2007

Virtual Vistas: High School Students Describing Their Experiences In Online Courses.

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VIRTUAL VISTAS: HIGH SCHOOL STUDENTS DESCRIBING THEIR EXPERIENCES IN ONLINE COURSES

by

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A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
in the College of Education
at the University of Central Florida
Orlando, Florida

Spring Term
2007

Major Professor: Glenda A. Gunter

ABSTRACT

Current research indicates that distance education courses can be as effective as traditional courses when the method and technologies used are appropriate to the instructional tasks. The number of states, counties, and school districts that provide online courses for high school students has rapidly expanded during the last ten years. The number of students, who enroll in these courses, has often grown by double digits each year. Understanding K-12 students' experiences in, and expectations of, online learning is important for many reasons. Online learning is certainly growing and may become a graduation requirement in more states. Currently Michigan requires every student must participate in some form of online learning as a high school graduation requirement. High school students enrolling in online courses may have a measurable influence on higher education courses in the future, as students become more experienced with online learning.

A great deal has been written about the development of virtual high schools, some of the issues surrounding them and basic student demographics. There are only a few studies that have interviewed students in detail as to why they have chosen to participate in a virtual school and examined how this choice has impacted them.

The purpose of this study was to describe from the student's perspective, why they had enrolled in online courses and allowed them to characterize their experiences. Further, this study sought to identify the personality types and traits of the students enrolled in online high school courses and reported on one measure of the student's cognitive style or cognitive tempo.

Forty-three students who were enrolled in a state sponsored virtual high school participated in this study. The study used three online instruments to collect data. The Matching Familiar Figures Test-20 was used to measure the impulsive or reflective responses of the

students. The Long-Dziuban Reactive Behavioral Survey was used to determine the students' personality types. The third instrument was an online questionnaire of open-ended questions asking the students about their online experiences. In addition, twelve students participated in follow-up interviews.

The study found that the students enrolled in online courses for a variety of reasons; students were concerned about and wanted control over the timing and pacing of their learning. Students' comments suggested that there may be a relationship between cognitive tempo as classified by the MFFT-20, and the students' preference for pacing through the online course materials. In addition, the distribution of personality types and cognitive styles represented in this sample were different from the general school population suggesting that perhaps some students are more interested in online learning than others are. After reviewing the results of the students responses to the MFFT-20, it may be that students may are becoming faster at processing visual information with fewer errors. More research is needed in this area. There does seem to be a trend in this direction and this could have implications for students enrolled in virtual high school courses.

Finally, the students in this study characterized their online learning experiences as positive but did not feel that online learning should be a high school graduation requirement for all students.

I dedicate this dissertation to my family. You are always in my thoughts and prayers. You are so dear to my heart. Thank you for the many years of encouragement and support.

I love you all.

ACKNOWLEDGMENTS

This project simply would not have been possible without the help of so many people. First, I would like to thank my committee for all of the advice and encouragement they have provided. I am grateful to my chair, Dr. Glenda Gunter, as she has guided me through two degrees. Your wisdom, guidance, patience, and friendship have been of inestimable value. I would also like to thank Dr. Robert Kenny for his encouragement and patience. I have learned so much from you and appreciated your insights on cognitive styles. Dr. Witta your insights have been so helpful and encouraging. I have really appreciated your input as my professor and committee member. You too, have been my professor through two degrees. Dr. Baumbach and Dr. Robinson, I would like to thank you both for the input you have given me through this dissertation process and during my doctoral program. It has been a privilege to work with both of you. I also am indebted to Dr. Charles Dziuban for the instrument and advice about the Long-Dziuban Survey.

I would also like to thank Mr. Matt Wicks, as the administrator of the Illinois Virtual High School and the teachers who provided the extra credit opportunities for the students who participated in this study. Thank you for your support and assistance with the students. Working with you was a wonderful experience and I am indebted. I would also want to thank the students at IVHS for your participation in this study. You were a blessing to me.

I also want to thank the members of DAG. You guys are awesome and have been so supportive. Your friendship and support have made the not-so-fun parts of this process bearable as we have cheered each other on. I would especially like to thank Drs. Penny Beile, Becky Fiedler, and Julie Phelps for your feedback, encouragement, and unfailing support. Thank you too, to my buddies, Dr. Debbie Hahs-Vaughn, Larry Bedenbaugh, Vicki Rath, and Tracy McCoy

for your friendship and support. Michael Soliven; thank you, for your editorial expertise. You were an answer to prayer. Thank you too, to Mr. Matt Waller, the editor at UCF's Thesis and Dissertation Office. I have appreciated your assistance and feedback.

I would also like to thank my friend Lorraine, for your patience, support, and for the endless hours, you were willing to proofread.

Finally, I want to thank my parents, Ralph and Jackie, for your love and endless encouragement for all of the endeavors I have attempted in my life. I will never be able to express how much that means. To my sisters, I would like to say bless you for listening, I cannot imagine life without you. I would also like to thank my "other" parents, Karl and Marianne for all of your support and encouragement for our family. The ways you all have blessed us are too numerous to mention.

I want to thank my husband Jeff, for his overwhelming support through the process of obtaining this degree. Thank you for helping me achieve my dream. I am so thankful that we both value education and you continue to encourage our children to achieve their dreams.

Lastly, I want to thank my children Sarah, Steven, Stacey and Savannah who have taught me so much about teaching and learning. We have all learned so much together. I love you.

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CHAPTER ONE: INTRODUCTION

Introduction and Background of the Study

A man's mind, stretched by a new idea, can never go back to its original dimension.

Oliver Wendell Holmes, 19th century writer and poet

A new millennium has brought many changes to the role of distance education for students in grades K-12. R.D. Laing, a Scottish psychiatrist, once said, "We live in a moment of history where change is so speeded up that we begin to see the present only when it is disappearing." This could not be more applicable when considering distance education and a new generation of students. Students are enrolling in virtual high schools in startling numbers.

The number of states, counties, and school districts that provide online courses has rapidly expanded in recent years. The number of students, who enroll in these courses, has often grown by double digits each year (Watson, 2005). Picciano & Seaman (2007), in a recent study of the nation's school districts, found that 63% of the districts surveyed currently had students enrolled in online courses. Sixty percent of these districts expected the requests for online course enrollments to grow. Moreover, 20% of the nation's school districts planned to introduce online course enrollments within the next three years. In the current study, online courses are defined as K-12 educational content that is delivered over the Internet. As with many technological innovations, urgent questions ensue after the innovation has impacted our society.

For over a century, common thought for the education of students was to bring them together, grouped by grade levels, to be taught by an experienced educator. Generally, we have regarded that educating students at a distance was acceptable if circumstances prevented their

attendance in traditional brick and mortar schools. Educators, students, and researchers have pondered whether distance education courses were as effective as face-to-face courses. Distance education has a long history of research in comparing distance and traditional classroom forms of instruction. When distance education was primarily conducted by mail, research studies supported the notion that students could learn with alternative methods of delivery (MacKenzie, Christensen & Bigby, 1968; Moore & Thompson, 1990; Verduin & Clark, 1991). Presently, most distance education courses are primarily taught via the Internet. Allen and Seaman (2005) reported in a study called *Making the Grade: Online Education in the United States, 2006,* that "nearly 3.2 million students were taking at least one online class during the fall 2005 term, a substantial increase over the 2.3 million reported the previous year" (p.6).

Current research indicates that distance education courses can be as effective as traditional courses when the method and technologies used are appropriate to the instructional tasks, there is student-to-student interaction, and there is timely teacher-to-student feedback. Dutton, Dutton, and Perry (2002) suggested that online courses could be more effective than traditional and found that students enrolled in online courses earned higher grades. In another study, Diaz (2000) also found that students in the online sections of health education courses received higher grades and described higher levels of satisfaction with the courses. Allen & Seaman (2003) found that one-third of the academic leaders at higher education institutions expected that "learning outcomes for online education will be superior to face-to-face instruction in three years, and nearly three-quarters of them expect learning outcomes for online education to be equal to or better than face-to-face instruction" (p. 3).

Some studies have suggested that students in online courses have less favorable academic outcomes. These studies found that online students experienced lower course grades when

compared to the same course in a traditional classroom setting (Wang & Newlin, 2000; Edmonds, 2006).

Other studies comparing traditional courses and online course modalities have concluded that there is no significant difference in student outcomes based on the medium of instruction (Russell, 1999; Kinney, 2001). Indeed, Russell has devoted an entire Web site with abstracts indexed by year, providing summaries of studies that support this phenomenon of "no significant difference." These studies support the assertion that the medium does not matter for learning assuming the content and instruction are constant (Russell, 2006).

Many methodological issues have been scrutinized in comparing traditional and online courses and student academic outcomes and satisfaction levels. Comparing the two modalities has been problematic. Some of the issues that have been identified in comparing the different modalities are small sample sizes, course design, failure to randomly assign, and student characteristics (Edmonds, 2006; Phipps & Merisotis, 1999).

Despite these concerns, enrollment in online courses continues to grow. Allen & Seaman (2005) in a survey called *Growing By Degrees* noted that for institutions of higher education, "The overall percent of schools identifying online education as a critical long-term strategy grew from 49% in 2003 to 56% in 2005" (p.8). In their survey of over 1,000 institutions, they noted that enrollment in online courses has continued to increase by roughly 18% annually. Student interest and enrollments continue to grow as more institutions offer a variety of courses and degree programs online.

While the idea that online courses may be an appropriate choice for adults, is it an appropriate choice for high school students? Do adolescents have different developmental needs that would affect their social and academic progress when they participate in online courses?

How do adolescents view learning online? Do they enroll in online courses for the same reasons that adults do? Assuming the instruction and online content are similar, would high school students experience the same educational outcomes whether online or not?

Online learning opportunities have emerged on the educational landscape not only for high school students but also for primary and middle school students as well. There are virtual schools that offer online courses to students in grades K-12. In 1999, William Bennett, the former United States Secretary of Education, launched an online program called *K12 Inc.* This school offers self-paced online classes for grades K-8. Enrollment in this program varies by the state in which the student resides. *K12 Inc.* provides online content to states or local districts who want to implement online learning. Currently, they are working in conjunction with thirteen states or districts to provide state sponsored public or charter schools called "Virtual Academies." The states are Agora (Pennsylvania sponsored state charter school), Arizona, Arkansas, California, Chicago, Colorado, Florida, Idaho, Ohio, and Kansas. *K12 Inc*. has also collaborated with local districts or counties in seven states: Alaska, California, Kansas, Minnesota, Pennsylvania, Utah, and Wyoming. They have a Virtual School program, which provides online content only to private, charter, and public schools.

For example, a student in the state of Florida can enroll and utilize the course materials in the Florida Virtual Academy. The Florida Virtual Academy (FVA) is a public school and enrollment is free. Once the student is enrolled, FVA provides the appropriate curriculum materials, such as textbooks, multimedia CDs, a computer with software and Internet access while the student is enrolled in courses (K12 Inc., 2006). An elementary or secondary student residing anywhere in Alaska can enroll in one of six schools, which offer *K12 Inc.'s* online courses (K12 Inc., 2006). Enrollment is free.

There is a myriad of other for-profit companies, like Connections Academy, providing K-12 enrollment in online classes as a public or charter school. They are working with ten different states: Arizona, California, Colorado, Florida, Idaho, Minnesota, Ohio, Oregon, Pennsylvania, and Wisconsin. Connections Academies (2006) explain their program as "…new form of free public school that students attend from home. This is a unique program that combines strong parental involvement, the expertise and accountability of public funded education, and the flexibility of online classes" (¶1). Each Web site describes the programs and course offerings for their K-12 curriculum and provides information about the courses, the advantages of these programs, as well as who should enroll. There is scant research discussing enrollment numbers, attrition, and academic success rates. Here again, in spite of the questions, enrollment in online courses for K-12 continue to grow. The North American Council for Online Learning (NACOL, 2006a), estimates that "There are more than 500,000 enrollments in online courses across the U.S…Online courses are in all 50 states" (¶1).

Students growing up with ubiquitous technology at their fingertips may have acquired a certain comfort-level in integrating technology in everyday tasks. Marc Prensky refers to today's Millennial students as "digital natives." He noted, "They are native speakers of technology, fluent in the digital language of computers, video games, and the Internet" (p. 10, 2006). Prensky also describes "digital immigrants." These are individuals for whom; technology was an invention or an innovation that we have adapted to. They are not native speakers of the language of technology.

While Prensky's observations about natives and immigrants are anecdotal, some research has begun to illuminate how immersed these "digital natives" are in technology use. In a National Center for Educational Statistics report, *Computer and Internet Use by Students in*

2003, some key findings were that approximately 91% of the students over the age of 3 through 12th grade use computers and 59% use the Internet (DeBell & Chapman, 2003). This report also noted that use of computers and the Internet begins early with "...two-thirds of children in nursery school and 80% of children in kindergarten use computers, and 97% of students in 9-12th grades do so" (p. iv). It seems that since students have achieved familiarity and perhaps expertise with using the Internet as a source of information and a communication tool, they may easily transition to using the Internet as a tool for learning.

The Internet as a Learning Tool

Students view the Internet as an educational tool. In a study, Levin and Arafeh (2002) described key findings about how adolescents view the Internet. The students in this study sponsored by the Pew Internet & American Life Project, stated that they relied on the Internet to help them do their schoolwork and they described different metaphors for the educational uses of the Internet such as, the Internet as a "virtual textbook", a "virtual tutor", "virtual study group", and a "virtual locker", and "backpack" (p. iii). Levin and Arafe (2002) noted, "Many schools and teachers have not yet recognized-much less responded to-the new ways students communicate and access information over the Internet" (p. iii). Students view the Internet as a resource for learning.

Clark (2001) predicted, "The trend from 'virtual high schools' to virtual K-12 schools will continue to grow" (p. 5). In 2005, Watson noted that approximately 21 states have established statewide, online learning programs and typically are experiencing double-digit increases in annual enrollments (Watson, 2005). Picciano & Seaman (2007) estimated that there were approximately 700,000 public school students enrolled in online courses during the 2005-2006 school year. This estimate does not include students who enrolled in online courses who were

home-schooled or enrolled in private schools. Private and home-schooled students are also enrolling in online courses. Rapid growth is not limited to virtual or online high schools. Thirty-two states support online learning initiatives for a variety of K-12 courses (Cavanaugh, 2004). If enrollments and course options continue to grow at a rapid rate, it is imperative to understand how online learning affects K-12 students.

In April 2006, the Michigan Board of Education approved a new graduation requirement stating that in order for a student to graduate from high school they would be required to take at least one online course. The Michigan board voted for this requirement because they wanted their students to be prepared for college and for more technology based jobs (Carnevale, 2006). While, this is the first state in the nation to endorse such a requirement, other states may follow. Susan Patrick, president of the North American Council of Online Learning points out an advantage of online learning,

> Online learning through virtual schools is one of the most important advancements in attempting to rethink the effectiveness of education in the United States. The virtual school provides access to online, collaborative, and self-paced learning environments – settings that can facilitate 21st Century skills. (NACOL, 2006b)

Understanding K-12 students' experiences in, and expectations of, online learning is important for several reasons. Online learning is certainly growing and may become a graduation requirement in more states. High school students enrolling in online courses now may have a measurable influence on higher education online courses in the future.

A great deal has been written about the development of virtual high schools, some of the issues surrounding them and basic student demographics (Cavanaugh, 2004; Clark, 2001; Doherty, 2002; Roblyer, 1999; Roblyer & Marshall, 2003, Watson, 2005). However, there are only a few studies that have interviewed students in detail as to why they have chosen to

participate in a virtual school and examined how this choice has impacted them (Bigbie & McCarroll, 2000; Geary, 2003; Gray, 2005, Weiner, 2001; Zucker & Kozma, 2003).

From the wealth of research available concerning students who take online courses in higher education institutions, it is known that the typical online student who experiences academic success is typically: older, female, completed more course credits, and has a higher GPA than a student who enrolls in traditional courses (Diaz, 2002). Other studies have yielded additional insights. Wyatt (2005) found that online courses are more attractive to non-traditional students and they believed that the quality of the courses was comparable to traditional courses. In many cases, students stated that they would not have been able to take courses due to employment and familial obligations if they were not offered online. Students felt that taking courses online saved time and was more motivational than commuting and being on campus. In this study, there was no significant difference in their responses based on gender, except a significant difference in overall satisfaction based on age. Older students were more likely to be more satisfied with online courses. Harris (1994) and Klinger and Connet (1992) (as cited in Gonzales & Sujo de Monres, 2001) noted that the typical online learner is 26 years of age or older, highly motivated, self-disciplined, goal oriented, has average or better verbal and quantitative skills, and has relatively consistent access to technology.

As we consider which adolescent students are attracted to online learning, none of what we have previously learned about online students may be applicable to the adolescent students enrolled in online courses. Who enrolls in online courses in institutions of higher education, is no longer a salient research topic. However, this is a significant topic for virtual high schools. Not only is it important to know who is enrolling but why and are there any typical characteristics of adolescent students who take courses online?

Development of Virtual High Schools

Zucker and Kozma (2003) commented, "Just a decade ago, the notion of offering high school courses on the Internet seemed futuristic and utopian. Yet, today thousands of Americans log on to take high school…courses" (p.1). A virtual high school is defined as a state approved and/or accredited school that offers high school courses for credit through the Internet (Clark, 2000). In the United States, the number of virtual schools for K–12 students changes rapidly. Sixteen states support a state sponsored virtual school (Robelen, Metzger, Bowman, Sack, Hurst & Archer, et. al., 2004, Watson, 2005). Clark (2000) in his Virtual High Schools: State of the States noted, “Virtual high schools are very diverse in their purposes and characteristics” (p. 1).

Virtual high schools present a variety of options. Most virtual schools fall into one or more of the categories listed below:

- State sponsored schools
- Consortiums and regionally based
- Local school or city district schools
- College or University based schools
- Charter schools
- Private schools
- For-profit companies providing curriculum, content, tools, and infrastructure (Clark, 2001).

Many states have adopted or created virtual schools such as the Florida Virtual School (FLVS), based in Orlando, Florida. Other states that have state sponsored schools are Alaska, Alabama, Illinois, Kentucky, Michigan, Ohio, West Virginia, New Mexico, Utah, and Washington (Watson, 2005). There are also virtual charter schools such as the Pennsylvania

Virtual Charter School or Oregon's CyberSchool. Some virtual schools are sponsored by local school districts and schools such as the Cincinnati Virtual High School and Houston's Independent School District Virtual School. The University of Nebraska-Lincoln operates an Independent Study High School, which is an example of a university-based virtual school. There are other private virtual schools and related for profit providers of online curriculum such as Apex Learning and Class.com (Cavanaugh, 2004).

States continue to expand online learning options especially at the secondary level. Picciano & Seaman (2007) noted that out of the all of the public school students who enroll in online courses 73% are in grades 9-12. States can utilize virtual schools to meet their own educational needs while providing the maximum of educational options for students while mindful of shrinking educational budgets (Mupinga, Nora, & Yaw, 2006). Liz Pape (2005), the administrator of the Virtual High school stated,

> Online education also allows individual schools and districts to expand their curricular offerings in advanced and specialty courses as well as technical, remedial, and credit-recovery courses. Innovative core academic classes can be designed to meet a variety of learning styles and needs. In short, online educators helps schools administrators find the balance between the optimal learning environment offered by small high schools and the rich and varied and course offerings, often found only in larger schools… (p. 13).

The Florida Virtual School

The Florida Virtual School (FLVS) is the largest state sponsored school in the United States. The school was and remains a trend-setting pioneer for state sponsored virtual schools. The school began in the 1997 school year as a collaboration between Alachua and Orange County Public School Districts (Clark, 2000). When the Florida Virtual School began, their enrollment was 150 students (Bigbie & McCarroll, 2000). Since 1997, the Florida Virtual School

has performed a "…meaningful role in serving the unique educational needs of high school students throughout Florida's sixty-seven counties" (Bigbie & McCarroll, 2000 p. 10).

The Florida Virtual School offers free middle and high school courses to students who reside within the state. Out-of-state students can enroll and pay tuition. The school's course offerings include 91 different courses, including Honors and 11 Advanced Placement (AP) courses. The school is accredited and offers a full high school curriculum online (Watson, 2005). The school became a pioneer by providing three different pacing options from which students can choose to complete their course work: accelerated, standard, and extended. The Florida Virtual School's motto is "Any time, any place, any path, any pace" (Clark, 2000).

Enrollment at FLVS is expected to continue to rise at an accelerated rate; in 2005, the school saw a 58% increase in course registrations and a 65% increase in students from the previous year (See Figure 1). During the 2005-2006 school year, approximately 65,000 students enrolled in the Florida Virtual School. These students primarily used the school for supplemental course work but they do have some full-time students (Florida Virtual School Data, 2005; Watson, 2005).

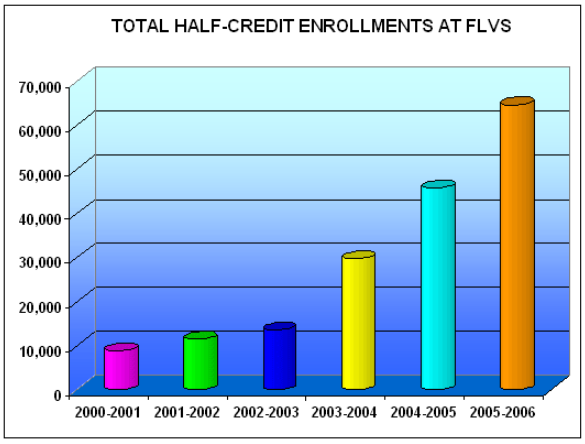


Figure 1: Enrollment participation by academic year

The Florida Virtual School became a model for other state sponsored virtual schools by its structure and curriculum. The school provides courses and training for others interested in starting or expanding virtual schools. Funding for the FLVS is provided directly by the state's budget and the school offers priority enrollment to students who attend low-performing schools as measured by the Florida Comprehensive Assessment Exam (FCAT). While the Florida Virtual School has been a model for curriculum and policy, other states such as Illinois, Michigan, and Idaho implement virtual high schools are well established and successful.

The Purpose of this Study

The purpose of this study was to describe from the student's perspective, why they had enrolled in online courses and allowed them to characterize their experiences. Further, this study sought to identify the personality types and traits of the students enrolled in online courses and reported on one measure of the student's cognitive style. This study sought to examine if there was any difference between these groups based on their personality types, cognitive style, and their self-reported grades.

Research Questions for this Study

The research questions framing this study are:

1. How will the scores of 9th grade high school students who are enrolled in online courses, differ from 9th grade students enrolled in traditional face-to-face courses as measure by the Matching Familiar Figures Test?
2. What were the behavioral types and traits of the students enrolled in online courses as measured by the Long-Dziuban Reactive Behavior Scale?

3. Was there a significant difference in grades based on the student's scores on the Matching Familiar Figures Test and the Long-Dziuban Reactive Behavioral Scale?
4. What were the factors that influenced the student's choice to enroll in an online course?
5. How would the students enrolled in an online course characterize their communication and interaction with other students enrolled in an online course?
6. How would students in an online course characterize their learning and their interaction with the content in that online course?

The Population

The population for this study were students who have enrolled in the state-sponsored Illinois Virtual High School located in the central United States. Enrollment in this school is modest; serving less than 5,000 students during the 2004-2005 school year. The majority of students who enrolled in these courses were concurrently attending public schools. This particular school has also experienced rapid growth and has been mandated to target minority populations. The school has been in operation for over six years.

The Sample

During the 2006 spring semester, 1,211 students enrolled in 90 courses with 75 instructors in the Illinois Virtual High School. The sample consisted of 43 adolescent students who voluntarily participated in this study, of which, 72% were female (n=31) and 26% were males (n=11). One student did not specify his or her gender. All students were enrolled in or had recently completed at least one online course. Their ages ranged from 13 to 20 years with a median age of 17 years.

Methodology

This mixed method study utilized three online instruments and online interviews to collect data from the students who attended the Illinois Virtual High School. One instrument was a series of open-ended questions asking IVHS students about their experiences in online courses. Prior to analyzing the qualitative data that was collected using this instrument; the researcher "bracketed" her experiences with online learning. Miles & Huberman (1994) noted that "Any researcher, no matter how unstructured or inductive, comes to fieldwork with some orienting ideas" (p.17). The process of bracketing facilitated the researcher summarizing her preconceived ideas and perspectives in relationship to her online experiences (Tesch, 1990). This analysis was completed before the qualitative data were reviewed and was summarized in Chapter Three.

The Significance of this Study

Enrollment growth in online high schools continues to be exponential and more states may mandate online learning as a high school graduation requirement. In this environment, it seems vital to understand more about why students enroll in online courses and as much as possible about the students who enroll, so that all stakeholders can create online opportunities that are equitable for academic success. This study's findings are significant because it describes the students' perspective why they have chosen to participate in an online course and asks them to characterize that experience. This study also considered what cognitive and personality characteristics might influence a student's experience and success in online courses. Cognitive and behavioral factors may influence students' achievement and satisfaction in online courses (Bigbie, & McCarroll; 2000, Geary, 2003; Weiner, 2001). Students must read online course material for content and must determine any appropriate tasks or assignments, a strategy that differs from the listening and communication skills utilized in a traditional face-to-face

classroom (Hiltz, 1994). This study identified the personality types and traits and examined one measure of cognitive style; impulsivity and reflectivity with a sample of adolescents who were enrolled in an online high school.

Limitations of the Study

Participation in this study was voluntary. The majority of the sample participants were minors and participation in this study was dependent on not only the minor's willingness to participate but also required their parents and/or guardians permission to do so as well.

The data collected from the participants regarding their Reflective or Impulsive reactions and their personality types and traits are not generalizable as the school and its participants have not been randomly selected.

Results from the qualitative data collected from the participants cannot be generalized to other students who participate in online high school courses.

The study was restricted to students who were enrolled in the Illinois Virtual High School.

Assumptions of the Study

Assumptions of the study included:

Students answered the instruments and any interview questions truthfully and to the best of their ability.

Students were comfortable using computers.

Survey instruments were reliable and valid.

Definition of Terms

Correspondence/home study/independent courses: a method of instruction where the content was developed by a teacher and/or an educational institution and the student and teacher interact by mail (MacKenzie, Christensen & Rigby, 1968).

Digital Native: Students who have grown up with ubiquitous technology and other modern digital devices.

Digital Immigrant: An adult who has adapted and learned to use technology and other modern digital devices. An example of a digital immigrant would be someone who learned to type on a typewriter but learned to use a keyboard.

Distance education: "Students and teachers are separated by distance and sometimes time" (Moore & Kearsley, 1996, p. 1). This can be accomplished through a number of different mediums such as mail, radio, television and the Internet. In this study, the medium was the Internet.

Online learning: Educational opportunities such as enrolling in classes or courses using the Internet as the medium for presenting content and interaction.

Virtual or online high school: a state sponsored or regionally accredited school that provides secondary school instruction and curriculum for credit via the Internet (Clark, 2000).

Virtual or online course: the curriculum materials and instruction offered to students via the Internet from a online high school.

Millennial generation or Millennials was defined as: children and youths between the ages of 2 and 26 as of 2003. (United States Department of Education, 2003).

Cognitive style: the manner in which an individual processes information and "…uses strategies to respond to tasks" (Brophy, 1998 p. 225).

Cognitive tempo: is a measure of one aspect of cognitive style; the impulsive or reflective responses of an individual. Cognitive tempo measures how quickly and accurately an individual will react to a stimulus.

Phenomenology: describes the meaning of experiences for individuals about a phenomenon (Creswell, 1998).

CHAPTER TWO: REVIEW OF THE LITERATURE

Overview of Distance Education

Distance education has an extensive history in the United States and internationally as a viable form of education for both children and adults. Virtual high schools are a relatively new construct in the history of distance education. The first virtual or online high schools began in 1996 (Clark, 2001).

In the mid 1800's, distance education began with correspondence courses (Yates, 2003). These courses were sometimes referred to as independent, home, or correspondence study (Moore & Kearsley, 1996). Moore & Kearsley defined correspondence study as courses that were delivered by mail. Organized mail delivery offered students new learning opportunities through the written interaction between students and instructors who were not located in the same physical proximity. There were many types of organizations private, public and for profit that offered courses on a variety of educational topics. In 1840, Isaac Pittman offered a correspondence course to teach shorthand; other courses were offered such as mining, foreign languages and in Boston, Massachusetts in 1873, the Society to Encourage Studies at Home was formed to promote educational opportunities for women (Moore & Kearsley, Yates).

