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Student and parent satisfaction with online education at the elementary and secondary levels

Craig Warner Butz

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STUDENT AND PARENT SATISFACTION WITH
ONLINE EDUCATION AT THE ELEMENTARY
AND SECONDARY LEVELS

by

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A dissertation submitted in partial fulfillment
of the requirements for the

Doctor of Education Degree in Special Education
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May 2004

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March 26, 2004

Examination Committee Chair

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ABSTRACT

Student and Parent Satisfaction with Online Education at the Elementary and Secondary Levels

by

Craig Warner Butz

Dr. Amanda Kyle Higgins, Examination Committee Chair
Professor of Special Education
University of Nevada, Las Vegas

The purpose of this study was to examine factors associated with student and parent satisfaction with online education at the elementary and secondary level. The study involved the development and validation of two questionnaires (student and parent) to determine factors related to satisfaction. The questionnaires were developed through a review of current literature concerning distance and online education and with feedback from administrators and teachers currently working in online education at the elementary and secondary levels.

The student satisfaction questionnaire contained 27 items that were assigned to five hypothesized dimensions or factors: (a) school-level technology support, (b) school-level instructional support, (c) curriculum programs, (d) social interactions, and (e) overall satisfaction. The students who completed the digital questionnaire were enrolled in one of three different programs of online education.

Results of a maximum likelihood exploratory factor analysis with oblimin (oblique) rotation supported the hypothesized factor structure. A multiple regression analysis also was conducted to determine which of the four specific factors identified by the
exploratory factor analysis were related to overall student satisfaction with online education. The multiple regression analysis indicated that school-level technology support, school-level instructional support, curriculum programs, and social interactions were all significantly related to overall student satisfaction.

The parent satisfaction questionnaire contained 28 items that were assigned to the same five hypothesized dimensions or factors (e.g., school-level technology support; school-level instructional support; curriculum programs; social interactions; and overall satisfaction). The parents who completed the digital questionnaire had at least one child who was enrolled in one of three different programs of online education.

Results of a maximum likelihood exploratory factor analysis with oblimin (oblique) rotation supported the hypothesized factor structure. A multiple regression analysis also was conducted to determine which of the four specific factors identified by the exploratory factor analysis were related to overall parent satisfaction with online education. The multiple regression analysis indicated that school-level instructional support, curriculum programs, and social interactions were significantly related to overall parent satisfaction. School-level technology support was not significantly related to overall parent satisfaction.
## TABLE OF CONTENTS

ABSTRACT ............................................................................................................................. iii

LIST OF TABLES .................................................................................................................. vii

ACKNOWLEDGMENTS ........................................................................................................ viii

CHAPTER 1  INTRODUCTION .......................................................................................... 1
  Distance Education .............................................................................................................. 1
  Online Education ................................................................................................................. 4
  Statement of the Problem .................................................................................................. 10
  Significance of the Study ................................................................................................... 12
  Limitations .......................................................................................................................... 12
  Definitions .......................................................................................................................... 13
  Summary ............................................................................................................................. 14

CHAPTER 2  REVIEW OF RELATED LITERATURE ................................................. 16
  Student Satisfaction with Distance Education ................................................................. 17
  Student Learning in Distance Education ......................................................................... 33
  Characteristics of Online Learners ................................................................................... 45
  Elementary and Secondary Distance Education .............................................................. 47
  Summary ............................................................................................................................. 52

CHAPTER 3  METHODOLOGY ......................................................................................... 54
  Overview ............................................................................................................................ 54
  Research Questions ............................................................................................................ 54
  Participants ........................................................................................................................ 55
  Setting ................................................................................................................................. 61
  Design and Procedures ...................................................................................................... 64

CHAPTER 4  RESULTS ..................................................................................................... 69
  Student Satisfaction With Online Education ...................................................................... 69
  Parent Satisfaction with Online Education ....................................................................... 82

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<table>
<thead>
<tr>
<th>Chapter/Appendix</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Satisfaction With Online Education</td>
<td>97</td>
</tr>
<tr>
<td>Conclusions</td>
<td>99</td>
</tr>
<tr>
<td>Recommendations for Further Study</td>
<td>100</td>
</tr>
<tr>
<td>Parent Satisfaction With Online Education</td>
<td>102</td>
</tr>
<tr>
<td>Conclusions</td>
<td>105</td>
</tr>
<tr>
<td>Recommendations for Further Study</td>
<td>106</td>
</tr>
<tr>
<td>Summary</td>
<td>107</td>
</tr>
<tr>
<td>APPENDIX A</td>
<td>108</td>
</tr>
<tr>
<td>APPENDIX B</td>
<td>116</td>
</tr>
<tr>
<td>APPENDIX C</td>
<td>124</td>
</tr>
<tr>
<td>APPENDIX D</td>
<td>126</td>
</tr>
<tr>
<td>APPENDIX E</td>
<td>128</td>
</tr>
<tr>
<td>APPENDIX F</td>
<td>130</td>
</tr>
<tr>
<td>APPENDIX G</td>
<td>133</td>
</tr>
<tr>
<td>APPENDIX H</td>
<td>136</td>
</tr>
<tr>
<td>APPENDIX I</td>
<td>140</td>
</tr>
<tr>
<td>APPENDIX J</td>
<td>143</td>
</tr>
<tr>
<td>APPENDIX K</td>
<td>147</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>151</td>
</tr>
<tr>
<td>VITA</td>
<td>159</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 1 Summary of student demographics .................................................................57
Table 2 Summary of parent demographics ................................................................58
Table 3 Summary of teacher and administrator demographics ...............................59
Table 4 Questionnaire items and hypothesized dimensions (students) ...................72
Table 5 Student satisfaction questionnaire item means .........................................73
Table 6 Frequency and percentages of responses (students) .................................74
Table 7 Alpha coefficients for dimensions identified in phase one (students) ...........75
Table 8 Pattern matrix derived through ml with direct oblimin (oblique) rotation (five factor) ..................................................................................................................80
Table 9 Pattern matrix derived through ml with direct oblimin (oblique) rotation (four factor) ..................................................................................................................81
Table 10 Summary of regression analysis for factor scores predicting overall student satisfaction ..............................................................................................................81
Table 11 Questionnaire items and hypothesized dimensions (parents) ....................85
Table 12 Parent satisfaction questionnaire item means .............................................86
Table 13 Frequency and percentages of responses (parents) ....................................87
Table 14 Alpha coefficients for dimensions identified in phase one (parents) ...........88
Table 15 Pattern matrix derived through ml with direct oblimin (oblique) rotation (five factor) ..................................................................................................................92
Table 16 Pattern matrix derived through ml with direct oblimin (oblique) rotation (four factor) ..................................................................................................................93
Table 17 Summary of regression analysis for factor scores predicting overall parent satisfaction ..............................................................................................................95
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CHAPTER 1

INTRODUCTION

Historically, distance education has been defined as a learning situation in which the teacher and student are separated geographically for the majority of the instructional process (Matthews, 1999). The definition now includes educational digital media as a means of instruction in which electronic two-way communication between the teacher and student is provided via the Internet (Lewis, Alexander, & Farris, 1997).

Distance education has its roots in correspondence study and has existed for at least 160 years (Matthews, 1999). In the past, a variety of media were used to conduct distance education. These included print correspondence, videotapes, radio, and television. Currently, the Internet, email, teleconferencing, and web-conferencing have been introduced into distance education. As new technologies emerge, an increasing number of entities have started to use the Internet as the primary medium for distance education. Online education has been used most extensively in university settings; however, recently it is viewed as a viable option in the elementary and secondary settings as well (Clark, 2001; Goral, 2001; Kellogg & Politoski, 2002; Russo, 2001).

Distance Education

The roots of distance education can be traced back to 1840 when Sir Issac Pitman delivered shorthand instruction through the use of mail-based correspondence courses to
students. Course materials and assignments were mailed to students who completed the in this manner. This method of distance education continued relatively unchanged until the 1960s when new technologies such as videotapes, radio, television broadcasts, and videoconferencing were introduced and used (Matthews, 1999; Rumble, 2001).

The Current Evolution of Distance Education

The most recent phase of distance education began in 1969 with the founding of the Open University in England (Matthews, 1999). The Open University ushered in a multimedia approach to distance education with the use of video and audio media to supplement the traditional text-based course materials (Rumble, 2001). The Open University used a mixed-media type of distance education that included audio and visual materials as well as broadcast radio and television coupled with the print correspondence. Students also were assigned a tutor who provided instruction during evening and weekend group sessions and via the telephone as needed. By 1994 the Open University was serving over 200,000 students across Europe. Similar programs began in other countries around the world and in 1997 approximately 12% of undergraduate students were enrolled in distance education programs (Rumble, 2001). According to Lewis and Greene (1997) over one-third of the universities in the United States offered a total of 25,730 courses via distance education programs.

With the increasing affordability and accessibility of the personal computer in the 1980s and the evolution of Internet in the 1990s, the stage was set for today’s online educational systems. As of 2002, over 50% of Americans (143 million) had Internet access, and 75% of 14-17 year-olds reported using the Internet (U.S. Department of Commerce, 2002). Internet access in public school classrooms has grown from 4% in 1994 to 87% in 2001 (United States Department of Education, 2002).
Rumble (2001) discussed four areas in which distance education research should focus as this delivery medium continues to evolve. These include the actual use of the technology (e.g., how the technology is incorporated into instruction), the type of pedagogy or instructional design used, the level of acceptance by users, and the public perception of distance learning. He maintains that, for distance education to be a viable alternative to face-to-face education, current research must provide guidance to educators and developers. Without research-based guidance, developers of online learning may not take full advantage of the uniqueness of the media and limit its instructional potential.

Advantages of Distance Education

Matthews (1999) lists several benefits of distance education for both students and the institution offering the instruction. Because of the multidimensionality of distance education, more students have access to educational opportunities. In the distance education environment, students can complete their studies conveniently because of the increased flexibility of scheduling and a decreased need to travel to classes. While interacting in distance education courses, students have the opportunity to spend more time formulating answers and have the luxury to work at their own pace. Matthews also maintains that institutions benefit from distance education through increased enrollment and a reduced need for facilities.

Majdalany and Guiney (1999) found that distance education allows institutions or school districts to offer courses that typically have low enrollment. This may be accomplished through teaming with other institutions in an effort to combine resources through shared courses. This results in the institutions involved being able to provide courses to a wider audience. They also maintain that distance education provides increased opportunities for students who are at risk for school failure, students with
special needs, and English language learners to access alternative forms of education. This can lead to even more students being able to access an appropriate education in an efficient, cost-effective manner (Majdalany and Guiney, 1999).

Disadvantages of Distance Education

Distance education is not without its problems (Matthews, 1999). The initial cost of developing a distance education program can be very high and takes a great deal of preparation by the faculty involved. The adequate training of staff can be very intensive in distance education. And, finally, because students are not in a classroom during instruction, there may be insufficient interaction between students and teachers.

Although distance education offers an alternative to traditional programs for students, course completion rates can be lower in distance education than in traditional education. This may be due to the fact that students often do not realize the amount of effort required to be successful in distance education courses (Serwatka, 2002; Dominguez & Ridley, 1999).

Online Education

Mason (1998) describes online courses as instructional systems involving asynchronous messaging and real-time interactive events that provide access to course content and materials. Currently, this takes the form of elaborate systems of interactive materials, online assessment, and collaborative learning activities. Blomeyer (2002) believes that online courses provide a new and significant medium through which standard-based learning, online collaboration, and participation in virtual communities quickly are becoming a reality in education.

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The Evolution of Online Education

Kellogg and Politoski (2002) provide the most extensive and recent data on elementary and secondary students who participate in online education in the United States. The data indicate that in the 2001-2002 school year there were approximately 85,500 students enrolled in 88 virtual schools. If this growth rate continues, they estimate that elementary and secondary online enrollment could reach over a half million by the 2004-2005 school year.

Several entities are involved in the delivery of online education at the elementary and secondary level (Kellogg & Politoski, 2002). These include statewide initiatives, university-based programs, local district programs, charter schools, and for-profit private schools. Within each educational entity there is a wide discrepancy in the development of course materials, as well as the amount and type of student-to-student interaction. There are also large differences in the amount and type of teacher-to-student interaction.

Over 50% of the programs that offer online education to elementary and secondary students develop their own course content internally and post them online using different media (Kellogg & Politoski, 2002). Other programs purchase their courses from commercial curriculum vendors and provide them through password-protected avenues. Most elementary and secondary online education programs feature little to no face-to-face interaction between teacher and student. Often, communication is limited to email, telephone contact, or chat room sessions. However, some programs do offer a hybrid format that couples actual face-to-face classroom instruction with online assignments. One common element among all of the programs is the asynchronous nature of the courses that allows students to access courses at any time of the day or night.
At this point in time, approximately 15% of high schools in the United States offer some form of online coursework (Clark, 2001). Because of the discrepancies in online education program delivery models at the elementary and secondary levels, it is important that research focus on examining the factors that result in a high level of student learning and satisfaction.

**Advantages of Elementary and Secondary Online Education**

Many benefits of online education for elementary and secondary students have been discussed in the literature (Kellogg & Politoski, 2002). These include: (a) individualization of education to meet student needs and learning styles, (b) schedule and geographic flexibility, (c) options for students who are physically unable to attend a traditional school, and (d) high learner motivation.

Cavanaugh (2001) believes the low cost of online courses and the increased ability to teach courses not available in rural areas or small school districts (e.g., advanced math and science courses) are the major benefits of online education. Russo (2001) maintains that online education can help school districts address teacher shortages, limited course offerings, high dropout rates, lack of space, and the movement toward homeschooling.

Fulton (2002) identified students who were taking advantage of online learning at the elementary and secondary levels. He found that hospitalized or homebound students, incarcerated youth, students who were suspended or assigned to alternative programs, athletes, and atypical students for whom regular classrooms are not practical or effective are the primary participants in online education at this time. For these students, online education provides an alternative to missing important instruction or, in the worst-case scenario, not graduating.
Fulton (2002) also maintains that part time enrollment in online education can allow students who lack credits to graduate or who want to take extra classes in addition to their regular schedule. In these cases, online education offers educators another method of instruction to meet the educational needs of these learners.

Online instruction also can be motivational for students with different learning styles. For example, students who are not socially comfortable in large group settings, or students who have been unsuccessful in traditional schooling often do well in an online setting (Fulton, 2003). For parents who choose homeschooling for their children, online education provides access to coursework, curricula, and research-based instruction typically not available in homeschooling situations. Online education provides the vehicle through which parents can ensure that their children receive quality instruction (Fulton, 2002).

Zucker and Kozma (2003) maintain that online education may lead to increased global economic competitiveness for the United States and better prepare students for the 21st century information age. Students who take online courses also may be better prepared for the demands of post-secondary education in that many universities now offer online education (Lewis & Greene, 1997).

Disadvantages to Elementary and Secondary Online Education

Although there are many advantages to using online education in elementary and secondary settings, researchers also maintain that online education has disadvantages as well. Russo (2001) found that course completion rates tend to be lower in online education than in traditionally offered courses. This may be due to learner isolation; a reported problem for many young distance education students (Russo, 2001; Fulton, 2002). It is possible that some students do not have the same quality or quantity of
interaction with peers and teachers in the online environment and that this lack of
interaction results in a sense of isolation and results in a decision to leave the class.

