly for me. Maybe if it does still have the underline, then check the link codes to see if it mentions underlines in any other place on your page.

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VITA

Janice I. Robbins

43559 Sorbonne Lane
South Riding, VA 20152

Education

- Ph.D.** Educational Research and Evaluation, 2001
Dissertation: "Making Connections: Adolescent Girls' Use of the Internet"
Virginia Polytechnic Institute & State University
- M.Ed.** Curriculum and Instruction, 1983
George Mason University
- B.S.** Elementary Education, 1967
Gannon University, Villa Maria College

Work Experience

- Coordinator**, Gifted Education and Middle School Education
Department of Defense Education Activity February 2000 – Present
- Principal**, Elementary and Middle School
Fairfax County Public Schools 1991-2000
- Coordinator**, Assistant Coordinator Gifted and Talented Program
Fairfax County Public Schools 1986-1991
- Resource Teacher**
Fairfax County Public Schools 1981-1986
- Classroom Teacher**
Fairfax County Public Schools 1968-1981
- Adjunct Instructor**
George Mason University
University of Virginia
James Madison University

Research

- Arlington Health Foundation, Implementation of Community of Caring, Program Evaluation 1998-2000

Recognition and Awards

Education Policy Fellow, Institute for Educational Leadership
 Educator of the Year, Phi Delta Kappa Chapter 1144
 Principal of the Year Finalist, Fairfax County Public Schools
 Alumna of the Year Finalist, Villa Maria College
 President, Northern Virginia Council for Gifted Education
 Vice-President, Phi Delta Kappa
 Member, Virginia Tech Northern Virginia Center Advisory Board
 Member, Virginia Department of Education Gifted Advisory
 Committee
 Member, National Board of Directors, Community of Caring
 Bachelor of Science, Magna Cum Laude

Selected Publications

Critical Issues in Gifted Education, Pro-Ed Publications, 1993
 (Contributing Author)
Guidelines for Middle School Gifted Education, Virginia
 Department of Education, 1993
Providing for the Handicapped Gifted and Talented, Virginia
 Department of Education, 1991 (Editor)
Reading – A Novel Approach, Frank Schaffer Publications, 1984
 “Just Think,” Challenge Magazine, monthly column, 1984-1991
Homework Helper, Broderbund Software, 1983