In 1862, The Morrill Act was passed: this legislation created educational opportunities by giving Union states land to sell to begin colleges and universities. After the Civil War, an amendment in 1890 gave southern states grant money to develop institutions of higher education. Each state established a college or university that offered agricultural, military, and technical skills in addition to classical studies (U.S. Dept. of State, 2006). An important provision in this Act was that these colleges and universities must allow women to enroll and not discriminate

against race or provide separate colleges. Not only did higher education opportunities become available for those that could afford them, but they also offered a new motivation to enroll due to the practical application of the agricultural and technical training. Courses were available to any interested student regardless of which state they resided in via correspondence courses (Yates, 2003). This had a major impact on students allowing participation in educational opportunities irrespective of time and place. Prior to the Morrill Act, students could only enroll in correspondence courses in the state where they resided. Following this legislation, a plethora of courses was offered by a variety of public, private, and for profit schools.

Some universities began offering courses to adults who wanted to improve their skills or earn a degree. In 1883, the state of New York authorized The Chautauqua Institute to award degrees to students who had participated in correspondence study; this was the beginning of academic credibility for correspondence courses (Moore & Kearsley, 1996). The University of Wisconsin was another example; in the late 1890's they offered agricultural correspondence courses to farmers (Stevenson, as cited in Silverman, 2001). The Blackstone School of Law was established to teach law by correspondence in 1890 (Yates, 2003).

In 1909, Henry W. Holmes, the chairman of Harvard University stated in his report titled Educational Progress in 1908, that 22 universities planned or implemented lecture or correspondence courses (Holmes, 1909). Holmes noted that the University of Wisconsin pledged itself to "...reach every section of the state and to make the university of immediate and direct value to every citizen who may need and profit from its assistance" (p.297). By 1906, the University of Wisconsin had 24,555 students enrolled in their Correspondence Study Department (Watkins & Wright, 1991).

Distance Education for K-12

Most of the correspondence courses offered were for adults although distance education for children in the United States began in the early 1900's for primary school age children. In 1906, the Calvert Primary School of Baltimore, Maryland offered the first home study course where students could work on assignments at home. The enrollment consisted of four students. This was the first primary school in the United States to offer instruction by written correspondence (MacKenzie & Christensen, 1971, Moore & Kearsley, 1996, Yates, 2003). Calvert Primary School began in 1857 with 15 students enrolled in traditional classroom setting. By 1906, the school's headmaster Virgil Hillyer decided there was a need for instruction at a distance and he then created the "Home Instruction Department." By the end of 1909, there were 171 students enrolled in their program (MacKenzie & Christensen).

Calvert School is still in existence today and continues to offer a variety of learning options to students. They offer a traditional education for primary and middle grades and offer their curriculum through Calvert Education Services; this curriculum can be used for home-schooling or home study. For home-schooling, the parent is responsible for assessment and feedback and for home study; a certified instructor is responsible for assessment and feedback (Calvert, 2004).

Home study courses for students were not widely implemented but some children had few options for education as we naturally moved from our agricultural roots to an industrialized nation in the 20th century. In an article published in 1939, Professor Broady from the University of Nebraska argued that home study is an excellent option for primary and secondary students. He noted in his research that home study for K-12 students had been successfully used for some time internationally. He also argued that, while most people believe that a one-room school or

the consolidated school were the only options for rural children, he believed that research confirmed that home study is was just as effective as any other method of formal education. In his essay, Broady described home study as using materials that have been prepared by a teacher similar to materials that would be used in a consolidated school. He felt that home study was the most appropriate economic and educational choice rather than providing a one-room school with a small enrollment or providing transportation so that children could attend a larger school farther away from their rural community. In addition, he also stated that home study was the most appropriate option for isolated students, physically handicapped children, and children who were already attending a one-room school (Broady, 1939).

Distance Education Today

Independent study is still in use today for K-12 students (Green, 2006, Clark, 2001, Clark & Else, 1996). Although, independent study or correspondence school options have changed significantly in the 21st century from the independent and home study courses that were offered in the beginning of this century. Instead of using the terms independent, correspondence, or home study courses, the term "distance education" is implemented. Distance education can now be referred to as distance, online, virtual or distributed, learning. Most terms are synonymous. Waterhouse (2005) notes that "Distance learning is learning whereby students and instructors are engaged in learning activities in different locations and typically do not come face-to-face with each other" (p.44). Moore and Kearsley (1996) define distance education as:

> Planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements (p.2).

During the 1900's more reliable mail service, radio, television, and video technologies continued to expand distance education opportunities for adults; however, the Internet has been the catalyst for explosive growth in the field of distance education for both adults and children (Cavanaugh; 2004; MacKenzie & Christensen, 1971; Moore & Kearsley; 1996; Yates, 2003).

Previously, in distance learning education, students and teachers primarily interacted through printed materials sent via postal mail and this interaction was slow and limited. Instructors sought ways to provide feedback in a timely manner for their students. Two-thirds of the respondents in a 1966 study conducted by the Correspondence Education Research Project (CERP) stated that the instructors responded to a students work, seven days or less from the time that they receive it (MacKenzie, Christensen & Rigby, 1968).

Mail was not the only means by which courses were taught. As radio and television became more prevalent in our society, various attempts were made to utilize these mediums for instruction in schools. The impetus to use these mediums was to bring to small and rural schools opportunities for instruction that the schools could not provide locally. Using radio for broadcasting educational content met with lukewarm success. Television was more successful largely due to the passage of the Educational Television Facilities Act in 1962 (Felsenthal, 1971; Moore, 2003). The Educational Television Facilities grant provided matching federal funds to produce educational television (White, 1994). In 1965, the Ford Foundation provided a series of grants totaling $15 million dollars for the development of the Midwest Program for Airborne Television Instruction or MPATI. This program provided educational content for many Midwestern public schools broadcasting over six states for a period of twelve years (Felsenthal, 1971). The Midwest Program for Airborne Television Instruction was based at Purdue University, in West Lafayette, Indiana. Rigorous telecourses were developed utilizing teachers

and university professors from different Midwestern states. These telecourses were broadcast during an eight hour period from an airborne DC-6 aircraft. Broadcasting from an aircraft significantly increased the range of transmission at a fraction of the cost of providing ground based transmitters. After twelve years of operation, MPATI closed due to the organization's inability to sustain funding and issues with the Federal Communication Commission over the number of channels needed to continue to broadcast. In spite of the difficulties, it was a popular program (Felsenthal, 1971). As technologies have advanced, many different forms of broadcast television were utilized such as the Star Schools Project but each form of broadcast or satellite television had limited or only regional success (Moore, 2003).

With the development of the Internet and widespread computer access, the focus of distance education changed. Currently, most colleges and universities utilize the Internet to offer distance education courses. In a study sponsored by the Sloan Consortium, Allen & Seaman (2003) noted that 90% of two and four year colleges and universities in the United States now offer some form of online courses. With the advent of the Web, both higher education institutions and students began to see several advantages of offering and participating in online courses. While the student and instructor are separated by distance, the time required for interaction has been greatly reduced. Instructors and students can participate in both synchronous and asynchronous communication; they can interact through email, chat, instant messaging, video conferencing, and electronic courseware. Students are able to take courses or obtain a degree without driving to a campus or interrupting personal schedules. Sorg, Truman-Davis, Dziuban, Moskal, Hartman, and Juge (1999) found that the primary reason students take a course online is the convenience and flexibility.

Colleges and universities offer online courses to both traditional and non-traditional students for a number of reasons; one being to increase enrollment and secondly to reduce costs (Denton, 2001). Previously, it was assumed that the primary reason these students participated in distance education was they did not have access to a traditional college campus (Denton, 2001). This is no longer the case. Online courses can expand their student populations by increasing enrollment in some courses that might have otherwise experienced limited enrollment (Bagnato, 2004). Students can enjoy the flexibility of learning whenever it is convenient.

Distance education is not only growing but there may be an increased need for online courses. In the report *Growing By Degrees*, Allen & Seaman (2005) noted "The number of students who study online has been increasing at a rate far in excess of the rate of growth in the overall higher education student population" (p.5). In response to this trend, academic leaders in higher education consider supporting online education as part of the school's critical long-term strategies (Allen & Seaman).

The Millennial Generation

A new era of students may have a major impact on online high school education now and in the online courses, they will enroll in, in the future. The United States Department of Education (USDOE, 2003) published a summary of research called *Students in Today's Schools*. This report outlined some important facts regarding the Millennial Generation. The Millennials are defined as those who were born between the years 1980-2001. These students currently range between 6 and 27 years of age (USDOE, 2003).

This generation has some significant characteristics that are different from previous generations. The Millennial Generation is the largest generation enrolled in schools and represents 36% of the total population in the United States (USDOE, 2003). They are also the

most diverse. Thirty-one percent (31%) are minorities, which are more diverse than the current adult population. This study noted that the students reported strong ties to family. They also reported that they value education and are achievement oriented. In the USDOE report (2003), 96% stated that “doing well in school is important in their lives” (p. 5). An unexpected finding was the amount of influence this has on the economy. The USDOE study reported that "In 2002, teens (ages 12-19) spent $170 billion. Two out of three students reported influencing their parents' buying decisions,” and “that 20% of teenagers own their own stock" (p. 6).

The Millennial Generation has grown up with ubiquitous technology; and using it has become an integral part of their everyday lives. Computer networks have been created and utilized by most elementary and secondary schools across the United States to access the Internet and share instructional resources within the school (Moore & Kearsley, 1996). Students have increased access to computers and the Internet at home as well.

In the report *Students in Today's Schools*, 90% of the teens surveyed reported they had access to a computer (USDOE, 2003). The report, noted that 64% of online teens say that they know more about the Internet than their parents do and 66% of the parents agree (USDOE, p. 7). Teenagers and young adults between the ages of 12 to 24 were the largest group to use the Internet, which provides free access to information, and this generation considers community to be a "digital place of common interest, not just a shared physical space" (USDOE).

The Internet as a Communication Tool

Millennials are using the Internet as a source of information and to communicate through a variety of technologies such as email and instant messaging (IM) to create digital communities. A Pew Internet & American Life Project study titled, *Teenage Life Online* provided insight as to

how the Internet is having an important impact on their relationships with their friends, families, and schools. (Lenhart, Rainie, & Lewis, 2001) Seventy-nine percent of the students in grades 9-12 use the Internet (NCES, 2006). These teens said "Internet communication, especially instant messaging (IM), has become an essential feature of their social lives. For teens, face-to-face interaction and some telephone conversations have been partially replaced with email and instant message communication" (Lenhart, Rainie, & Lewis, p.16). Forty eight percent of teens believe the Internet strengthens their friendships and teens use it to both communicate with their friends and manage their social life. Seventy four percent (74%) of online teens use instant messaging compared to 44% of adults and 37% said they have used IM to say something online that they would not have said in person (Lenhart, Rainie, & Lewis).

The Internet is augmenting how youths or teenagers between the ages of 12 to 17 communicate and increasing its role in education. Teenagers in the study *Teenage Life Online* said that the Internet has replaced the library as their primary research source for information. The parents of the teenagers in this study agreed with their children that the Internet is a tool that helps with learning (Lenhart, Rainie, & Lewis, 2001). As more and more schools have added computers with Internet access, students have had increased opportunities to be online at home and school. In a report for *Education Week*, Robelen, Metzger, Bowman, Sack, Hurst & Archer (2004), noted that 92% of schools in the United States have Internet access on one or more computers. Approximately 77% of the classrooms in public schools have Internet access for students (Lenhart, Rainie, & Lewis). Levin & Arafeh (2002) interviewed 236 students who attended public middle and high schools. These students described how they wanted to see:

- Schools increase significantly the quality of access to the Internet in schools

- Schools should place priority of developing programs to teach keyboarding, computer, and Internet literacy skills
- Schools and teachers should incorporate more engaging Internet based assignments relevant to their lives.
- Many students asserted that this would significantly improve their attitude towards school and learning (p. iv).

The Internet for Learning

Since the Internet has been increasingly integrated into the home and academic lives of students, it would seem appropriate for them to use the Internet to attend school or participate in online courses. Teens are embracing learning online. Pascopella (2003), estimated that more than 100,000 students use distance education programs, other estimates are much lower but Clark (2001) stated that the numbers are changing so rapidly it is difficult to "guesstimate." Yet, a variety of virtual high schools has developed. According to a report by the Distance Learning Resource Network and WestEd, well over 100 online schools were in operation during 2001; this is a statistic that does not include the numerous other providers of online courses that are not structured as schools (Fulton, 2002).

The concept of distance education for high school students is not innovative, as mentioned previously; distance education for children and teens has existed since the early 1900's (Broady, 1939, Calvert, 2004, Moore & Kearsley, 1996). Distance education was initially touted as an excellent alternative to brick and mortar schools when students lived in rural areas and would have to travel great distances or simply did not have access to a school, or suffered from chronic illness, physical disabilities, or for economic reasons needed employment (Broady). Moore & Kearsley (1996) point out that early distance education (correspondence education)

established a tradition of offering courses to learners who were otherwise not provided for (p.22). This is still somewhat true today. Initially, online courses for high school students were seen as a way to increase course offerings by utilizing the Internet. Advanced Placement (AP) courses, vocational, or other specialized courses could be offered to students over a large geographical area as online courses. Specialized instructors who were qualified to teach the online courses would not necessarily have to live in the same districts that offered them. This gives school administrators, districts, states, and teachers themselves more flexibility. Schrum & Luetkehans (1997) wrote,

> In many institutions, especially those in rural areas, administrators are caught in a dilemma. States are demanding that high school students meet more stringent graduation requirements just as the school districts are losing pupils and cutting back on course offerings…Further, students who wish to attend universities expect to be able to take advanced classes (p. 8).

The Virtual High School

Online schools vary enormously in their structure, funding, sponsorship, course offerings and method of instruction. Two of the largest and most experienced online high schools are the Virtual High School (VHS) based in Concord, Massachusetts and The Florida Virtual School (FLVS) in Orlando. The Florida Virtual School was initially named the Florida Online High School. Both schools have been significantly influential in the development and structure of other online high schools and experienced unprecedented growth. These two schools have modeled for other schools, how to structure enrollment, courses policies and development, as well as create professional development guidelines for teachers teaching high school students online. Both schools have sought to create an environment where students achieve academic success yet, are divergent in their organizational structures.

The Virtual High School was created with a grant from the U.S. Department of Education as a national consortium of schools. Zucker & Kozma, (2003) outlined the grant's five goals:

1. Create a large diverse collaboration of schools to share resources.
2. Provide high quality professional development to prepare teachers to teach online.
3. Develop and offer a wide range of innovative virtual courses to serve a diverse group of students.
4. Create a collaboration model that is feasible, scalable, and replicable.
5. Evaluate the project and its potential for wide scale adoption (p. 8-9).

The five-year grant was funded and Virtual High School began in 1996 with 28 schools participating, offering 30 courses with 710 students. In 2006, VHS is flourishing; it now has grown to over 7,000 students, offering 237 courses with 394 participating schools from 30 states and 25 international schools (VHS, 2006; Zucker & Kozma, 2003). The Virtual High School offers a variety of courses from Advanced Placement math, science and foreign language courses; International Baccalaureate courses, specialized courses in the arts, for example Caribbean Art History and American Popular Music, as well as standard language arts, math and science classes and the not-so-standard classes for example, Ghoulies, Ghosties, and Long-Legged Beasties (Donlevy, 2003; VHS, 2006).

The benefits for schools to participate are the broad range of courses that are usually only available to schools with higher enrollments and resources. Students also benefit in indirect ways. Students also gain technology skills while participating in online courses. Donlevy (2003) stated, "Increasing amounts of work in higher education and the corporate world are accomplished online" (p.120).

The Virtual High School has been the subject of several external evaluations (Kozma, Zucker, Espinoza, McGhee, Yarnell, Zalles, et.al, 2000; Zucker & Kozma, 2003). Zucker & Kozma also found that students who participated in the VHS courses are usually enrolled in other schools. Zucker & Kozma also noted that 13% of the students were enrolled in online courses at VHS to fulfill a core high school course requirement. Fifty-six percent were taking an online course as an elective in their current high school curriculum and 31% stated they were taking a course as an elective in addition to their current high school requirements. The dropout rates were low and students reported satisfaction with their courses but the researchers noted that in the first few years of the VHS there was a noticeable lack of student-to-student interaction in the online courses. Unlike many online schools, there are some key differences about the structure of VHS consortium schools. Often the teacher from the participating school is teaching a face-to-face course as well as an online one. This has allowed for some unique comparisons by researchers. Overall, the VHS students described their online courses were of high quality and hard work (Zucker & Kozma).

The Florida Virtual High School

The Florida Virtual School (FLVS) began in 1997 as a cooperative effort between Orange and Alachua counties and was funded by a grant from the Florida Department of Education (Bigby & McCarroll, 2000). One of their goals was to provide a complete high school curriculum online by the year 2001 (Clark, 2001; Bigbie & McCarroll). Enrollment is open to any high school student who is a Florida resident. Currently, the school is funded by the Florida legislature as a separate education entity with a governing board appointed by the governor of Florida (Johnston, as cited in Cavanaugh, 2004).

Student centered learning is an important emphasis at FLVS. Students reported overall satisfaction with their online courses but that the courses are more difficult than traditional high school courses. The majority of students would recommend FLVS to other students (Bigbie & McCarroll, 2000). The FLVS curriculum must meet national, state curriculum standards as well as Gagne's nine events of instruction (Gagne, Briggs, & Wager, as cited in Johnston, 2004). Curriculum activities and assignments are also designed to meet Bloom's taxonomy levels (Johnston). Students have reported overall satisfaction with the courses and FLVS students have scored higher on national Advanced Placement (AP) exams than students who took the courses in Florida public high schools (Bigby & McCarroll, Clark).

Originally, many online high schools sought to offer online courses as a supplement to local high schools. One area of concern was providing students with equitable access to Advanced Placement (AP) courses. Advanced Placement courses are more challenging than a regular high school course. A student who is enrolled in an AP course, not only receives a grade for the course through their local high school but they take a national exam. If they score a two or three (out of 5), the student may receive elective college credits. This decision is at the discretion of the college or university where the student eventually matriculates. If the student scores a four or five, an undergraduate course may be waived in that content area. For example, if the student takes AP biology and scores a five on the exam, a college will usually waive an undergraduate science requirement for biology. Not all high schools can provide AP courses due to the advanced training needed for teachers and there may not be enough student interest in small, local, public schools to fill more than one or two AP courses. Online Advanced Placement courses have successfully been implemented in many online high schools.

The Illinois Virtual High School

The students who participated in this study were enrolled in at least one course through the Illinois Virtual School during the spring and early summer semesters of 2006. The Illinois Virtual High School (IVHS) is a state sponsored school that was established in 2000 and began enrolling students in 2001 (Watson, Winograd, & Kalmon, 2004). The school began as an educational entity managed by the Illinois State Board of Education to "…expand student access to challenging high school curricula" (IVHS Executive Briefing, 2005).

The mission of the Illinois Virtual High School states that they will "…use new and emerging technologies that expand the boundaries of space and time to provide Illinois students and their teachers with increased equity and access to the highest quality educational opportunities" (IVHS: FAQs, 2006, p.1). The Illinois Board of Education stated that IVHS had three mandates;

1. Assure equitable access to rich and varied learning opportunities for Illinois students, with emphasis on curricular areas needed to ensure that all students can meet the Illinois Learning Standards and succeed in higher education and the workplace;
2. Expand high-quality professional development opportunities for Illinois teachers and other educators; and
3. Support schools in integrating technology into teaching and learning (IVHS Web site, 2006).

Like the Florida Virtual School, IVHS does not grant diplomas. Students must register for courses through their local schools or district. The local school district decides whether not a student can enroll and how many classes they may take. Local school personnel may base this decision based on whether or not the student has access to technology at home or is allocated

time during the school day to use the school's technology. Local schools may also provide some technical support for the student if they are granted time during the school day to participate in their course. Local schools usually pay the course fees for the students and the local school district grants the course credit. At the end of the term the IVHS instructors provides feedback to the students' schools describing their course grade and other information about each student's progress within the course. IVHS does allow home-schooled students to register but they must do so through their local school districts.

Reasons for Enrollment in Online Schools

A widely held belief is that online courses might be beneficial for students who found traditional education too challenging due to personal or learning disabilities (Geary, 2003, Smouse, 2004). Students have stated they enrolled in FLVS for a variety of reasons. They needed a course not offered at their school, to repeat a failed course, or have health or schedule conflicts. In addition, students may want to pursue athletic talents, or other non-academic interests (Smouse, 2004). In addition, Bigbie & McCarroll (2000) described in their survey of FLVS students some of the varied reasons that students wanted to take an online course, as "wanting to experience an online course, too hard to go to a regular school due to a baby, to go faster than a normal school, feeling uncomfortable in public school" (p.141).

When students were surveyed as to why they wanted to enroll in the FLVS, they stated:

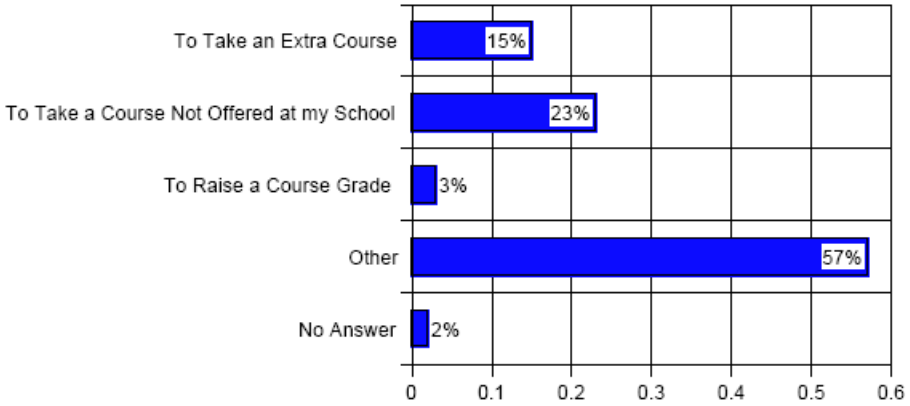


Figure 2: Reasons for Enrollment

(Bigbie & McCarroll, 2000)

Bigbie & McCarroll (2000) reported that 57% of the students chose "Other" as their reason to enroll in an online course (Figure 2) suggesting the need for more research as to why students wanted to enroll in online classes and to determine what they find attractive about enrolling in online schools instead of or in addition to traditional schools.

Reasons that students wanted to enroll in online high schools may vary regionally. The Branson School District in southeastern Colorado was experiencing declining enrollment. In an entrepreneurial effort, they created The Branson Online School to serve the needs of local students in 2000 (Gray, 2005). This school has also experienced phenomenal growth. The school began with forty-two students in the year 2000 from the Branson School District. Due to the school's popularity enrollment swelled to 900 in 2004 enrolling students from all over the state.

The students in Gray's study explained that the reasons they wanted to enroll in a online high school were:

- safety issues relating to school
- negative peer pressure
- dissatisfaction with traditional school classes
- teaching practices
- traditional time schedules
- a challenging curriculum
- a background of either home or private schooling
- being a teen parent

Student Demographics of Virtual Schools

As previously noted, online schools are diverse in their student characteristics. Table 1 below provides some of the available demographics from the two largest online schools and from the Illinois Virtual School, which were used in this study.

Table 1: Demographics of Virtual High Schools

	Gender	Public School	Ethnicity	Approximate course enrollment for 2004-2005 school years
FLVS	60% Female 40% Male	73% Public 20% Home-Schooled 6% Private 1% Charter	69% White Non-Hispanic 13% Hispanic 8% African-American 4% Multi-Ethic	33,767
VHS	57% Female 43% Male	Majority are enrolled pubic/charter schools	This information is not available. VHS is a consortium of schools.	7,573
IVHS	55% Female 45% Male	Majority are enrolled pubic/charter schools	46% White Non-Hispanic 24% African-American 18% Hispanic 7% Asian 5% Other	3,245

(Watson, 2005)

Academic Success in a Virtual School

Although online learning opportunities are readily available and convenient, questions remain as to whether students are academically successful in online courses and whether it is known what makes some students more successful than others. The answer to these questions is ambiguous. In a meta-analysis of K12 online learning studies, Cavanaugh (2001) stated that in some studies, the students did as well as traditional classrooms and others fared much worse. When all of the studies were analyzed, it appeared that the students can be as academically successful or unsuccessful online as in traditional classrooms. Because different variables where examined in each study, it was not always clear what factors contributed to academic success.

Lary (2002), noted in her study of Oregon's Azalea Online School that "…online success may be related to two factors; student characteristics and learner support" (p.20). Student

characteristics may include student grade point average, student attitudes, reasons for enrollment, and technology skills. Learner support could be characterized by the course structure and pacing, access to technology and technical support.

Students who are enrolled in online courses may have a significant advantage over students enrolled in traditional courses because they have more control over the pacing of their progress throughout the course. Some, not all, online high schools provide pacing options for students. Students enrolled in the Azalea Online School can take as long as they need to when working through the course material (Lary, 2002). This would provide the school with a higher course completion rate.

The Florida Virtual School also provides different pacing options; accelerated, traditional, and extended, although students are required to maintain a minimum pace. During the 1999-2000 school year, 79% of the students earned either an "A" or "B" for their course grade. Only 4% during that year earned an "F" (Bigbie & McCarroll, 2000). Cleary many students were academically successful but identifying which factors most influenced that success was not identified.

Lary's (2002) case study provided interesting insights as to who has enrolled in the online school and what factors may influence academic success. Academic success was defined as students who had earned a passing grade. Some of the findings were that females accounted for the majority of online students approximately 60%. There was no correlation between gender, writing ability, or academic success. Thirty-three percent of students in 12^{th} grade accounted for the majority of course enrollments. She also noted that there were significant differences in GPA's and the reading abilities of the students who completed online courses and those who did not. There is a great deal of reading in an online course as most course materials are text based.

Parents also seem to be supportive of their student's progress in online schools. Most state virtual schools conduct annual surveys of students, parents, and public school administrators. Gray (2005) noted, "Parents were very enthusiastic about the various opportunities that online school provides…" (p. 133). At the Florida Virtual School, parents are also positive about their student's academic progress. Fifty percent reported that they believed their students learned more in their FLVS class than in their traditional school. Thirty percent of the parents said they learned at the same level and 4% said they learned less (FLVS Executive Summary, 2004).

Behavioral Characteristics of Online High School Students

There is some information about demographics, academic success, and motivation for enrollment in online high schools but there is a paucity of research about the behavioral characteristics of students enrolled in them. A common theme throughout the research and anecdotal articles is that students must be self-motivated to be successful in online high schools. The Student Handbook for Illinois Virtual High School states,

> Taking an online course presents both advantages and disadvantages to the student. While online courses permit flexibility with regard to daily routine, they lack the regimented structure of the traditional classroom setting. Therefore, it behooves the student to organize his/her daily activities around a coherent agenda of classroom obligations (i.e. what he/she deems important classroom duties) in accordance with the mandates of IVHS protocol, the syllabi of instructors, and local school policy (p.8).

Roblyer & Marshall (2003), created the Educational Success Prediction Instrument (ESPRI), an instrument for measuring course completion rates of high school students in online courses. The tool was used in a study of Virtual High School students, exploring whether it could be used to determine whether high school students would most likely be successful in completing an online course and to provide information and feedback for students who might be at risk of

non-completion. Collaborating with the staff at VHS, nine constructs were identified in the development of the ESPRI. They were:

- Locus of control
- Internal versus external motivation
- Self confidence/self esteem
- Responsibility
- Degree of experimentation (risk taking)
- Time management
- Ability to set goals
- Achievement motivation
- Self-reported computer/technology skills

The 70-item instrument Roblyer & Marshall (2003) developed had an overall reliability coefficient of .92. In their sample of 94 students, the instrument was highly effective at predicting whether or not a student would receive a passing score. In addition, the instructional staff and researchers agreed that a student's success in an online course was also determined by whether or not students had reliable access to computers, their schoolwork habits were very important and technical difficulties needed to be resolved quickly for the students. The instructors felt that "Students who succeeded were described consistently as very motivated and mature in their approach to school" (p.251).

A number of online high schools encourage students to use an online assessment survey so that the student can make an informed choice as to whether or not virtual learning might be an appropriate option for them (FLVS, 2005, IVHS, 2006, Zucker & Kozma, 2003). This activity assists the student in becoming aware of some of the key behavioral aspects of online learning.