Another factor identified in the research is difficulty with the technology, both user
and hardware based. These problems can lead to learner frustration as technology glitches
increase the amount of time needed to complete assignments as well as hinder instruction
(Fulton, 2002).

The differences between the traditional classroom and the online environment have
been discussed in the literature. Fulton (2002) reported that teachers of online education
courses believe that some aspects of face-to-face instruction cannot be replicated in
online education. The teachers indicated that they do not have the opportunity to view the
students in order to gauge their understanding. This hindered the teachers’ ability to
provide prompt feedback and use classroom theatrics to pique student interest. Educators
using online education have found that the initial cost of course development was very
high and, for this reason, teacher unions have not been receptive to online education for
younger students (Russo, 2001).

The digital divide also has been identified as a negative factor in online education
(Zucker & Kozma, 2003; Kellogg & Politoski, 2002). Computer and Internet access
varies with such factors as age, ethnicity, disability, education, and income. Certain
groups of people may not be able to take advantage of the opportunities available through
online education. Even those who have access may be at a disadvantage in an online
education setting because of limited technology skills and experience. Zucker and Kozma
(2003) maintain that some learning styles may not be suited to online learning because of
the autonomous learning ability demanded in this environment. Thus, care must be taken
to assess an individual's access to technology as well as their learning style before assuming that online education is the appropriate instructional medium.

*Student Learning in Online Education*

LeBaron and Tello (1998) believe that research comparing student learning in a distance education course to learning in a traditional setting fails to address the important issues related to online education. They believe that comparison studies simplify a complex process and merely focus on comparing two very different instructional delivery systems. Limited research has been conducted in distance learning to determine the appropriate blend of media, content, learner satisfaction, and learner gain. Rockwell, Furgason, and Marx (2000) believe that research and evaluation of online learning should focus on the design of the educational experience, teacher preparation, and educational outcomes. Thus, research must go beyond student counts, completion rates, and other less meaningful measures and must begin to examine learning outcomes as well as consumer satisfaction with the learning experience.

Stewart (2001) identified tools to facilitate online instruction that may result in increased student learning and satisfaction. These include class procedures and expectations, instruction, and interaction as a framework for the evaluation of the online learning experience. Other important factors identified in the literature include collaboration, instructor feedback, and level of student learning (Baron & McKay, 2001; McGee, 2002). Hawkes (2002) identified four areas for the evaluation of online education programs. These include technical criteria, instructional criteria, organizational criteria, and ethical criteria.
Student Satisfaction

Gabrielle (1997) examined the relationship between student satisfaction and online coursework. She found that in courses that featured higher levels of student interaction with teachers, higher satisfaction ratings occurred. The students who reported that they believed the quality of instructional media in the online course was high were more satisfied with their online experience than the students who reported low quality. She also found that student access to technology and previous experiences with distance education were positive predictors of student satisfaction with online education.

The level of teacher-to-student interaction and student-to-student interaction and students’ perceptions of belonging in a class were found to be important elements in the design of online education (Picciano, 2002; Schrumm & Hong, 2002). It appears that the provision of opportunities to interact frequently correlates highly with student satisfaction in an online learning environment. Schrumm and Hong (2002) also identified the level of program flexibility to complete coursework at the learner’s convenience to be vital to student achievement and satisfaction.

Statement of the Problem

Although online education has an emerging history in post-secondary education, it only recently has become a viable option in elementary and secondary settings (Cavanaugh, 2001; Clark, 2001; Lary, 2002). Because of this, little research concerning online education exists at the elementary and secondary levels. Cavanaugh (2001) maintains that the developing research base at the postsecondary level may not be relevant to the experiences of elementary and secondary students in an online learning environment. Therefore, as online education becomes more of a presence at the
elementary and secondary levels, it is important that educators explore the various factors inherent in this learning environment to achieve the maximum potential of the medium (Kellogg & Politoski, 2002).

Unfortunately, current research in the area of elementary and secondary online education has focused on the number of students being served (Cavanaugh, 2001; Blomeyer, 2002). Because online learning quickly is becoming a presence in elementary and secondary education, research must begin to evaluate the effectiveness of this learning system (Blomeyer, 2002). Russo (2001) maintains that the growth in elementary and secondary online education would even be faster if research data existed concerning instructional effectiveness, cost benefit, the logistics of developing online programs, and consumer satisfaction.

In this study two questionnaires were developed. The first questionnaire was developed to determine factors related to student satisfaction with online education (See Appendix A). The second questionnaire was designed to determine the factors related to parent satisfaction with online education (See Appendix B). Items included on the questionnaires were based on a review of the current literature, consultation with administrators, and consultation with teachers from one elementary and two secondary online education programs. The questionnaires were developed in four phases: (a) development of the initial instrument, (b) data collection, (c) validation of the instrument, and (d) development of the final instrument. In the development phase the questionnaires were administered to students currently enrolled in an online educational program and their parents. After the initial questionnaires were administered and validated, the final questionnaires were developed based on the findings of the previous three phases.
The study involved the administration of the two questionnaires to investigate the factors involved in student and parent satisfaction with online education. The research questions were:

1. What factors are associated with student satisfaction with online education at the secondary level?
2. What factors are associated with student satisfaction with online education at the elementary level?
3. What factors are associated with parent satisfaction with online education at the secondary level?
4. What factors are associated with parent satisfaction with online education at the elementary level?

Significance of the Study

This research is important for several reasons. It contributes to the educational knowledge-base concerning factors contributing to student satisfaction with online education at the elementary and secondary level as well as the factors contributing to parent satisfaction with online education at these levels. A valid instrument to measure parent and student satisfaction with online education at the elementary and secondary level was developed.

Limitations

This study has five limitations. Studies that make use of self-reported data are limited in that participants may not be honest with their responses because they feel compelled to provide answers that are socially desirable. Another limitation is that all students enrolled
in the three participating schools and their parents were asked to take part in the study in order to secure enough participants to validate the instrument. This eliminated the ability to draw upon randomly selected samples. Additionally, this study is limited to three online schools which may not represent all formats of online education at the elementary and secondary level and may limit the generalizability of the study. Another limitation was the sample size of both the student participants and the parent participants was not large enough to conduct factor analyses for elementary and secondary separately. The data had to be combined to allow for the statistical analyses to be valid. Finally, because the study only includes students in the third grade and above, the results may not be generalizable to younger students.

Definitions

The following terms and definitions are used in this study. Precise definitions of terms are critical to understanding the procedures and results of this study.

Asynchronous

Events that take place irrespective of time or location. In an asynchronous learning environment, teachers and students do not need to be online at the same time in order to teach, communicate, or learn.

Chat room

An online format that features students or teachers posting comments on the Internet in a synchronous time frame.

Distance education

A learning situation in which the teacher and student are separated geographically for at least the majority of the instructional process. In this situation, educational media are
used to carry out instruction, and there are provisions for two-way communication between teacher and student (e.g. email, telephone).

*Face-to-face*

Teacher-to-student and student-to-student interaction in the same geographical location, typically a classroom setting.

*Hybrid format*

A program of distance or online education that includes regularly scheduled face-to-face sessions.

*Online course*

An asynchronous course taught via the Internet in which students access course materials from a computer. Courses have a defined beginning and ending date and include assignments that must be completed during the course.

*Online student*

A student who participates in an online course or courses.

*Online education*

A form of distance education in which the primary mode of accessing course materials and person-to-person interaction is via the Internet. In online education the student may access courses, communicate with teachers, and complete assessments at their convenience.

**Summary**

Online education is a growing trend in elementary and secondary education in the United States (Clark, 2001; Kellogg & Politoski, 2002). Most research in this area focuses on the demographics of the participants and the delivery models used.
(Cavanaugh, 2001; Blomeyer, 2002). If online education is to become a permanent option for students and their families, research must examine the factors that lead to its successful implementation. Because student satisfaction with an educational environment can have a direct impact on student learning in that environment, it is important that researchers begin to identify the factors that may impact student satisfaction with online education at the elementary and secondary levels. It is also important to assess parent satisfaction with this mode of educational delivery, because parents play an integral role in their children’s learning.
CHAPTER 2

REVIEW OF RELATED LITERATURE

The growth of online education, particularly elementary and secondary online education, traces its origins to the concept of distance education created in the 1840s (Matthews, 1999). Throughout its evolution, distance education has gone through three distinct phases (Cambre, 1991; Matthews, 1999; Rumble, 1999). These phases include correspondence courses, one-way communication (e.g., radio, television, and videotapes), and two-way communication (e.g., telephone and Internet-based communication).

In a modified Delphi study Rockwell, Furgason, and Marx (2000) attempted to identify research and evaluation priorities for online education. In their study, three groups of distance educators participated: (a) those with local, national, and international interests in distance education, (b) administrators from universities, elementary and secondary education, and government, and (c) elementary and secondary classroom teachers, technologists, community leaders, instructional designers, media specialists, professors, and school board members. Results from this national Delphi study indicated that educators believe research concerning distance education should focus on the design aspects of the courses, teacher preparation, and the educational outcomes of distance education.
Currently, the major themes that appear in the literature relating to distance education include: (a) student satisfaction with distance education, (b) student learning in distance education environments, (c) the characteristics of online learners, and (d) research into distance education at the elementary and secondary level. Most data-based research deals with the use of distance education at the postsecondary level; however, there is an emerging research base that focuses on elementary and secondary distance education (Clark, 2001; Kellogg & Politoski, 2002).

Student Satisfaction with Distance Education

Research investigating student satisfaction with distance education is primarily survey-based (Biner, Dean, & Mellinger, 1994; Egan, Welch, Page, & Sebastian, 1993; Fulford & Zhang, 1993). The student satisfaction surveys have examined the factors of quality of courses, satisfaction with the instructor, satisfaction with the instructional media, and willingness to take more courses via distance education.

Traditional Distance Education

According to Matthews (1999), the roots of distance education can be traced back to 1840 when Sir Isaac Pitman delivered correspondence course instruction through the mail in England. Course materials and assignments were mailed to students who completed their assignments and mailed them back. By the early 1900s several universities offered courses in this manner.

It appears from the research that students at the post-secondary level tend to have a high level of satisfaction with correspondence courses (St. Pierre & Olsen, 1991; Tallman, 1992). St. Pierre and Olsen (1991) analyzed students’ perceptions of their instructors and the instructional impact of their courses in terms of student satisfaction
with college correspondence courses. They developed a questionnaire to elicit
demographic data and other information that could be used to test the relationships
among feedback, experiential learning, lesson return, didactic communication, course
materials and content, communication with instructors, and student satisfaction with the
learning experience.

The questionnaire was mailed to 700 students who had completed correspondence
courses at a university in the eastern United States. Of the 700 students who received the
questionnaire, 337 students completed and returned it. Data were analyzed using an
analysis of variance and a regression analysis.

The flexibility of the courses was cited by the majority of the students as the primary
reason for taking a correspondence course. In the area of feedback-related variables,
motivation was cited as the most important influence on student satisfaction. Positive
reinforcement from instructors and suggestions for improvement were the next most
important factors relating to feedback. St. Pierre and Olsen (1991) also reported a
significant positive relationship between the opportunity to apply experiential learning,
prompt return of lessons, and didactic conversation with instructors as influencing overall
student satisfaction with the correspondence courses. Students who reported satisfaction
with the correspondence course experience also were more likely to take other such
courses.

St. Pierre and Olsen (1991) concluded that students appear to be satisfied with taking
a course through correspondence. This conclusion was derived from the high percentage
of students who reported that they would enroll in future correspondence courses and
would recommend correspondence study to others.
In a study designed to identify factors that contribute to student satisfaction and persistence in correspondence courses, Tallman (1992) examined the relationship between satisfaction and persistence and students' perceptions of course quality and student-support services. Specifically, Tallman examined whether a pre-enrollment orientation session; direct communication with instructors during the course; accessible and relevant student-support services; and clearly-written understandable course materials correlated with student satisfaction and the probability of course completion.

The participants were 311 students enrolled in correspondence courses at a small private university in the United States. Tallman used a questionnaire designed to gather data relating to the admissions process, instructor feedback, student self-assessment of learning, student-instructor interaction, and the impact of mailing course materials to students. The Likert-style questionnaire had 49 items relating to the admissions process, the type of instructor feedback, student self-assessment of learning, and student-instructor feedback. Student satisfaction was determined based on student reporting of a positive learning experience, the likelihood to take further correspondence courses, and whether they would recommend correspondence study to other students. Persistence was measured by course completion.

Data analysis was performed in three phases. The first phase was comprised of a descriptive overview of the demographic data. The second phase included a factor analysis to identify the interrelated independent variables, and the final phase involved the application of a stepwise regression and an analysis of variance.

According to the factor analysis, the admissions process was the single most important factor associated with student satisfaction with their courses. However, it was not related to student completion rates. Prompt feedback and high levels of interaction
with instructors, student-support services, and quality of course materials were also significant predictors of student satisfaction, but again were not associated with course completion.

Tallman (1992) concluded that the flexibility afforded through correspondence study was important to students. He also maintained that developing correspondence courses that include a smooth admissions process, prompt feedback, high levels of interaction, and quality course materials contribute to student satisfaction. He believed that these components can lead to high rates of course completion even though course completion was not significantly related to any of the factors in the study. Tallman (1992) recommended further study to identify other factors (e.g., cultural differences and goal articulation) that may be related to correspondence study course completion.

Television and radio broadcasts were used in distance education in the late 1950s and early 1960s. Master teachers conducted one-way broadcasts from studios and students accessed the courses from remote areas. The major drawback of using television and radio was the lack of two-way interaction between teachers and students (Cambre, 1991). To enhance this instruction, the next phase of distance education began in 1969 with the founding of the Open University in England (Matthews, 1999). The Open University used a mixed-media approach to distance education by adding audio and visual materials, broadcast radio, and television to the traditional printed materials used in the programs. Students were assigned a tutor who provided instruction over the telephone and during group sessions that were held in the evenings and on weekends.

Other studies have examined student satisfaction with distance education offered through one-way communication such as television, radio broadcasts, and video recordings (Biner, Dean, & Mellinger, 1994; Fulford & Zhang, 1993). Two separate
investigations over a two-year period were conducted by Biner, Dean, and Mellinger (1994) to identify the factors leading to student satisfaction with a televised live-broadcast, college-level course. The first study used an exploratory factor analysis to determine the factors relating to student satisfaction. The second study, conducted one year later, involved a confirmatory factor analysis to validate the results from the original study.

The participants in the first study were 201 students enrolled in 14 live, interactive televised courses located at 43 off-campus locations. The students completed a 33-item questionnaire designed to assess student satisfaction with the interactive courses. The questionnaire used a five-point Likert scale to assess the level of student satisfaction with a variety of dimensions (e.g., instructor quality, technology used, course management, on-site personnel, promptness of material delivery, support services, and out-of-class communication with the instructor). The questionnaire was administered by the site coordinators at the end of each course.

The exploratory factor analysis identified seven factors that accounted for student satisfaction with the televised distance education courses. The factors identified included: (a) instructor quality, (b) technology used, (c) course management, (d) on-site personnel, (e) promptness of material delivery, (f) support services, (g) and out-of-class communication with the instructor.

The second study by Biner, et al. (1994) involved 177 students who were enrolled in 13 courses offered by the same university. The same questionnaire was administered to the students following completion of their courses. The confirmatory factor analysis conducted in this study identified the same seven factors as being significantly related to
student satisfaction (e.g., technology used, course management, on-site personnel, promptness of material delivery, support services, and out-of-class communications).

Biner et al. (1994) concluded from the two studies that the factors identified could be used to assess student satisfaction with programs that offered interactive televised courses. They suggested that these factors be used by programs offering televised courses to improve the courses to ensure student satisfaction. They recommended that ongoing assessment of student satisfaction be done and that modifications to televised courses be based on these assessments. Biner et al. (1994) maintained that ensuring high student satisfaction leads to high student motivation, low program attrition, and better learning.

Fulford and Zhang (1993) collected information concerning student perceptions of student-student and student-instructor interaction in an interactive television course and student satisfaction with the course. The participants were 123 teachers enrolled in a professional development program in Hawaii. Instruction was delivered to remote sites and was scheduled after school.

After three of the ten scheduled sessions, the participants completed an 18-item, Likert-style questionnaire concerning their perceptions of the amount of interaction and the quality of the instruction in the course. Each participant’s responses were compared to their responses on the series of questionnaires completed throughout the course to determine if the responses remained consistent.

The three variables examined by the questionnaire were: (a) perception of personal interaction (e.g., student interaction with peers and instructors), (b) perception of overall interaction (e.g., the total amount of interaction), and (c) satisfaction with the learning experience. Both personal interaction and overall interaction were correlated with satisfaction with the course by calculating Pearson’s product-moment correlation.
coefficients. Fulford and Zhang (1993) reported that the participants' perceptions of the overall course interaction were significantly correlated with their level of satisfaction with the course. The participants' perceptions of their personal level of interaction were moderately, but not significantly correlated with their satisfaction.

Fulford and Zhang (1993) concluded that to ensure student satisfaction with a televised course, high levels of student-student and student-instructor interaction should be facilitated. They recommended that future research should investigate the design of specific strategies for improving student interaction and sustaining student satisfaction in the distance education television classroom.

The perceptions of students participating in three instructional delivery systems were examined by Egan, Welch, Page, and Sebastian (1992). They compared traditional face-to-face instruction to two different types of distance education models. The first distance education model used a closed-circuit broadcast system through which students participated in live, interactive sessions. The second model used video recordings of weekly conventional classes in which the instructors made special adaptations to the lessons so they could be used in the distance education setting. The videos were viewed by small groups of students and facilitators who supervised the course.

There were 154 students in the traditional classes, 93 students in the live telecast sessions, and 267 students participating in the video-viewing classes. A Likert-style survey that measured student perceptions of course effectiveness was administered at the conclusion of the courses.

A series of one-way analyses of variance were used to determine if there were significant differences among the student ratings for the three instructional delivery models. Ten variables relating to student perceptions of the effectiveness of the delivery
systems were examined. These included: (a) amount of material covered, (b) level of difficulty, (c) organization of content, (d) clarity of content, (e) relevancy of learning activities, (f) quality of the instructor's delivery, (g) integration of assignments, (h) value of visual materials, (i) value of text screens, and (j) degree to which the course held student interest.

The conventional class model scored significantly higher than the live broadcast classes on six of the variables studied. These included organization, clarity, relevance, integration, visual materials, and text screens. The conventional class also was rated higher than the video class on all of the variables except amount of content covered and level of difficulty. When comparing the live telecast classes to the video classes, only visual materials was found to be rated significantly higher in the live telecast model.

Egan et al. (1993) concluded that although the learners in the traditional classes perceived the overall quality of course presentation to be higher than the learners in the two distance education groups, all three groups reported that the amount of material covered and the level of difficulty of the material was high. The researchers recommended that further study was needed to maximize the benefits of instruction delivered through television delivery systems.

In the area of student satisfaction, Egan et al. (1993) found that students who perceived student interaction to be high in a course were more likely to be satisfied with the course. They also maintained that, since the perception of overall interaction was more highly correlated with learner satisfaction, further research should investigate specific strategies for improving the overall level of student-student and student-instructor interaction within televised courses.
Online Education

Online programs are now a part of almost all institutions of post-secondary education in the United States, with some offering only online education (Rumble, 1999). It is not uncommon to find institutions of higher education requiring students to take at least one course online as well as requiring faculty to teach at least one course online. Online education is defined in the literature as a form of distance education in which the primary mode of accessing course materials and person-to-person interaction is via the Internet (Rumble, 1999). In online education the student may access courses, communicate with teachers, and complete assessments at their convenience.

As online education becomes more and more a part of education, public perception of online education is improving. Research indicates that the learning of online students is equivocal to learning in traditional settings, which increases positive perception of online courses (Rumble, 1999). Several recent studies have examined student satisfaction with online education (Leonard & Guha, 2001; Shea, Frederickson, & Pickett, 2001; Valenta, Therriault, Dieter, & Mrtek, 2001).

Valenta, Therriault, Dieter, and Mrtek (2001) surveyed post-secondary students to identify the positive and negative aspects of online education. They also examined factors of online education that learners believe are important in choosing online education as an option. Seventy-four students taking an online course for the first time participated in the study.

Valenta et al. used a questionnaire that included 23 statements relating to positive and negative aspects of online education. The students were asked to rate each statement in terms of its importance in choosing and participating in an online course. The students
rated each statement on a scale of negative three (very unimportant) to positive three (very important).

According to the exploratory factor analysis conducted, questionnaire items loaded on three factors, two of which were identified as positive and one as negative. The positive factors were time and structure in learning and convenience in learning. The negative factor was social interaction in learning. Items that loaded on time and structure in learning included: (a) provides flexible time management, (b) requires active learning, (c) can work at home, (d) requires self-discipline, and (f) learn at own pace. The items that loaded on convenience of learning included: (a) can work at home, (b) saves travel time, (c) potential interference with work, (d) provides flexible time management, and (e) saves commuting costs. Items that loaded on the negative factor, social interaction in learning, were: (a) less participant discussion, (b) less enrichment from others, and (c) less input from teachers.

Positive aspects of online education identified by the survey included flexibility, access to the instructor, better performance, collaborative learning opportunities, and positive learning experiences. Negative aspects included limitations on interactivity, technical problems, lack of administrative and technical support, and cost.

Valenta et al. (2001) concluded that flexibility in learning, including the ability to work from home, was considered by the students to be the most important positive aspect of online education. They suggested that further research examine the relationships between student learning style, success, and satisfaction with online education.

In another attempt to identify the factors that contribute to student satisfaction with online education, Shea, Frederickson, & Pickett (2001) surveyed 935 university students who recently had finished one or more online courses. The survey was a Likert-style...
instrument and consisted of 33 questions relating to flexible access, course quality, and
level of online teaching and learning. The students accessed the survey online at the
conclusion of their courses. Overall, 87% of the students reported being satisfied or very
satisfied with their online courses, 90% reported learning a great deal, 94% reported
being satisfied with the program's technical and administrative support, and only 1.7%
reported that they definitely would not take another online course.

Based on student responses to the survey, Shea et al. (2001) concluded that good
practices in online education included: (a) frequent contact between students and faculty,
(b) student-centered learning opportunities, (c) prompt feedback, (d) high teacher
expectations, and (e) time on task. They also maintained that properly designed online
courses can be equally satisfying for students as traditional face-to-face instruction.

In an attempt to correlate the amount of instructor-initiated email contact with
students and the student satisfaction with the online course, Woods (2002) randomly
assigned 40 students to four instructional groups. The students received weekly emails,
monthly emails, emails twice during the semester, or no emails from the instructor. The
emails included words of encouragement, inquiries regarding student performance, and
reminders to participate in mandatory online group sessions. Woods believed that more
frequent emails would lead to higher satisfaction scores.

An email survey was sent to each student following their completion of the course.
The instrument used a Likert-style format to measure the students' perceptions of the
student-instructor relationship, student online presence within the class, and student
overall satisfaction with the course. A one-way analysis of variance was used to compare
the scores among the groups. No significant statistical difference was found among the
four groups in student satisfaction with the online course. However, the students who
received more emails interacted more with other students in the online chat sessions and with the instructors in reciprocal emails.

Although these findings did not support Wood's hypothesis, he concluded that practitioners should continue to initiate high levels of interaction with students. He suggested that future research examine the relationship between teacher-initiated interactions and student performance in online courses.

In a similar study, Picciano (2002) focused on the relationship between student performance in an online university course based on scores on course assignments and exams and student perception of the quality and quantity of student-to-student interaction. At the conclusion of an educational administration online course, 23 students completed a 44-item course satisfaction survey that was divided into three sections. The survey focused on student perceptions concerning their interactions, sense of presence, and quality and quantity of learning in the course. The first section included demographic items and perceptions of the overall quality of the course, the second section contained Likert-style questions concerning the amount and quality of student-student and student-instructor interaction, and the third section included Likert-style items dealing with perceptions of student social presence in the course. Several correlations were calculated comparing the different variables.

The perceptions of the students concerning interaction correlated at a statistically significant positive level with student perception of the quality and quantity of their learning experience. The level of student interaction, based on student posting on discussion boards, did not correlate significantly with student performance on the exam or written assignments. Student perception of social presence in the course correlated positively with perception of performance and was statically significant. Perception of
social presence also correlated positively and significantly with performance on written assignments, but not with student exam performance. Data indicated that there were inconsistencies between perceived level of interaction and actual level of interaction, but the correlation values were not given.

Picciano (2002) concluded that the success of an online course is dependant on the nature of student-to-student and student-to-teacher interaction. He also suggested that further research into the complex relationship between adult interaction and learning outcomes is needed.

Mason and Weller (2000) conducted a qualitative study to determine factors relating to student satisfaction with an online course at a post-secondary institution in England. The study examined the responses of 850 students who were interviewed to determine the aspects of the online course that led to their satisfaction with the medium. Based on student answers in the interviews, the researchers found the factors that most affected student satisfaction with online learning were: (a) the support of the tutor or instructor, (b) the amount of time, patience, and motivation they had to devote to the course, and (c) the extent to which the course content and presentation matched their expectations for the course. One factor that frustrated the students was the time necessary to become proficient with the web-based materials and the online conferencing component of the course.

Mason and Weller (2000) suggested that online course developers should focus on these identified factors (e.g., student support, motivation, and content that match learner expectations) when designing future courses and improving existing courses. They maintained that a concerted effort to include these factors will result in online courses that students enjoy.
A study conducted by Leonard and Guha (2001) examined the perceptions of traditional students not enrolled in an online course as well as the perceptions of students taking an online course. The traditional students were enrolled in a separate section of the same teacher education mathematics methods course as the online students. Following the completion of the course, the students completed a 10-item, Likert-style questionnaire concerning their beliefs about online education.

Of the 24 students in the traditional setting, a majority (78%) believed that online courses should be offered by the university. There were no positive or negative responses to questions concerning the effectiveness of online classes and whether students would take an online class. The one question that received a strong negative response from the traditional students dealt with chat rooms replacing or being as effective as classroom discussion. Seventy-eight percent of the traditional students believed that chat rooms were not as effective as classroom discussions.

The majority (75%) of the 20 students taking the online course stated that they were satisfied with the experience and would take more classes online. Furthermore, 50% of the students believed that they had more interaction through chat rooms than in their traditional class discussions. Sixty percent of the online students reported that the online course provided them with a better learning opportunity than did traditional classes.

Leonard and Guha (2001) concluded that after actually experiencing an online course, a student’s perception of the delivery model is apt to be more positive. They recommended further study into the effectiveness of online education.

Gabrielle (1997) collected data from 253 students in eight, post-secondary institutions to examine student beliefs concerning the effectiveness of online courses and their satisfaction with the online courses in which they were enrolled. The following factors
were examined: (a) student-teacher interaction, (b) student-material interaction, (c) access to technology, (d) prior experience, and (e) technology expertise. Students completed a survey at the end of the course to assess these variables. The survey instrument was not described.

A multiple regression analysis was used to predict perceived instructional effectiveness and satisfaction. Significant positive relationships existed between perceived effectiveness of the online courses and teacher-student interaction and student-material interaction. No relationship was found between student technological level and perceived effectiveness of the courses. Also, no significant relationships were found between educational factors and student satisfaction.

Gabrielle (1997) concluded that student-instructor interaction and perceived media quality are consistent positive predictors of student perceptions of instructional effectiveness and student satisfaction in online instruction. She recommends further research into how increased student-instructor interaction and media quality can be used to increase student learning and completion rates in distance education courses.

A combination of quantitative and qualitative methods were employed by Jiang and Ting (2000) to identify factors that influenced the perceived learning of students in 19 web-based university courses. Perceived learning was defined as the amount of material the students believed they had learned in the courses. A total of 183 students completed a survey concerning their experiences with the online courses. The students also provided access to their course records to determine course grades. The survey consisted of three questions that asked the students to compare their experience in the online course with their experience in traditional courses. Specifically, the survey focused on: (a) level of
interaction with other students, (b) interactions with the instructor, and (c) whether
students learned as much in the course as in traditional courses.

Participant observation, the electronic online survey, and a collection of documents
from the 19 courses were used to identify four variables for the study. The variables
included: (a) perceived learning, (b) grade for online discussions, (c) grades for written
assignments, and (d) instructor requirements for online discussion. The variables were
then correlated to ascertain if relationships existed among them. Student grades on
discussion assignments and the instructor’s requirements for discussion assignments both
correlated significantly with students’ perceived learning. There was no significant
correlation between teacher-student interaction and perceived learning.

Jiang and Ting (2000) concluded that their findings favor an interactive and
collaborative online course environment. The requirement of a high amount of online
discussion made the most significant difference in student perceived learning in this
study. They recommended that future research use larger sample sizes to test whether
there is a cause-effect relationship among these and other variables involved in online
education.

O’Malley and McCraw (1999) surveyed 128 students after they completed an online
undergraduate business course that was offered in traditional and online settings. Sixty-
seven students took the class in the traditional setting and 61 students took the course
online. The students filled out a 62-item, Likert-style questionnaire at the conclusion of
the course. Items on the questionnaire were designed to examine the perceptions of both
groups of students concerning online education.

Student responses from the traditional groups were compared to student responses in
the online group using a $t$ test comparison of means. No significant differences were
found between the two groups concerning their perceived learning in the course. The online students reported they learned as much in the online course as they would have in a traditional setting, however they did indicate a need to change their study habits in order to be successful in the online course. Students in both groups reported that they did not believe that online education was superior to traditional teaching methods. However, they did report that they wanted the university to offer more online courses.

O’Malley and McCraw (1999) concluded that students in online courses perceive their educational experience to be equivalent to that of a traditional course. They maintained that online education appears to be the teaching technology of the future and as such they recommended that further research include students enrolled in a variety of online courses across university settings.

Student Learning in Distance Education

Another area in which distance education research has focused is student learning (Cheng, Lehman, & Armstrong, 1991; Dellana, Collins, & West, 2000; Ridley & Husband, 1998). Much of this research involves comparisons of distance education delivery models with traditional face-to-face instructional formats.

Traditional Distance Education

In an attempt to compare the effectiveness of a variety of alternative distance education delivery mediums, Beare (1998) examined student learning as measured by scores on exams and the quality of the instructional format as measured by a 21-item course evaluation that was completed by students at the conclusion of a course. The six instructional formats used in the study included: (a) lecture, (b) lecture with videotape
backup, (c) televised lecture, (d) independent study with audio recordings, (e) independent study with video recordings, and (f) group study with video recordings.

One hundred seventy-five post-secondary students self-selected into one of the six instructional formats. Achievement was measured using scores on exams administered during the course and was compared using a two-way analysis of variance. The data analysis revealed no statistically significant difference among the six instructional formats on the percentage of questions answered correctly on the exams. Each item on the course evaluation was compared using a Chi-square procedure. There were no statistically significant differences on any of the items on the evaluation among the six instructional format groups.