At the Virtual High School, the student completes a Student Pre-Enrollment Questionnaire and receives a score based on their responses to 15 questions. Zucker & Kozma reported the topics focus on "...the degree to which students are willing to take responsibility for their own learning, whether or not they do their work on time and their reading and writing abilities…" (p. 110). If students receive a low score they are strongly advised that online learning may not be the best option them.

Many online high schools, Virtual High School, Illinois Virtual High School and the Florida Virtual School strive to meet the needs of diverse student populations. Priority is given to Florida students who attend public schools that received a "D" or "F" rating and to rural schools (Bigbie & McCarroll, 2000). In the state of Florida, the Florida Department of Education evaluates and grades all public schools based on students' academic progress on the Florida Comprehensive Assessment Test or FCAT (FLDOE, 2006). Zucker & Kozma (2003) also pointed out that VHS strives to meet the needs of diverse learners but it seems clear that "students must have a higher-than-average degree of motivation to succeed in online courses and for VHS that has meant serving many more honors and college-bound students than others" (p. 111).

Weiner (2001) studied the CyberSchool based in Oregon, an online charter school that began in 1997. Among other things, this study looked at what characteristics students needed to succeed in an online high school. The students said they would "recommend online learning to other students if the student had the following capabilities" (p.94):

- Highly self-motivated
- Interested in the subject
- Disciplined

- Patient
- Responsible
- Able to handle freedom
- Able to work on their own
- Self-directed
- Able to cope with things on their own
- Possess a high work ethic
- Desire to learn

Donlevy (2003) pointed out that students with low reading abilities and problems with motivation may find it difficult to complete all of the assignments and activities in an online course. Zucker & Kozma (2000), in their evaluation of VHS, noted that many students who enroll in online courses may lack the independence and discipline needed to succeed in online courses. These issues may also be true in students who are in traditional high school courses.

Personality Types and Traits

There are only a few studies that have considered how personality types or traits, or characteristics might affect online high school students' grades and/or performance, motivation, or satisfaction levels. Several studies and most of the online high school websites have alluded to the idea that a student needs to be self motivated in order to succeed in an online course (Kozma, et.al.2000, Roblyer & Marshall, 2003, Weiner, 2001).

Weiner (2001) conducted a study of the students attending CyberSchool in Oregon and only two of the 130 students enrolled in the school responded to her questionnaire. Weiner wanted to look at several factors; one of which was motivational issues. Despite the

administration's cooperation and the utmost care in designing the study, apparently the students were not interested in discussing their experiences with the researcher. Weiner was able to use the administration's end of the year evaluation forms as data since many of the questions addressed her research questions but she was unable to collect any further information or ask students to elaborate on their comments (Weiner). She concluded that motivation influenced students' success; however, it was not clear in her study what the specific motivational issues were in participating in online courses (Weiner).

The idea that a student needs to be self-motivated to participate in an online class sounds pragmatic. Students must have a willingness to participate and the ability to do so via access to technology, etc. Adolescence is a unique period of time, which is not always characterized by logical decisions. Perhaps the personalities of adolescent students who enroll in online courses also influence not only their decision to enroll but also their academic success. Other important cognitive factors also play a role in a student's decision to enroll in online courses and succeed in them.

The Long-Dziuban Reactive Behavior Survey

Long (1985), a pediatrician, defined adolescence as a period marked by "...ambivalence the coexistent state of continuing dependency on parent of other authority and a developing need for independence from that relationship" (p. 87). This ambivalence leads to conflict as the teenager struggles from dependence to independence as an adult. This process does not end at the age of 18 but can range anywhere from beginning around the age of 12 and continuing until the mid 20's. Long defined four personality types and four traits. These types and traits help define the adolescent behavior during this period.

The four personality types as defined by Long (1985) are explained as follows:

1. *Aggressive-Independent*: These teenagers have high energy levels and are action oriented. They tend to act out their feelings and behaviors. They typically tell you exactly what they are thinking. They are usually not worried about pleasing people in fact they can be confrontational (Dziuban & Dziuban, 1997; Cioffi & Kysilka, 1997).
2. *Aggressive-Dependent*: These teenagers also have high energy levels. Approval of others strongly motivates them. They are excellent students. AD students with strong intellectual abilities can become merit scholars. They are usually cooperative and compliant.
3. *Passive-Independent*: These teenagers have lower energy levels. They are not concerned about pleasing others and tend to be loners. The behavior of these teenagers is often stubborn. Often they perform below their abilities in schools.
4. *Passive-Dependent*: These teenagers have low energy levels but are very much interested in the approval of others. Typically, they also tend to be affectionate. As students, they typically do what is required of them but little more. They are loyal and sensitive to the feelings of others.

While each student is predominantly one personality type, they may exhibit one or more of these traits or a combination of them (Dziuban, Moskal, Dziuban, 2000). Long (1985) noted that these traits

> …color and modify behavior in ways that complicate behavioral problems or conversely enrich normal behavior patterns. In the context of this discussion, none of them is considered to be diagnostic of problematic behavior in themselves unless carried to the extreme… (p.5).

The four traits as defined by Long (1985) that often accompany these personality types are:

1. *Impulsive:* characterized by lack of forethought and judgment.

2. *Compulsive*: often characterized by neatness in appearance and study habits. These students are very methodical.
3. *Phobic*: these teens are fearful. Their fears are often narrowly focused and not focused in realistic proportions.
4. *Hysterical:* these teenagers are dramatic and often excessive in their emotions. It was also noted that hysterics often have a hard time seeing things realistically (Cioffi & Kysilka, 1997; Dziuban, Moskal & Dziuban, 2000; Geary, 2003; Wiens & Dziuban, 1996).

Geary (2003) surveyed students who enrolled Cincinnati Virtual High School (CVHS) as the population for his doctoral research. Most of the students that attend the CVHS have dropped out of traditional high schools. Students complete their coursework online utilizing a computer lab provided by CVHS. Geary administered the Long-Dziuban Reactive Behavior Survey to a group of students. Long & Dziuban (1985) developed the survey based on adolescent personality types and traits that Long identified. Relationships between behavior type and success towards graduation were examined for these at-risk primarily inner-city students. Geary (2003) found that 41% of the student population was Aggressive Dependent and 31% of the population were Aggressive Independent.

Dziuban, Moskal, & Dziuban (2000) suggested that Aggressive Dependent students may be more attracted to some types of academic learning environments. Dziuban, Moskal, and Dziuban noted that most frequent personality type in online courses at the University of Central Florida was Aggressive Dependent. Dziuban et.al, posited that passive learners whether independent or dependent are underrepresented in online courses.

Young & Dziuban (2000) found that the most common personality type to seek help from university writing centers were Aggressive Dependent (AD) students. Cioffi (1995) found that 81% of the students surveyed in a public high school gifted and Advanced Placement programs were Aggressive-Dependent personality types. Sixty percent (60%) of her population was also compulsive. Dziuban (1997) found that in an average urban elementary school the four personality types were "…fully represented across the grades" (p. 90).

Long (1985) noted that personality types and traits are stable throughout our lives. However, the manner in which the types and traits are demonstrated does change with maturity. This suggests that if a student were identified as a Passive-Independent in elementary school that student would still be identified as the same in high school and beyond. In a study of gifted and advanced placements students, Cioffi (1995) had both parents and teachers used the Long-Dziuban Reactive Behavior survey to identify the students' personality type and ancillary traits. The survey demonstrated a 90% congruence rate in identifying personality types and traits as identified by parents and teachers.

By comparison, Cioffi (1995) found that 60% of the students enrolled in high school Advanced Placement (AP) courses were rated compulsive by parents and teachers. They also identified 31% as hysterical, 12% Impulsive, and 11% phobic (See Table 2). In other studies, Chin-Onn (2000) and Dziuban (1996) found a more equitable distribution of personality types and traits using the Long Dziuban Reactive Behavior Survey. Young and Dziuban's (2000) study of university writing centers, found the traits were equally distributed among the personality types.

Dziuban, Moskal and Dziuban's (2000) study of online courses at a large metropolitan university in the southeast theorized that some personality types may be more attracted to online

learning. The three research studies summarized in Table 2 found that the Aggressive-Dependent personality type was the most common personality type represented in the online courses. The results in this study supports previous studies suggesting that some personality types are more interested in online learning than others. These students are typically very interested in academic success.

Table 2: Personality Types and Traits in Online or Gifted Courses

	High School Gifted Students	Cincinnati Virtual High School students	University of Central Florida's online students
Long-Dziuban Personality types and traits	Cioffi (1995)	Geary (2003)	Dziuban, Moskal & Dziuban (2000)
Aggressive-Independent	10%	31%	23%
Passive Independent	5%	17%	12%
Aggressive-Dependent	81%	41%	60%
Passive-Dependent	4%	12%	5%
Compulsive	60%	32%	72%
Phobic	11%	7%	26%
Hysteric	31%	13%	25%
Impulsive	12%	7%	13%
Total	n=100	n=108	n=381

Not all Aggressive-Dependent personality types are gifted, but it may be that because these personality types are typically energetic, want to do well in school, and please others they may find online courses a comfortable environment to accomplish their goals. In particular, Aggressive-Dependent high school students may find enrollment in online courses particularly appealing especially if the school that they attend does not offer advanced courses. Paired with the personality trait of compulsive, these students are typically organized, self-disciplined, and

have requisite skills to thrive in an online environment. In this study, 67% of the students classified themselves as compulsive and 56% said they were Phobic. Based on the Long Dziuban Reactive Behavior Survey the majority of students in this sample are high energy, organized, thoughtful, careful, and very concerned about their academic success.

Other studies have found that the Aggressive Dependent personality type is not the dominant type in schools. In a study of 141 Hispanic students in a Central Florida elementary school, Chin-Onn (2000) found that the four different personality types were fairly well distributed. Dziuban (1996) also surveyed approximately 900 elementary school students using the Long Dziuban Reactive Behavior Survey and found that all personality types were more evenly distributed. Only 31% were Aggressive Dependent and the lowest personality type represented were the Passive Independents at 18%. Dziuban (1996) found that students who rated themselves as Passive Independent and Passive Dependent had the greatest academic difficulties.

Table 3: Personality Types and Traits

Long-Dziuban Personality Types & Traits	Students enrolled in Central Florida elementary school	Hispanic Students enrolled in Central Florida elementary schools
	Dziuban (1996)	Chin-Onn (2000)
Aggressive-Independent	20%	19%
Passive Independent	18%	18%
Aggressive-Dependent	34%	36%
Passive-Dependent	28%	28%
Compulsive	32%	40%
Phobic	26%	18%
Hysteric	31%	32%
Impulsive	21%	27%
Total	n=834	n=141

Chin-Onn (2000)

Impulsive and Reflective Behaviors

Other behavioral factors might need to be considered for academic success in an online course. Phipps and Merisotis (1999 as cited in Denton, 2001) profiled successful students in online courses as ones who are intrinsically motivated and have an internal locus of control. In an online course, the students must read the material that is presented to determine what action or assignments are expected of them without verbal instructions. In a face-to-face classroom, students usually receive verbal instructions in addition to any written instructions about assignments and can ask for immediate clarification from the teacher if the information is not clear to them. Because of the changing dynamics in the online classroom from verbal instructions utilizing auditory skills to visual instructions, students are much more dependent on reading skills and independent cognitive processing.

Cognitive Styles

Some researchers believe that a student's cognitive style influences their progress in an online course. Guilford (1980) noted that cognitive styles are in the general family of personality traits. He also stated that we can view cognitive styles as functions as well as traits. Guilford's (1980) research on cognitive styles suggested that "…these traits apply to memory, thinking, and problem solving…" (p.717). Archer (2005) and Frank (2002) in their studies, found a strong relationship between cognitive styles and students learning in online classes. Kenny (2002) noted that cognitive style had an impact on students' pictorial memory. Gagne (1985) also stated that cognitive styles are "…skills by means of which learners regulate their own internal processes of attending, learning, remembering, and thinking" (p. 55).

Nine cognitive styles have been identified and they are field-dependent versus field-independent, impulsive versus reflective, scanning, breadth of categorization or equivalency

range, complexity versus simplicity, conceptualizing style, leveling and sharpening, distractibility, and tolerance for unrealistic experiences (Green, 1985; Messick, 1970).

Messick (1984) posited that understanding a student's cognitive style could provide important insights that can improve instruction, student understanding, and communication. Understanding students can improve instructional methods. It may also enrich teacher behavior and conceptions. He noted that "Teachers and students who are similar in cognitive style tend to view each other with greater mutual esteem than do those who are dissimilar: they also end to communicate more effectively as if they were on the same wavelength" (p.69). In addition, Messick noted that identifying a student's cognitive style can enhance student learning and thinking strategies, which seems a salient point in this study.

This current study examined one measure of cognitive tempo: how Impulsive or Reflective the adolescent students were that enrolled in online courses. Reflectivity versus impulsivity is an index "…of the speed and attention to detail with which hypotheses are selected and information is processed. A Reflective person will consider various options before responding; an Impulsive person will respond quickly with the first answer that occurs even though it may be wrong" (Green, 1985, p. 6). Green also noted that research suggested that a student who has Impulsive cognitive style may be at a disadvantage academically. Impulsive students react more quickly and make more errors than Reflective students (Green; Kagan, Pearson & Welch, 1966). For example, in a traditional classroom, a teacher may have the opportunity to intervene if a student undertakes an assignment without carefully reading the directions. In an online environment, this becomes more difficult for a teacher to intervene and for an online student to realize what is happening.

The Matching Familiar Figures Test-20

The Matching Familiar Figures Test (MFFT) was developed by Jerome Kagan, a Harvard researcher and is the most common instrument used to assess the Impulsive-Reflective dimension of cognitive style (Green, 1985 & Kagan, 1964). Initially the instrument was designed to test how Impulsive or Reflective the subjects' reactions were, when testing reading ability. This test requires a systematic visual search, hypothesis testing and impulse control (Crone, Vendel, & van der Molen, 2003). The test shows a familiar figure such as a leaf and then asks the student to compare that picture with six other similar leaves and choose which one is an exact match. The variables scored are the total number of attempts (errors) and the average response time (latency) on the test (Cairns & Cammock, 1978a; Kagan, 1965). The scores for the number of errors and the response time groups the subjects into four categories: fast inaccurate (Impulsive), Slow-Inaccurate, Fast-Accurate, Slow-Accurate (Reflective). This test is a measure of disinhibition or impulsivity within a developmental context (Crone, Vendel, & van der Molen, 2003). Kagan stated that "The impulsive child who makes fast decisions always makes more errors than the Reflective child who has long decision times" (p. 610). Cairns & Cammock (1984) developed a more statistically reliable version of the Matching Familiar Figures Test that contained 20 items instead of the 12 that Kagan originally developed.

This test has also been used as a measure of impulsive and reflective behavior on both children and adults over many years. The Matching Familiar Figures Test (MFFT) has been used as a measure of impulsivity and personality in a variety of psychological contexts. For example, it has been used as a measure of impulsivity with Attention Deficit Hyperactivity Disorder (ADHD) and Attention Deficit Disorder (Warner-Rogers, Taylor, Taylor, & Sandberg, 2000;

Young, 2004) and as a measure of inhibition and personality for gambling and alcohol addictions (Crone, Vendel, & van der Molen, 2003, Weijers, Wiesbeck, & Boning, 2001).

The instrument continues to be utilized in a variety of ways. Kenny (2002) found that there was a significant difference in gist memory between adolescent students and their Impulsive and Reflective scores using the Matching Familiar Figures Test. Gist memory is different from verbatim memory in that it focuses on recall of themes or ideas. While reading skills and abilities are critically important for students to have when taking an online course, it may be that this one aspect of their cognitive style: impulsivity and reflection may also significantly influence their academic success in an online course.

CHAPTER THREE: METHODOLOGY

Introduction to the Problem

This study describes the experiences of high school students enrolled in online courses, identifies the personality types and traits of the students, and, examines one measure of their cognitive tempo: (i.e. their reflective or impulsive behaviors). This study utilized both quantitative and qualitative research methods for gathering data and analysis. Students were asked to complete three online instruments: a questionnaire of open-ended questions about their experiences while attending online schools, the Long Dziuban Reactive Behavioral Survey, and the Twenty Question Matching Familiar Figures Test (MFFT-20). After all of the responses were reviewed from the questionnaire, several questions were formulated and all of the students who consented to participate in follow-up interviews were emailed several questions to obtain a more rich description of their experiences and to clarify some of their responses (Merriam, 2002). The students were not all located in one geographical location and because it was assumed that they were comfortable communicating online all data were collected online.

Research Questions

The research questions framing this study are:

1. How will the scores of 9th grade high school students who are enrolled in online courses, differ from 9th grade students enrolled in traditional face-to-face courses as measured by the Matching Familiar Figures Test (MFFT-20)?

2. What were the behavioral types and traits of the students enrolled in online courses as measured by the Long-Dziuban Reactive Behavior Scale?
3. Was there a significant difference in grades based on the student's scores on the MFFT-20 and the Long-Dziuban Reactive Behavioral Scale?
4. What were the factors that influenced the student's choice to enroll in an online course?
5. How would the students enrolled in an online course characterize their communication and interaction with other students enrolled in an online course?
6. How would students in an online course characterize their learning and their interaction with the content in that online course?

Population

The population in this study was students who were enrolled in at least one online course at the Illinois Virtual High School during the spring semester of 2006. During the 2006 spring semester, 1,211 students enrolled in 90 courses with 75 instructors.

Sample

Forty-three adolescent students voluntarily participated in this study, of which, 72% are female (n=31) and 26% were males (n=11). One student did not specify his or her gender. All students were enrolled in or had recently completed at least one online course. The majority of which were concurrently enrolled in Illinois public schools. Their ages ranged from 13 to 20 years with a median age of 17 years.

Instrumentation

The Matching Familiar Figures Test

This study utilized the twenty-item Matching Familiar Figures Test (MFFT-20) which was developed by Cairns and Cammock in Northern Ireland (1978a; 1978b 1981). This instrument (MFFT-20) is a reliable and valid instrument. This version of the test has produced higher estimates of reliability of data than the original twelve-question version developed by Jerome Kagan (Kagan, 1964). In the last of their five studies, Cairns and Cammock presented a split-half and test-retest reliability coefficient of .83 and .85 respectively. They performed five separate reliability measurements with over 300 subjects and established strong correlations between order positions of distracter images and error rates, and significant interactions between ages and gender (Cairns & Cammock, 1978a; Cairns & Cammock, 1984; Kenny, 2002). The researchers found that so much disparity existed between the results for males and females, for example, that the latter group was not included in their sample, fearing that gender differences would adversely skew the results (Cairns & Cammock). In his more recent administration of the test, Kenny noted that gender differences were not significantly different. For that reason, it was determined that both genders would also be included in this study.

Over the years, researchers have utilized the Matching Familiar Figures Test in a variety of contexts. Most often, this instrument has been utilized to assess impulsivity as it relates to cognitive, behavioral, and psychological development (Cairns & Cammock, 1984; Kagan, 1964; Mitchell, & Ault, 1979; Rozencwajg & Corroyer, 2005; Sonuga-Barke, Elgie & Hall, 2005), and as a measure of potential academic success (Kenny, 2002).

The MFFT-20 is a measure of reflection and impulsivity; which, has been defined as one measure of cognitive style (Cairns & Cammock, 1978a, Green, 1985). The instrument

categorizes subjects as Impulsive, Reflective, Fast-Accurate, or Slow-Accurate. Kenny (2002) explains that the "…subjects are classified as Reflective or Impulsive using the double median split criterion" (p. 87). After the test is administered, the median for the total number of errors and the median for average latency are calculated. These medians create the crossing axes forming four quadrants into which each subject is placed (See Figure 3). If a subject made a quick choice but it is inaccurate, they were placed in the Impulsive quadrant. Green (1985) explained that "Subjects are classified as Impulsive if they are below the median on latency and above the median on errors" (p.10). If the subject scores above the median on latency but below the median on errors, they are classified in the Reflective quadrant (Cairns & Cammock, 1978a). In addition, subjects may also fall into the Fast-Accurate or Slow-Inaccurate categories. Only those classified as Reflective or Impulsive were considered in the original MFFT-20 studies.

Table 4: MFFT-20 Categories

Fast-Accurate	Subjects who choose quickly and accurately
Impulsive or Fast-Inaccurate	Subjects who choose quickly but are inaccurate
Slow-Inaccurate	Subjects who choose slowly but are inaccurate
Reflective or Slow-Accurate	Subjects who choose slowly but are accurate

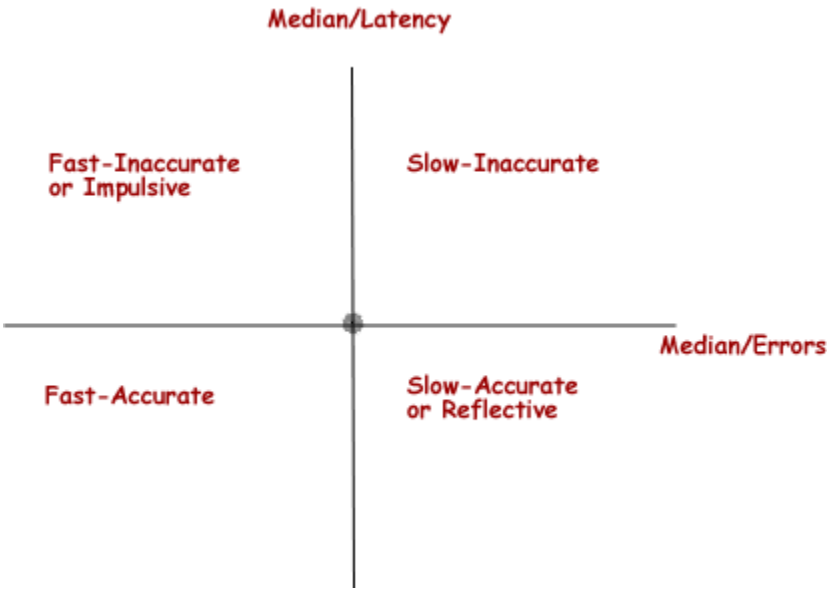


Figure 3: Matching Familiar Figures Test Categories

To administer the MFFT-20, subjects are presented with one familiar figure such as a leaf shown in Figure 4 below, and then are asked to correctly select this example from a group of six other similar examples. To familiarize them with the test the subjects are given two simple examples to match before the test begins. When subjects correctly choose the correct figure, or have made up to six attempts, they are shown the next set of figures. When examining the pictures, if subjects incorrectly match the figure, this is considered an error and they are told to select again. The complexity of the figures varies with each set. Figure 4 is a sample screen shot from the instrument.

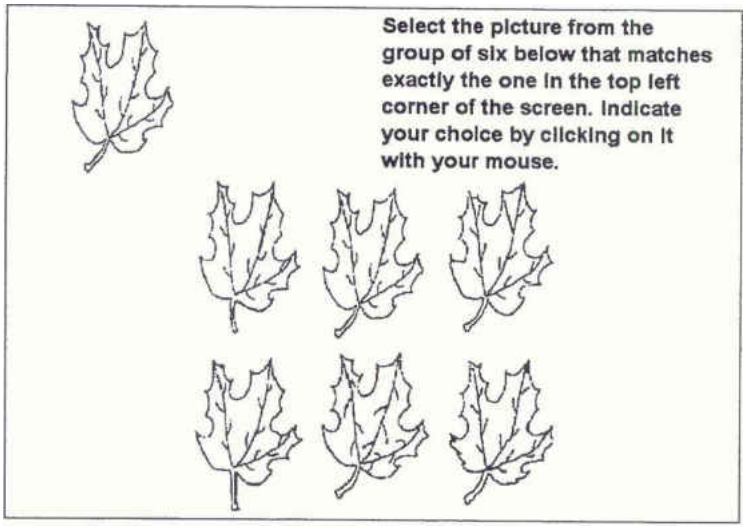


Figure 4: Screen Shot of MFFT-20

In the original administration of the MFFT-20 test, subjects were instructed to point at what they believed was the correctly matching picture. The original implementation of this test required three researchers to administer. One researcher gives the students instructions and flips the pages after each matching picture is identified; a second notes how many choices the subject makes before choosing the correct answer (errors), and a third, who uses a stopwatch to measure the time (latency) it took before the subject made their first choice (Cairns & Cammock, 1978a: Cronbach & Snow, 1981).

In order to use the MFFT-20 in this study, a computerized version was needed to collect data online. Kenny (in press; 2002) used a software program called Macromedia's Director to create a computer based version of the MFFT-20. He administered the test in a computer lab setting. Kenny provided the researcher with a copy of his computerized version of the MFFT-20 but several obstacles became apparent in utilizing the computer based test. This computer based version of the MFFT-20 could not be administered to students online, unless the students used a computer that had Macromedia's Director software installed on it. This would be very unlikely

that students would have access to this software program. An application file created using Macromedia's Director software can be converted to a Web format by creating a Shockwave file. The researcher quickly discovered that while this seemed like a promising solution, the Shockwave file did not contain the capability of collecting data online. Another program needed to be considered to administer the MFFT-20 online.

For this study, an online version of the MFFT-20 was developed using a software program called Macromedia Flash. The researcher obtained a copy of the Cairns & Cammock's (1978) paper version of the Matching Familiar Figures Test-20. Next, the pictures were scanned and an experienced programmer used the digitized graphics from the original test to build this instrument as a coded Macromedia Flash application capable of collecting data (Macromedia, 2006). The directions and procedures given to the students were the same as the paper test except as noted. For this online administration of the MFFT-20, the students were presented with a screen that asks to input a prearranged login code because the student participated online. The login code was arranged by the researcher and the student to ensure that there were no duplications and that all responses in the instruments could be correlated to a completed consent form for each student. Once the code was entered, the screen advanced and provided instructions and sample pictures. The students were instructed to click on the matching picture using their computer mouse. The Macromedia Flash application calculated the seconds it took for the students to make their first choice (latency) and how many choices the students made (errors) for each set of graphics. If the students chose the correct match, the screen advanced to the next group of pictures. If the students incorrectly identified the matching picture, they received a message asking them to try again. Like the paper and pencil version, the screen automatically advanced to the next set of pictures if the student was unable to select the correct answer after six

attempts. At the end of this application, the students were prompted to click "submit" which sent a results file to the researcher's email program. Once the data collection period had ended, the researcher calculated the median for latency and errors to determine the categories (Impulsive, Reflective, Slow-Inaccurate, and Fast-Accurate) from the participating students. Each student was placed into one of four quadrants based on whether they were above or below the medians for latency and errors. The results for each student were entered into SPSS a statistical software program. Other data collected from the questionnaire such as gender, age, grades, estimated Grade Point Average were also analyzed by SPSS.

This study was the first time the MFFT-20 was used to collect and analyze data online in the United States. These findings were also unique due to the collection technique and the sample pulled from students enrolled in the online high school. Previously, Kenny (2002) developed a computerized version of the MFFT-20 using Macromedia Director that was administered to students in a computer lab as a computer based test. Other researchers have developed and utilized computerized versions of the MFFT (Sonuga-Barke, Elgie, & Hall, 2005; van Merrienboer, 1990).

Developing a computer based test (CBT) from a paper and pencil test (P&P) is not new. While data produced by computer based assessment (CBA) may be qualitatively different, it can be both reliable and valid (Sandene et.al, 2005, Vispoel, Boo, & Bleiler, 2001). The Graduate Record Exam (GRE) has moved from a paper and pencil test to a computer based assessment (Educational Testing Service, 2006). Currently, the GRE is administered in a computer lab however, Educational Testing Service plans to implement an online version of the GRE in 2007 (Rainey, 2006) The GRE is no longer administered in a P&P form unless there is no computerized location available (Educational Testing Service, Vispoel, Boo, & Bleiler).

There may be a growing trend to convert more paper and pencil (P&P) tests to computer based assessments (CBA) and moving to administrating online assessments. Gipps (2005) noted that as learners use computers and the Internet for learning, computer based assessment would be the most appropriate means of testing. Russell & Haney noted, "If teaching and the associated resources become electronic, then assessment too, will need to take that route, to ensure a match between teaching mode and assessment mode" (as cited in Gipps, p.174). Vispoel, Boo, & Bleiler (2001) tested two hundred and twenty four college students with a computerized version of the Rosenber Self-Esteem Scale and found no difference in means, variances, or factor structures between the P&P version and the CBA (p.471). Vispoel, et.al. stated that "Commonly cited advantages of computerized assessment include greater standardization; increased test security; reduced costs of test production; administration and scoring; the possibility of immediately reporting and interpreting results; greater respondent motivation; and ease of changing scoring algorithms when scores are renormed" (p. 461).