Beare (1989) also examined the written comments on the evaluations. The student comments concerning the course were positive across the six instructional groups. However, several of the distance education participants stated that they would have preferred to take the course in the face-to-face format. Beare (1989) concluded that the instructional format (e.g., lecture, lecture with videotape backup, televised lecture, independent study with audio recordings, independent study with video recordings, and group study with video recordings) had no effect on student achievement or student course evaluations. He maintained that the lack of direct contact with the instructor in the distance education formats was offset by the opportunity to review the materials repeatedly by watching or playing the tapes more than one time.

The effectiveness of two distance education methods for training emergency medical service providers was compared to the effectiveness of a traditional classroom course by Moshinskie (1996). He compared scores on post-course exams from students in three different instructional methods: (a) traditional classrooms, (b) two-way audio/graphical
computer delivery, and (c) two-way audio/video satellite-broadcast delivery. No demographic data were provided and the number of participants was not reported.

The students in the two-way audio/graphical model met around computer screens in their rural ambulance stations and interacted with the instructor online. In the two-way audio/video model, a teleconferencing appliance was set up in the rural ambulance station and live interactive sessions took place between the instructor and students. The third group took the course in a traditional classroom setting.

Student achievement in the course was measured using exam scores administered during and at the conclusion of the course. Student exam scores were compared using a t-test comparison of means. There was no significant difference in the exam scores or in attrition rates among the three groups. Moshinskie (1996) concluded that distance education may be an acceptable educational resource for training students in rural areas where they do not have access to traditional classroom settings or instructors.

McCleary and Egan (1998) examined several variables to compare two groups of students taking the same three teacher-certification courses consecutively in different instructional formats (e.g., traditional classroom and two-way interactive television). The major variable was student outcomes as measured by pre- and post-test scores in the courses. Other variables were measured using a five-point Likert-style course evaluation and included: (a) overall instructor effectiveness, (b) feedback concerning student progress, (c) the amount of material covered, (d) level of difficulty of each course, (e) course organization, and (f) helpfulness of visual materials used in the course.

The traditional classroom was located in the originating site of the television broadcasts. Twenty students were enrolled in the televised courses, and it was not reported how many students took the course in the traditional setting.
$T$ test comparisons of means were conducted to compare the results of the two groups on both the pre- and post-test. There was no significant difference on post-test scores between the two groups in any of the three courses. There were no significant differences on the pre-test between the two groups in the first two courses; however in course three, the students in the traditional setting scored significantly higher on the pre-test. That difference in pre-test scores was overcome during the duration of the course.

Instructor effectiveness was compared between the two groups using $t$ tests on the paired ratings among the three courses. No significant differences were found. $T$ test comparisons also were conducted on student ratings of the level of difficulty of the courses with no significant difference being found between the two types of instruction. The amount of material covered in the two sets of courses also was compared using $t$ test comparisons and, again, no significant differences were found. The course design variables (e.g., visual materials, course organization, and feedback) also were compared with $t$ test comparisons. No significant differences were found between the television group and the traditional group for any of the three variables.

McCleary and Egan (1989) concluded that televised instruction is neither superior nor inferior to traditional classroom instruction. They maintained that researchers should move beyond studying which medium works best to the components of effective instruction in the various mediums.

In an attempt to ascertain the impact of the instructional environment on student performance, frequency and type of student-student and student-instructor interactions, and student attitude, Ritchie and Newby (1989) compared three delivery mediums. The delivery mediums were: (a) the traditional classroom, (b) a television broadcast studio
with the instructor present, and (c) television broadcasts to a remote site without the instructor.

Twenty-six college undergraduates were randomly assigned to the three instructional mediums. Each group attended a thirteen-minute lecture in one of the three delivery mediums concerning normative absolute clauses, which was a novel concept for the participants. Following instruction, the students completed a personal information form, an achievement test, and an attitude survey.

Results from a multiple regression analysis on the achievement test indicated that the studio classroom group scored significantly higher than the remote site broadcast group, but no difference was found between the studio classroom group and the traditional classroom group or the remote broadcast site group and the traditional classroom group. Interaction was measured by comparing the frequency of student interactions as scored by independent observers. Interaction was significantly higher in the traditional setting than the studio classroom group and the remote broadcast group. However, this interaction did not result in higher test performance by the students in the traditional setting.

The attitudes of the students, as measured by the post-instruction survey were compared using a Kruskal-Wallis nonparametric test. The results differed significantly based on the instructional format (e.g., traditional classroom, studio classroom, and remote broadcast). Specifically, students in the traditional classroom rated the instruction significantly more enjoyable than did the students in the other two groups. The remote broadcast group had significantly higher attitude rating scores than those in the studio classroom.
This study indicates that students who do not have an instructor onsite tend to experience less interaction and enjoyment from the delivery model (Ritchie & Newby, 1989). However, Ritchie and Newby (1989) reported that student achievement was not negatively affected by the lack of an onsite instructor. They concluded that further study concerning instructional formats, the amount of interaction, and an increased length of instruction may yield more conclusive results.

**Online Education**

If online education is to grow and achieve recognition as a viable educational option, the impact of the medium on student learning must be explored (Navarro & Shoemaker, 2000; Neuhauser, 2002; Wegner, Holloway, & Garton, 1999). Tucker (2001) examined pre- and post-test scores, homework grades, research paper grades, and final course scores of 47 students enrolled in an online or traditional business technologies course. The same instructor taught both courses to ensure that the information covered, requirements, and grading criteria were identical in both courses.

Twenty-three students were enrolled in the traditional course and 24 students were enrolled in the online course. *T* test comparisons of means were conducted to compare the results of the two groups on the pre- and post-test scores, homework grades, research paper grades, and final course scores. There were no significant differences between the two groups in pre-test scores, homework grades, research paper grades, or final course grades, but the online students scored significantly higher in post-test scores and on final exam scores.

Tucker (2001) maintained that this did not necessarily mean that online education was superior to traditional education, but that it was a viable alternative. She recommended that further study be done to determine if students taking more than one
course online, including those taking an entire online education program, learned as much as those taking traditional classes.

A two-semester study was conducted by Wegner, Holloway, & Garton (1999). The study compared student test scores in a graduate-level, curriculum development and evaluation course taught in two formats (e.g., online and traditional). The students self-selected into either the online or traditional setting.

Seventeen students enrolled in the traditional course and 14 students selected the online option. The course was taken over two semesters. In order to assess student learning, an identical 100-point post-test exam was administered to both groups. Scores on the exam were compared between the two groups using a $t$ test for independent samples. There was no statistically significant difference between the test scores of the online and traditional groups on the exam.

Wegner et al. (1999) concluded that the novelty of taking a course online may have contributed to the students performing at a level equivalent to those in the traditional setting. They recommended that, to ensure student success in online courses, careful attention to instructional design is vital.

Dellana, Collins, and West (2000) compared the mean course grades of students taking an undergraduate business course in either a traditional classroom or online. Seventy students participated in a traditionally taught section of the course and 151 students enrolled in an online section of the same course. Dellana et al. (2000) also correlated grade point average (GPA) and absence rates with student achievement in both groups. Grade point average data were collected by examining student records. Absenteeism was determined by the number of course sessions missed by the students.
Using a $t$ test comparison of means for average course grades between the two groups, no statistically significant difference was found. Dellana et al. (2000) used a Pearson’s product-moment correlation to correlate GPA and absentee rates with course grades to ascertain if they had an effect on achievement. Results indicated that for both of the groups the final course grades correlated highly positively with GPA and highly negatively with absentee rate.

Dellana et al. (2000) concluded that a course taught online was just as effective as the same course taught in a traditional setting. They also concluded that similar factors (e.g., GPA and absence rate) influenced success in both the traditional and the online environment. Dellana et al. (2000) recommended that care be taken to assure that the quality of education is not compromised as universities move forward in the provision of online courses.

A study by Carey (2001) compared student learning outcomes as measured by pre- and post-test scores and final course grades for students enrolled in a science methods course offered in traditional and online formats at the post-secondary level. Students self-selected into the traditional and online courses. Sixty students enrolled in the traditional course and 103 students took the course online.

The study used $t$ test comparisons of means to compare pre- and post-test scores and final course grades between the traditional group and the online group. Carey (2001) found that there were no statistically significant differences between the two groups in pre-test scores, post-test scores, or final course grades.

Carey (2001) concluded that students may learn as well in online courses as in traditional courses. She notes that although there have been many studies indicating that online students perform at a similar level as those in traditional courses, many of these
studies are suspect because they are conducted by the instructors who teach the online courses. She recommends further study concerning the various design methods of online instruction in order to improve the educational outcomes of learners.

The influence of student learning style preferences on performance in online education and face-to-face settings was examined by Aragon, Johnson, and Shaik (2002). The study compared the learning styles as measured by three separate learning style instruments: (a) Reichmann and Grasha’s Student Learning Style Scale (1974), (b) Weinstein, Palmer and Schulte’s Learning and Study Strategies Inventory (1987), and (c) Kolb’ Learning Style Inventory (1985). Performance was measured by grades on assignments and the exams of the 19 students enrolled in a face-to-face course to those of 19 students enrolled in the same course offered online.

Data from the learning style instruments indicated that in most areas no significant differences between the groups were found. However, the online students were significantly more likely to prefer abstract conceptualization than their traditional peers. The students who received face-to-face instruction significantly preferred hands-on activities and using study aids over the online students. Although significant differences were found between some of the learning style preferences of the online students and the face-to-face students, no significant differences were reported in exam and assignment scores between the two groups. Aragon et al. (2002) concluded that, regardless of learning style differences, students can succeed as well in an online learning environment as they do in a traditional setting. Because of this, they maintained that the use of online education should be considered a viable instructional format for students.

Neuhauser (2002) also examined learning style and its effect on student learning in online and face-to-face instructional settings. The purpose of the study was to determine
if students enrolled in online or traditional courses differed significantly in their learning styles as measured by a learning modality preference inventory developed for the study. The inventory was administered at the beginning of the course and learning outcomes were measured by test scores and final grades.

Students in two sections (online and face-to-face) of the same undergraduate management course taught by the same instructor participated in the study. The instructor used similar learning activities in each course. Twenty-five students were enrolled in the traditional course and 27 students were enrolled in the online course. The students self-selected into the two courses.

No significant difference was found between the groups in learning style. When comparing students with different learning styles within the online group, no significant difference in online course performance was found among the students with different learning styles as identified by the learning modality preference inventory.

A t test comparison of means for test scores and final grades indicated that there were no significant differences between the groups. However, the online students scored slightly higher than the face-to-face students on test scores and on final grades. In a post-course survey, 96% of the online students reported believing that they had learned as much or more than if they had taken the course face-to-face.

Neuhauser (2002) concluded that equivalent learning activities can be taught equally well in online and traditional courses and that student learning style had no effect on student outcomes in either the traditional or online courses. She recommended that the results of the study not be generalized to all online courses because the online course in this study had a high level of student-instructor interaction. She believes that further
study is needed that focuses on a variety of online education mediums (e.g., asynchronous, synchronous, and hybrid courses).

Performance as measured by achievement tests in a university level computer applications course was examined by Cheng, Lehman, and Armstrong (1991). The course was offered in both a traditional setting and at a remote site. The off-campus students accessed the course material on the Internet and interacted with instructors via email and the telephone. Twenty-five graduate students were enrolled in the traditional course and 28 in-service teachers participated in the online course.

A pre-study questionnaire was used to collect information concerning demographics, student attitude (toward the computer and course content), and course expectations. A knowledge-based pre-test was also completed by the students. No significant differences were found between the two groups on the pre-assessment information collected. Two formative achievement tests were given during the course as well as a post-course attitude survey and a final exam of student knowledge gained through the course.

A series of one-way analyses of variance were used to determine if any significant differences in student achievement or attitude could be attributed to differences in course delivery. No significant difference was found in student achievement based on the scores on the final exam. However, student attitudes toward the computer and course content were significantly higher in both groups when the post-survey data was compared to the pre-survey data.

Cheng et al. (1991) concluded that online classes could be an effective means of instruction for post-secondary students. They recommended further research to examine other areas of online education, including time-on-task, cooperative learning opportunities, and its effectiveness in other areas of study.
A study by Navarro and Shoemaker (2000) compared the scores on final exams completed by students enrolled in an introductory macroeconomics class. At the beginning of the course, the 200 students were given the option of taking the course in a traditional classroom setting or via the Internet. Only 49 students chose the online format, while 151 students selected the traditional setting.

Students completed identical final exams at the conclusion of the course. $T$ test comparisons of mean final exam scores indicated that the online students scored significantly higher than those in the traditional classroom setting. Other learner characteristics, collected in a pre-course survey (e.g., gender, age, ethnicity, and computer ability) were also compared with $t$ test comparisons with no significant differences found. An analysis of covariance showed no relationship between the slightly higher overall grade point average of the online learners when compared to the traditional group at the outset of the study.

These results led Navarro and Shoemaker (2000) to conclude that online learning was a viable option for college-level students regardless of learner characteristics such as gender age, ethnicity, and computer ability. They also recommended that online courses include features designed to maintain high levels of student interaction and motivation. They suggest: (a) multimedia digital lectures, (b) active threaded bulletin-board discussion groups, and (c) digital testing of important course content with immediate feedback.

Ridley and Husband (1998) compared the grade-point averages of students taking courses online to that of students enrolled in traditional courses. The focus of the study was to ascertain if students enrolled in online courses were more likely to cheat. They also wanted to measure the academic rigor of online courses. Ridley and Husband (1998)
believed that student grades in the online courses would be higher than student grades in
the traditional classes because of a lack of academic rigor and integrity in the online
classes.

The study compared the grades of students who took classes in both settings (online
and traditional), the grades of students taking only online classes, and the grades of
students taking only traditional courses. T test comparisons of mean course grades were
conducted to determine if any differences occurred between the groups based on the
instructional setting. The students in the online classes had marginally lower grades than
those in the traditional classes based on a four-point scale.

Because they found that online students did not score higher in course grades than
traditional students, Ridley and Husband (1998) concluded that the concerns raised by
critics of online education regarding academic rigor and integrity were exaggerated if not
unfounded. They recommended further studies using other measures and methods into
possible cheating in the online environment.

Characteristics of Online Learners

Another area that has received attention from researchers recently is the learner
characteristics of online students (Dutton, Dutton, & Perry, 2002; Kozma, 2000). Dutton,
Dutton, and Perry (2002) examined the learning characteristics of university students
enrolled in an online course and those taking the same course in a traditional setting. The
196 students in the two groups were asked to complete a survey rating the importance of
11 factors (e.g., opportunity for face-to-face contact with an instructor, opportunity for
face-to-face contact with fellow students, conflict between class time and work
commitments, conflict between class time and childcare commitments, course scheduling
conflicts, reduced time commuting to class, motivation provided by regular class meetings, flexibility in setting pace and time for studying, better learning from hearing a lecture, better learning from reading the lecture materials, and advice from an advisor or other university official) in choosing a course format. Data were analyzed using Chi-square tests to evaluate differences between the two groups.

Of the 11 factors originally examined, three (conflict between class time and childcare commitments, better learning from reading the lecture materials, and course scheduling conflicts) showed no difference between the two groups. However, the traditional students rated face-to-face contact with the instructor, face-to-face contact with fellow students, motivation from regular class meetings, better learning from hearing a lecture, and advice from an advisor as more important factors than did the online students. The factors considered more important by the online students when compared to the traditional students were conflict between class time and work, time commuting to class, and flexibility in setting pace and time of study.

Dutton et al. (2002) concluded that online and traditional students do differ concerning their reasons for selecting the type of course in which they enroll. They recommended future studies examine other aspects of online education including student learning and student satisfaction.

An evaluation of a large consortium of online secondary education programs in a Northeastern state was conducted by Kozma (2000). Students taking the online courses were not enrolled full-time in the program, but were taking courses as a supplement to their traditional school program.

The study featured a quasi-experimental design comparing online student outcomes and attitudes with those of students who took the same courses in a traditional format as
well as comparing the online courses to the traditional courses. The study was limited to only four courses because most of the consortium’s 98 courses were not offered in a traditional setting. Results were separated into three areas: (a) findings based on course analysis, (b) findings based on student questionnaires, and (c) findings based on student assessments.

Course analysis found similarities and differences between the two formats. The online courses were similar to their traditional counterparts in terms of goals and objectives, content, student drop rates, and assignments. Interaction among students and between students and teachers was less in quantity and of lower quality in the online courses than in the traditional format. In the area of course evaluations, the traditional students rated their courses as being more difficult than the online students, and they rated their courses higher in overall quality than did the online students. The traditional students reported a higher rate of communication with their teachers than did the online students and felt this communication was an important part of their learning. There was no difference between the groups in terms of reported use of technology in doing research for coursework. There was no significant difference in the grades between the two groups, but online students scored higher than the traditional students on the technology use portion and the skills portion of an Internet assessment conducted for all students. Kozma (2000) concluded that students in an online program can receive a comparable, if not identical, educational experience as those in traditional settings.

Elementary and Secondary Distance Education

Although most of the research concerning distance and online education to date has focused on the post-secondary level, researchers recently have begun to study the use of
online education at the elementary and secondary level (Clark, 2001; Kellogg & Politoski, 2002; Roblyer & Marshall, 2003).

In the first extensive survey of elementary and secondary online education programs, Clark (2001) gathered data on program types to analyze the trends in elementary and secondary online education. The survey attempted to identify the entities who offer elementary and secondary online education. These include state-sanctioned/state-level programs, consortium/regionally-based programs, school district programs, online charter schools, private online schools, and for-profit curricula providers. The survey was completed by administrators from 33 elementary and secondary online programs that were identified through Internet research, literature review, and personal contacts.

The 33 schools offered online courses to students either on a full- or part-time basis. Initial contact was done through a personal email to an administrator from each program. Each individual was given the online link for the survey and was encouraged to complete it. Two follow-up emails were sent to remind the participants to complete the survey.

According to Clark (2001), 43% of the schools reported beginning operations in 2000 or 2001. Twenty-five percent reported starting before 1995. However, further analysis revealed that many were referring to the date they began planning the online program and not when they actually began to work with students.

All 33 schools reported serving students in the high school grades, while only 17 schools served middle school students and nine served students in the primary grades. Clark (2001) estimated that between 40,000 and 50,000 elementary and secondary students were enrolled in one or more online courses in 2000-2001. He concluded that online education at the elementary and secondary level is a growing phenomenon that will impact education in the future as more students access online education programs.
In the most recent and extensive report on elementary and secondary online education, Kellogg and Politoski (2002) conducted a survey involving 88 programs that provide online courses to students in elementary, middle, and high school. To participate in the survey a school had to meet the following criteria as an online school: (a) courses are delivered primarily over the Internet; (b) elementary and secondary audiences are the target of instruction; (c) a broader audience than a traditional day school is reached; (d) it is accredited or associated with an accredited organization; and (e) credit is granted by the program or its sponsoring agency.

One or more administrators in each of the programs answered questions during phone interviews to complete the survey. The survey focused on program delivery model, number of students currently enrolled, projected enrollment in future years, budget information, and marketing strategies.

Kellogg and Politoski (2002) identified two basic service models utilized by online elementary and secondary programs. In the supplemental model, online programs provide specific courses that students may take in addition to their traditional school day. The majority (62.5%) of the programs studied did not enroll full-time students and offered courses only as a supplement for students enrolled in traditional programs. In the full-time model, 37.5% of the online programs offered a full curriculum in which a student enrolled full-time to obtain a high school diploma online. At the time of the study, over 85,000 elementary and secondary students were taking at least one course online. Kellogg and Politoski (2002) estimated that by the 2004-2005 school year over 500,000 students would be involved in online education. They also concluded that online education at the elementary and secondary level will continue to grow in the future.
A study by Martin and Rainey (1996) examined the effect of satellite-delivered, two-way interactive television on student achievement in two high school science courses. The control group consisted of high school students enrolled in a traditional classroom setting and the experimental group included students taking the same courses via interactive television.

There were 98 students enrolled in the anatomy and physiology courses, however the number of students in the control group and the experimental group was not reported. Data analysis was conducted using matched-pair $t$ test comparisons of post-test scores at the conclusion of the course. The mean post-test score of the group taking the course via interactive television was significantly higher than that of the group in the traditional setting.

Martin and Rainey (1996) concluded that student achievement was not adversely affected by this format of distance education delivery. They recommended that criteria for students participating in distance education should be developed and that research examining the use of distance education with elementary school students be conducted.

Other recent studies have examined learner characteristics as predictors of student learning in secondary online education (Roblyer & Marshall, 2003; Weiner, 2003). Roblyer and Marshall (2003) created the Educational Success Prediction Instrument (ESPRI) for their study in an attempt to predict student success in secondary online courses. A total of 135 students enrolled in online education participated in the study. The hypothesis was that high scores on the ESPRI indicated that the students believed they were good students. The scores on the ESPRI were then correlated with student achievement as measured by student grades in their online courses. The researchers...
reported that there was a statistically significant correlation between student confidence
in their academic ability and achievement in these online education classes.

Roblyer and Marshall (2003) concluded that students be provided guidance
concerning their possible chances for success in online courses based on their academic
ability and confidence prior to enrolling in online education programs. They
recommended further research into the correlation between academic ability and online
success.

Weiner (2003) conducted a qualitative study involving 118 students enrolled in
online education at the secondary level. Data were collected using interviews with
students and teachers at a secondary online program operating in a Northwest state.
Weiner (2003) interviewed students and teachers in person and over the phone.
Responses to the interview questions were tabulated to determine the frequency of the
different responses.

Based on the data from these interviews, Weiner (2003) reported that student
motivation was the most often cited factor in predicting student learning in the online
environment. According to the participants, motivation was strongly influenced by
teacher support, peer interaction, and technology support. Successful completion of
online courses relied on a student’s desire to finish courses, keep up with deadlines, and
previous success in online education.

Weiner (2003) concluded that when secondary students believe they are being
supported by their instructors and peers and have strong motivation to learn, they will be
successful in online education. She recommended that more research take place
concerning best practices in online education in order to strengthen online programs at
the secondary level.
A case study of one online education program serving students in middle school was conducted by Litke (1998). The study was qualitative in design and involved interviews with teachers, parents, and students.

The students, teachers, and parents interviewed identified the strengths of the online program as time flexibility, improvements over other forms of distance education, and the ability to do school work from home. Criticism of the online program studied included: (a) student isolation, (b) the high level of labor intensity for teachers, and (c) technical difficulties. Litke (1998) recommended that more research concerning the use of online education with younger students be conducted.

Summary

Distance education has been used as an instructional method for decades now and has seen many advances over time. Much of the literature deals with the history of the medium, student demographics, student satisfaction, and student learning at the post-secondary level.

As online education continues to be used more extensively in elementary and secondary levels, it is important for research to be conducted that is specific to these age groups. Research in this area must move beyond demographics and explore the multiple factors related to student learning and success in online education.

The research in this dissertation will contribute to the expanding field of study concerning elementary and secondary online education. If elementary and secondary online education is to become a viable educational medium, it is important to identify factors that contribute to parent and student satisfaction. Through an understanding of
student and parent satisfaction at these levels, schools will be prepared to strengthen their online education to better serve the needs and expectations of students and their parents.
CHAPTER 3

METHODOLOGY

Overview

Many factors relating to student satisfaction with online education at the post-secondary level have been identified in the literature (Picciano, 2002; Shea, Frederickson, & Pickett, 2001; Gabrielle, 2001). While online education is a growing trend in elementary and secondary education (Kellogg & Politoski, 2002; Clark, 2001; Trotter, 2001), there is little research available that addresses student and parent satisfaction at this level.

Because student satisfaction with an educational environment can have a direct impact on student learning in that environment, it is important that researchers begin to identify the factors that may impact student satisfaction with online education. It is also important to assess parent satisfaction with this mode of educational delivery, as parents can play an integral role in the learning of their child.

Research Questions

This study administered two questionnaires designed to investigate the factors involved in student and parent satisfaction with online education.
The research questions were:

1. What factors are associated with student satisfaction with online education at the secondary level?
2. What factors are associated with student satisfaction with online education at the elementary level?
3. What factors are associated with parent satisfaction with online education at the secondary level?
4. What factors are associated with parent satisfaction with online education at the elementary level?

Participants

A total of 195 students from three schools that offer online education participated in this study. The students were in grades three through 12. One hundred and eighty-six parents of students enrolled in the same three schools also participated in this study. Twenty-five teachers and administrators from the three schools participated in the creation of items for the questionnaires.

Students

Students from three online schools located in two states participated in this study. School A was a school district program located in a northwestern state, school B was a K-8 charter school located in a southwestern state, and school C was a secondary charter school located in a southwestern state. There were 200 students enrolled full-time in school A of which 45 participated in the study, 575 students enrolled in school B of which 107 participated in the study and 400 students enrolled in school C of which 44
participated in the study. Only students enrolled in coursework full-time were included in the study. Student demographic data were collected (See Table 1).

The principals of the three schools provided letters stating their willingness to allow their students to participate in the study (See Appendixes C, D, and E). Written permission was obtained from the parents of all participating students (See Appendix F). Participating students and parents also signed assent forms (See Appendixes G and H).

Parents

One parent of each student enrolled fulltime in the three schools was asked to complete the parent questionnaire. Because there are approximately 1000 students enrolled in the three schools, there were approximately 1000 parents who could participate, however only 186 completed the questionnaire. Parent demographic information was collected (See Table 2).

Teachers and Administrators

Teachers and administrators currently working in the field of elementary and secondary online education were asked to participate in the initial development of items for the two questionnaires. Twenty teachers and five administrators currently employed at the three schools participated in the study. The teachers and administrators were asked to consider the type of feedback they believed was important concerning student and parent satisfaction with online education. This information was used in the development of items for the questionnaires. The teachers and administrators completed an assent form before participating (See Appendix I). Administrator and teacher demographic data were collected (See Table 3).
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|                   |           |           |          |           |
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| Five              | 0         | 11        | 0        | 11        |
| Six               | 0         | 20        | 0        | 20        |
| Seven             | 2         | 25        | 0        | 27        |
| Eight             | 1         | 29        | 0        | 30        |
| Nine              | 3         | 0         | 14       | 17        |
| Ten               | 12        | 0         | 12       | 24        |
| Eleven            | 13        | 0         | 14       | 27        |
| Twelve            | 13        | 0         | 4        | 17        |
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Table 1: Summary of Student Demographics
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Table 2: Summary of Parent Demographics
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(n=13) | School C  
(n=12) | Total  
(n=30) |
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<td>Doctoral Degree</td>
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<td>2</td>
</tr>
</tbody>
</table>

Table 3: Summary of Teacher and Administrator Demographics

Setting

Three schools that use online education participated in this study. One school is operated by a large school district located in the Northwestern section of the United States. A full-time or part-time online education option for secondary students who reside both within and outside of the school district is available at this school. The second school is a K-8 charter school located in a large urban school district located in a
Southwestern state and the third school is a secondary charter school located in the same Southwestern urban school district. The charter schools serve full-time students who live within the boundary of their local school district.

District Operated School

School A functions as a fulltime alternative or as a supplement to a traditional high school program of study. It is operated in a facility provided by the school district and all administrators and teachers are employees of the school district. Some teachers in the program are assigned fulltime to the online school, while others teach part time in the online school and part time in a traditional school setting. Teachers develop all of their online courses based on State educational standards.

In this school, students may take a single course to supplement their traditional high school coursework or may enroll fulltime in the program. The school allows a student to set the pace for their learning and often a student finishes a course in a shorter time period than they would in a traditional setting. The school does not require students to start and finish coursework on specific dates and students can earn course credit after completion of all assignments, regardless of the amount of time spent on a course.

There are approximately 200 students enrolled in School A on fulltime basis and 500 students attending on a part time basis. Only fulltime students participated in this study.

School A involves infrequent to almost no face-to-face interaction between teachers and students. Communication between a teacher and student is conducted electronically through email and telephone contact.

K-8 Charter School

School B operates as an independent entity under the charter school law and distance education regulations of the Southwestern State in which it is located. It provides a
fulltime online educational program to its students. The school uses vendor-developed curricula and provides free curricular subscriptions to its students.

Teachers in School B are assigned to monitor a caseload of approximately 24 students and supplement school-adopted curricula with other assignments as appropriate. The teachers conduct weekly home visits to each student in order to monitor student progress, advise parents concerning the weekly study routine, and provide direct instruction. Students communicate with their teacher via email and the telephone to ask questions and get clarification on assignments.

Students work at their appropriate ability level regardless of their grade level or age, but generally advance the equivalent of one school year for each year they are enrolled. All students are required to participate in monthly group classes with the other students on their teacher’s caseload. School B also schedules social activities on a monthly basis (e.g., fieldtrips, skate nights).

There are approximately 575 students enrolled in School B. However, only students enrolled in grades three through eight participated in the study. Students in kindergarten through second grade did not participate because younger students may not provide adequate responses to the questionnaire.

Secondary Charter School

School C is a secondary charter school that operates as an independent entity under the charter school law and distance education regulations of the Southwestern State in which it is located. The school has classrooms on its campus and students attend on-campus classes in each subject area one day a week. During these 50-minute periods, the 20 students in each class receive teacher-led instruction. The school provides free subscriptions to each student for the vendor-developed curricula used for online
instruction. Students in this school communicate with their teachers via email, telephone, or in person should they need help with an assignment.

Teachers in School C teach two classes on campus each day. The remainder of their instructional day is spent providing assistance to students who contact them and monitoring student progress in the online learning environment. All assignments are posted on the school’s website. The website also provides information to students and parents concerning weekly coursework. Courses in School C follow the more traditional semester timeline found in the traditional high schools in the district. The first semester begins in late August each year and ends in January. The second semester ends in early June.

Design and Procedures

The student and parent questionnaires were developed in four phases. In the first phase, the initial questionnaires were developed. In the second phase, data were collected. Validation studies were done in the third phase and the final questionnaires were developed in phase four.

Phase One: Development of the Initial Questionnaires

In this phase of the study the items for the student and parent questionnaires were created. The questions were based on a review of pertinent online educational literature as well as information gathered from administrators and teachers currently working in the field of elementary and secondary online education. The administrators and teachers were asked to consider the type of feedback from students and parents they believed would be helpful to evaluate the programs in which they work.

The student and parent questionnaires contain items that relate to each factor identified in the literature review and from the administrators and the teachers. These
factors include technology support, instructional support, quality of the online curriculum (e.g. technical and content aspects), interaction with peers, and the overall educational program.