The Long-Dziuban Reactive Behavior Survey

The students in this study completed the Long Dziuban Reactive Behavior Survey. The researcher obtained permission from the author to create an online version of the instrument using the categories that were utilized in previous studies (Dziuban, Moskal, Dziuban, 2000; Geary, 2003). The researcher assembled this survey online using a commercially available survey program.

The Long-Dziuban Reactive Behavior Survey is a self-reported survey of personality types and traits, which is brief and well suited for online administration. Dziuban, Moskal, & Dziuban outline the four categories of personality types are as follows:

1. Aggressive Dependent (AD): These students are high achievers found in honors courses, student government, and athletic programs. They are non-confrontational, eager to please, and have high energy levels.
2. Aggressive Independent (AI): These students possess high energy levels and have little need for peer or teacher approval. They lack judgment, express their thoughts and feelings impulsively.
3. Passive Independent (PI): These students can be stubborn, non-communicative, non-participatory, or withdrawn. The have superior abilities but often underachieve. They posses low energy levels.
4. Passive Dependent (PD): These students have low energy levels. They are sensitive, affectionate, gentle, and non-confrontational. Their need for approval dominates parental, peer and teacher relationships (2000, p. 8-9).

Each student read a description of the personality types and traits and then was asked to choose which category best represented themselves most of the time. The students were instructed to select only one personality type. After reading the descriptions of personality traits, they were asked to select which traits represent themselves most of the time. They can select more than one trait.

Dziuban, Moskal, & Dziuban (2000) describe the four personality traits as follows:

1. Hysteric: These students are creative, compassionate, helpful, and dramatic. Their colorful behavior creates a positive classroom atmosphere.
2. Phobic: These students develop focused fears regarding negative outcomes. They are very cautious decision makers.

3. Compulsive: These students are careful, thorough, and methodical in their work habits and organization is their forte. They successfully complete their work and enjoy academic excellence.
4. Impulsive: These students are erratic and changeable. They may answer a question before it is finished (interrupt) or undertake a project before understanding its requirements.

Dziuban, Moskel, and Dziuban (2000) point out that Long's theory of reactive behavior of adolescents "…provides another vehicle for recognizing and responding to learning diversity in our classrooms" (p.173). Long's theory (1985) suggested that every individual has similarities to one of these four personality types and has none or some combination of these aforementioned traits. While these personality types and traits may not explain the entirety of an individual's personality, Dziuban, Long and Cioffi (1995) developed a "…protocol that would be valid for assessing the types and traits in an objective format while corresponding to clinical diagnosis" (p.175). Using this instrument, the researchers noted a 90% congruence rate (Cioffi).

Cioffi (1995) using the Long Dziuban Reactive Survey found a 76% agreement between parents and teachers when applying these personality types and traits to their gifted students. Dziuban and Dziuban (1997) assessed an entire school population and found all types and traits represented in the school's population. Dziuban, Moskal, and Dziuban (2000) found in their study of students enrolled in fully online courses at the University of Central Florida that students who categorized themselves as Passive Dependents and Passive Independents were underrepresented in online courses. Geary (2003) used this instrument in a study at the Cincinnati Virtual High School and did find that most of the students were Aggressive Dependents and that Passive Dependents and Passive Independents were underrepresented in

online courses at CVHS. In this study, the instrument was used to investigate whether or not the students at the Illinois Virtual High School were also predominantly Aggressive Independents.

Qualitative Data

Qualitative data was also collected to understand the experiences of students enrolled in an online course. a phenomenological approach was also used to obtain and further analyze the qualitative data. The nature of phenomenological research is that its "...focus is on describing the essence of a phenomenon from the perspective of those who have experienced it" (Merriman, 2002, p. 93). General research questions were outlined to structure the open-ended survey (Creswell, 1998). Some demographic and open-ended questions used in the online questionnaire were:

- Why did you decide to take an online course?
- What words would you use to describe your experience in this course?
- What do you like the most about taking a course online?
- What do you like the least about taking a course online?
- What kinds of interaction do you have with other students in your course?
- Do you think every high school student should take an online course in order to graduate from high school? Why or why not?

Data Collection

Before beginning this study, the researcher obtained permission from the Institutional Review Board for Human Subjects (IRB) at the University of Central Florida. In addition, the researcher obtained permission from the Illinois Mathematics and Science Academy's (IMSA) Human and Animal Subject's Review Committee, which oversees any research involving

students who are enrolled in the Illinois Virtual High School (IVHS). Both boards agreed that it would be necessary to obtain printed copies of the signed consent forms. To facilitate this process, the researcher provided a toll-free fax line for parents and students to use when submitting the signed consent forms. They were also offered the opportunity to mail in their forms through the postal system. The IMSA's Human and Animal Subject's Review Committee stipulated that the consent forms for students and parents and/or guardians must contain the same information. Because these students were in high school and some were over the age of 18, it was deemed that a simple letter of assent was not appropriate. Both IRB's allowed the researcher to combine the letter of consent and the parental permission form for any student who was 17 years of age or under reducing the number of pages to be faxed from six to three. A separate letter of consent containing the same information was provided for the students who were 18 years of age or older.

In order to obtain the broadest perspective of students and due to the possibility of a tenuous response rate, an email request for participation was sent out by the school's administrator to all the students who were enrolled in the school. An email was also sent to the parents of students. The emails contained a link to the consent forms, which the researcher had posted online giving the parents and students the opportunity to read about the study and contact the researcher if they had any questions. Those willing to participate were instructed to print and complete the form. After receiving the appropriately signed consent form, the researcher then emailed each student the links for the online instruments. The students could answer the instruments successively or at separate times.

Both review boards stipulated that the students must have the option to skip any question they did not wish to answer. The students were required to provide an identification number that

the researcher requested. This number was used to match the results from the three instruments to the students. By doing this, the researcher could verify there were no duplications of the results. The students and parents were asked on the original consent form if they would consent to follow up interviews via phone, email, and/or instant messaging. A review of the research revealed that these were the preferred forms of communication for this age group (Lenhart, Rainie, & Lewis, 2001). The follow up interviews were used to clarify any answers and explore the topics listed in more depth.

Initially, three students obtained parental consent and faxed their consent forms and only two of the students completed all three instruments. During the next six weeks, the researcher sent three more requests for participation to students and parents; there were no further responses.

The researcher contacted the school's administration to request that extra credit be offered to those willing to participate. The administration agreed to support this offer. The researcher received eight responses from teachers stating that they would be willing to offer extra credit. At this point, an addendum was drafted and submitted for both Institutional Review Boards to review. The addendum was approved by both Institutional Review Boards. Those students willing to complete the three instruments would be given a $10 gift card to either a movie rental company or a nationwide department store. Further, extra credit was also provided by the teachers for other optional activities so that no student who needed extra credit felt unduly pressured to participate in this study.

The researcher drafted another email that the administrator of the Illinois Virtual School sent out. The teachers that were interested in offering extra credit also sent out information to their students. Within eight weeks, 43 students responded. Three students submitted signed

consent forms but, for different reasons, the researcher was unable to contact these students. One parent faxed the consent form from a public library but refused to give their email address or their student's, citing that they wanted to protect the student's privacy. Because there was no way to then contact the student or parent with the links for the surveys this person was unable to participate.

Data Analysis

The data collected from the instruments were entered into spreadsheets and tables. Demographic information and the results of the Long Dziuban Reactive Behavioral Survey were imported into SPSS. The data gathered from the MFFT-20 were entered into a spreadsheet and the medians for latency and errors were calculated. The results of the students' tests were then plotted onto the four axis graph to determine which quadrant each belonged as described by the procedures for administering the test. Once this was done, each student's classification was entered into SPSS for further data analysis.

A phenomenological approach was used for data analysis. A phenomenological study is an attempt to understand the lived experience of individuals or phenomena (Creswell, 1998, Merriam, 2002); in this case, the students who were enrolled in online high school courses. Before the qualitative data were analyzed, the researcher reflected on her own experiences with online learning. Anasstoos (1985) noted that "In other words to understand the subject's world, one must first arrive at it by a suspension, or bracketing of all presumptive constructs about it (p. 91). When that process was complete, the researcher began the process of analyzing the collected data. The bracketing developed for this study is presented at the end of this chapter.

In addition to bracketing, the phenomenological approach also contains four essential steps of data analysis. Anasstoos (1985) described these steps in which the researcher:

> (1) Reads the entire description in order to get a general sense of the whole statement. (2) Once the sense of the whole has been grasped, the researcher goes back to the beginning and reads through the text once more with the specific aim of discriminating 'meaning units' from within a psychological perspective and with a focus on the phenomenon being researched. (3) Once 'meaning units' have been delineated, the researcher then goes through all of the meaning units and expresses the psychological insight contained in them more directly. This is especially true of the 'meaning units' most revelatory of the phenomenon under consideration. (4) Finally, the researcher synthesizes all of the transformed meaning units into a consistent statement regarding the subject's experience and can be expressed at a number of levels. (p. 10).

Miles and Huberman (1994) point out that "Analysts aiming for a phenomenological understanding of a text may well need to read and reread an extended text to experience its deeper messages and meaning" (p.141n). In this study, each open-ended answer was sorted by student and entered into tables by question asked. The researcher read through and reviewed the responses multiple times. The responses to the open-ended questions were then sorted by grade level to identify any patterns in the responses based on grade level. Finally, the qualitative responses to the questions were sorted by each student's personality type and the respective MFFT-20 cognitive style. At this point, several questions emerged and the researcher emailed the students for follow-up responses. Meaning units were identified and summarized. These summaries were compared with the results of the Long-Dziuban Reactive Survey and the results from the MFFT- 20.

Researcher Bracketing

When undertaking a qualitative study, the researcher becomes the primary instrument for data collection (Merriman, 2002). The researcher formulates questions and ideas and begins interviewing participants to understand their culture or experiences. Because some bias is

inherent in this process, during a phenomenological study, the researcher "brackets" experiences to provide further understanding of the researcher's point of view to aid in the interpretation the data. Merriman stated that "Rather than trying to eliminate their biases or "subjectivities," it is important to identify them and monitor them as to who they may be shaping the collection and interpretation of data" (p.5).

The bracketing process benefits the researcher as well as the reader. Working through the process of writing down everything relevant to the topic being researched and summarizing any relevant experiences helps the researcher to recognize bias and preconceived ideas that the researcher holds related to the topic. As the researcher, I have attempted to describe fully my experiences with online learning as both a student and an instructor in and designer of online courses. In addition, two of my four children have enrolled and completed online high school courses through the Florida Virtual School. The following paragraphs summarize the many pages of journaling that were written regarding my experiences in online learning. More details about my experiences are presented in Appendix O.

Experiences of Online Learning

After bracketing my experiences with online learning, there was no question in my mind that online learning can be an excellent way to take a class or course. I have had a variety of positive experiences as a student enrolled in online courses, teaching online courses, and being a parent of children who have enrolled in online courses, that have shaped my perspective. Although I have experienced all three roles, I most identify with the role of an online instructor. I have taught more online courses than I have taken.

As an online instructor, I had formal and informal training for teaching and developing online course materials. I read articles and had the opportunity to discuss online pedagogy with

experienced professors. These experiences and others have shaped my views that online learning can be an excellent alternative for learning. I have been successful in teaching online and in general; the students enrolled in my courses have also been academically successful. I am now convinced that comparing online and face-to-face courses is like comparing apples and oranges. Both can be effective mediums for learning, but have entirely different flavors.

After going back to graduate school, I enrolled in online courses. I enjoyed them and was academically successful in them. I fit the profile of a typical online learner who views online learning as an attractive option. I am over thirty, female, employed, working on a graduate degree, live more than 30 miles from the university, and must juggle the responsibilities of a family. My primary consideration was how to juggle the competing time demands placed on my schedule, rather than my social needs when enrolling in a course. Once I took an online course, I realized that the convenience of online courses far outweighed any need for social interaction for me; however, I do not believe the social aspects of face-to-face courses are not important - they are.

I was successful academically in my online courses and did not feel that the course's modality influenced my academic progress. I recognize that my perspective might have been different (and my academic progress) if I had taken courses from professors who were not experienced in online pedagogy. The professors I had were committed to online and blended learning courses and structured their courses to reflect that commitment. I enjoyed the assignments and did not believe they were too difficult or different from my expectations of college courses. The professors were responsive to emails and provided timely feedback on assignments.

Learning styles also play a role in students' academic success in online learning situations. I know that I am a Reflective learner as defined by the MFFT-20. I enjoyed my interactions with the professors and the students in the online courses that I enrolled in. I appreciated having the time to think about and read through the course content and discussions at my own pace. According to the Long Dziuban scale, my personality type is Aggressive Dependent. I am action oriented, highly motivated, and want to excel academically. I am willing to problem solve and take the initiative to figure out what is expected of me. In my first two online courses, the professors offered a face-to-face orientation class to explain their courses. I made sure I attended both even though one was a considerable distance from my home. I was willing to attend to ensure I understood all of what was expected of me.

Teaching Online

Not long after I entered a doctoral program I began teaching online and really enjoy the freedom and flexibility. I can work on my courses at home or in my office; I do not have to be anywhere at a certain time for class. After I began teaching online, I began to realize some of the differences between teaching online and in traditional classrooms. Teaching online courses required me to be very organized before the course began. I update the course each semester, but once a course begins I no longer have to think about what I am going to teach; which I felt gave me more freedom. Once my online class starts, my primary responsibilities become grading and communicating. I login daily and answer questions, handle any issues, and grade assignments. At least once a week I formally communicate with my students.

When teaching a lab or face-to-face class, I know in general terms what I am going to teach each week, but I revisit and revise what I am teaching before and during each class. A three hour class can be tiring as I spend a considerable amount of time walking around the classroom,

giving directions and answering students' questions about their assignments. I have noticed that many of the questions asked have already been addressed in the directions, but not all students carefully read them. In the online environment, the same experience happens, but less often.

Sometimes when I am teaching online, I miss the spontaneous interaction of a classroom or a lab. I teach an educational technology course online and, occasionally, both my students and I feel the great frustration of not being able to show them what to do. I must describe for students in an email or in an instant message how to solve problems with software or assignments. This process can take much longer and require a lot more thought than a question in the classroom. Yet, students in my online classes are more likely to take the time to email and express gratitude about the way that I might handle a problem or resolve an issue.

There are challenges for communication and instruction in all modalities: between instructor and student, student to student, and with the content. In writing this reflection, I realized that I try to bring the best of both worlds to each modality that I teach. In my online courses, I offer optional labs, where we meet to work on the more challenging assignments like building a class Web site. This lab assignment is usually completed in 90 minutes whereas I am sure that students who are unable to attend the optional lab spend more than 90 minutes to create this project. In my face-to-face courses, I incorporate some online assignments and asynchronous discussions. To facilitate more communication with all of my students online and face to-face, I sign on to an instant messaging program as often as I can. This allows them to ask me any questions whenever they see me online. I found that most of my students use instant messaging tools and at least one-third of my students contact me regularly during the semester.

Parenting Online Children

Two of our four children have taken courses from the Florida Virtual School (FLVS). They indicated they thoroughly enjoyed these courses and both were academically successful. I have personally known several instructors that taught at FLVS so I recommended the school to our teenagers. So far, two of our daughters have taken five courses. Our oldest daughter enrolled out of curiosity. She enrolled in 2000-2001. Our second daughter enrolled because she wanted more control and flexibility with her schedule during her senior year. Her last semester as a senior had all academic and mostly AP courses. She enrolled in online courses during her first semester so that she could work at an accelerated pace and finish the online courses before taking her AP Courses. She felt this would balance her schedule. She was glad to be able to rearrange her schedule this way.

I have been very amazed by the instructors and the course content at the FLVS. The instructors consistently initiate contact with their students by email and phone. The instructors involve the parents as well. When my daughter participates in her monthly chat, she coordinates it with me, because the instructor also updates me as to my daughter's progress. She is self-disciplined and achievement-oriented so I have not been concerned about her progress. I am inspired by how the FLVS instructors personalize their contact with their online students. I realize this is in part because the FLVS is funded by how many students complete a course; a fundamental difference from how we are funded in higher education. We also expect that students enrolled in our universities are more independent about their learning than high school students.

One of my daughter's online instructors uses verbal assessments for his online students. We arranged a time and my daughter called her instructor and he asked her a few questions and

then he spoke to me and asked me to verify that she did not have her textbook and was not sitting in front of the computer. I verified that and then handed the phone back to my daughter who successfully navigated her first phone quiz. I was impressed because this was a way to combat plagiarism as well as increase communication. The instructors are learning about who their students are and trying to ascertain that they indeed are doing the work. This is not a foolproof method, but it is another tool.

The course content in my daughter's online courses has been excellent and engaging. They use multimedia and excellent course design. I know that these courses are developed for the teachers by the school and it is the teacher's responsibilities then to manage the interaction, communication, and assessment within the course. I think that some of these students may be disappointed when they take some college courses online because we incorporate so little multimedia into our university courses and many of them are not very interactive.

Summary of Beliefs

My experiences with online learning have been positive. These experiences have allowed me greater flexibility and control over the timing of learning. Online learning is harder for both student and instructor. Well designed online instruction requires the learner to be more engaged in the learning process. They must take more responsibility for their learning because an instructor is not verbally explaining what to do; online learners must read the content and decide what is being asked.

Teaching online provides greater flexibility over my job because I can be anywhere. Teaching is hard work because the instruction must be carefully planned and organized before each course or class begins or else students become quickly frustrated. In my experience, online courses are more restrictive in the content. Not all face-to-face assignments easily translate to the

online environment. This can be frustrating but I have discovered it also requires creativity. Students can help me in this process and I can incorporate into the assignment the feedback they give me. There is little spontaneity in online courses.

I do interact as much online with my students as I do in my face-to-face courses. Interacting and communication with my students is important to me. Even in my online course, I have found that students will interact on a personal level using email or, most often, by instant message. This is important because I believe that a really effective instructor communicates his or her concern and caring for students. In my years of experience as an instructor, I have found that communicating concern for students can be a factor in motivating students to achieve more in a course.

I have been teaching online courses for five years and have enjoyed teaching in all modalities online, blended, and face-to-face. For me, each has a different set of advantages and disadvantages. Yet, I fully acknowledge that my experience is not exhaustive and while I have described some of my personal experiences with online learning, this may not be representative of anyone else's. As I analyze the data from the students enrolled in IVHS, I believe I need to consciously set aside my beliefs that online learning is a positive learning experience. I realize that for me it has been but this is not universally true. I also am conscious that as an online instructor, I have practices that support my students in my online courses, but again I must consciously set aside any assumptions I have that all instructors support their students or they may support them in different ways than I am accustomed.

CHAPTER FOUR: FINDINGS

This chapter includes the analysis of the quantitative and qualitative findings. The purpose of this study was to describe the experiences of high schools students enrolled in online courses in the Illinois Virtual High School and to identify the personality types and traits of the students who participated and also to identify one measure of their cognitive tempo. The data in this study was collected using three online instruments and by follow-up interviews via email.

Illinois Virtual High School Sample

Forty-three students participated in this study however, not all of the 43 students completed all three instruments. Forty-three students completed Part I (The Long-Dziuban Reactive Behavioral Survey), and Part 2 (The Questionnaire). Thirty-nine students completed Part 3 (The MFFT-20). Data was gathered over a period of approximately five months during the spring of 2006. The sample for this study was students who were enrolled in the Illinois Virtual High School during the spring semester of 2006.

Demographic Data

Of the 43 students who participated in this study, 31 were female, 11 were male, and one student omitted their gender. The median age in this sample was 17 years and the median grade level completed was 11th grade. The students ranged from 13 to 20 years of age.

Table 5: Grade Level Completed

Grade	n	%
9th grade	2	4
10th grade	11	26
11th grade	22	51
12th grade	7	16
Not answered	1	2
Total	43	

This was the first online class for 42% of the students in this study and 93% were concurrently enrolled in Illinois public schools.

Table 6: Number of Previous Courses

Courses Taken	n	%
First enrollment	18	42
Completed 1 online course	13	30
Completed 2 online courses	7	16
Completed 3 online courses	2	5
Completed 4 or more online courses	3	7
Total	43	

Research Question 1

How will the scores of 9th grade high school students who are enrolled in online courses, be different from 9th grade students enrolled in traditional face-to-face courses as measured by the Matching Familiar Figures Test-20?

Of the 43 students who participated in this study, only two were enrolled in ninth grade. In addition, only 39 of these students completed the MFFT-20 and only one of these students was enrolled in 9th grade. No meaningful comparison could be made to any other 9th grade students when only one student took the MFFT-20. This research question could not be answered based on the data collected.

During the spring 2006 semester, the Illinois Virtual High School had 1,233 requests for course enrollments. During that time, the school filled all of these requests. Of those enrolled in IVHS, 1,018 students provided information about their grade level. Of those students who provided data, 67 students (6%) indicated they were enrolled in 9th grade. As a comparison, in an average high school the enrollment of 9th grade students usually exceeds that of the enrollment of either 11th or 12th grades. It was not clear why more 9th grade students did not participate.

Although there was a lack of 9th graders who volunteered to participate in this study, we subsequently explored the research and determined to combine the MFFT-20 results in this study and compare them with the results of two other studies for several reasons. First, Long (1985) defined adolescence not so much by chronological age but as a phase of ambivalence, potentially spanning from 13 to 20 years of age. Long explained adolescents phase of ambivalence this way:

> If there is a single definition of adolescence, it is ambivalence; that is, the coincident existence of conflicting feelings at any given point in time. At this time in life, these young people are seeking independence, but are retaining some of their dependency on parents and other authority figures and are making the transition between childhood and adulthood…. (p. 67)

All of the students in this sample were enrolled in high schools or taking high school courses. It may not be salient to restrict a comparison of the data collected in this study to one particular grade level. In each grade level in a typical high school, there is a variety of ages enrolled. Secondly, although Cairns & Cammock (1984) noted that the number of errors and latency in the MFFT-20 is mitigated by age they stated that students' scores seemed to stabilize around 12 years of age. Young children have demonstrated to be more impulsive than older children are. Finally, other studies have also grouped adults and adolescents regardless of age (Young, 2004) and Brumby (as cited in Green, 1985) posited that with regard to cognitive style, an individual's cognitive style is stable across situations and time. In this study, the median

latency for the MFFT-20 was 7.58 seconds and the median number of errors was 10. In this administration of the MFFT-20, the reliability for latency was .765 and the reliability for errors was .839. Table 7 provides the results for all the students who took the MFFT-20 regardless of grade level.

Kenny (in press; 2002) administered a computer based version of the MFFT-20 with 9th grade students. He found the medians for latency and errors had decreased from earlier administrations of this test with approximately the same age group. This study found similar results: a decrease in the medium number of errors and latency. Table 7 summarizes the medians for latency and errors for the current study and for two other administrations of the MFFT-20. Latency was the number of seconds before a student made their first guess for the matching picture.

Table 7: MFFT-20 results over time

Cairns & Cammock (1984) Paper & Pencil administration	Scheick (2006) Online administration	Kenny (in press) Computer-based administration
Median Latency: 13.4 Median Errors: 18.84 Age: 12	Median Latency: 7.58 Median Errors: 10 9th – 12th Grades	Median Latency: 9.2 Median Errors: 11 9th Grade
n=100	n=39	n=204

Research Question 2

What were the behavioral types and traits of the students enrolled in online courses as measured by the Long-Dziuban Reactive Behavior Scale?

Long Dziuban Personality Types

Forty-three students completed the Long-Dziuban Reactive Behavior Survey. In this survey, students were instructed to choose one personality type they felt best represented them the majority of the time (See Appendix L). The data revealed that the students in this study predominately identified themselves as the Aggressive Dependent personality type and the second most common type was Passive Independent. Table 8 illustrates the results of the student sample from the Long Dziuban Reactive Behavior Survey.

Table 8: IVHS Student Results of Personality Types

Personality type	n	%
Aggressive Dependent	30	70
Passive Independent	8	19
Passive Dependent	3	7
Aggressive Independent	2	5
Total	43	

Long Dziuban Personality Traits

The adolescent students in this study primarily reported Compulsive and Phobic traits with greater frequency than Impulsive or Hysteric.

Table 9: Long Dziuban Personality Traits

Trait	n	%
Phobic	23	53
Compulsive	14	33
Hysteric	5	12
Impulsive	1	2
Total	43	

Students were instructed to choose as many traits as apply. Forty-two percent of students identified themselves as having only one trait, with 37% reporting two traits.

Table 10: Frequency of Traits Selected

Number of traits identified	n	%
1 trait	18	42
2 traits	16	37
3 traits	8	19
4 traits	1	2
Total	43	

The findings in this study support results of previous studies that reported that the ratio of Aggressive Dependent personality types is found with greater frequency in online learning environments than in traditional face-to-face classrooms.

Table 11: Long-Dziuban Reactive Behavior Survey Personality Types and Traits

	High School Gifted Students	Cincinnati Virtual High School students	University of Central Florida's online students	Illinois Virtual High School students
LD Personality types and traits	Cioffi (1995)	Geary (2003)	Dziuban, Moskal & Dziuban (2000)	Scheick (2006)
Aggressive-Independent	10%	31%	23%	5%
Passive Independent	5%	17%	12%	19%
Aggressive-Dependent	81%	41%	60%	70%
Passive-Dependent	4%	12%	5%	7%
Compulsive	60%	32%	72%	33%
Phobic	11%	7%	26%	53%
Hysteric	31%	13%	25%	12%
Impulsive	12%	7%	13%	2%
Total	n=100	n=108	n=381	n=43

Research Question 3

Was there a significant difference in grades based on the student's scores on the MFFT-20 and the Long-Dziuban Reactive Behavioral Scale?

Answering this research question as to whether or not there was a significant difference in grades based on personality type and their scores on the MFFT-20, was problematic due to inconsistencies in the self-reported data information regarding their current course grades and the small sample size.

In Part 2 of this study, students were asked to estimate their current course letter grade and their numeric grade on the Questionnaire (See Appendix M for full questionnaire). These questions were:

- Question 7: If you have completed the online course, you are currently enrolled in what grade did you receive?
- Question 8: If you have completed the online course you are currently enrolled in, what would you estimate is your numeric grade? (i.e. 85pts)
- Question 9: If you have NOT completed your course at this time, what is your best estimate of your grade?

Letter Grades

The responses to questions seven and nine were inconsistent. Not all of the students provided responses to these questions and some of the responses were difficult to interpret. Twenty-six of the 43 students provided a letter grade in response to Question 7. The responses varied widely. One student stated that she had an “A-ish grade.” Another student said he had earned “A’s and B’s.” One stated she had “close to a D.”

Numeric Grades

Only 19 students entered a numeric grade in response to Question 8. A few students entered the number of points they had earned in their course but not how many total points were in the course, therefore making any meaningful comparison impossible. Some students indicated their responses in percentages; they stated they had 97% in the course but without any reference to scale.

Part 2 contained questions that requested for students to provide their grade point average in school. Forty-one students provided their grade point average (GPA). Grade point average is also considered an indicator of a student's academic progress in school. Because insufficient information was provided about the student's numeric grades, the students' grade point average was used to see if there was a significant difference in grade point averages based on the student's scores on the MFFT-20 and the Long Dziuban Reactive Behavior Scale. No significant difference was found (F_{39} =.54 p > .05). The results of the ANOVA calculation are listed in Table 12. There were inconsistencies noted in the grade point averages' data provided by the students leading the researcher to consider that the result of no significant difference may not be accurate.

Table 12: ANOVA Calculation

Source	df	Mean Square	F
Corrected Model	9	.21	.95
Intercept	1	152.35	696.22**
MFFT	3	.18	.83
LD_PerType	3	.42	1.91
MFFT * LD_PerType	3	.12	.54
Error	28	.22	

Note: *p<.05, *p<.01

In this study, the self-reported GPA was suspect in at least two cases; the students provided inconsistent reports leading the researcher to conclude that some of the information might not be accurate. One student indicated an overall 4.0 GPA, yet also stated in the last class enrolled in at IVHS a C was earned and the best estimate for a current course grade enrollment was a B. If a student previously received a C for a course grade, a 4.0 GPA is impossible. A 4.0 GPA in the United States is indicative that a student received all A's in previous coursework.