Factors Identified by Literature Review

The first factor identified in the literature focused on the quality and quantity of teacher-to-student interaction (Stewart, 2001; Baron & McKay, 2001; Hawkes, 2002; Rockwell et al. 2000; Picciano, 2002; Schrumm & Hong, 2002). Items in this area (instructional support) related to timeliness of requests for assistance, amount and quality of teacher feedback, teacher accessibility, and modes of teacher-to-student interaction.

Student-to-student interaction was identified as an important factor in satisfaction with online education (Picciano, 2002; Schrumm & Hong, 2002; McGee, 2002; Valenta, Therriault, Dieter, & Mrtek, 2001; Baron & McKay, 2001). Items in this area (social opportunities) related to opportunities for collaboration, feeling of social presence in the online setting, and opportunities for socialization.

Quality of online course design was identified as an important factor in student satisfaction (Farrell, 2001; Baron & McKay, 2001; Blomeyer, 2002; Seltzer, 2001; Rockwell et al., 2000). Items relating to this factor (curriculum programs) included interactivity of curriculum, design of curriculum, depth of content, and ease of use of the curriculum within the online course.

Factors Identified by Administrators and Teachers

Administrators and teachers who currently work in the participating schools were queried as to the factors they believe are important to student and parent satisfaction with online education. Administrators and teachers identified similar factors as the literature review as well as one other factor. They believed the level of technology support offered
by the individual program is an important factor in student and parent satisfaction with online education.

**Structure of the Questionnaire**

A five-point Likert scale was used to create the student and parent questionnaires. Response choices were: 1= Strongly Disagree, 2= Disagree, 3= Undecided, 4= Agree, and 5= Strongly Agree. According to Ary, Jacobs, and Razavieh (1990), the main advantage of a Likert scale is that it provides a rank of the respondents' attitudes in terms of favorableness to a particular issue or object. Nine structural issues were considered in the construction of the two questionnaires: (a) quality of presentation, (b) brevity, (c) provision of necessary information, (d) wording of questions so respondents can understand them, (e) simplifying the format, (f) eliciting unambiguous answers, (g) avoiding questions that may bias a response, (h) avoiding misleading questions, and (i) expressing all possible alternatives (Ary et al., 1990). Items were reviewed by a university professor from the field of educational statistics for clarity, grammar, spelling, and for adherence to proper questionnaire guidelines.

**Phase Two: Data Collection**

This phase involved data collection from the elementary and secondary students as well as their parents. Written permission was required for all participants in this study. Parents were required to complete consent forms for their children as well as their own participation in the study (See Appendixes F and G). Students were also required to complete assent forms before participating in this study (See Appendix H).

After permission was granted, the two questionnaires were made available to the participants via email. The two questionnaires were converted to an Internet-based format and accessed from an email asking participants to go to the questionnaires via a link.
Students and parents received the email asking them to participate in the study. The email contained the link to the web address where the questionnaires were posted. The students and parents had two weeks to complete the questionnaire. After the first week, the participants were sent a reminder email asking them to complete the questionnaire, if they had not done so. Three attempts were made to have students and parents complete the questionnaires.

**Phase Three: Validation**

In this phase several validation studies were conducted. The following tasks were conducted:

1. Clusters of items gleaned from the literature, administrators, and teachers were identified by exploratory factor analyses. The two extraction approaches that were used were principal component analysis and maximum likelihood method. They were employed with both orthogonal and oblique rotation.

2. The factor loadings for each item were examined. The factor structure as determined by the participants' responses to the questionnaires were then compared with the one determined in Phase I of this study.

3. Mean, standard deviation, and item discrimination index for each item were examined.

4. The reliability coefficients of the scale scores were computed.

5. Poor items were removed based on the findings from the analysis.

**Phase Four: Development of the Final Instruments**

During Phase Four, the final instruments were revised based on the findings of the previous three phases. The following tasks were carried out during this phase:

1. The instruments were revised based on the results of Phase I to III.
2. The final names for the dimensions were determined.

3. Aesthetically appealing final instruments were developed (See Appendices J and K).

After completion of the instrument validation, two multiple regression analyses were conducted to answer the research questions.

The research questions were:

1. What factors are associated with student satisfaction with online education at the secondary level?
2. What factors are associated with student satisfaction with online education at the elementary level?
3. What factors are associated with parent satisfaction with online education at the secondary level?
4. What factors are associated with parent satisfaction with online education at the elementary level?

The multiple regression analyses were conducted to determine which of the identified factors had a significant relationship with overall satisfaction with student and parent satisfaction at the elementary and secondary levels. The overall satisfaction score, which was the mean of the item scores in the overall satisfaction dimension, was regressed on the factor score for each factor identified in the exploratory factor analyses.
CHAPTER 4

RESULTS

Student Satisfaction with Online Education

The purpose of this study was to develop a questionnaire to examine student satisfaction with online education at the elementary and secondary level. The questionnaire was developed in four phases: (a) development of the initial instrument, (b) data collection, (c) validation, and (d) development of the final instrument.

Development of the Initial Instrument

The student satisfaction questionnaire was developed through a review of current literature concerning distance and online education and from input from teachers and administrators currently working in the field. In developing the student questionnaire used in the study, teachers and administrators (N=30) working in online education programs at the elementary and secondary level were asked to consider the type of feedback from students they believed would be helpful to evaluate the programs in which they worked. Information gathered from the teachers and administrators as well as information gleaned from a review of current literature was used to develop the items and dimensions for the questionnaire.

A first draft of the questionnaire, based on the review of literature and teacher and administrator feedback, was emailed to the teachers and administrators who provided the original feedback. The teachers and administrators were asked to review the
questionnaire for clarity, suggest additional items, and make any other comments on the
items and dimensions listed.

Twenty-seven items were developed for the student questionnaire (See Appendix A). The
questionnaire used a five-point Likert scale (with 1=strongly disagree and 5=strongly
agree as its anchoring points). The questionnaire was divided into five sections: (a)
school-level technology support, (b) school-level instructional support, (c) online
curriculum programs, (d) social interactions, and (e) overall satisfaction.

Each section of the student satisfaction questionnaire contained several items
concerning student satisfaction with a specific aspect of the online education program.
Items in section one (school-level technology support) included: (a) technology support
at my school is prompt, (b) technology support at my school is courteous, (c) technology
support at my school is effective, and (d) technology support at my school is available
when I need it. Items in section two (school-level instructional support) included: (a) my
teacher is available for assistance when needed, (b) my teacher gives prompt feedback,
(c) my teacher gives appropriate, helpful feedback, (d) my teacher adequately measures
and reports academic progress, (e) my teacher shows respect to students' individual
differences, and (f) my teacher knows my strengths and weaknesses. Items in section
three (online curriculum programs) included: (a) the online curricular programs at my
school are visually pleasing, (b) the online curricular programs at my school are free of
technical problems, (c) logging on to the online curricular programs at my school is
efficient, (d) the online curricular programs at my school are easy to navigate, and (f) the
online curricular programs allow me to work independently. Items in section four (social
interactions) included: (a) the social opportunities available through my school are
adequate in quantity, (b) the social opportunities available through my school are
adequate in quality, (c) I feel like part of a community at my school, (d) I have made friends at my school, and (e) I don’t miss going to school every day. Items in section five (overall satisfaction) included: (a) I am able to learn at my own pace in this school, (b) I am able to work at my own level in this school, (c) I feel comfortable working independently when a teacher is not available, (d) I am learning as much or more than if I was in a traditional school setting, (e) the administrators at my school are supportive of my needs, (f) overall, I am happy with my online education at this school, and (g) I would recommend an online school to my friends. For items and their hypothesized factors, see Table 4.

Participants

Students (N=195) from three programs offering online education programs (School A, School B, and School C) participated in this study. Data from the student responses were analyzed to determine mean, range, and standard deviation for each item (See Table 5). Data concerning frequency and percentage of each response for each item also were analyzed (See Table 6).
<table>
<thead>
<tr>
<th>Items</th>
<th>Hypothesized Factor</th>
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<tbody>
<tr>
<td>1. Technology support at my school is prompt.</td>
<td>School-level Technology Support</td>
</tr>
<tr>
<td>2. Technology support at my school is courteous.</td>
<td>School-level Technology Support</td>
</tr>
<tr>
<td>3. Technology support at my school is effective.</td>
<td>School-level Technology Support</td>
</tr>
<tr>
<td>4. Technology support at my school is available when I need it.</td>
<td>School-level Technology Support</td>
</tr>
<tr>
<td>5. My teacher is available for assistance when needed.</td>
<td>School-level Instructional Support</td>
</tr>
<tr>
<td>6. My teacher gives prompt feedback.</td>
<td>School-level Instructional Support</td>
</tr>
<tr>
<td>7. My teacher gives appropriate, helpful feedback.</td>
<td>School-level Instructional Support</td>
</tr>
<tr>
<td>8. My teacher adequately measures and reports academic progress.</td>
<td>School-level Instructional Support</td>
</tr>
<tr>
<td>9. My teacher shows respect to students' individual differences.</td>
<td>School-level Instructional Support</td>
</tr>
<tr>
<td>10. My teachers knows my strengths and weaknesses.</td>
<td>School-level Instructional Support</td>
</tr>
<tr>
<td>11. The online curricular programs at my school are visually pleasing.</td>
<td>Curriculum Programs</td>
</tr>
<tr>
<td>12. The online curricular programs at my school are free of technical problems.</td>
<td>Curriculum Programs</td>
</tr>
<tr>
<td>13. Logging on to the online curricular programs at my school is efficient.</td>
<td>Curriculum Programs</td>
</tr>
<tr>
<td>14. The online curricular programs at my school are easy to navigate.</td>
<td>Curriculum Programs</td>
</tr>
<tr>
<td>15. The online curricular program allows me to work independently.</td>
<td>Curriculum Programs</td>
</tr>
<tr>
<td>16. The social opportunities available through my school are adequate in quantity.</td>
<td>Social Interactions</td>
</tr>
<tr>
<td>17. The social opportunities available through my school are adequate in quality.</td>
<td>Social Interactions</td>
</tr>
<tr>
<td>18. I feel like part of a school community at my school.</td>
<td>Social Interactions</td>
</tr>
<tr>
<td>19. I have made friends at my school.</td>
<td>Social Interactions</td>
</tr>
<tr>
<td>20. I don't miss going to school everyday.</td>
<td>Social Interactions</td>
</tr>
<tr>
<td>21. I am able to learn at my own pace at this school.</td>
<td>Social Interactions</td>
</tr>
<tr>
<td>22. I am able to work at my own level at this school.</td>
<td>Overall Satisfaction</td>
</tr>
<tr>
<td>23. I feel comfortable working independently when a teacher is not available.</td>
<td>Overall Satisfaction</td>
</tr>
<tr>
<td>24. I am learning as much or more than if I was in a traditional school setting.</td>
<td>Overall Satisfaction</td>
</tr>
<tr>
<td>25. The administrators at my school are supportive of my needs.</td>
<td>Overall Satisfaction</td>
</tr>
<tr>
<td>26. Overall, I am happy with my online education at this school.</td>
<td>Overall Satisfaction</td>
</tr>
<tr>
<td>27. I would recommend an online school to my friends.</td>
<td>Overall Satisfaction</td>
</tr>
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Table 4: Questionnaire Items and Hypothesized Dimensions
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<th>Range</th>
<th>Mean</th>
<th>Standard Deviation</th>
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<td>1-5</td>
<td>3.8</td>
<td>.93</td>
</tr>
<tr>
<td>2. Technology support at my school is courteous.</td>
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<td>1-5</td>
<td>3.99</td>
<td>.85</td>
</tr>
<tr>
<td>3. Technology support at my school is effective.</td>
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<td>1-5</td>
<td>3.89</td>
<td>.91</td>
</tr>
<tr>
<td>4. Technology support at my school is available when I need it.</td>
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<td>1-5</td>
<td>3.95</td>
<td>.9</td>
</tr>
<tr>
<td>5. My teacher is available for assistance when needed.</td>
<td>195</td>
<td>1-5</td>
<td>4.16</td>
<td>.93</td>
</tr>
<tr>
<td>6. My teacher gives prompt feedback.</td>
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<td>1-5</td>
<td>4.21</td>
<td>.94</td>
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<tr>
<td>7. My teacher gives appropriate, helpful feedback.</td>
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<td>1-5</td>
<td>4.21</td>
<td>.94</td>
</tr>
<tr>
<td>8. My teacher adequately measures and reports academic progress.</td>
<td>193</td>
<td>1-5</td>
<td>4.19</td>
<td>.85</td>
</tr>
<tr>
<td>9. My teacher shows respect to students’ individual differences.</td>
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<td>1-5</td>
<td>4.29</td>
<td>.97</td>
</tr>
<tr>
<td>10. My teachers knows my strengths and weaknesses.</td>
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<td>1-5</td>
<td>3.92</td>
<td>1.12</td>
</tr>
<tr>
<td>11. The online curricular programs at my school are visually pleasing.</td>
<td>192</td>
<td>1-5</td>
<td>3.92</td>
<td>1.12</td>
</tr>
<tr>
<td>12. The online curricular programs at my school are free of technical problems.</td>
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<td>1-5</td>
<td>2.98</td>
<td>1.08</td>
</tr>
<tr>
<td>13. Logging on to the online curricular programs at my school is efficient.</td>
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<td>1-5</td>
<td>3.92</td>
<td>.87</td>
</tr>
<tr>
<td>14. The online curricular programs at my school are easy to navigate.</td>
<td>193</td>
<td>1-5</td>
<td>4.02</td>
<td>.91</td>
</tr>
<tr>
<td>15. The online curricular program allows me to work independently.</td>
<td>191</td>
<td>1-5</td>
<td>4.17</td>
<td>.84</td>
</tr>
<tr>
<td>16. The social opportunities available through my school are adequate in quantity.</td>
<td>192</td>
<td>1-5</td>
<td>3.43</td>
<td>1.17</td>
</tr>
<tr>
<td>17. The social opportunities available through my school are adequate in quality.</td>
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<td>1-5</td>
<td>3.6</td>
<td>1.14</td>
</tr>
<tr>
<td>18. I feel like part of a school community at my school.</td>
<td>189</td>
<td>1-5</td>
<td>3.47</td>
<td>1.17</td>
</tr>
<tr>
<td>19. I have made friends at my school.</td>
<td>192</td>
<td>1-5</td>
<td>3.53</td>
<td>1.28</td>
</tr>
<tr>
<td>20. I don’t miss going to school everyday.</td>
<td>194</td>
<td>1-5</td>
<td>4.15</td>
<td>.99</td>
</tr>
<tr>
<td>21. I am able to learn at my own pace at this school.</td>
<td>194</td>
<td>1-5</td>
<td>4.13</td>
<td>1.02</td>
</tr>
<tr>
<td>22. I am able to work at my own level at this school.</td>
<td>194</td>
<td>1-5</td>
<td>4.15</td>
<td>.9</td>
</tr>
<tr>
<td>23. I feel comfortable working independently when a teacher is not available.</td>
<td>192</td>
<td>1-5</td>
<td>4.09</td>
<td>1.08</td>
</tr>
<tr>
<td>24. I am learning as much or more than if I was in a traditional school setting.</td>
<td>192</td>
<td>1-5</td>
<td>4.2</td>
<td>.89</td>
</tr>
<tr>
<td>25. The administrators at my school are supportive of my needs.</td>
<td>191</td>
<td>1-5</td>
<td>3.73</td>
<td>1.3</td>
</tr>
<tr>
<td>26. Overall, I am happy with my online education at this school.</td>
<td>193</td>
<td>1-5</td>
<td>4.02</td>
<td>.86</td>
</tr>
<tr>
<td>27. I would recommend an online school to my friends.</td>
<td>193</td>
<td>1-5</td>
<td>4.16</td>
<td>1.06</td>
</tr>
</tbody>
</table>

Table 5: Student Satisfaction Questionnaire Item Means
<table>
<thead>
<tr>
<th>Items</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Technology support at my school is prompt.</td>
<td>5 (2.6%)</td>
<td>11 (5.6%)</td>
<td>45 (23.0%)</td>
<td>91 (46.4%)</td>
<td>43 (21.9%)</td>
</tr>
<tr>
<td>2. Technology support at my school is courteous.</td>
<td>2 (1.0%)</td>
<td>7 (3.6%)</td>
<td>38 (19.4%)</td>
<td>91 (46.4%)</td>
<td>57</td>
</tr>
<tr>
<td>3. Technology support at my school is effective.</td>
<td>4 (2.0%)</td>
<td>9 (4.6%)</td>
<td>41 (20.9%)</td>
<td>91 (46.4%)</td>
<td>50</td>
</tr>
<tr>
<td>4. Technology support at my school is available when I need it.</td>
<td>2 (1.0%)</td>
<td>12 (6.1%)</td>
<td>35 (17.9%)</td>
<td>90 (46.4%)</td>
<td>56</td>
</tr>
<tr>
<td>5. My teacher is available for assistance when needed.</td>
<td>4 (2.0%)</td>
<td>9 (4.6%)</td>
<td>20 (10.2%)</td>
<td>80 (40.8%)</td>
<td>82</td>
</tr>
<tr>
<td>6. My teacher gives prompt feedback.</td>
<td>8 (4.1%)</td>
<td>13 (6.6%)</td>
<td>19 (9.7%)</td>
<td>72 (36.7%)</td>
<td>90</td>
</tr>
<tr>
<td>7. My teacher gives appropriate, helpful feedback.</td>
<td>3 (1.5%)</td>
<td>11 (5.6%)</td>
<td>18 (9.2%)</td>
<td>67 (34.2%)</td>
<td>101</td>
</tr>
<tr>
<td>8. My teacher adequately measures and reports academic progress.</td>
<td>2 (1.5%)</td>
<td>5 (2.6%)</td>
<td>22 (11.2%)</td>
<td>85 (43.4%)</td>
<td>78</td>
</tr>
<tr>
<td>9. My teacher shows respect to students' individual differences.</td>
<td>6 (3.1%)</td>
<td>7 (3.6%)</td>
<td>13 (6.6%)</td>
<td>67 (34.2%)</td>
<td>101</td>
</tr>
<tr>
<td>10. My teachers knows my strengths and weaknesses.</td>
<td>7 (3.6%)</td>
<td>16 (8.2%)</td>
<td>38 (19.4%)</td>
<td>56 (28.6%)</td>
<td>75</td>
</tr>
<tr>
<td>11. The online curricular programs at my school are visually pleasing.</td>
<td>8 (4.1%)</td>
<td>9 (4.6%)</td>
<td>30 (15.3%)</td>
<td>104 (53.1%)</td>
<td>42</td>
</tr>
<tr>
<td>12. The online curricular programs at my school are free of technical problems.</td>
<td>9 (4.6%)</td>
<td>72 (36.7%)</td>
<td>37 (18.9%)</td>
<td>60 (30.6%)</td>
<td>13</td>
</tr>
<tr>
<td>13. Logging on to the online curricular programs at my school is efficient.</td>
<td>4 (2.0%)</td>
<td>10 (5.1%)</td>
<td>27 (13.8%)</td>
<td>109 (55.6%)</td>
<td>43</td>
</tr>
<tr>
<td>14. The online curricular programs at my school are easy to navigate.</td>
<td>4 (2.0%)</td>
<td>12 (6.1%)</td>
<td>17 (8.7%)</td>
<td>103 (52.6%)</td>
<td>57</td>
</tr>
<tr>
<td>15. The online curricular program allows me to work independently.</td>
<td>7 (3.1%)</td>
<td>7 (3.6%)</td>
<td>15 (7.7%)</td>
<td>95 (48.5%)</td>
<td>71</td>
</tr>
<tr>
<td>16. The social opportunities available through my school are adequate in quantity.</td>
<td>18 (9.2%)</td>
<td>25 (12.8%)</td>
<td>34 (17.3%)</td>
<td>87 (44.4%)</td>
<td>28</td>
</tr>
<tr>
<td>17. The social opportunities available through my school are adequate in quality.</td>
<td>15 (7.7%)</td>
<td>19 (9.7%)</td>
<td>31 (15.8%)</td>
<td>89 (45.4%)</td>
<td>38</td>
</tr>
<tr>
<td>19. I have made friends at my school.</td>
<td>17 (8.7%)</td>
<td>33 (16.8%)</td>
<td>21 (10.2%)</td>
<td>73 (37.2%)</td>
<td>48</td>
</tr>
<tr>
<td>20. I don’t miss going to school everyday.</td>
<td>4 (2.0%)</td>
<td>16 (8.2%)</td>
<td>10 (5.1%)</td>
<td>81 (41.3%)</td>
<td>83</td>
</tr>
<tr>
<td>21. I am able to learn at my own pace at this school.</td>
<td>6 (3.1%)</td>
<td>14 (7.1%)</td>
<td>12 (6.1%)</td>
<td>79 (40.3%)</td>
<td>83</td>
</tr>
<tr>
<td>22. I am able to work at my own level at this school.</td>
<td>4 (2.0%)</td>
<td>9 (4.6%)</td>
<td>15 (7.7%)</td>
<td>92 (46.9%)</td>
<td>74</td>
</tr>
<tr>
<td>23. I feel comfortable working independently when a teacher is not available.</td>
<td>9 (4.6%)</td>
<td>8 (4.1%)</td>
<td>25 (12.8%)</td>
<td>65 (33.2%)</td>
<td>85</td>
</tr>
<tr>
<td>24. I am learning as much or more than if I was in a traditional school setting.</td>
<td>4 (2.0%)</td>
<td>7 (3.6%)</td>
<td>16 (8.2%)</td>
<td>85 (43.4%)</td>
<td>80</td>
</tr>
<tr>
<td>25. The administrators at my school are supportive of my needs.</td>
<td>18 (9.2%)</td>
<td>17 (8.7%)</td>
<td>35 (17.9%)</td>
<td>50 (25.5%)</td>
<td>71</td>
</tr>
<tr>
<td>26. Overall, I am happy with my online education at this school.</td>
<td>2 (1.0%)</td>
<td>7 (3.6%)</td>
<td>36 (18.4%)</td>
<td>89 (45.4%)</td>
<td>59</td>
</tr>
<tr>
<td>27. I would recommend an online school to my friends.</td>
<td>9 (4.6%)</td>
<td>7 (3.6%)</td>
<td>19 (9.7%)</td>
<td>67 (34.2%)</td>
<td>91</td>
</tr>
</tbody>
</table>

Table 6: Frequency and Percentages of Responses
**Item Reliability**

Each of the dimensions identified in the first phase of the study were tested for item reliability. Items were tested as a group for each dimension and individually within its dimension. Cronbach’s alpha was calculated for each of the five dimensions (e.g., school-level technology support, school-level instructional support, online curriculum programs, social interactions, and overall satisfaction) identified in the first phase of this study (See Table 7). Each dimension had an alpha score above .80, which is in the acceptable range (Gable & Wolf, 1993). This means that all dimensions were deemed to be acceptable.

Items were also analyzed to ascertain if the alpha score would improve dramatically if an item was removed from its dimension. For most items, alpha scores went down just slightly if an item were to be removed. In some cases the alpha went up but only marginally. Based on these reliability analyses, no items were removed from their dimensions before doing the factor analyses.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Number of Cases</th>
<th>Alpha Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>School-level Technology Support</td>
<td>195</td>
<td>.8763</td>
</tr>
<tr>
<td>School-level Instructional Support</td>
<td>190</td>
<td>.9196</td>
</tr>
<tr>
<td>Online Curriculum Programs</td>
<td>189</td>
<td>.8052</td>
</tr>
<tr>
<td>Social Interactions</td>
<td>189</td>
<td>.8144</td>
</tr>
<tr>
<td>Overall Educational Program</td>
<td>186</td>
<td>.8391</td>
</tr>
</tbody>
</table>

Table 7: Alpha Coefficients for Dimensions Identified in Phase One

**Exploratory Factor Analyses**

Exploratory factor analyses were carried out to statistically substantiate the dimensions identified in the first phase of this study. Principal component analysis (PCA)
and maximum likelihood (ML) methods were used to determine the factor structure that best described the data. A varimax (orthogonal) and direct oblimin (oblique) rotation were employed for both extractions. The criterion used for each combination of extraction and rotation methods was eigenvalue greater than one. The extraction combination that produced the factor structure that was the clearest and also best matched the hypothesized five-factor structure was ML extraction with direct oblimin (oblique) rotation. The results of the pattern matrix are provided in the following text.

Five factors (e.g., school-level technology support, school-level instructional support, online curriculum programs, social interactions, and overall satisfaction) were identified by the ML extraction with nearly every item loading on its hypothesized factor. The first factor identified was the dimension concerning school-level instructional support. All six items (e.g., my teacher is available for assistance when needed; my teacher gives prompt feedback; my teacher gives appropriate, helpful feedback; my teacher adequately measures and reports academic progress; my teacher shows respect to students’ individual differences; and my teacher knows my strengths and weaknesses) that were hypothesized to load most heavily on this factor did so. None of the items in this dimension loaded on any other factor.

The second factor identified contained the items concerning school-level instructional support. All four items (e.g., technology support at my school is prompt; technology support at my school is courteous; technology support at my school is effective; and technology support at my school is available when I need it) hypothesized to load on this factor did so. None of the items in this dimension loaded on any of the other factors.

The third factor identified in this extraction was labeled overall satisfaction. This factor was not as clean as the previous two factors identified. Only five of the seven
hypothesized items (e.g., I am able to learn at my own pace in this school; I am able to
work at my own level in this school; I feel comfortable working independently when a
teacher is not available; I am learning as much or more than if I was in a traditional
school setting; and the administrators at my school are supportive of my needs) loaded on
this factor. Item 26 (overall, I am happy with my online education at this school) loaded
on the technology support factor. Item 25 (the administrators at my school are supportive
of my needs) loaded on the social interactions factor. Item 27 (I would recommend an
online school to my friends) loaded on the overall satisfaction and also loaded on the
social interactions factor. One other item (I don’t miss going to school every day) that
was hypothesized to load on the social interactions factor, loaded on the overall
satisfaction factor.

The fourth factor extracted by the analysis was the social interactions factor. Four of
the five items (e.g., the social opportunities available through my school are adequate in
quantity; the social opportunities available through my school are adequate in quality; I
feel like part of a community at my school; and I have made friends at my school)
hypothesized to load on this factor did so. None of these four items loaded on any other
factor. As mentioned, item 20 (I don’t miss going to school every day) also loaded on the
overall satisfaction factor.

The fifth factor identified by the factor analysis was the curriculum programs factor.
This factor came out very clean as all five hypothesized items (e.g., the online curricular
programs at my school are visually pleasing; the online curricular programs at my school
are free of technical problems; logging on to the online curricular programs at my school
is efficient; the online curricular programs at my school are easy to navigate; and the
online curricular programs allow me to work independently) loaded on the factor. For the five-factor pattern matrix see Table 8.

After determining that the factor structure hypothesized in the first phase of this study was supported by the ML exploratory factor analysis with oblimin rotation, a second factor analysis was conducted excluding the items that were hypothesized to load on the overall satisfaction factor. This analysis was done using ML with oblimin (oblique) rotation as well, based on the fact that this extraction method gave the best results in the five-factor solution. For the four-factor pattern matrix see Table 9. Factor scores from this four-factor solution were used to determine if there were any relationships between the four area-specific factors (e.g., school-level technology support, school-level instructional support, curriculum programs, and social interactions) and overall satisfaction with the online program.

*Multiple Regression*

A multiple regression analysis was conducted to answer the following research questions:

1. What factors are associated with student satisfaction with online education at the secondary level?

2. What factors are associated with student satisfaction with online education at the elementary level?

Factor scores from the four-factor solution were used to determine if there were any relationships between the four area-specific factors (e.g., school-level technology support, school-level instructional support, curriculum programs, and social interactions) and overall student satisfaction with the online program. This was done by doing a multiple regression analysis in which factor scores derived from the four-factor ML
extraction: (a) school-level technology support, (b) school-level instructional support, (c) curriculum programs, and (d) social interactions were the independent variables. The dependent variable for the multiple regression analysis was overall satisfaction. The factor score for overall satisfaction from the five-factor solution was not used as the measurement for overall satisfaction because there were some items that did not load as hypothesized. Based on the item and scale reliability analysis and a ML extraction including only the items from the overall satisfaction dimension that extracted only one factor, it was determined that the mean of these items could be used as the dependent variable measurement for overall satisfaction for the multiple regression.

The multiple regression analysis determined that the four factors (e.g., technology support, instructional support, curriculum programs, and social interactions) accounted for 53.1% of the variance in overall student satisfaction, \( F(4,171) = 48.44, p < .005 \). This indicates a statistically significant relationship between the four factor scores and overall student satisfaction. Individually, each independent variable contributed to the explanation of the variance in overall student satisfaction. The standard solution indicated that social interaction was the most important variable in explaining the variance in overall student satisfaction, \( b = -.207, P = -.274, t = -4.045, p < .005 \). Technology support was the next most important variable in explaining the variance in overall student satisfaction, \( b = .196, P = .255, t = 3.553, p < .005 \). The curriculum program factor was the next most important variable in explaining the variance in overall student satisfaction, \( b = .190, P = .240, t = 3.528, p < .005 \). Instructional support also explained part of the variance in overall student satisfaction, \( b = .105, P = .140, t = 2.192, p < .05 \) (See Table 10). This means that individually, each of the four area-specific factors (e.g., technology...
support, instructional support, curriculum programs, and social interactions) is significantly associated with overall student satisfaction.

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instructional Support</td>
<td>Technology Support</td>
<td>Overall Satisfaction</td>
<td>Social Interaction</td>
<td>Curricular Programs</td>
</tr>
<tr>
<td>1 (TS)*</td>
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<td></td>
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<td>2 (TS)</td>
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</tbody>
</table>

Table 8: Pattern Matrix Derived Through ML with Direct Oblimin (Oblique) Rotation

* Hypothesized Factors: (TS) = School-level Instructional Support, (IS) = School-level Instructional Support, (CP) = Curriculum Programs, (SI) = Social Interaction, (OS) = Overall Satisfaction. Loadings smaller than .30 were not included in the table.
<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instructional Support</td>
<td>Technology Support</td>
<td>Social Interactions</td>
<td>Curriculum Programs</td>
</tr>
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<td>1 (TS)*</td>
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</table>

Table 9: Pattern Matrix Derive Through ML with Direct Oblimin (Oblique) Rotation

* Hypothesized Factors: (TS) = School-level Instructional Support, (IS) = School-level Instructional Support, CP) = Curriculum Programs, (SI) = Social Interaction. Loadings smaller than .30 were not included in the table.