In addition to inconsistent data, and the small sample size, an analysis of variance assumes that the underlying distribution of categories will be balanced. Table 13 provided the results from a Crosstabs analysis of the scores of the MFFT-20 and the Long-Dziuban Reactive Behavior Survey. The results illustrated the unbalanced design of the categories. In this study, the majority of students were identified as Aggressive Dependent on the Long Dziuban (LD) Reactive Behavior Survey and the MFFT scores the students' scores placed them in the Fast-Accurate or Slow-Inaccurate categories.

Table 13: Crosstab of MFFT-20 and LD Personality Type

	Long Dziuban Personality Type				
MFFT	AI	PI	AD	PD	Total
Impulsive	0	1	5	0	6
Slow-Inaccurate	0	2	9	2	13
Fast-Accurate	0	4	8	1	13
Reflective	1	0	6	0	7
Total	1	7	28	3	39

Note:
AI-Aggressive Independent
PI-Passive Independent
AG-Aggressive Dependent
PD-Passive Dependent

Due to these mitigating factors, the researcher was unable to confidently answer this research question based on the small sample size, uneven distribution of the scores, and the potentially unreliable data (numeric grades and estimated grade point averages).

Research Question 4

What were the factors that influenced the student's choice to enroll in an online course?

Two questions in Part 2 related to this research question regarding factors that influenced the student's decision to seek enrollment in IVHS. The first was "How did you hear about the online course?" The second question was "Why did you decide to enroll in an online course?" Forty-two students responded to both questions.

How Did You Hear About IVHS?

Gaining information on how students heard about IVHS was important for two reasons. If students were not aware of IVHS they obviously cannot enroll. Typically, school counselors and teachers assist students in planning their academic schedules. An additional reason for asking students how they became aware of IVHS is that who is informing them about online learning might influence why students enroll. In this study, the two primary ways the students reported learning about IVHS was from their schools and peers. Ninety-three percent of the sample attended local public schools, so public schools played an important part for the majority of the students as to how they heard about IVHS. Table 14 reveals the students' responses.

Table 14: How Students Heard About IVHS

How students were most likely to hear about IVHS	n	%
School	27	64
Peers	12	29
Parents	2	5
Internet	1	2
Total	42	

Students frequently mentioned hearing about IVHS from more than one source. One student commented that they heard about IVHS, "Through my friends who have taken IVHS in the past and by school announcements." Two students said they heard about IVHS through their school but did not elaborate as to where or how at their school.

Within their schools, students heard about IVHS from different sources. When the different types of school support for IVHS were broken down (Table 15), again the two primary ways that students were most likely to hear about IVHS were through their guidance counselors and their peers at school.

Table 15: School Support for IVHS

In school, where were students most likely to hear about IVHS		
	n	%
Guidance Counselors	17	40
Peers	12	29
Teachers/Media Specialists	4	10
School (General Comment)	3	7
School course	2	5
Administration	1	2
Total	39	

Deciding To Enroll in an Online Course

Student responses to this question primarily focused on wanting to enroll in a course and adjusting their schedule of classes. Students were interested in the courses offered by IVHS, wanted to enroll in a course that often was not offered at their school, and/or they thought the course might be interesting. The responses that students provided as to why they enrolled in IVHS courses centered on the following topics:

- Interest in the courses offered by IVHS
- Desire to have flexibility with school schedule

- Novelty or Curiosity
- Future
- Conflict with school or personal issues

Some of the student responses included:

"My high school did not offer enough classes. I basically finished everything my junior year in high school."

"I decided to take this course because it was not offered at my high school and I was very interested in different cultures."

Other perspectives from students were that taking online course helped them achieve some flexibility in their schedule for the timing of their learning. One student explained in this way:

> I thought it might be nice to be able to work at my own pace. I also thought it would [sic] interesting to talk to other people from other places who have had different experiences in life than I have, instead of the same people I have always gone to school with. It also has given me an opportunity to take classes that are not offered at my high school.

Some students thought the idea of online learning was interesting or novel. Student comments included:

"Honestly, I really needed to fill up my class list and I heard this was fun."

"I wanted to have a new challenge, and a different teaching method."

"I wanted to try something new and I wanted less classroom time. I thought taking an on-line class would be a lot more convenient."

Students mentioned that they wanted to enroll for a variety of reasons; this was reflected in their statements. After reviewing all of the students' comments, two key themes emerged.

Students sought control over their learning and the timing of their learning. These themes were present throughout many of the student responses to the survey questions in Part 2.

While a student might feel the need or was interested in a course not offered at their school, most of their responses focused on the need to have control over their learning. In other words, students stated they wanted to have control over what they learned and when they learned it. Students who enrolled in online courses could expand their options beyond the brick and mortar buildings. One student explained:

> I have taken them before, so I am already familiar with the environment. I like the variety that online classes offer. I don't have any of these courses offered in my school. It gives me more opportunities for AP courses, and I like doing my work on my own terms.

Scheduling classes to allow maximum flexibility was important to students. A 10th grade student stated, "I choose to take an online course due to scheduling conflicts at my high school and because of the lack of challenging material still available to me." Another student also struggled with his schedule. A student stated, "Due to my busy schedule, including three hours of work during the normal school, I wanted to take an online course in order to free up other periods during the day." For another 11th grade student, his goal was, "I wanted to see if I'm independent enough to deal with doing my work on my own time without having somebody constantly remind me."

In addition, students mentioned concern for their schedules and planning to achieve the maximum benefit for their future. A female 12th grade student stated:

> I was able to advance my class rank by taking an advanced class because it would boost my GPA. Also taking AP classes looks better on college applications. It should be noted that I took this class also because my school didn't offer any other educational classes that would be accounted for towards my GPA during that class period.

Research Question 5

How would the students enrolled in an online course characterize their communication and interaction with other students enrolled in an online course?

Forty-two students answered a question focusing on whether or not they interacted with other students in their course and to describe that interaction. Of those that did indicate a response, 60% said they did interact in their course. One student indicated both yes and no and did not elaborate his response.

Communicating Online

Table 16: Interaction with Other Students in Course

Did you interact with other students in your course?	n	%
Yes	25	60
No	16	38
Invalid	1	2
Total	42	

Twenty-three students provided additional comments about their interaction online. The students discussed the types of interaction and explained that interaction varied by course and the types of assignments the instructor utilized. The communication tools that the students discussed using were chat, discussion boards, email, Elluminate, an online Web conferencing program, and face-to-face discussions. Three students who were enrolled in the same public high school were additionally enrolled in the same online course. They discussed their online course and its assignments with each other during their regular school day.

While students liked the flexibility and pacing of online learning in general, they did seem disappointed by the lack of interaction in some courses and sometimes the lack of quality within that interaction. Six students, 26% described the required discussions were perfunctory.

One student felt, “We have to do a discussion at almost every new lesson. It's a grade.” Another commented, “We have online discussions together, like a forum. It's not nearly as great as having a live discussion.”

Clearly, some students had hoped for more. Some of their comments included:

- “Because I wanted to see how other kids from different schools were [sic] and what made them take the class.”
- “I interacted with students through required class discussions. The quality of the interaction was not very good, and I never felt like I was actually talking to a fellow student.”

Sixty percent of the students stated they did have some form of interaction within their courses and 39% felt they benefited from that communication. The students discussed how they learned from online interaction and it gave them a sense of the course as a class. A 12th grade student explained:

> In some of my classes (course name removed) I did not interact much at all- we simple [sic] had to post in a discussion, once, answering the instructors prompt. But this really wasn’t a discussion at all. I didn't even read any one else's response simply because it wasn't required of us to, in order to answer an instructor-generated question. In (another) course I interacted with students A LOT. Our teacher would give us an opinionated question, in which we were supposed to answer, and then respond to another student. It was so engaging I sometimes posted more than was required because I had actually formed an opinion on something and wanted to prove my way of thinking as the right way. We also had Elluminate meetings, where we used microphones and speakers to introduce ourselves, study, and answer questions together as a class.

A female student described her interaction this way, “It was fun to get to know people from different areas of the state. Also, the interaction was funny at times because we would talk about how far behind we had got, or whatever.” These students enjoyed participating in the interaction and felt they learned more about themselves and others. Another student explained,

> I interacted with others because it gave me a sense of who I was sharing the class with and the similarities or differences of their experiences in the class. I did discussions with other students and read what they had to say about family, death, land, and identity.

Another 11th grader agreed,

> In all four online courses I have taken, I have participated in online discussions on various topics that the whole class would have to first answer to and then respond to a previous post to keep the discussion going. I thought that although the discussions could become somewhat monotonous at first, there were times where another student would think of something I never would have thought of. This sparks an even bigger conversation and analysis of the topic at hand, so I thought the discussions worked well.

Sometimes students found creative ways to interact on their own. One male student stated,

> In my oceanography class me and this guy talked like everyday on the chat thing. We would just talk about what happened that day and talk about the class and how he was so far behind and I was far ahead. It was fun to talk to him.

Students also provided glimpses of their online course interaction in other questions. When asked the question "What did you like the least about the online course?" one student replied, "I didn't like not knowing my classmates or teacher personally." They also struggled with communication online. "It was hard to stay in contact with my teacher…" Sometimes they just reflected on the differences between communication online and face-to-face. One 12th grade female student pointed out, "And sometimes, though there are many ways one is able to interact with students from the class, they are not utilized by the instructor in the course, so there is very little communication, as opposed to actual classes." A 10th grade female student astutely noted, "All of the communication between you and the teacher/peers are written out. My local school has more conflict because their [sic] is more personal interaction, online their [sic] are only words to read."

In general, students in this age group use the Internet for communication. While 60% of the students enrolled in IVHS said there was some sort of interaction in their courses, many students would have liked or possibly expected more quality interaction in their courses. One

student mused, “At my school I must [sic] on projects and class content according to my teacher’s schedules. There is a lot more communication within a class at school than some of my online classes…some of my online classes did have a lot of student-oriented communication and discussion.”

Of course, not everybody agreed that interacting online was important. One student presented a divergent perspective. She felt that not having social interaction allowed her to concentrate more on learning. She stated, “If a student works at their own pace, without the distractions of other students around the class is easier.” Another student stated that while he was amenable to interacting this was not a high priority. “I only interacted with my teacher through e-mailing and dropping off my assignments. I e-mailed my peers twice and I've read their discussion accounts a few times, but mostly, I felt I didn't need too.”

Research Question 6

How would students in an online course characterize their learning and their interaction with the content in that online course?

To obtain a more robust picture of the student’s interaction and characterization of their learning in the course, the researcher asked the following questions in Part 2 (the questionnaire) about the students experience and learning in their online course:

Some students have said that in an online course they have to work harder. Do you agree with that? If so, why do you think this is true? If you do not agree, why not?

What words would you use to describe your experience in this course?

How do you think taking an online course has impacted you?

Is Online More Difficult?

Students, who were enrolled in the Florida Virtual School, stated that online courses were more difficult. Students also describe online courses as more challenging because they are required to read more than in traditional courses, thus increasing the amount of time it takes to review the materials and decipher their assignments.

In this study, 42 students responded to this question with 60% of students saying that they agreed online courses were more difficult (See Table 17).

Table 17: Difficulty of Online Courses

Are online courses harder?	n	%
Yes	25	60
No	16	38
Equal	1	2
Total	42	

The students stated that online courses are harder but interesting and challenging. In most cases, what the students described as hard about online courses was not only the course content but also utilizing time management skills. Students who felt that online courses were harder cited this for a variety of reasons. Six students qualified their yes answers to this question, but only three stated that the actual course was more difficult. One 11th grade student noted, "Yes, I have had to put much more effort into my online class then any of my school classes. There is so much more to do in a shorter amount of time." Another male 10th grade student reflected, "I agree that I had to work a bit harder within the confines of the online course. I know for myself this was true, since I was preparing for an AP Exam and had a lot of material I needed to cover."

Many students qualified their yes and no answers. Even though the majority said it was harder, what the data revealed was students struggled on the handling of the independence and

responsibility of an online class was more challenging than a traditional course. One student, who said online courses were more difficult, qualified his answer this way:

> I agree and disagree. In my opinion it is harder in the fact that you have to motivate yourself to do it and you don't have someone telling you when to do what. It is also easier in some cases because you can work on it when you have time and, if you are like me, I can work through it a lot faster because I don't have to sit through all of the slow lectures.

Even the students, who said an online course was not more difficult, often acknowledged the importance of being self-motivated. This male 12th grade student explained,

> You must be self motivated to begin with and be able to problem solve because sometimes you are on your own. Whenever I ran into problems, I would contact the teacher. I really don't think that the work is harder-you just have to take the responsibility for getting it completed.

Describing an Online Course

Students were asked what words they would use to describe their experience in the course. Forty-one students responded to this question. This open-ended question was designed to allow students to discuss any thoughts they held regarding their online course. The students were remarkably cohesive in their descriptions of their courses. When students were asked to describe their experience in their online course, they most often used the following words or phrases: These words appeared most often.

- Interesting (11)
- Time (10)
- Difficult (7)
- Learn (6)
- Challenging (5)
- Easy (5)

- Fun (5)
- Hard work (5)

Students often combined contradictory adjectives in the same sentences. A student characterized her experience in this way, “Time-consuming, challenging, beneficial, interesting, fun.” Another echoed, “Hard work, a challege [sic], fun and difficult.”

Many students supported the idea that this learning was interesting to them. The most frequently used adjective was interesting. Some of the student comments included:

“Informative, new method of learning, interesting, independent”

- “It was very interesting and a learned quite a bit of information. It provided me with a new interest.”
- “Interesting, fairly easy”
- “Interesting and at times difficult.”

The students mentioned time in various contexts. This suggests that the timing and amount of time involved in their learning was important. A student stated that learning online is, “Very efficient and a good way to take courses that I am interested in or like but I don’t have time for them in my school schedule.” Another student addressed the convenience of learning online, “I would use the words: convenient, challenging, and informative to describe my online course.” A few students used adjectives like tedious and busy work, possibly indicating frustration with the number and types of assignments in their courses.

Impact of an Online Course

The students were also asked how they believed taking an online course had impacted them. This open ended question produced a number of responses, but most of the students stated that the online course had impacted them in the following ways:

- Time-management skills (9)
- Better preparation for college (7)
- Learning (5)
- New perspectives (5)
- Greater independence (5)
- Improved computer skills (3)

Nine students acknowledged that the self-discipline that was necessary to participate in an online course had helped their time-management skills. One female 10th grade student stated, "I think it has made me even more highly-motivated, and I am better at my time management. I can also easily analyze the things that I read because I did a lot [sic] of reading during my course." Another female 11th grade student noted, "I have improved my work habits by being more disciplined."

Another area in which students stated online courses had positively impacted them was in regard to preparing them for college. Several mentioned taking online courses in college and felt that the independence and time management skills would be important when enrolling in online college courses. In addition, two students mentioned that online courses would help them in their future but did not specifically mention college.

Five students specifically explained that what impacted them the most was the learning they had achieved in the process of completing the online course. A female 11th grade student

carefully explained, “It has sparked my interests to several additional topics of study that I might not have otherwise had the chance to explore.” Other students expressed that they felt their online course had helped them to be learners that are more independent. One 11th grade student said, “I think they have help [sic] me to desire to better manage my time and to simply learn more about myself. It has opened my eye just a bit about who I am and who I’m aiming to become.”

Three students stated that they did not believe that the online course had not impacted them very much and one student felt that the online course created more stress.

Follow-Up Interviews

Forty-one students consented to follow interviews. Figure 5 illustrates the students’ strong preference for follow-up interviews to be conducted by email. In addition, while some students indicated that they were amenable to either a phone or an email interview, the researcher contacted students by email.

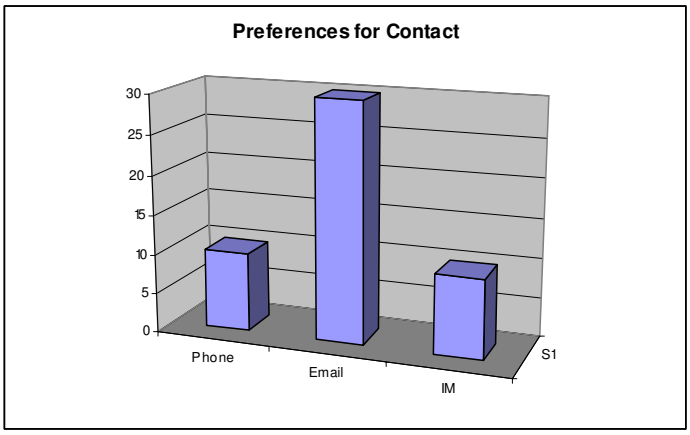


Figure 5: Preferences for Follow-up Interviews

The researcher emailed follow-up questions to all of the forty-one students who said they were willing to be contacted.

Thirty percent of the students in 10th, 11th, and 12th grades said they believed that taking an online course was good preparation for college and/or their future.

The researcher asked the students several questions. The questions were:

"Some students mentioned that they thought an online class was a good thing to help them get ready for college. Would you agree with that? Why do you think they said that?'

"How would you say taking online classes have helped you?'

Do you remember if you were doing anything else while you were taking the Matching Familiar Figures test?

Twelve students responded. Eleven by email and one by AOL's instant messaging program. Four students emailed back more than once. The students in the follow-up conversations reiterated through email that they believed online learning helped them prepare for college by working independently, and in a timely manner. One student said she wrote more papers in her online course than she did in her regular high school classes. Two students did not believe that their experience with online courses had helped them all that much.

One student commented:

> I do think that an online class is a good way to get ready for college, since you have to make the effort to teach yourself and do the homework on your own, but it is not something all people can do. They may have said this because that is how they may learn best by teaching themselves at the moment, but some may have struggled due they need someone to teach them before they can go thru and understand the material.

This student also described how she felt online learning had helped her.

> They have helped me realize that I really can learn on my own and that I really enjoy my time more when I can do it on my own. I can work at my own pace and spend time on stuff when I need it and when I dont [sic].

Overall, the students characterized their learning in online courses in positive terms. The students sought to enroll in online courses to gain control over what the learned and when they

learned it. They described the courses as hard work and challenging but one in which they learned a great deal. Students did interact with other students in their online courses but would have like more interaction both related to the course content interaction with other students.

Additional Findings

Requiring Online Learning

Students were asked if they thought it was good idea to require that all students complete an online course as a graduation requirement. Sixty-three percent said this should not be a requirement (See Table 18). They felt that while this was a positive experienced for them, this should not be a requirement for all students for a variety of reasons.

Table 18: Online Graduation Requirement

Do you think every high school student should take an online course as part of his or her high school requirements?		
	n	%
No	26	63
Yes	13	32
Maybe	2	5
Total	41	

Some students felt that many students are not independent enough to learn online and there is so much work involved that it would be unfair to make this a requirement for all students. One student added this additional thought:

> No, I don't think every student should [*sic*]this type of class because most of them can't handle the responsibility of completing assignments on their own and getting them in by a certain date. Most students would fail an online course because they would blow the entire thing off. Also, most schools don't have enough computers to allow people to take an IVHS course and that state shouldn't require students to take a course outside of school.

Thirty-two percent disagreed. The students, who said yes, argued that online learning was good preparation for their future and college. They also felt that online learning offered students more course options. Another student explained that the reason she felt that online learning should be a requirement was because it will teach students something about themselves. One student concluded, “Yes, because it will show them that it is their responsibility to stay focused on their work when there isn't a teacher to tell you.”

Summary

Chapter Four provides an analysis of the data collected from three online instruments that were used to collect the data in this study of virtual high school students. The three online instruments that were used to collect the data were the Long-Dziuban Reactive Behavior Survey, a questionnaire of open-ended and demographic questions, and the Matching Familiar Figures Test-20. Data were analyzed to answer the six research questions presented in this study. The research questions were formulated to provide insight into the experiences of adolescents students who enroll in online classes as well as to identify one measure of their cognitive style and personality type and traits. Chapter 5 will interpret these findings and recommend further research.

CHAPTER FIVE
SUMMARY, DISCUSSION AND CONCLUSION

Summary

This study described the experiences of students who enrolled in online courses at the Illinois Virtual High School and identified the personality types and traits of these students and analyzed their cognitive style: their Reflective or Impulsive reactions. This study utilized both quantitative and qualitative research methods for gathering data and analysis.

Forty-three students completed one or more online instruments: The Long Dziuban Reactive Behavioral Survey, the Matching Familiar Figures Test (MFFT-20) and a questionnaire of open-ended questions about student experiences while enrolled in online courses. In addition, twelve students participated in follow-up interviews by email or instant message.

Discussion

Research Question 1

How will the scores of 9th grade students who are enrolled in online courses differ from 9th grade students enrolled in traditional face-to-face courses as measured by the Matching Familiar Figures Test-20 (MFFT-20)?

This question could not be answered as stated due to the low participation from 9th grade students. Only two 9th grade students participated in this research study. There were 67 students enrolled in IVHS courses who stated they were in 9th grade. Enrollment at the 9th grade level in IVHS was much lower than enrollment in a typical public high school where traditionally 9th grade students outnumber the 12th grade students.

Even though the question posed could not be answered, it was not clear why there was such low participation from 9th grade students in this study. Several mitigating factors may have influenced the lack of participation from 9th grade students and the low enrollment in IVHS. Typically, 9th grade students may not have the flexibility in their current high school program of study to enroll in any courses outside of their local public high school. Also, 9th grade students may still be exploring their personal curricular interests at their high school level and they are usually not yet eligible to enroll in Advanced Placement program courses or need to take a course for credit recovery.

Students, who participated in this study, were offered some compensation for their time. Receiving extra credit points was highly motivating for students to participate in this study. Yet, teachers who offered the extra credit points were not just the Advanced Placement or other upper division courses, but other instructors such as Algebra I and Beginning HTML also offered this opportunity. Many of the courses were open to all grade levels.

Since so few 9th grade students participated, the researcher combined the data collected from the MFFT-20, for all grade levels. This seemed appropriate due to the small sample size and the scores for latency and errors scores stabilize for older children and adults (Young, 2004, Cairns & Cammock, 1984; 1978a). In this study, the data collected from the MFFT-20 was compared to previous administrations of this instrument on related age groups. Kenny (in press; 2002) posited that the medians for latency and errors were decreasing over time. In this study, the medians for latency and errors were lower in this administration of the MFFT-20. Table 7 illustrated that the students in this study, fewer more errors (*Mdn*=10) than what Kenny found (*Mdn* =11), yet the numbers are similar in range and these numbers are significantly less errors than what Cairns and Cammock found in their study (*Mdn* =28-30).

The results of this study were inconclusive yet suggestive as to whether or not the medians are decreasing over time. Millennial students may be faster at processing visual information with fewer errors. More research is needed in this area. There does seem to be a trend in this direction and this could have implications for students enrolled in virtual high school courses. One implication is that more information or content could be presented to students graphically. This could include but not limited to videos, graphics, and animated tutorials. Kenny (2002) noted, "Students appear to be developing a propensity for remembering things from rapid visual presentation" (p.127).

Research Question 2

What were the behavioral types and traits of the students enrolled in online courses as measured by the Long Dziuban Reactive Behavior Survey?

Seventy percent of the students in this sample were classified as Aggressive Dependent (AD). This finding is consistent with previous research suggesting that students who are AD are overrepresented in online courses perhaps suggesting an attraction to online learning to increase their academic success (Dziuban, Moskel, & Dziuban, 2000). In a traditional school setting, one would expect to find that AD students would represent between 25%-35% of the population (Chin-Onn, 2000, Dziuban, 1996). Typically, AD students are academically successful students in both traditional and online environments in part due to their desire to please others.

Aggressive Dependents are sometimes academically gifted or advanced students. Cioffi (1995) noted that in academically gifted or in Advanced Placement courses, 81% of the students were classified as Aggressive Dependent. In this study, 70% of the students were Aggressive Dependent. Many of the students were enrolled in Advanced Placement courses. Because some of the students listed all of the courses they were taking that semester, it was not possible to

ascertain exactly how many were enrolled in the online or traditional AP courses. Yet, it seems clear that some of these students could have been academically gifted as well.

The student comments in this study were consistent with the typical profile of Aggressive Dependent students. They were typically achievement oriented and set high goals for themselves. They expressed a desire to achieve academically by increasing their grade point averages and preparing for college. It was not surprising to note that 93% of the students in this study were also enrolled in public schools as well as IVHS potentially creating additional stress for students. A few students stated that they did experience stress due to the responsibility of juggling enrollment in two schools. Ascertaining how many students were enrolled in a full course load at their high school and were additionally enrolled in IVHS was beyond the scope of this study. A few students did allude to the fact that their schools allow them a free period to go to their Media Center to work on their class. Aggressive Dependent students are energetic and are known to place undue pressure on themselves to achieve.

Students who were classified as Passive Independents represented 19% of the sample in this study. Passive Independent students have lower energy levels but are very independent. Long (1985), described how Passive Independent are not driven by approval and when pressure is applied to these students, they can become stubborn and withdrawn. In reviewing why these students enrolled in online courses, it was evident that they also wanted flexibility over their personal and school schedules and in some cases wanted advanced courses to accelerate their academic progress. These reasons were very similar to the reasons that Aggressive Dependent students stated.

Interestingly, the students who chose Passive Independent as their personality type primarily choose either compulsive or phobic or both for their ancillary traits. This may suggest

that their cautious, reflective, organized traits influence their personality type in such a way that benefits their academic progress in online courses. A student who is independent, organized, and cautious could be academically successful in an online environment. Students who were classified as Passive Dependent and Aggressive Independent were significantly underrepresented compared to previous research of traditional school populations.

The most common ancillary traits represented in this study, were compulsive and phobic. This too, was similar to other research findings of gifted and online students. Compulsive students are typically very organized and meticulous. Phobic students are cautious, reflective, and careful thinkers. These are characteristics that may be beneficial for students in the online environment. Students in the online environment do not have as many external cues to remind them of assignments, so the more organized (compulsive) and concerned about their progress (phobic) the students are the more potentially successful they might be.

If access to online learning is to be encouraged and equitable for all students then some thought should be given to develop policies and strategies to support students of varying personality types and academic abilities. This could be critically important if an online learning experience becomes a high school graduation requirement for all students. Even if enrollment in online courses is not required, many schools may encourage enrollment in online courses because students may not have access to some courses in their local schools. Additionally, students may seek enrollment in online courses simply because it is their only option. This information could be very helpful for teachers and students to know which types of personalities are enrolled in their class. These personality types will typically have different reactions to different policies in the online high schools. Identifying a student's personality type can assist the instructor with an understanding what kinds of challenges they and their students face

(Young & Dziuban, 2000, Long, 1986). Both the Passive and Aggressive Independent personality types are typically unconcerned with pleasing the instructor. It may be that allowing these students more choices within the types of assignments and using flexible due dates could be a way to give them more control and take responsibility for their learning. Perhaps informing students which type of personality they have identified will also aid in student awareness of what types of challenges they face in an online environment.

All personality types benefit from frequent communication from the instructor and opportunities to interact with other students but for different reasons. The Passive Dependent and Aggressive Dependent students thrive on encouragement and interaction. In reviewing the comments made by the students, Aggressive Dependent students in particular were more interested in increased communication with the instructor and other students. Students who are Passive Independents may resist more communication; however, the communication can simply be an opportunity for both the teacher and student to get to know each other. Passive Independents are not likely to email to ask questions, but they might ask for assistance if the instructor initiates the communication. Some students in this study did recognize that even though they were resistant to teacher communication, they recognized that they needed this at times in the online environment.

Research Question 3

Was there a difference in grades based on the student's scores on the MFFT-20 and the Long Dziuban Reactive Behavior Survey?

Answering this research question was problematic due to the small sample size and other factors. A one-way ANOVA showed no statistically significant difference, but that may not be a valid result. A Crosstab analysis of this sample highlighted that the students were not evenly

distributed among the four categories in each of the MFFT-20 and the Long Dziuban Reactive Behavior Survey, which created an unbalanced design. Additionally, not enough students reported numeric grades. Most of the students did provide their grade point averages yet; there was suspect reporting of some students' grade point averages. Due to the small sample size, the unbalanced categories in the MFFT-20 and the Long Dziuban, and the potentially inaccurate grade point averages, the results of an ANOVA could have yielded a potentially invalid result. While the research question could not be answered as stated, the data from the Cross tabulation yielded other insights.

Matching Familiar Figures Test Results

In a general population of high school students, one would expect to see a more even distribution of students within the four categories of the MFFT-20 than was found in this study. A Chi Square test of frequency (Table 19) illustrated that most of the students who enrolled were categorized as Slow-Inaccurates or Fast-Accurates. These two categories comprise 64% of the sample. This finding was unexpected. While Dziuban, Moskal & Dziuban (2000), posited that Aggressive Dependent students were more attracted to online learning, no one has suggested that perhaps some categories of cognitive tempo might be more attracted to online learning as well.

Seventy percent of the students in this study were identified as Aggressive Dependent. In the AD group, the researcher also noted that here too, are the largest concentrations of the other categories of cognitive style as measured by the MFFT-20. Of those students who were defined as Aggressive Dependent, there are also the largest concentrations of students who were Fast-Accurates or Slow-Inaccurates. In other words, more students who were Fast-Accurates were more likely to be Aggressive Dependent than Passive Independent. Finding a larger concentration of Aggressive Dependent personality types in this online sample was consistent

with other research; yet, within this category of Aggressive Dependent were students who represent differing cognitive tempos. These students were interested and motivated to learn online, but differed greatly, in the way that they processed decision making skills. Cognitive style is one way students process visual information and their reaction to it. During the follow up interviews, some students stated they were unable to remember if they were multi-tasking while completing the MFFT-20; it is possible that even more students are Reflective than are Slow-Inaccurates.

Table 19: Chi Square Test of Frequency

MFFT Results for IVHS Students	Observed n	Expected n	Actual
Impulsive	6	9.5	-4.5
Slow-Inaccurate	12	9.5	2.5
Fast-Accurate	13	9.5	3.5
Reflective	8	9.5	-1.5
Total	39		

Table 20 presents a more typical distribution of cognitive styles found in the general school population. Here, in these studies Impulsive and Reflective students averaged 63% and 76% respectively. Reuchlin (1991) estimated that 70% of the population is classified as either Impulsive or Reflective. In this sample, 36% are categorized as Impulsive or Reflective and 64% are categorized as Slow-Inaccurate or Fast-Accurate. This finding is unusual. Many studies only consider the categories Impulsive and Reflective. The other two categories are discarded and yet they seem disproportionately represented in these online courses. Yet, in online courses, students may find that online courses allow them to process information and make decisions more congruent with their cognitive tempo.

Table 20: Matching Familiar Figures Test Results from Traditional Classrooms

MFFT Categories	Kenny (in press)	Rozencwajg & Corroyer, 2005
Fast-Accurate	38	5
Reflective	64	16
Impulsive	65	16
Slow-Inaccurate	37	5
Total	n=204	n=42

To encourage students' academic success in online courses, reviewing both personality type and cognitive style are helpful to illustrate potential behavioral combinations and policies that may facilitate academic success. The categories defined by the MFFT-20 are constructs of one measure of a student's cognitive tempo. In this study, identifying whether a student is Impulsive or Reflective was in part a measure of their decision making strategies. Impulsive students make decisions more quickly than Reflective students and are more likely to err. In contrast, Slow-Inaccurate students are also likely to make more errors but also are slow to react to the information they are presented. In the online environment, a Slow-Inaccurate student is likely to want more time to complete assignments and like Reflective students, they may require more time to think and read through the information and want more time to complete the assignments.

The students who were Aggressive Dependents students were also classified as Impulsive by the MFFT-20. They were likely to begin assignments quickly without necessarily understanding the full scope of their task. They were likely to make a high number of errors in the assignment. Yet, as they are Aggressive Dependent, they were concerned about their grades and want to succeed academically. A policy that may help all students who are either Impulsive

or Slow-Inaccurate learners is to allow them to resubmit some assignments after receiving feedback from the instructors for an improved grade.

Collecting MFFT-20 Data Online

Some interesting lessons were learned about computer based and online testing in this study. In the researcher's endeavor to make certain to replicate the paper and pencil test as exactly as possible, explicit directions for the students were not included about the timing of the test. The administration directions for the MFFT-20 do not include telling the subject they are being timed. Students who took the paper and pencil test implicitly knew they were being timed because one of the examiners used a stop watch. In this online administration, the students did not have any way of knowing that they were being timed and that speed mattered. In examining the data for the MFFT-20, there were three significant outliers for students who classified as Slow-Inaccurate. These students took more than four or five times longer to match some of the pictures than other slow-inaccurate students. These outliers did not affect the results for the other students since the medians for latency and errors are used to establish the dividing lines for the categories. As a precaution, the researcher removed the outliers, recalculated the dividing medians for this group, and then compared the medians for both latency and errors and none of the students would have placed in another category if the outliers were included. Three of the students who scored a large number of errors and took a long time to complete the MFFT-20 may not necessarily be Slow-Inaccurate students; they could potentially be Impulsive or Reflective.

In the follow-up interviews, the researcher asked the students if they remember what they were doing while taking the MFFT-20. Two of the outliers mentioned they were probably multitasking while taking the test, the third student did not respond. Many of the students

confirmed that they did not realize that the test was one where timing mattered. In future administrations of this online instrument the directions need to be revised. This is an ongoing challenge of online testing. The researchers or administrators are not able to solely control the testing environment.

The students' behaviors while completing these instruments are indicative of what we know anecdotally and from research about their online behaviors and attitudes. Adolescent students are digital natives; multitasking, multisensory, and active while using digital devices. Multitasking may not always be beneficial for them but it is typical behavior. Students, who are digital natives, are accustomed to learning while completing other tasks. Digital Immigrants prefer to focus on one task at a time. One student said she could not remember what she was doing while she took the MFFT-20, but she said she was probably doing other things as well.

Researcher Bracketing Discussion

The process of bracketing proved to be especially helpful in the data analysis of this study. This was the researcher's first study using the methodology of bracketing her experiences before analyzing any of the qualitative data. After working through the arduous process of writing out all of her experiences with online learning, the researcher became more aware of how positive her experiences have been, in spite of some minor frustrations. Summarizing these experiences in the methodology chapter was beneficial in bringing to the forefront her beliefs and an awareness of how these might influence her during the process of analyzing the data. Most of the students in this study were very positive about their experiences with online learning. Only two students expressed some ambivalence about their online experience. This initial finding of the students' describing online learning in positive terms caused the research to carefully review the data, in an attempt to avoid as much bias as humanly possible. The process

of bracketing worked as an effective methodological tool to sift through the qualitative data, since the researcher was able to recognize and set aside any conscious personal bias before and during the process of data analysis.

Research Question 4

What are the factors that influenced the student's choice to enroll in an online course?

Students stated a variety of personal reasons for wanting to enroll in an online course. All but two students were enthusiastic about enrolling in IVHS. Enrollment in the school was not always easy. In one of the follow-up interviews, one student mentioned that he had to pay for the course himself, as his school refused. Two students enrolled in IVHS for personal reasons and their willingness to enroll sounded tentative. One student had personal and health issues that influenced the decision to enroll however; this 11th grader's enthusiasm for online learning was tepid.

The responses that students provided in regard to why they enrolled in IVHS courses centered on the following topics:

- Interest in the courses offered by IVHS
- Desire to adjust and have flexibility with school schedule
- Novelty or Curiosity
- Preparation for their future
- Conflict with school or personal issues

Since 70% of the students classified themselves as Aggressive Dependent, the reasons given for wanting to enroll in the virtual school were typical of this personality type. It was not surprising then, to review their reasons for enrollment and overlay the predominant personality type. Aggressive Dependents are energetic, want to please, set high goals for themselves, and

value their academic progress, however, beyond personality type; timing of their learning was mentioned more frequently than any other reason. This may be suggesting that cognitive tempo is working in conjunction with personality type in terms of who is willing to enroll and what they liked best in online courses.

Timing of Learning

Although students stated different reasons for enrollment, when analyzing their comments a common theme was evident. Whatever their personality type, students indicated a desire to try to organize their courses, their school or personal schedules to fit their needs and allow them to achieve academic success. Some students implied that academic success was completing an interesting course; others wanted to increase their grade point averages by completing online advanced placement courses. Additionally, many of the students also mentioned timing as a factor in choosing to enroll in an online course. They expressed a desire to mediate the timing of their learning and sometimes this was in the context of their schedules and sometimes not. Students discussed how they liked online courses because the student could "Being able to work on it when I please." and another stated they liked online courses because they allowed them to learn "on their own terms." Still, one 11th grade female student put it this way:

> It offers subjects that I'm interested in that are not offered at school, and I can do tasks on my own terms. I like the flexibility because I can deal with it. This year was an exception because of other events in my life that slowed me down, but up to this point in my life I have always been self-motivated and I know that I always will be. IVHS gives me the chance to put that to good use.

Pacing Options

Virtual high schools offer pacing options to support and encourage students to finish their courses. The Florida Virtual School has been a trend setter in this area by providing three different pacing options for students: Accelerated, traditional or extended. When FLVS students begin a course, they are required to choose a pacing option. Pacing options also allow schools to extend flexibility to students in assisting them to complete a course. In many cases, students who are enrolled in virtual high schools have a myriad of other academic, employment or other obligations. They may underestimate how much time it would take to complete an online course or have other impediments that prevent them from finishing during a traditional semester. Additionally, course completion rates are important to some virtual high schools as they receive state funding based on the student completion rate.

From the students' perspective, they may be seeking pacing options that support their cognitive tempo. This was true for all categories identified by the MFFT-20 but for different reasons. An online high school could be an excellent option for a Passive Independent student who measures as a Fast-Accurate learner. There were four students (10%) who fit the category in this study. This student likes working independently, can do so quickly, and is likely to be accurate in their work. An online course gives them more control over their schedule and frees them from classroom constraints. Independent students mentioned their desire for more control over the timing of their learning repeatedly in the qualitative data. One Passive Independent student, when asked what he liked best about an online course, stated, "That I can move at my own pace." One note of caution; a Passive Independent student has to want to enroll in an online course. This category of student can be an underachiever and this is especially true when they have not independently chosen to participate in an activity. Requiring online learning for all

students could be very challenging for teachers, parents, and administrators when working with this particular personality style.

Students enrolled in IVHS were represented in all categories defined by the MFFT-20. The results from this instrument and the qualitative data suggest that all students enrolled in online courses thrive with different pacing options. A Reflective learner requires more time to process information than a Fast-Accurate learner, yet both are students that are likely to turn in high quality work. A policy that might be important for online high schools is to allow all students to choose pacing options for not only their pace through a course but allowing flexible due dates for assignments within the course. Requiring flexible due dates is not so much about accepting late work as it is allowing students to work at a cognitive tempo that is comfortable for them. This may increase the students' satisfaction in the course as well as scaffold them towards academic success.

In this study, students who were classified as Fast-Accurates represented 33% of the sample. These students may find the pace of traditional classrooms frustrating. In a face-to-face classroom, generally, one pace fits all. The qualitative responses of these students really focused on the students wanting to control the pacing and timing of their learning, which, they have in an online course. In most cases, they stated that this was the best part about learning online.

Most students access computers at home. Students may be more attracted to online learning because it gives them more control over the pacing of their learning. Learning at home allows them to work at a pace that is comfortable for their cognitive tempo and allows them to multitask. The qualitative data supported the assertion, that the students wanted more control and had more control over the timing of their learning. However, students found enrolling in online classes challenging due to the self-discipline and maturity required to manage their time

appropriately. This too, is not surprising because they are adolescents and maturing at different rates.

Research Question 5

How would the students enrolled in an online course characterize their communication and interaction with other students enrolled in an online course?

In general, while students liked the flexibility and pacing of online learning, they did seem disappointed by the lack of interaction in some courses and in a few cases the lack of quality within that interaction. Overall, students wanted more interaction with each other and with their instructor. This finding may have been because the majority of students categorized themselves as Aggressive Dependent, however not all of the students who stated they wanted more interaction were Aggressive Dependent. Some students expressed surprise that an online course did not provide the same types of casual interaction that a classroom allows. Students explained that they missed knowing more about their instructor and other students. Others expressed surprise that course discussions were either not evident or limited in content. Again, students expressed disappointment when comparing online discussions with classroom discussions, overall, the students felt they had not benefited as much from the online ones as they do the face-to-face discussions. For those who stated they had meaningful online discussions, they felt they had learned more and enjoyed the discussions. This may be that both the students and instructors are still experimenting and trying to find a balance of providing opportunities for interaction and discussion both relating to the course content and occasions for informal socialization.

From the qualitative comments, the researcher noted that some students were interested in and engaged by the online discussions in their courses. The amount of discussion and

interaction within the course might have been related to the course topic. Students mentioned that most courses incorporated some form of discussion. In certain courses like Anthropology, adding group discussions would be appropriate and the course topics lend themselves to this. An Algebra I instructor might find it much more difficult for to incorporate meaningful discussion into that course.

For most students this was their first experience in an online course. It was not surprising that students compared their online and classroom experiences. Generally, adolescents are social and value input from peer groups. Students stating that they wanted meaningful online discussions and opportunities for social interaction were also not surprising. Adolescents seek communication and view the Internet as an important communication tool for them. It may be important for an online instructor to consider ways to encourage general interaction among students within their courses and also to seek to find ways to join some of those online conversations. When students were asked what they did not like about online learning, the majority of comments stated they missed getting to know their instructor and other students.

Again, the predominant personality type answering this question was Aggressive Dependent. This personality type is interesting in social interactions and in pleasing people. So, it would not be surprising that these students would be interested in social interaction. The instructors who teach online courses should experiment with the many different forms of communication tools that are available and used regularly by this age group to see which ones are beneficial for increasing the amount of class communication between the students and instructor.

Research Question 6

How would student enrolled in an online course characterize their learning and their interaction with the content in that online course?

Students reported that online classes were harder but it was not necessarily the content that was more challenging. For many what was challenging was managing their time. While they were enthusiastic about the freedom and flexibility of online courses, some struggled with managing their time and pacing themselves within the course. Some courses had flexible due dates and/or accepted late work, some students found this to be blessing and a curse. One female student explained it this way:

> …my other school is all about the deadlines, and here we have to whole semester to do this class, and if we really wanted to, we can wait until the last minute to do everything. (But I really hope no one does).

Students indicated that they had learned a great deal in their online course. They found this learning to be interesting, challenging, sometimes difficult, and fun. Learning in an online course was hard work and time-consuming. Eighty-eight percent of students were concurrently enrolled in public schools as well as IVHS. For some students enrollment in two schools was very time consuming and for others it was simply more convenient. One student enrolled in an online course to gain a lunch period during their traditional school day. This student needed the course credit for graduation, but enrollment in an online course did not add additional course credits. Many students were enrolled in advanced placement or challenging courses, to maintain and even increase their overall grade point average and maintain a full public school course load. These students stated repeatedly that while an increased course load and new modality of learning was challenging they described online courses as a valuable endeavor.

While this sample was small and not necessarily representative of all the enrolled students in IVHS, overall, students stated they believed enrollment in online courses has had a positive impact on them. They described the positive impact as increasing their time management skills, preparing them for college, and increasing their independence, by helping them to learn or problem solve on their own. Two students were neutral as to whether or not an online course had impacted them and one student stated that enrollment in an online course had not impacted them.

When students were asked what the best part of online learning was, the majority most frequently used words like flexibility, pacing, control, timing, independence. Some statements from the students included:

- "It gave me the independence to work at my own pace and taught me skills that I may use in future classes."
- "At my school we go at a pace that best fits everyone and with the online you can go at your own pace. Also, there is much more varity [sic] in doing online classes than my school."
- "The ability to be in charge of my own work and my own time."

These comments made by the students in this study may be a small insight as to why enrollment in online courses continues to grow at a phenomenal rate. These students who enrolled in online courses were interested in learning and in preparing for their future. Even if they did not see themselves going to college, students in this study stated that online courses allowed them to learn in ways that are more comfortable for them. Learning online allowed them to progress at a pace that is comfortable for their cognitive tempo. Learning online allowed them

to expand their course options; taking more classes to help them plan for their future. Students can utilize the Internet, multitask, while learning and communicating online or with other digital devices. Online courses continue to offer students more course options and the students find that they have more control and flexibility over the pacing of that learning than they do in a traditional classroom.

Additional Findings

While most students said they enjoyed their online course experience, and felt that this would prepare them for their future; 60% of the students in this study do not endorse the idea that all students should be required to take an online course in order to graduate from high school. They recognized that online learning is not for everyone. The students argued that online learning required different skills than those needed in a traditional classroom. These students argued that requiring online learning for every student would be unfair.

Overall, 60% of the students stated that online courses are harder. This statement was not necessarily negative. They described their online courses as interesting and challenging. Students explained that not only is the content harder, but online courses required more self-discipline and personal motivation.

Learning Soft Skills: Time Management and Self-Discipline

Students wanted control over their learning and the pacing of their learning, but they discovered that for some it was challenging to work independently. They mentioned that they had to learn new skills in time management and self discipline. One issue was the delay in getting questions answered. Three students specifically mentioned having to plan for delays in getting questions answered by emails. One female student described her struggle this way:

> … even though it was nice not to have a teacher constantly over your head it was difficult to manage when you had questions but you first had to write an email then wait for an answer, which may take a few days.

Some students intimated that in their face-to-face classes they were used to being reminded about what assignments are due. A 10th grade male student stated, "It is easier to procrastinate than when you see the teacher every day." A female student also noted another issue about time management. She stated, "I didn't like not being reminded daily to complete my work." Yet an 11th grader realized how this very issue could help her. She noted: "It has helped to prepare me for college, where I wont [sic] have a teacher reminding me to do homework."

Students discussed that online is distinctly different from face-to-face classrooms. Learning online required different skills to achieve academic success. Students mentioned the need for time to read and work through the online course materials: To plan so that they could get questions answered and complete assignments. They needed to adjust to different forms of communication with other students and their instructor. Once they enrolled, they needed to utilize their skills to help them achieve their goal of successfully completing the course. They needed to be self motivated to keep working.

> The difference is time. I have motivation to begin these online courses with. As for the in-school classes, I'd rather get it done and done. I like the fact you can pick your pace and teach yourself to keep up or to get ahead. Oh, and you have a second chance. Instead of not understanding the homework and being required to take the test the next day, *teacher is unavailable or just looks like they hate their job... I'd bug them anyways* you can take your time to finally learn the material you wanted to understand and again, go at your own pace.

This researcher believes that after six years of experience teaching online and researching virtual high schools, that no instructor works harder than an instructor who teaches adolescents online. Online instructors have not only the challenge of teaching online, but they have the additional challenge of working with adolescents who are very adept using digital technology but

are still in various stages of maturity in terms of self-discipline, organizational skills, and motivation. Some comments also clearly reflected the ambivalence that Long (1985) referred to, in wanting independence and yet, struggling with the independence that online learning required. In general, adolescents were comfortable with the technology, but may need a lot of scaffolding and patience, to support them in the online environment.

The majority of students stated that they were pleased with their experience and 46% said they would like to enroll in another course at IVHS. While, 53% said they do not plan to take another course, 14% were seniors and did not plan to because the question only asked them about additional courses through IVHS.

An interesting area of future research would be whether or not the students who enrolled in online courses were more likely to enroll in them when they matriculate into colleges and universities and also to examine their expectations for those courses. Many virtual high schools provide high quality courses, which meet their state standards of learning as well as ISTE's National Educational Technology Standards for Students. Virtual high school courses often incorporate media that are designed for Digital Kids. Many virtual high schools do an excellent job of using digital tools for communication and learning. In most colleges and universities around the country, the online courses are created by Digital Immigrants who are not necessarily comfortable with utilizing the Internet as a tool for learning and communication. This may be very challenging to incorporate.

Conclusion

Students stated they enrolled in online courses at IVHS for a variety of reasons. Some wanted to improve their academic standing; some needed a course to graduate, others were interested in a particular course and others were curious about online learning. In reviewing the

students' comments collected from the online questionnaire and the follow-up interviews, it appears that was most important for the students was to have control over their learning and the timing of it. Their primary goal was to manage their learning. When public schools, their own previous choices, or life limited their options, learning online presented possible solutions. Once enrolled in online courses students now had some control over their schedule and the timing of that learning. Online learning can be any time, any place, or any path (FLVS, 2005).

In all of the categories of personality and cognitive styles, students mentioned enrolling because they wanted to work independently, to have control over the timing of their learning, and to work at their own pace. They were already aware that online learning offered this benefit. After enrolling in an online course, students realized they now had some measure of control over the pacing of their learning. How much control each student had in their online course, depended on the course and the instructor.

When student comments were grouped by their personality styles there were no major differences as to why students wanted to enroll, what they thought was the best part or the worst part of learning online. While pacing was a theme mentioned by all students in each category of cognitive styles, pacing was mentioned more often by students who were categorized as Reflective or Fast-Accurate. For these students being able to move through the course content at a pace that was comfortable for them may be more of an issue. Typically, in traditional schools, the class is moving at the same pace and students cannot work faster through course content. One Fast-Accurate student explained what he thought was the best part of taking an online course, "No teachers, and no lectures, and I can for the most part work at my own pace." A Reflective student described how she can choose the pace, "I liked the freedom of completing the course at my own speed."

When reviewing the cognitive tempo categories identified by the MFFT-20, these students also enrolled for a variety of reasons. Impulsive students, when discussing reasons for enrollment did not mention controlling their schedule or pacing of their learning. In this sample, Impulsive students' reasons focused on wanting a specific course and one student wanted to enroll for the novelty of the online experience. However, there were only five students who were categorized as Impulsive so this may have been a random occurrence.

Another difference that was noted based on cognitive style was that both Impulsive and Fast-Accurate students mentioned they were glad that they were able to work independently without the guidance of a teacher; however, when these students had questions they noted that it was frustrating not to have prompt answers. Both Impulsive and Fast-Accurate students process information quickly. Impulsive students typically make a lot of errors in their assessment and may need more teacher support.

In an online classroom, prompt replies to students' questions are very important. For Fast-Accurate students this may be especially important. They are students who do very well in processing information quickly and accurately but that does not always mean they are capable of completing an assignment or task without additional clarification or support as they ruefully pointed out. Allowing students to have pacing options is important but online instructors need to be very much involved within the course and with their students.

The MFFT-20 Results

Using the MFFT-20 may assist students, parents, teachers, and school administration in identifying students who are at risk for poor academic achievement in the online environment. In previous uses of the MFFT-20, only the Impulsive and Reflective categories of students were used. Most often researchers were measuring whether or not the subject was impulsive in making

decisions or reflective. In the online learning environment, the researcher felt it was important to consider students who were categorized as Fast-Accurate and Slow-Inaccurate in addition to looking the students who were categorized as Impulsive and Reflective. These students have important implications for the online classroom. Very few Impulsive students participated in this study, for unknown reasons. It may be that not very many impulsive students were enrolled in IVHS classes or it may have been that they were not interested in participating in this study. Impulsive students process information and act quickly but have a high rate of errors.

In this study, all four categories of cognitive tempo were represented among the students. Yet, these categories were not evenly distributed among the sample and different from what previous researchers have found in traditional school populations. In this study, 34% were classified as Fast-Accurate students; this was a much higher percentage than has been estimated to be present in traditional school populations. It has been estimated that in the general population 70% would be classified as Impulsive or Reflective (Rozencwajg & Corroyer, (2005). In this sample, only 5% were categorized as Impulsive. Clearly, this sample of students who enrolled in online courses was different from a traditional school population. Because this was not a random sample, it is not clear if all students who enroll in online courses are primarily Fast-Accurates or Slow-Inaccurate students. Students who are frustrated or bored by traditional schooling and possibly just curious about online courses may seek other options through enrollment in online courses.

All four categories of cognitive style would have potentially different preferences for the pacing of assignments in a course. The qualitative data in this study supported that the Reflective students do not like to move too fast, they are careful, thoughtful, and accurate. Students who were Fast-Accurates appreciated moving at an accelerated pace through assignments or a course.

Online courses may provide Fast-Accurate students with more time for other activities. They are not required to sit in a class for a prescribed amount of time, but can learn at a pace that they are comfortable with. Allowing all students to have these pacing options may increase their motivation to continue their participation in an online course. This may become especially important if online learning becomes a graduation requirement.

Online courses have unique capabilities to address the different learning needs of students. One Impulsive student said this when she was asked if online learning was harder:

> I dont [sic] agree because on online courses that answers are there, all you have to do is read. You dont [sic] have take any notes, you can just go back to the page where you know you can find the answers.

Members of the educational community have known for some time that one type of education does not fit all. Online courses have great potential to meet the educational needs of students on so many levels. The qualitative and quantitative data in this study support this research. Students were interested in their academic progress and enrolled in online courses as a means to assist them in creating an environment where they asserted some control over their learning, what they learned and the timing of their learning.

As online learning opportunities increase, it is important for K-12 students that we try not to create one model of online learning that fits all. One of the enormous benefits of online learning is that it provides some flexibility to meet the needs of individual learners. Students in this study overwhelming voiced their appreciation for the opportunity to participate in online learning. They enjoyed the independence and options for the pacing of their assignments. Yet, they struggled with the very thing that they wanted. They wanted independence yet, not all students were prepared for that. They admitted they wrestled with the self-discipline necessary to stay motivated to achieve academic success. For some students this was a greater challenge than

for others. This is how Long (1985) defined adolescence as a journey from dependence to independence, often characterized by ambivalence.

Students need an involved instructor to assist them in this process of becoming academically independent. Instructors should be supportive of and responsive to students' requests for assistance. Instructors may want to incorporate more interaction within their course and give students who are interested opportunities to learn more about the instructor and students enrolled in the course. Educating students about different cognitive and personality styles is also important. This can assist them in helping themselves be more aware of their natural tendencies in an online environment.

Many online high schools already have pacing options and flexible due dates. They understand that these strategies have kept students interested and motivated in completing a course and achieving academic success. In this study 93% of the students were enrolled in public high schools, in the Florida Virtual High School up to 80% are concurrently enrolled in other public schools. Giving online students as much personal, academic, and technical support as possible is important to assist them in achieving their goals for academic success.

The majority of students in this study and others who enroll in virtual courses are creating an individual blended learning environment. Most students who enroll in online courses are concurrently enrolled in their local public schools. Dziuban, Hartman & Moskal (2005) pointed out that traditional classroom instruction combined with technology-mediated learning is not a new phenomenon. There have been numerous attempts in the last fifty years at blending radio, television, and the Internet with traditional classroom instruction. What is different now is that these students who enroll in online courses are creating individual blended learning environments; it is not necessarily being organized by their school or classroom. Dziuban,

Moskal & Futch (2007) noted that Millennials "readily acknowledge that the Internet is their first source of information" (p. 6). Meyer (as cited in Dziuban, Moskal & Futch) suggested that perhaps we should consider that online learning and blended learning is really just learning. These Millennial students may not even realize the innovation they have created.

Enrollment in virtual high schools continues to expand. Many states and local school districts are expanding or developing opportunities for high school aged students to enroll in online courses and students are filling up these courses. This phenomena cannot be dismissed as novel, since the two largest virtual high schools, the Florida Virtual School and the Virtual High School Consortium have been in operation for over 10 years, during which time they have experienced steady and sometimes explosive growth. Both the Idaho Digital Academy and the Florida Virtual School grew over 50% last year (NACOL, 2006). The growth in other states was modest but most continue to receive requests for enrollment at double-digit rates. Students are clearly attracted to learning online.

Continued research and updated policies are integral to the continued success of virtual high schools. Communicating more about what we have learned regarding online learning in higher education and examining this research in light of what we have learned about adolescents would be prudent in planning virtual high schools. We know that communicating presence and incorporating interactivity is important in online learning this also seems to be something that high school students are agreeing is important. In this study, the average virtual high school student was older, 17 years of age, female and was primarily seeking to improve their academic success.

We also must recognize that while virtual high schools may have been designed by digital immigrants to expand course options, and clearly, students are enrolling for that purpose,

something else is also happening. Adolescent students who are digital kids are enrolling for other reasons as well. Students are comfortable with using the Internet for learning and communication. Some students are interested in enrolling just because the course is taught online. These Millennial or Digital Kids have created many notable innovations in the way we use, create, and share information online. Some examples of this are: MySpace, YouTube, Google, and Wikipedia. As these adolescent students mature, they may continue to innovate online education as we understand it today. Many online courses in higher education are text-based and incorporate basic communication tools. The Millennials students may expect to utilize more communication tools and video with future online courses.

For now, providing students with continued access to online learning and a plethora of course options can certainly enhance their education, whether or not they go to college. Even if students plan to pursue employment without college, online and computer based training is ubiquitous in business and industry. Encouraging students to take online courses would be beneficial for them on many levels but requiring online learning at the high school level may not be an appropriate goal. Further research is needed to explore whether requiring online learning is in the best interests of adolescent students. These students are maturing at different rates and in this study; they clearly acknowledged that they believe requiring an online course would be deleterious. They expressed that they believed online learning was a positive experience for them, but did not believe that all students would be motivated to adapt to the different learning strategies needed for online learning. We must continue to develop different strategies to support students while they are learning online and educate teachers as to appropriate pedagogy for online instruction for high school students.

Recommendations for Further Research

Based on upon the related research and the findings of this study, the following recommendations are made for future research.

1. More information is needed for students who enroll in online courses about the role of personality and its impact on online learning. Currently students are told in many schools that they must be self-disciplined to succeed in online courses. Surveying students who enroll in online high schools at the beginning of a course using the Long Dziuban Reactive Behavior Survey can help to educate students and teachers about the impact personality types and traits of students may have in online learning.
2. More studies are needed to review the amount and types of interaction that happen in online courses between students and between instructor and students to determine best practices for designing interactions.
3. More follow-up studies are needed about students to determine what impact if any online learning has had on students as they transition to the workplace or to college.
4. Further studies are needed to test the validity and reliability of the online version of the MFFT-20. This instrument is used with groups and many researchers have called for norms to be established so that this instrument can be used with individuals as well as with groups.
5. Further studies need done establishing best practices for online instruction as it relates to K-12 students. There are studies that identify best practices for online instruction in higher education settings; however, these practices do not necessarily transfer to the environment.

6. In order to validate and expand on the results found in this study, it would be appropriate to use the instruments in this study on a different population of students enrolled in an online high school.
7. Studies are needed to examine the types of communication amount, and types of communication tools that work best with adolescent students.
8. Research is needed to consider whether or not online learning should be a universal graduation requirement for all adolescent students.

APPENDIX A: IRB APPROVAL FORM

University of Central Florida

Office of Research & Commercialization

July 21, 2005

Amy Scheick
1775 Ayshire Dr.
Titusville, Fl 32796

Dear Mrs. Scheick:

With reference to your protocol #05-2667 entitled, "Virtual Vistas: High School Students Describing Their Experiences in Online Classes" I am enclosing for your records the approved, expedited document of the UCFIRB Form you had submitted to our office. **This study was approved by the Chairman on 7/6/05. The expiration date for this study will be 7/5/06.** Should there be a need to extend this study, a Continuing Review form must be submitted to the IRB Office for review by the Chairman or full IRB at least one month prior to the expiration date. This is the responsibility of the investigator. **Please notify the IRB when you have completed this study.**

Please be advised that this approval is given for one year. Should there be any addendums or administrative changes to the already approved protocol, they must also be submitted to the Board through use of the Addendum/Modification Request form. Changes should not be initiated until written IRB approval is received. Adverse events should be reported to the IRB as they occur.

Should you have any questions, please do not hesitate to call me at 407-823-2901.

Please accept our best wishes for the success of your endeavors.

Cordially,

Barbara Ward

Barbara Ward, CIM
IRB Coordinator

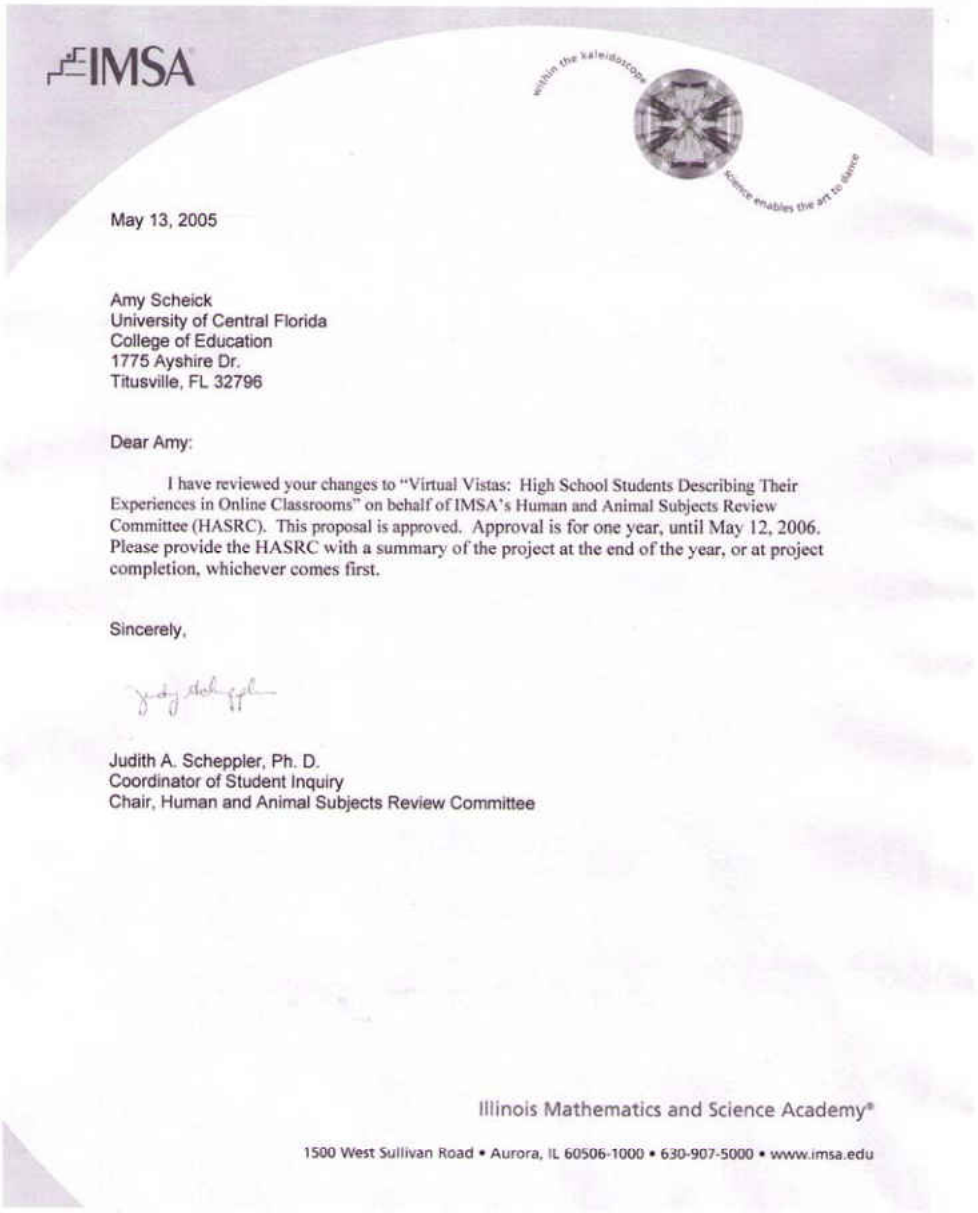
Copy: IRB file

BW:cc

12443 Research Parkway • Suite 302 • Orlando, FL 32826-3252 • 407-823-3778 • Fax 407-823-3299

APPENDIX B: IMSA's HASRC APPROVAL FORM

Illinois Mathematics & Science Academy's Human and Animal Subject's Review Committee's Approval Form for Virtual Vista's



IMSA

within the kaleidoscope

science enables the art to dance

May 13, 2005

Amy Scheick
University of Central Florida
College of Education
1775 Ayshire Dr.
Titusville, FL 32796

Dear Amy:

I have reviewed your changes to "Virtual Vistas: High School Students Describing Their Experiences in Online Classrooms" on behalf of IMSA's Human and Animal Subjects Review Committee (HASRC). This proposal is approved. Approval is for one year, until May 12, 2006. Please provide the HASRC with a summary of the project at the end of the year, or at project completion, whichever comes first.

Sincerely,

Judith A. Scheppler, Ph. D.
Coordinator of Student Inquiry
Chair, Human and Animal Subjects Review Committee

Illinois Mathematics and Science Academy®

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APPENDIX C: UCF's IRB ADDENDUM APPROVAL

Revised 09/05

UCF IRB Addendum/Modification Request Form

This addendum form does NOT extend the IRB approval period or replace the Continuing Review form for renewal of the study.

INSTRUCTIONS: Please complete the upper portion of this form and attach all revised/new consent forms, altered data collection instruments, and/or any other documents that have been updated. **The proposed changes on the revised documents must be clearly indicated by using bold print, highlighting, or any other method of visible indication. Attach a highlighted and a clean copy of each revised form.** This Addendum/Modification Request Form may be emailed to IRB@mail.ucf.edu or mailed to the IRB Office: ATTN: IRB Coordinator, 12443 Research Parkway, Suite 302, Orlando, FL 32826-3252 or campus mail 32816-0150. Phone: 407-823-2901 or 407-882-1139, Fax: 407-823-3299.

- **DATE OF ADDENDUM:** 02/23/06__ to IRB# 05-2667 IRB Addendum # #06-3367

- **PROJECT TITLE: Virtual Vistas: High School Students Describing their Experiences in Online Classes**

- **PRINCIPAL INVESTIGATOR:** Amy J. Scheick

- **MAILING ADDRESS:**
  1775 Ayshire Dr. Titusville, FL 32796

- **PHONE NUMBER & EMAIL ADDRESS:** (321-268-3145 home), (407-823-0228 work)
  ascheick@mail.ucf.edu (work) or ascheick@cfl.rr.com (personal)

- **REASON FOR ADDENDUM/MODIFICATION:** After 8 weeks of data collection, I have received only three responses. During this time, the school administrator has forwarded (emailed) **3** requests for student participation in my study to students and parents. The administrator has also "posted" my request for participation in the school's online bulletin board 3 times. Three responses is insufficient for my study. SFD

- **DESCRIPTION OF WHAT YOU WANT TO ADD OR MODIFY:**
  After discussion with my advisor Glenda A. Gunter and the administrator of IVHS, Mr. Matt Wicks, I would like to try to increase the motivation level of the students to participate in this study by offering the students some compensation.. There are approximately 1200 students who would be eligible to participate in my study this SFD semester. I would hope to have a response rate of at least 10%, which would be 100 students.

  First, I sought to see if there were any teachers at IVHS who would be willing to offer some extra credit points if SFD the students participate in my study. The administrator of IVHS asked his teachers to contact me if they were

SECTION BELOW - FOR UCF IRB USE ONLY

X Approved	___ Disapproved	IRB Chair Signature	3/14/2006 Date
___ Full Board	X Chair Expedited	IRB Member/Designated Reviewer	Date

1

interested and I have been contacted by seven teachers. These teachers agreed to create another extra credit assignment in their course so that the students can either complete the surveys or the other assignment.

All of the teachers who contacted me were also willing to:

1. They understood they could not offer this option prior to IRB approval from UCF and by the IRB board at their supervising institution, Illinois Mathematics and Science Academy (IMSA)*
2. They also understood that I was also requesting approval of offering the students a gift card as compensation for their time, in addition to the extra credit option.

Second, I would like to offer the first 100 students who participate in this study a $10 gift card from either Blockbuster or Wal-Mart as compensation for their time. Completing my online forms could potentially take a student anywhere from 20 to 45 min. or more depending on the student's abilities. In addition, if the student consents to be interviewed by me, this would result in additional time, that is difficult to calculate. The majority of SFD these students are enrolled in local public schools as well as IVHS and have many demands on their time. The administrator and several teachers have noted in their emails that they believed offering a gift card as compensation would be very effective in motivating students to participate.

I have chosen a video card, as most teens enjoy renting videos and games however, renting from Blockbuster would most likely require that a parent or guardian have an account. Ten dollars would allow them to rent two videos however prices may vary regionally. In order, to make this opportunity more equitable, I'm also offering a gift card to Wal-Mart, which has 107 locations in Illinois. I could not find an overall estimate of how many Blockbuster locations are located in Illinois however, they are a national chain and I did use their website to sample 5 large and small cities and they do have numerous locations in both.

I plan to mail the gift card to the students, within two weeks or less when they participate in my study. I would like to define "participation" in this study as "if a student completes or partially completes my three online instruments." Students would still have the right to refuse to answer any question or questions on the surveys.

I would have to ask for the students' address for the sole purpose of mailing them the gift card. Their personal information would only be known to me and my advisor (if needed). The students' addresses are only needed to send the gift card, and can be shredded after a period of 4 months. This is enough time to make sure the students have received the gift card and resolve any issues if they arise.

I have attached my revised letters of consent for students under the age of 18 and for students who are over the age of 18.

Sincerely,
Amy Scheick

*Please note that I did not want to ask you or IMSA's IRB to approve this request if the teachers were not supportive of this option.

SECTION BELOW - FOR UCF IRB USE ONLY

X Approved ___ Disapproved

___ Full Board X Chair Expedited

IRB Chair Signature (Vice Chair) — Date: 3/14/2006

IRB Member/Designated Reviewer — Date

APPENDIX D: IMSA HASRC's ADDENDUM APPROVAL FORM

IMSA

March 14, 2006

Amy Scheick
University of Central Florida
College of Education
1775 Ayshire Dr.
Titusville, FL 32796

Dear Amy:

IMSA's Human and Animal Subjects Review Committee (HASRC) has conducted an expedited review of your addendum to "Virtual Vistas: High School Students Describing Their Experiences in Online Classrooms." The addendum is approved.

As a reminder, you project is Approved until May 12, 2006. If you are having trouble collecting data to complete by this date, please let me know.

Please provide the HASRC with a summary of the project at the end of the year, or at project completion, whichever comes first.

Sincerely,

Judith A. Scheppler, Ph. D.
Coordinator of Student Inquiry
Chair, Human and Animal Subjects Review Committee

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APPENDIX E: LETTERS OF CONSENT AND ASSENT

Combined Letter of Consent and Student Assent form

April, 2006

Dear Parent/Guardian and Students,

My name is Amy Scheick. I am a graduate student at the University of Central Florida working on my PhD in Instructional Technology. I am working under the supervision of Dr. Glenda Gunter to conduct this research regarding high school students who participate in online courses. My study is titled *Virtual Vistas: High School Students Describing Their Experiences in Online Classrooms*.

I would like to ask your student (or your child) to participate in this research study. I am interested in learning more about the personalities and experiences of students in taking classes in a virtual high school. Taking part in this study may not benefit you or your student directly, but may help other students, parents, and educators better understand student experiences in online classes.

I have three online forms that I would like the students to complete. Completion of these instruments should take the students anywhere from 20 to 45 minutes depending on the student. These online forms are available for you to preview.

The first online form measures the students' personality types and traits. **Part I is the Long-Dziuban Reactive Behavior Survey**. Four different personality types and traits have been identified. This survey has been administered to public high school students, undergraduates, and to other high school students who have taken online courses. Some of these studies suggest that two of the personality types are more attracted to online learning courses.

Part II is a questionnaire asking students why they decided to participate in the course and questions asking them to describe their experience.

Part III is the twenty-item Matching Familiar Figures Test. This test measures students' Impulsive and Reflective reactions. Previous research has suggested that students must be self-motivated to be successful in online learning. In addition, I am wondering how behavioral factors influence students' success in online learning. For instance, if a student is Impulsive they may not take the time to carefully read an online assignment before attempting it. If a student is Reflective, it may take them longer to read an assignment and this might be one factor as to why students report that they have to work harder in online classes.

Part IV is follow-up interviews. I would like to know if I may contact students either by instant message, email or by phone to ask for clarifications of their answers. At the end of the questionnaire, there will be a box, which the student can check if I may contact them for follow-up questions. My focus in the follow up interviews would be to clarify any comments they have already made and to ask additional questions based on the topics other students have presented. Again, the students may choose to terminate the follow up interview at any time and/or not answer any question they choose.

If a student is willing to be interviewed, I will ask them to provide their contact information at the end of the questionnaire. A follow-up interview should take between 5 and 15 minutes.

If they choose to be interviewed by phone, I will ask for their consent to tape the conversation so that I can accurately transcribe our conversation at a later time. If I interview the student by email or instant message, I will let the students know that I am saving our conversation to be sure that student comments are accurately represented.

Students will be asked to give some descriptive information when filling out the online forms such as their initials and birth date, in order to coordinate the results of the three online forms. Your student does not have to answer any question they do not want to answer and can stop at any time.

All of each student's information and identity will be kept confidential and will not be identifiable in this study. The results will be reported in the form of group data. Any student comments will be reported anonymously, such as "Student 1 said…." All of the data I collect from the students will be kept in a locked cabinet and only myself and possibly my advisor would have access to this data. The University of Central Florida requires me to keep this data for a period of three years and then I will shred these documents.

You and your student have the right to withdraw consent for your student's participation at any time without consequence. Participation or nonparticipation in this study will not affect any student's progress in their course or any future courses. The instructors and administrators at IVHS will not be aware of which students have participated in this research study.

There are no known risks or immediate benefits for the students. No compensation is offered for participation in this study. Group results of this study will be available after March. 24th upon request. You can email me at ascheick@mail.ucf.edu or at my home email address (removed). If you use AOL Instant Messenger you can enter my screen name and use this method to contact me. My AOL instant messenger screen name is "**(removed)**."

If you have any questions about this research project, please contact me at either my home phone (removed) or (407)-823-0228 or my faculty supervisor, Dr. Glenda Gunter, at (407) 823-3502. Questions or concerns about participant's rights may be directed to UCF's

Institutional Review Board (IRB) at (407) 823-2901. Their hours are 8am to 5pm Monday through Friday.

Sincerely,
Amy Scheick

If you are willing to allow your student to participate in this study, please print, sign and either fax this form to me at 1-877-367-5454 or mail it to my address below. The fax line is a toll-free number. You can also scan it and send it as an attachment to me in an email. Be sure to fill out all of the required items. Save a copy for your records.

Thank you very much for your support.

Parent's Section (Place an X on the line if you agree).

____I have read the information provided above.

_____I voluntarily give my consent for my student (child),_____, to participate in Amy Scheick's study of adolescent students participating in online high schools.

Parent/Guardian signature Date

2nd Parent/Guardian/Witness (if necessary) Date

____I also give my permission for my student(child) to participate in any follow-up interviews by phone, OR email OR instant message, if my student(child) is willing.

____I give permission for Mrs. Scheick to tape any phone conversations; to save any instant messages or emails that she may receive in conversing with my student (child).

Parent/Guardian signature Date

2nd Parent/Guardian/Witness (if necessary) Date

Student's Section (Place an X on the line if you agree).

____I have read the information provided above.

____I voluntarily agree to participate in this study, and I have printed a copy of this description

Student signature: Date

____I am willing to be contacted for a brief follow up interview. I understand I can change my mind at any time.

Student signature: Date

Please Print:

Student's Name:

Birthdate: (MM/DD/YEAR)

Parent/Guardian's email address

Student's email address

Mailing Information:
Mrs. Amy Scheick
1775 Ayshire Dr.
Titusville, FL 32796
407-823-0228
Fax: 1-877-367-5454 (toll free)

APPENDIX F: STUDENT LETTER OF CONSENT FORM FOR STUDENTS OVER THE AGE OF 18

Student Consent Form for Students 18 years or older

April, 2006

Dear Student,

Hello, my name is Amy Scheick. I am a graduate student at the University of Central Florida working on my PhD in Instructional Technology. I am working under the supervision of Dr. Glenda Gunter to conduct this research regarding high school students who participate in online courses. My study is titled *Virtual Vistas: High School Students Describing Their Experiences in Online Classrooms*.

I would like to ask you to participate in this research study. I am interested in learning more about the personalities and experiences of students in taking classes in a virtual high school. Taking part in this study may not benefit you personally, but may help other students, parents, and educators better understand student experiences in online classes.

There are several parts that I would like you to complete. If you complete or partially complete the 3 online forms, you will receive a $10 gift card for Blockbuster Video stores or Wal Mart as compensation for your time. By partially complete, I mean that you have the right to not answer any question you do not want to. Within two weeks of receiving your responses, I will mail you the gift card. In addition, some students may be eligible for extra credit for participating in this study, depending on the course they are enrolled in. Your instructor will notify you within your course, if this is an option for you.

Completion of these instruments or online forms should take anywhere from 20 to 45 minutes depending on the student. These forms are available for you to preview.

Part I measures the students' personality types and traits. Part I is the **Long-Dziuban Reactive Behavior Survey.** Four different personality types and traits have been identified. This

survey has been administered to public high school students, undergraduates, and to other high school students who have taken online courses. Some of these studies suggest that two of the personality types are more attracted to online learning courses.

Part II is a **questionnaire** asking students why they decided to participate in the course and questions asking them to describe their experience.

Part III is the twenty-item **Matching Familiar Figures Test**. This test measures students' Impulsive and Reflective reactions. Previous research has suggested that students must be self-motivated to be successful in online learning. In addition, I am wondering how behavioral factors influence students' success in online learning. For instance, if a student is Impulsive they may not take the time to carefully read an online assignment before attempting it. If a student is Reflective, it may take them longer to read an assignment and this might be one factor as to why students report that they have to work harder in online classes.

Part IV is follow-up interviews. I would like to conduct individual interviews with a small group of students either by instant message, email or by phone. At the end of the questionnaire in Part II, there will be a box, which you can check if I may contact you for any follow-up questions. My focus in the follow up interviews would be to clarify any comments you or other students have already made and to ask additional questions based on the topics presented. You may choose to end the follow up interview at any time and/or not answer any question you choose.

If you are willing to be interviewed, I will ask you to provide your contact information at the end of the questionnaire. A follow-up interview should take between 10 and 20 minutes.

If you choose to be interviewed by phone, I will ask for your consent to tape the conversation so that I can accurately transcribe our conversation at a later time. If I interview you

by email or instant message, I will let you know that I am saving our conversation to be sure that all student comments are accurately represented.

Students will be asked to give some descriptive information when filling out the online forms such as their initials and birth date, in order to coordinate the results of the three online forms. You do not have to answer any question you do not want to answer and can stop at any time.

All of each student's information and identity will be kept confidential and will not be identifiable in this study. The results will be reported in the form of group data. Any student comments will be reported anonymously, such as "Student 1 said…." All of the data I collect from the students will be kept in a locked cabinet and only myself and possibly my advisor would have access to this data. The University of Central Florida requires me to keep this data for a period of three years and then I will shred these documents.

You have the right to withdraw your consent at any time without consequence. Participation or nonparticipation in this study will not affect your progress in your course or any future courses. The instructors and administrators at IVHS will not be aware of which students have participated in this research study.

There are no known risks if you participate in this study. Compensation for your participation in this study is a $10 gift card. Group results of this study will be available after June 1, upon request. You can email me at my home email address (removed) or ascheick@mail.ucf.edu. If you use AOL Instant Messenger you can enter my screen name and use this method to contact me. My AOL instant messenger screen name is (removed).

If you have any questions about this research project, please contact me at (407) 823-0228 wk or at my home phone (removed) or my faculty supervisor, Dr. Glenda Gunter, at (407)

823-3502. Questions or concerns about participant's rights may be directed to UCF's Institutional Review Board (IRB) at (407) 823-2012. Their hours are 8am to 5pm Monday through Friday. You may also contact the IRB by mail at: 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246.

Sincerely,
Amy Scheick

If you are willing to allow your student to participate in this study, please print, sign and either fax this form to me at 1-877-367-5454 or mail it to my address below. The fax line is a toll-free number. You can also scan it and send it as an attachment to me in an email. Be sure to fill out all of the required items. Save a copy for your records.

Please print a copy for your records. Thank you so much for your support.

____I have read the information provided above.

____I voluntarily agree to participate in this study, and I am 18 years of age or older.

Student signature: Date

If you are 17 years old or younger, you must have a parent or guardian sign an additional form.

____I am willing to be contacted for a brief follow up interview. I understand I can change my mind at any time.

Student signature: Date

PLEASE PRINT CLEARLY :

Name:

Birthdate: (MM/DD/YEAR)

Email Address

Street Address

City, State & Zip Code

Mailing Information:
Mrs. Amy Scheick
1775 Ayshire Dr.
Titusville, FL 32796
407-823-0228
Fax: 1-877-367-5454 (toll free)

APPENDIX G: EMAIL REQUESTS FOR PARTICIPATION

Email for parents:

Hello, my name is Amy Scheick and I am an instructor at the University of Central Florida and I am trying to collect research for my doctoral dissertation about the experiences and personality types and traits of students who take courses online.

If your child is enrolled in or has recently completed a course through IVHS then they would qualify to participate in this study and would really appreciate his or her input. It may not directly benefit your child but their participation may definitely help us to better understand the needs of different personalities and experiences of high school students who take online courses.

If your child is under the age of 18, your permission is required for him/her to participate in the study. If your child is interested in participating and you are willing to grant permission, then please click on the link below to read the letter of consent, which explains more about the study. Your child's confidentially will be protected and they can stop participating at any time.

The letter of consent and must be signed by you and your child and returned to me via fax or by mail before they can participate in the study.

(Link)

If you have any questions please feel free to call or e-mail me.

Thank you so much for your assistance,

Sincerely,
Amy Scheick
Home phone #
ascheick@mail.ucf.edu

APPENDIX H: SURVEY LINKS

Mrs. Scheick's Research Study with IVHS

Hi (student name)!

Thanks for sending me your consent form.
There are 3 surveys I would like you to complete.
If you will click on this link below or copy and paste it into your browser, it will take you to my first survey form.

You can fill them out all at once or if you want to go back later or run out of time, I've pasted the links separately below.

Within a day or so after I receive the results I will email you back to let you know that I have your results.
Survey 1: Long Dziuban Survey
http://www.surveymonkey.com/s.asp?u=234382087282

Survey 2: Questionnaire
http://www.surveymonkey.com/s.asp?u=258312087489

Survey 3: Matching Familiar Figures Test
http://instrument.dyndns.org/
Thanks again! Please email me if you have any questions.
:-)
Mrs. Amy Scheick

APPENDIX I: REVISED EMAIL LINK FOR PARTICIPATION

New Challenge!

Hello, my name is Amy Scheick and I am an instructor at the University of Central Florida and I am trying to collect research for my doctoral dissertation about the experiences and personality types and traits of students who take courses online.

I have an exciting opportunity for your student. If your child is enrolled in or has recently completed a course through IVHS then they would qualify to participate in this study and would really appreciate his or her input. **I have three online forms that I would like your student to fill-out. If they complete these forms, I will mail them a $10 gift card to either Blockbuster or Wal Mart within two weeks of receiving their results. These gift cards are honored nationwide.**

If your child is under the age of 18, your permission is required for him/her to participate in the study. If your child is interested in participating and you are willing to grant permission, then please click on the link below to read the letter of consent, **for more information about the study.** Your child's confidentially will be protected and they can stop participating at any time.

The letter of consent and must be signed by you and your child and returned to me via a **toll-free** fax number or by mail before they can participate in the study.

(Link)

If you have any questions please feel free to call or e-mail me.

Thank you so much for your assistance,

Sincerely,

Amy Scheick

ascheick@mail.ucf.edu

APPENDIX J: IRB RENEWAL FORMS

University of Central Florida

Office of Research & Commercialization

August 15, 2006

Amy Scheick
1775 Ayshire Drive
Titusville, FL 32796

Dear Ms. Scheick:

With reference to your protocol #06-3671 entitled, "Virtual Vistas: High School Students Describing their Experiences in Online Classes" I am enclosing for your records the approved, expedited document of the UCFIRB Form you had submitted to our office. **This study was approved on 8/14/06. The expiration date for this study will be 8/13/2007. Due to a lapse in IRB approval prior to this renewal, you may not use any data collected between 7/5/06 and 8/13/06.** Should there be a need to extend this study, a Continuing Review form must be submitted to the IRB Office for review by the Chairman or full IRB at least one month prior to the expiration date. This is the responsibility of the investigator.

Please be advised that this approval is given for one year. Should there be any addendums or administrative changes to the already approved protocol, they must also be submitted to the Board through use of the Addendum/Modification Request form. Changes should not be initiated until written IRB approval is received. Adverse events should be reported to the IRB as they occur.

Should you have any questions, please do not hesitate to call me at 407-823-2901.

Please accept our best wishes for the success of your endeavors.

Cordially,

Joanne Muratori

Joanne Muratori
UCF IRB Coordinator
(FWA00000351 Exp. 5/13/07, IRB00001138)

Copies: IRB File
Glenda Gunter, Ph.D.

JM:jm

12201 Research Parkway • Suite 501 • Orlando, FL 32826-3246 • 407-823-3778 • Fax 407-823-3299

APPENDIX K: IMSA'S HASRC'S ADDENDUM APPROVAL LETTER

IMSA

September 25, 2006

Amy Scheick
University of Central Florida
College of Education
1775 Ayshire Dr.
Titusville, FL 32796

Dear Amy:

IMSA's Human and Animal Subjects Review Committee (HASRC) has conducted an expedited review of your continuation to "Virtual Vistas: High School Students Describing Their Experiences in Online Classrooms." The continuation is approved.

Approval is for one year, until September 24, 2007.

Please provide the HASRC with a summary of the project at the end of the year, or at project completion, whichever comes first.

Sincerely,

Judith A. Scheppler, Ph. D.
Coordinator of Student Inquiry
Chair, Human and Animal Subjects Review Committee

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APPENDIX L: PART 1: LONG DZIUBAN REACTIVE BEHAVIOR SURVEY

Part 1 Go on to Part 2

Long-Dziuban Survey

Personality Types and Traits

* **Please enter your initials and your birthdate below. For example, if your name is Jennifer Jones and you were born on July, 1989, you would enter jj071989 (initials MMYYYY).**

* **Directions: Please consider the descriptions of the groups in the four boxes below and select the ONE that you feel best portrays you.**

All the behaviors in the description may not fit you exactly, but please pick the ONE group you feel is the best fit.

Group A Group B Group C Group D

Group A:
Highly energized and action-oriented
Little need for approval; unconcerned with who they please
Puts thinking into immediate action
Very frank, speaks out freely
Is truthful about feelings
Has no problem confronting people

Group B:
Lower energy level
Little need for approval – unconcerned with pleasing others
Independent and strong-willed
Sometimes non-communicative
Prefers to work alone
May resist pressure from authority
Independent thinker

Group C:
Highly energized, and productive
Strongly motivated by approval
Sensitive to the wishes of others
Translates energies into constructive tasks
Deeply values close bonds with others
Some difficulty dealing with direct confrontation
Highly idealistic, setting lofty goals for themselves
Fosters harmonious relationships

Group D:
Lower energy level
Needs approval – concerned with pleasing others
Rarely shows anger or resentment
Very sensitive to the feelings of others
Very compliant and loyal
Forms strong attachments
Gives and thrives on affection

Please consider the descriptions of the four personality traits below and select the AS MANY as you feel apply to you.

Thinks of all possibilities and contingencies before **Highly organized and**

venturing into activities
"What if" ... person
May see the negative side of things
Unwilling to take risks

Trait 1

methodical
Strongly motivated to finish tasks
Perfectionistic
Tends to form habits
Extremely diligent in work habits
May be mildly ritualistic

Trait 2

Sometimes explosive and quick-tempered

Sharp tongued
Very frank
May act without thinking

Trait 3

Dramatic
May have wide mood swings
May overreact in some situations
Can have emotional outbursts
Creative thinker (rich imagination)

Artistically inclined
Devalues routine work

Trait 4

Submit

APPENDIX M: PART 2: QUESTIONNAIRE

Part 2: Questionnaire

Continue to Part 3

1. Experiences at your Virtual School

Please read through the questions below. Your opinion is very important, so please answer each question as best you can. You do not have to answer any question you don't want to.

Before you begin please enter your initials and your birthdate below.
For example, if your name is Jennifer Jones and you were born on July 4, 1989, you would enter jj071989 (initials MMYYYY).

*** 1. Your Initials & Birth date**

2. Gender:

Male Female

3. What most recent grade level have you completed?

9th 10th 11th 12th

4. What is the name of the course (or courses) you are currently taking or have just completed?

5. How many courses have you taken online, before the one that you are currently enrolled in?

None 1 2 3 4 or more

6. Please list the names of any other online courses you have completed.

7. If you have completed the online course you are currently enrolled in what grade did you receive?

A	A-	B+	B	B-	C+	C	C-	D	D-
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

8. If you have completed the online course you are currently enrolled in, what would you estimate is your numeric grade?(i.e. 85pts)

9. If you have NOT completed your course at this time, what is your best estimate of your grade?

10. What is your estimate of your overall GPA in school?

11. Are you enrolled in any other school?

Public	Private	Home-Schooled	Other
☐	☐	☐	☐

Questions about your experiences

13. Why did you decide to take an online course?

14. How did you learn about the online course at IVHS?

15. What words would you use to describe your experience in the online course?

16. What do you like the most about taking a course online?

17. What did you like the least about taking a course online?

18. How does your experience in the online course compare to your experience at your other school?

19. How do you think taking an online course has impacted you?

20. Some students have said that in an online course they have to work harder. Do you agree with that? If so, why do you think this is true? If you don't agree, why?

21. Did or do you interact with any other students in your online course?

Yes ☐ No ☐

22. Please explain how and why you interacted and the quality of that interaction.

23. What words would you use to describe your interaction with your instructor in this course?

24. Do you plan to take more classes online?

Yes No

25. If yes, please explain why you would like to take more classes online?

26. Do you think every high school student should take an online course as part of their high school requirements? Why or why not?

27. Would you be willing to be contacted for a follow-up interview?

Yes No

If yes, how would you prefer to be contacted?

28. How would you prefer to be contacted?

- Phone
- Email
- IM

29. Phone #

30. Email address

31. AOL Screen Name

Thank you for participating! If you complete the three online forms you are eligible for a $10 gift card.

32. Would you prefer a $10 gift card from:

WalMart Blockbuster

Within 2 weeks of receiving your results from the 3 questionnaires, or Parts 1, 2, & 3, I will send you your gift card.

Please include your mailing address AND zip code.
Thank you

33. Street Address

34. City and State

35. Zip code

Any Problems or questions?
You can email me at ascheick@mail.ucf.edu

AOL screen name is "scheick2040"

Submit

APPENDIX N: SCREEN SHOTS FOR MFFT-20

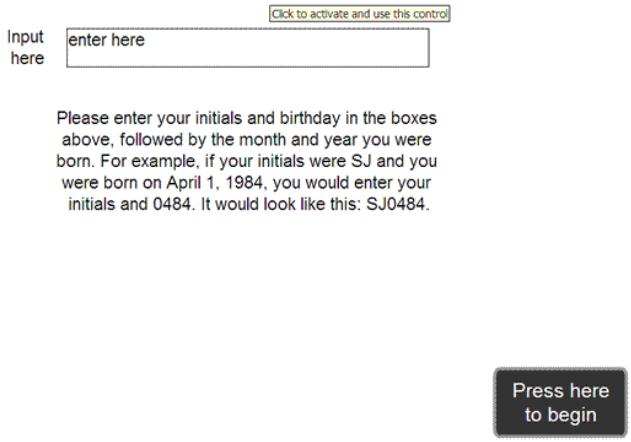

Figure 6 MFFT-20 Input Screen

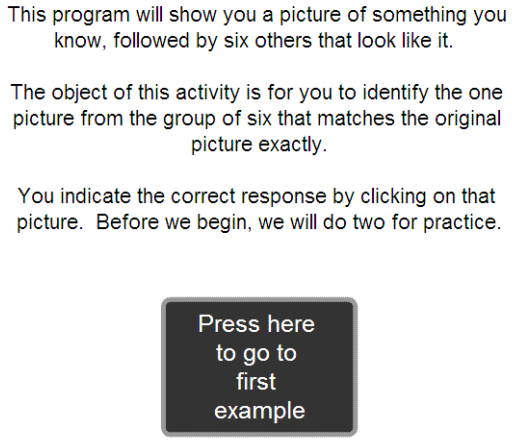

Figure 7: MFFT-20 Directions Screen

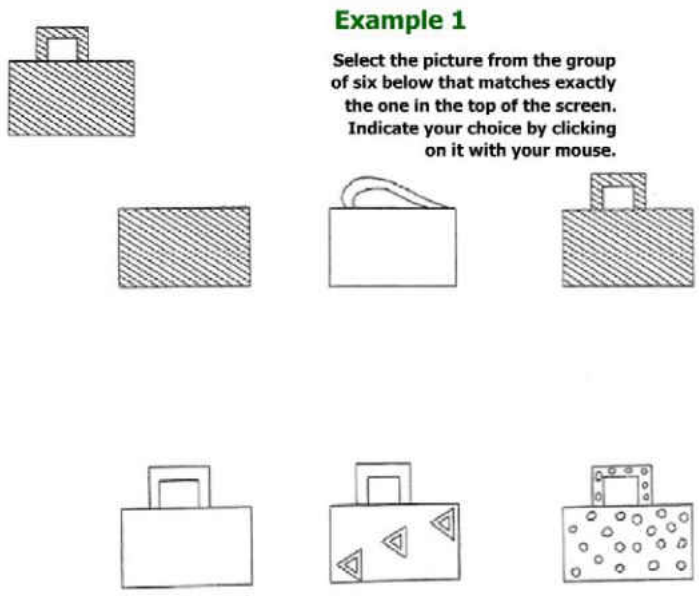

Figure 8: MFFT-20 Sample of Example 1

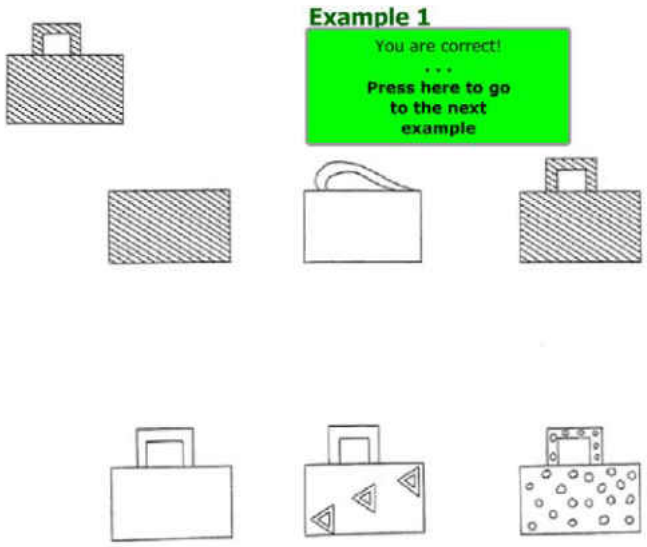

Figure 9: MFFT-20 Correct Feedback from Sample 1

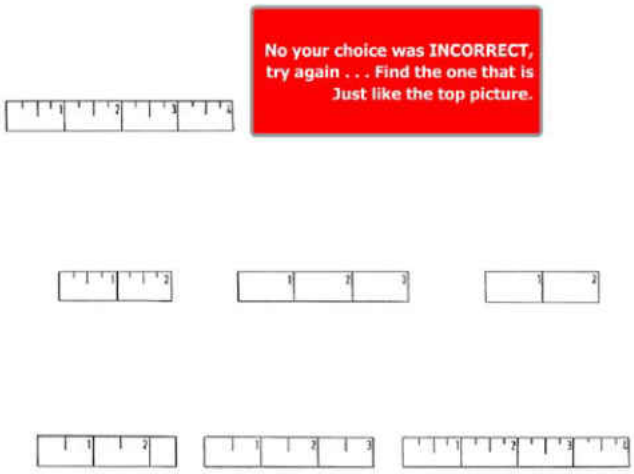

Figure 10: MFFT-20 Incorrect Feedback from Example 2

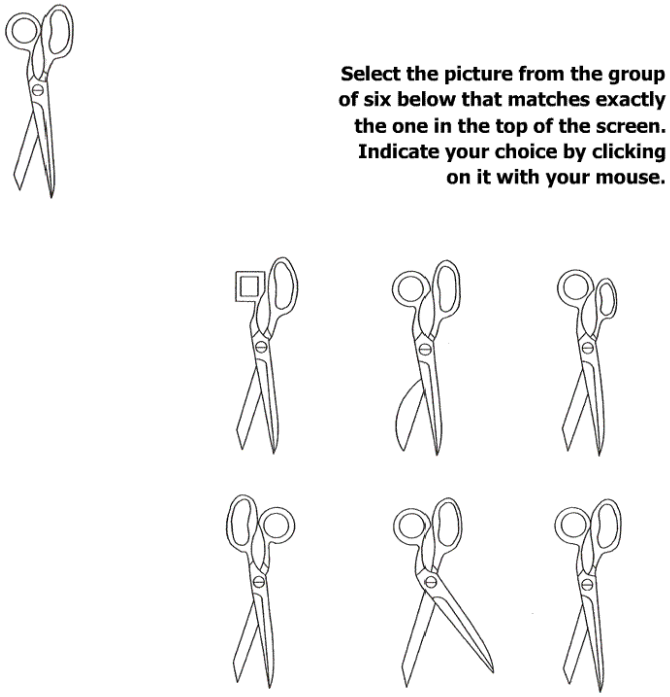

Figure 11: MFFT-20 Sample Screen Shot

APPENDIX O: RESEARCHER BRACKETING

Learning Online

When I went back to graduate school in late 1998, I planned to obtain my certification in high school language arts. Even though I already had a bachelor's degree, the state was asking me to complete two years of courses, in order to be certified. I realized after I surveyed the number of courses needed to become a certified teacher in the state of Florida, that I might as well seek a Master's degree in Education. I then decided to apply for admission to a graduate program in Educational Technology. At that time, I was employed as a technology aide in an elementary school and used a specialized software program to tutor below grade level readers. Technology and its potential to enhance learning and communication fascinated me.

My experience with online learning began when I was working on earning my Master's degree in Educational Technology. I attended a large metropolitan university, which provided several modalities for taking courses. When I enrolled in my first course, I quickly discovered that a lot had changed since I graduated in 1984. When I obtained my Bachelor's degree, the only choice was deciding whether I wanted to take a class that met MWF or T/TH formats. Now, in addition to the traditional graduate course that met weekly, I enrolled in graduate courses that met once a month on Saturdays for eight hours. Other courses in my program were online and some were blended. At this university, blended courses meant reduced seat time, where some course material was online and some was presented in traditional class meetings.

Going back to college provided me with many "firsts." The courses had different modalities to choose from, and I enrolled in my first online class. My Master's program was a cohort group, which provided much support and interaction both through email and in our courses. I had to learn to juggle so many responsibilities; college, working and family. Even

small things were new; one course had two instructors. This was a fun experience, but working through this program was a lot of work.

I quickly began to appreciate these different modalities. I lived more than thirty miles from the university, so many of these course options were attractive, because they allowed me to learn the content on my own while reducing the time spent driving to school. I am sure that part of my willingness to adapt to the different course options was because I also had to sift through multiple responsibilities. I appreciated the time we spent in the classroom because I not only learned from the instructor but from the members of my cohort as well. I felt that my understanding of the content and my technology skills increased exponentially.

My First Online Class

The first online class I enrolled in was an educational measurement class taken during the summer semester. It was a required course in my program and it was only offered online. However, summers are very busy for me. I was able to be home with my children and work part-time so having the flexibility of choosing when I wanted to work on the course was important.

The instructor had created an award-winning course. The content was very interesting and relevant to my current teaching job at that point and answered many questions that I had about educational testing. The instructor was experienced in teaching online. The instructor's feedback was prompt and timely. There was very little, if any interaction with other students in the course. I read the online modules and took quizzes. I had wondered if I would like and do well in an online course and the answer was yes. I enrolled in a traditional course with my cohort group so I did have the opportunity to discuss our online course as well.

Roughly, 50% of the courses I took during my Master's program were reduced seat time. I was very comfortable reading online modules and completing the assignments. I enjoyed the

support of other students in my cohort program. If I had any questions that my peers could not answer, my instructor was very good about responding by email and providing time before and after classes for questions. My technology skills dramatically improved throughout my coursework so that gradually I was beginning to become very comfortable learning online.

Teaching Online

My next experience with online learning came through an opportunity to teach online. After I finished my Master's degree, I had an opportunity to teach professional development courses online. Even though I was the instructor, I did not have to decide what to teach. The content for these courses had already been written. The students used a textbook in conjunction with online modules to create projects and write reflections. The students emailed me their assignments and I assessed their work. If they had difficulties, I would email them and allow them to redo their projects. Prior to the students creating the project, I had also completed the project in the textbook. I wanted to be sure I saw potential areas where they might have difficulties in order to help them. Occasionally, I would call a student and work with them on the telephone if I sensed their frustration level was getting too high. Troubleshooting potential problems over the telephone was sometimes challenging, as I could not "see" exactly what the student had done. Most of the time, we were able to resolve the issues in one telephone call. I do remember having one student who had difficulty on every project and I called her at least three times, to help her work through her project since that proved more expedient than trying to "talk" by email.

For the most part the students in my course were teachers who were enrolled to earn professional development credit or points, so that they can renew their professional teaching certificate. Most states require teachers to do earn points every five years. A few teachers in my

courses were taking the class for college credit. I knew from my training that one of the company's goals was to provide a positive experience for the students. I worked hard to do that.

Teaching and learning are important values to me. I wanted to be an "A" student and as a teacher I also worked hard to earn an "A" whether or not I was teaching online or in a traditional classroom setting. I did feel successful in this online environment. My students must have turned in good evaluations (or the company was desperate!) because I had a steady stream of classes.

This became my introduction to being a 'facilitator" of learning. An online instructor becomes a facilitator of learning not a dispenser of knowledge as sometimes happens in the traditional classroom. I did not have to "teach" these students in the manner in which I was used to, by planning assignments and giving verbal directions. I had been teaching computer applications to both children and adults and was confident in that role. However, I really enjoyed this new job. Looking back, I realized this was a great beginning to teaching online. I had anywhere from four to ten students in each class. For two years, I taught several online classes using this format. Each class was between six and eighteen weeks long depending on the subject. I learned to communicate and express myself via email. I would estimate that I probably taught eleven courses online in this format.

Learning Online Again…

I entered a doctoral program at the same university where I had earned my Master's degree. During my first semester, I took one of my courses online. It was a course in Language Arts education but not a required course for my program of study but one that interested me. The professor structured the course so that we read books, online course materials, answered discussion questions asynchronously and emailed reflections to the professor. She had an orientation at the beginning of the semester, which helped giving us an opportunity to meet her

and some of the students in the course. Overall, I found it to be a good experience and I did well academically. The professor was prompt in responding to any email and she included helpful comments in response to my reflections. Many of the students were working on graduate degrees in reading and had a lot of experience teaching this subject. We had some required discussion questions and the students dutifully responded. I thought this was normal. I had not ever used a discussion board before and enjoyed this part of the course. I enjoyed learning from these classroom teachers and appreciated this opportunity to learn beyond the professor and the textbooks. I enjoyed reading everyone's perspective. In time, I realized that when a discussion assignment was required several things happened that were quite different from a "classroom" discussion. The first was that everyone responded and I could take the time to read and reread responses if necessary and finally the quality of the students' responses was different because they had the opportunity to reflect and prepare a response.

I liked this professor and the format of her course, so I took another class. This course was about teaching writing skills. In addition to the modules, texts, a significant component of this course was online discussions. The number of students enrolled was much larger than I had experienced before. The professor enlisted two online facilitators for the discussions and she divided us into two groups; elementary and high school. I was assigned to the high school discussion group. I learned an amazing amount from this course about teaching writing to children. However, I was fascinated by how much I had learned from the discussion conversations. I experienced an eye-opening introduction to how writing is taught in public schools and the variety of methods that are employed. I was fascinated by the conversation of these teachers. I wanted to learn how to teach reading and writing skills but did not have much experience to offer to the conversation. However, the teachers who were teaching in schools had

much wisdom and insight to offer each other from the trenches. The discussion section had a life of its own completely outside of the professor and the online content. We discussed the textbooks some but mostly teachers shared their experiences in light of what they had read and tried in the classroom. The online camaraderie was evident to all of us.

I was surprised by the differences in the three online courses and the role of discussions. In the first course I enrolled in there was not any required discussion. The topic was educational measurement and I think that we would have benefited in some discussions, especially about the practice of measurement in education. I was so shocked that students graduating with a teaching degree did not have to take this course. No wonder we all experienced teachers who put questions on a test that had nothing to do with what was covered in class or in the textbook. I did talk about this idea with other people outside of the class and the professor. I guess I needed to process this revelation. Interestingly, I talked with other members of my cohort who were enrolled in this course, but I do not remember discussing it within the course with them.

In the second course, the professor required discussions. The students dutifully posted what was required but the discussion was stilted. This course was about adolescent literature and one of the topics was about censorship of texts. The discussion was sometimes interesting but limited. I asked the professor about this later why did one of her courses have such enthusiastic discussions and in another not. She said she did not know the reason. She felt it was some of the personalities involved in that course in combination with the topic. The teachers who enrolled in the writing had lots to say about their classroom practices and the writing course was a much larger class than the literature course.

Teaching Online Again...

In my doctoral program, I needed to complete an internship. Since I wanted to gain experience teaching in higher education, I was invited to co-teach an online graduate class with my advisor. I was very comfortable with the content, which was teaching teachers to integrate technology into their curriculum. The content had already been written by my advisor, so my role was to answer questions, provide feedback, and assess assignments. Although I wanted to be an excellent teacher, this course was the largest class I had ever experienced. There were thirty students enrolled in the class who submitted weekly reflections on the content that I emailed to answer. Grading and responding to student questions consumed an enormous amount of time. I never taught a class larger than 25 in a normal classroom setting. My advisor stepped in and gave me some very helpful hints for managing my time. I began to realize that teaching online at a college or university was going to be more challenging than I originally thought.

Soon after this, I was hired by the university to teach an undergraduate introduction to educational technology course. At first, I taught the lab sections face-to-face then this same course online. I have been doing this for two years. I usually teach two online sections each semester in addition to teaching the same course face-to-face.

I am puzzled by adults who said they did not like online courses. Most stated they missed the interaction with the class and the instructor. Some stated that they felt isolated. It seemed to me that they were very vague about what they did not like. I decided to look at this more closely.

At one point, in my doctoral program, I enrolled in qualitative research course. For my course project, I decided to try to understand more clearly; what do students mean when they stated that there is less interaction in online courses? I also wanted to know what kinds of interaction was taking place in the traditional classroom. I decided to sit in a graduate curriculum

class and to observe what kinds of transactional dialogue students engaged in. I also "observed" an online class to see what kinds of communication and interaction happened. This was not a scientifically rigorous study, However, I felt enlightened about the types of interaction that happened in a classroom.

In the online class, the students interacted in a minimal way using the discussion tool and email. They primarily interacted with the instructor as far as I could tell. This looked like the type of familiar experience I had in my adolescent literature course. I did not observe anything unusual in the online course; maybe that was noteworthy. I suspect that how much interaction there is in an online course may be dependant on how the instructor sets up the course and how relevant the students view the topics they are required to discuss. How much experience they have with the topic might also play an important role.

In my own course, I noticed that when I ask students to discuss a topic the activeness of that discussion seems dependent on how interesting or relevant students perceive the topic. Recently, I asked the students to discuss some issues about MySpace and Facebook. These are popular online portals where students post profiles, blog, email, and interact with friends and, sometimes, strangers. This discussion was lively and interactive. Students posted much longer responses than they had on previous discussion assignments. After reading their posts, I believe students saw the topic as both interesting and relevant to their lives. In contrast, when I asked students to discuss how they might use certain Web sites or software in their future classrooms, the discussion is often awkward and brief. Most of the students have not many classrooms experiences to draw from.

In contrast, there was a lot of discussion in the traditional classroom, but this primarily took place prior to class starting. As I mentioned before, sitting in the classroom to simply

observe the interaction was an eye-opening experience for me. I had never been in a classroom before where I was not the student or the teacher. As a student, I was always talking relevantly before class. As a teacher, I was getting ready to teach and addressing student issues before class started.

I sat in different locations each time I attended the class I observed and found that some people said nothing at all the entire semester. Some said a few things before class started and some talked a great deal while waiting for class to begin. It appeared that most people did not know each other when the class began. The number of people who chatted before class increased as the course went on. Before class began, most of the conversations centered on small talk about their experiences that day or during the week. One woman explained how she got a traffic ticket and another person talked about her dog's health and going to the vet. The students who were talking discussed a wide variety of issues that may have been very important to them personally, but I am not sure it was perceived by the recipient as important.

Another frequent topic of conversation was that students would talk with each other about the course's schedule and assignments. They often used each other to clarify questions about assignments and due dates. This surprised me. I would have expected that if they had a question they would ask the instructor to clarify. Only once did I observe a student asking another student about when an assignment was due, then asking the teacher when she arrived for clarification. I suspected that they asked each other for clarification but they already knew the answer.

When the instructor came to class and asked students questions in class, only a very small number would answer her questions each week. I did notice that some students, who came late or just as class started, never talked with anyone.

I also observed that a small minority were engaged in other tasks during class. During the course of my observations, a few teachers graded papers. One student regularly dozed and another seemed to be engaged in reading non-course materials.

Teenagers Online

In the process of working on my Master's degree, our professor invited a guest teacher from the Florida Virtual School to talk to our class about online learning. I was very excited about the idea of high school students being able to take a course online. I looked at the school's Web site and discussed the idea with my oldest daughter and son. My daughter was interested and she wanted to sign up for a course; however, my son was not. The Florida Virtual High School requires that if the student is already enrolled in a school, both parent and school must sign consent forms to place the student in a course. Even if all the parties agree, the student may be placed on a waiting list before a space becomes available.

We printed the enrollment forms and took them to my daughter's school counselor. The counselor was emphatically negative about the school and the idea of online learning for high school students. She claimed that all of the students she knew who tried this school received failing grades for the courses they had enrolled. I assured her we thought this was a great idea and appropriate for my daughter. My daughter also affirmed she really wanted to take a computer course online. The counselor referred us to one of the assistant deans at the school because she refused to sign the forms. The assistant dean was pleasant but reluctant, also. The dean finally signed the school's consent form because this particular high school did not offer the course. Our daughter was placed in a course and earned an A. She enrolled in a second computer course later that year. Once again, I went with my daughter to her high school guidance office. Her guidance counselor said she would sign the consent forms only because they did not offer

this computer programming course. Since my daughter had already proven herself by completing the previous course, we were not in the counseling office for very long. My daughter successfully completed this course as well. She graduated in 2001.

My third child was a junior in high school and a cheerleader when she enrolled in the online physical education (PE) course at FLVS. In our county, cheerleading is not considered as a sport in the high school curriculum. Many of the students and parents strongly disagree with this policy as cheerleaders participate in athletic conditioning as a regular part of practice. If it was considered a sport, then the students would not have to take an extra physical education class. Our daughter wanted to take some other academic classes so she decided to take P.E. online from the Florida Virtual School instead of taking it at her high school. I had suggested this idea to her after I learned that the online physical education course is the most popular course at the Florida Virtual School. I had also worked with an instructor who taught PE at FLVS. She had explained the structure of the course. I knew my daughter would be able to count her time at cheerleading as part of the physical activity component for the course. This seemed a win-win situation for her since she was already committed to the physical activity required for cheerleading. Once again, we went down to the high school to get the required consent forms signed. This was three years after our first daughter enrolled in FLVS. My third child had a different counselor who was somewhat dubious but did sign the form.

My daughter successfully completed the course in less than the required amount of time. She earned an A and said she learned more and worked harder completing the online modules than she had in her previous high school PE course.

This same daughter is now a senior and wants to take some more online courses. She could not arrange her schedule and take the classes she wanted to at her high school. Currently,

she is enrolled in two online courses in addition to classes at her local high school. I was impressed because my daughter has a new counselor this year and I did not have to go to the high school to encourage the counselor to sign the form. My daughter explained what she wanted to do and why and the consent form was signed.

When my daughters were enrolled in the virtual high school, I was surprised at how hard the teachers worked to stay in touch with their students. My daughters had the teacher's home telephone and beeper numbers. Each teacher has a school-issued beeper and the students know when they can call their instructor. The instructor is available for them between six to ten hours per day. Those are impressive office hours. The school policy is that the teachers will respond back by email or phone within 24 hours, with some exceptions. The school even employs substitute teachers so there is always someone to help.

The instructors talked with my daughters and one parent at least once a month. The instructor checks in to see if I have any questions as well as with my daughter. I have to say that I wish the teachers at my local public high school were half of this available.

I also spent an afternoon talking with the Director of Curriculum of the virtual high school. She talked about how each course was carefully developed and a team worked on the curriculum. Each course met the appropriate standards for our state and contained assignments that met different levels of Bloom's taxonomy. Some assignments checked the student's knowledge and comprehension of the course content. Other assignments asked the student to build on what they learned with assignments that required the student to analyze and synthesize information learned. The director noted this practice is often why students in virtual high school courses comment that the course is harder than the courses they have taken in their local high schools.

I also attended a national conference in Orlando, Florida that focused on many aspects of state virtual high schools. I had the opportunity to talk with a teacher and a few students who attended the Florida Virtual High School. The teacher showed me an American Government class and I was impressed with the care and creativity that was put into the course's design and curriculum. It was at this point that I began to think that what was being offered at the high school level at this virtual high school was far more impressive than what was being offered at the large university where I worked in our online course.

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