<table>
<thead>
<tr>
<th>Factor</th>
<th>b</th>
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</tr>
</thead>
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</tr>
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<td>-4.045</td>
<td>.000*</td>
</tr>
<tr>
<td>Technology Support</td>
<td>.196</td>
<td>.255</td>
<td>3.553</td>
<td>.000*</td>
</tr>
<tr>
<td>Instructional Support</td>
<td>.105</td>
<td>.140</td>
<td>2.192</td>
<td>.030*</td>
</tr>
</tbody>
</table>

Table 10: Summary of Regression Analysis for Factor Scores Predicting Overall Student Satisfaction

*Significance level set at p<.05
Parent Satisfaction with Online Education

The purpose of this study was to develop a questionnaire to examine parent satisfaction with online education at the elementary and secondary level. The questionnaire was developed in four phases: (a) development of the initial instrument, (b) data collection, (c) validation, and (d) development of the final instrument.

Development of the Initial Instrument

The parent satisfaction questionnaire was developed through a review of current literature concerning distance and online education and with input from teachers and administrators currently working in the field. In developing the parent questionnaire used in the study, teachers and administrators (N=30) currently working in online education programs at the elementary and secondary level were asked to consider what type of feedback from parents they believed would be helpful to evaluate the programs in which they worked. Information gathered from the teachers and administrators as well as information gleaned from a review of current literature was used to develop the items and dimensions for the questionnaire. A first draft of the questionnaire based on the review of literature and teacher and administrator feedback was then emailed to the teachers and administrators who had provided the original feedback. The teachers and administrators were asked to review the questionnaire for clarity, suggest additional items, and make any other comments on the items and dimensions listed.

Twenty-eight items were developed for the parent questionnaire (See Appendix B). The questionnaire used a five-point Likert scale with 1=strongly disagree and 5=strongly agree as its anchoring points. The questionnaire was divided into five sections or dimensions: (a) school-level technology support, (b) school-level instructional support, (c) online curriculum programs, (d) social interactions, and (e) overall satisfaction.
Items developed for the questionnaire were assigned to one of the dimensions in the formatting of the online instrument based on the hypothetical structure developed in the first phase of the study. Items in section one (school-level technology support) included: (a) technology support at my child’s school is prompt, (b) technology support at my child’s school is courteous, (c) technology support at my child’s school is effective, and (d) technology support at my child’s school is available when we need it. Items in section two (school-level instructional support) included: (a) my child’s teacher is available for assistance when needed, (b) my child’s teacher gives prompt feedback, (c) my child’s teacher give appropriate, helpful feedback, (d) my child’s teacher adequately measures and reports academic progress, (e) my child’s teacher shows respect to students’ individual differences, and (f) my child’s teacher knows his/her strengths and weaknesses. Items in section three (online curriculum programs) included: (a) the online curricular programs at my child’s school are visually pleasing, (b) the online curricular programs at my child’s school are free of technical problems, (c) the educational content of the online curricular programs are of high quality, (d) logging on to the online curricular programs at my child’s school is efficient, (e) the online curricular programs at my child’s school are easy to navigate, and (f) the online curricular programs allow my child to work independently. Items in section four (social interactions) included: (a) the social opportunities available through my child’s school are adequate in quantity, (b) the social opportunities available through my child’s school are adequate in quality, (c) my child feels like part of a community at his/her school, (d) my child has made friends through his/her school, and (e) my child does not miss going to school every day. Items in section five (overall satisfaction) included: (a) my child is able to learn at his or her own pace in this school, (b) my child is able to learn at his/her appropriate own level in
this school, (c) I feel comfortable providing assistance to my child when a teacher is not available, (d) my child is learning as much or more than if he/she was in a traditional school setting, (e) administrative support at my child’s school is adequate, (f) overall, I am satisfied with my child’s experience in online education at this school, and (g) I would suggest an online school to other parents for their children. See Table 11 for hypothesized dimension and items.

Participants

Parents (N=186) from three programs offering online education programs (School A, School B, and School C) participated in this study. Data from the parent responses were analyzed to determine mean, range, and standard deviation for each item (See Table 12). Data concerning frequency and percentage of each response for each item also were analyzed (See Table 13).
<table>
<thead>
<tr>
<th>Items</th>
<th>Hypothesized Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Technology support at my child’s school is prompt.</td>
<td>School-level Technology Support</td>
</tr>
<tr>
<td>2. Technology support at my child’s school is courteous.</td>
<td>School-level Technology Support</td>
</tr>
<tr>
<td>3. Technology support at my child’s school is effective.</td>
<td>School-level Technology Support</td>
</tr>
<tr>
<td>4. Technology support at my child’s school is available when I need it.</td>
<td>School-level Technology Support</td>
</tr>
<tr>
<td>5. My child’s teacher is available for assistance when needed.</td>
<td>School-level Instructional Support</td>
</tr>
<tr>
<td>6. My child’s teacher gives prompt feedback.</td>
<td>School-level Instructional Support</td>
</tr>
<tr>
<td>7. My child’s teacher gives appropriate, helpful feedback.</td>
<td>School-level Instructional Support</td>
</tr>
<tr>
<td>8. My child’s teacher adequately measures and reports academic progress.</td>
<td>School-level Instructional Support</td>
</tr>
<tr>
<td>9. My child’s teacher shows respect to students' individual differences.</td>
<td>School-level Instructional Support</td>
</tr>
<tr>
<td>10. My child’s teacher knows my strengths and weaknesses.</td>
<td>School-level Instructional Support</td>
</tr>
<tr>
<td>11. The online curricular programs at my child’s school are visually pleasing.</td>
<td>Curriculum Programs</td>
</tr>
<tr>
<td>12. The online curricular programs at my child’s school are free of technical problems.</td>
<td>Curriculum Programs</td>
</tr>
<tr>
<td>13. Logging on to the online curricular programs at my child’s school are of high content.</td>
<td>Curriculum Programs</td>
</tr>
<tr>
<td>14. Logging on to the online curricular programs at my child’s school is efficient.</td>
<td>Curriculum Programs</td>
</tr>
<tr>
<td>15. The online curricular program allows my child’s school are easy to navigate.</td>
<td>Curriculum Programs</td>
</tr>
<tr>
<td>16. The online curricular program allows my child to work independently.</td>
<td>Curriculum Programs</td>
</tr>
<tr>
<td>17. The social opportunities available through my child’s school are adequate in quality.</td>
<td>Social Interactions</td>
</tr>
<tr>
<td>20. My child has made friends through his/her school.</td>
<td>Social Interactions</td>
</tr>
<tr>
<td>21. My child does not miss going to school every day.</td>
<td>Social Interactions</td>
</tr>
<tr>
<td>22. My child is able to learn at his/her own pace at this school.</td>
<td>Overall Satisfaction</td>
</tr>
<tr>
<td>23. My child is able to work at his/her appropriate level at this school.</td>
<td>Overall Satisfaction</td>
</tr>
<tr>
<td>24. I feel comfortable providing assistance to my child when a teacher is not available.</td>
<td>Overall Satisfaction</td>
</tr>
<tr>
<td>25. My child is learning as much or more than if he/she was in a traditional setting.</td>
<td>Overall Satisfaction</td>
</tr>
<tr>
<td>26. Administrative support at my child’s school is adequate.</td>
<td>Overall Satisfaction</td>
</tr>
<tr>
<td>27. Overall, I am satisfied with my child’s experience in online education in this school.</td>
<td>Overall Satisfaction</td>
</tr>
<tr>
<td>28. I would suggest online school to other parents for their children.</td>
<td>Overall Satisfaction</td>
</tr>
</tbody>
</table>

Table 11: Questionnaire Items and Hypothesized Dimensions
<table>
<thead>
<tr>
<th>Items</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Technology support at my child's school is prompt.</td>
<td>186</td>
<td>1-5</td>
<td>3.90</td>
<td>.83</td>
</tr>
<tr>
<td>2. Technology support at my child's school is courteous.</td>
<td>186</td>
<td>1-5</td>
<td>4.12</td>
<td>.77</td>
</tr>
<tr>
<td>3. Technology support at my child's school is effective.</td>
<td>186</td>
<td>1-5</td>
<td>3.92</td>
<td>.86</td>
</tr>
<tr>
<td>4. Technology support at my child's school is available when I need it</td>
<td>186</td>
<td>1-5</td>
<td>3.82</td>
<td>.92</td>
</tr>
<tr>
<td>5. My child's teacher is available for assistance when needed.</td>
<td>186</td>
<td>1-5</td>
<td>4.37</td>
<td>.87</td>
</tr>
<tr>
<td>6. My child's teacher gives prompt feedback.</td>
<td>186</td>
<td>1-5</td>
<td>4.29</td>
<td>.94</td>
</tr>
<tr>
<td>7. My child's teacher gives appropriate, helpful feedback.</td>
<td>186</td>
<td>1-5</td>
<td>4.34</td>
<td>.85</td>
</tr>
<tr>
<td>8. My child's teacher adequately measures and reports academic progress</td>
<td>186</td>
<td>1-5</td>
<td>4.31</td>
<td>.93</td>
</tr>
<tr>
<td>9. My child's teacher shows respect to students' individual differences</td>
<td>186</td>
<td>1-5</td>
<td>4.45</td>
<td>.86</td>
</tr>
<tr>
<td>10. My child's teacher knows my strengths and weaknesses.</td>
<td>186</td>
<td>1-5</td>
<td>4.22</td>
<td>.98</td>
</tr>
<tr>
<td>11. The online curricular programs at my child's school are visually pleasing</td>
<td>186</td>
<td>1-5</td>
<td>4.09</td>
<td>.72</td>
</tr>
<tr>
<td>12. The online curricular programs at my child's school are free of technical problems</td>
<td>186</td>
<td>1-5</td>
<td>3.04</td>
<td>1.14</td>
</tr>
<tr>
<td>13. Logging on to the online curricular programs at my child's school are of high content</td>
<td>186</td>
<td>1-5</td>
<td>4.03</td>
<td>.72</td>
</tr>
<tr>
<td>14. Logging on to the online curricular programs at my child's school is efficient</td>
<td>186</td>
<td>1-5</td>
<td>3.99</td>
<td>.80</td>
</tr>
<tr>
<td>15. The online curricular program allows my child's school are easy to navigate.</td>
<td>185</td>
<td>1-5</td>
<td>4.08</td>
<td>.75</td>
</tr>
<tr>
<td>16. The online curricular program allows my child to work independently.</td>
<td>186</td>
<td>1-5</td>
<td>3.99</td>
<td>.92</td>
</tr>
<tr>
<td>17. The social opportunities available through my child's school are adequate in quantity.</td>
<td>184</td>
<td>1-5</td>
<td>3.52</td>
<td>1.01</td>
</tr>
<tr>
<td>18. The social opportunities available through my child's school are adequate in quality.</td>
<td>183</td>
<td>1-5</td>
<td>3.67</td>
<td>.98</td>
</tr>
<tr>
<td>19. My child has made friends through his/her school.</td>
<td>186</td>
<td>1-5</td>
<td>3.28</td>
<td>1.16</td>
</tr>
<tr>
<td>20. My child does not miss going to school every day.</td>
<td>185</td>
<td>1-5</td>
<td>4.39</td>
<td>.77</td>
</tr>
<tr>
<td>21. My child is able to learn at his/her own pace at this school.</td>
<td>186</td>
<td>1-5</td>
<td>4.34</td>
<td>.79</td>
</tr>
<tr>
<td>22. My child is able to work at his/her appropriate level at this school</td>
<td>186</td>
<td>1-5</td>
<td>4.37</td>
<td>.75</td>
</tr>
<tr>
<td>23. I feel comfortable providing assistance to my child when a teacher is not available.</td>
<td>186</td>
<td>1-5</td>
<td>4.34</td>
<td>.91</td>
</tr>
<tr>
<td>24. My child is learning as much or more than if he/she was in a traditional setting.</td>
<td>186</td>
<td>1-5</td>
<td>3.99</td>
<td>.90</td>
</tr>
<tr>
<td>25. Administrative support at my child's school is adequate.</td>
<td>186</td>
<td>1-5</td>
<td>4.27</td>
<td>.91</td>
</tr>
<tr>
<td>26. Overall, I am satisfied with my child's experience in online education in this school.</td>
<td>185</td>
<td>1-5</td>
<td>3.95</td>
<td>1.16</td>
</tr>
<tr>
<td>27. I would suggest online school to other parents for their children.</td>
<td>184</td>
<td>1-5</td>
<td>4.33</td>
<td>.86</td>
</tr>
</tbody>
</table>

Table 11: Parent Satisfaction Questionnaire Item Means
Table 13: Frequency and Percentage Responses

Note: Numbers inside the parenthesis represent the percentage of parents giving each response and numbers outside the parenthesis represents the number of parents (n) giving each response.

<table>
<thead>
<tr>
<th>Items</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Technology support at my child’s school is prompt.</td>
<td>3 (1.6%)</td>
<td>9 (4.8%)</td>
<td>29 (15.6%)</td>
<td>106 (57.5%)</td>
<td>38 (20.4%)</td>
</tr>
<tr>
<td>2. Technology support at my child’s school is courteous.</td>
<td>2 (1.1%)</td>
<td>3 (1.6%)</td>
<td>24 (12.9%)</td>
<td>99 (53.2%)</td>
<td>58 (31.2%)</td>
</tr>
<tr>
<td>3. Technology support at my child’s school is effective.</td>
<td>4 (2.7%)</td>
<td>12 (6.5%)</td>
<td>4 (2.1%)</td>
<td>100 (53.8%)</td>
<td>43 (23.1%)</td>
</tr>
<tr>
<td>4. Technology support at my child’s school is available when I need it.</td>
<td>5 (2.7%)</td>
<td>11 (5.9%)</td>
<td>35 (18.8%)</td>
<td>96 (51.6%)</td>
<td>39 (21.0%)</td>
</tr>
<tr>
<td>5. My child’s teacher is available for assistance when needed.</td>
<td>4 (2.2%)</td>
<td>5 (2.7%)</td>
<td>10 (5.4%)</td>
<td>66 (35.5%)</td>
<td>101 (54.3%)</td>
</tr>
<tr>
<td>6. My child’s teacher gives prompt feedback.</td>
<td>4 (2.2%)</td>
<td>8 (4.3%)</td>
<td>15 (8.1%)</td>
<td>62 (33.3%)</td>
<td>97 (52.2%)</td>
</tr>
<tr>
<td>7. My child’s teacher gives appropriate, helpful feedback.</td>
<td>3 (1.6%)</td>
<td>13 (7.0%)</td>
<td>11 (5.9%)</td>
<td>71 (38.2%)</td>
<td>95 (51.1%)</td>
</tr>
<tr>
<td>8. My child’s teacher adequately measures and reports academic progress.</td>
<td>8 (4.3%)</td>
<td>18 (9.7%)</td>
<td>28 (15.1%)</td>
<td>61 (32.8%)</td>
<td>98 (52.7%)</td>
</tr>
<tr>
<td>9. My child’s teacher shows respect to students’ individual differences.</td>
<td>4 (2.2%)</td>
<td>5 (2.7%)</td>
<td>12 (6.5%)</td>
<td>51 (27.4%)</td>
<td>115 (61.8%)</td>
</tr>
<tr>
<td>10. My teachers know my strengths and weaknesses.</td>
<td>4 (2.2%)</td>
<td>13 (7.0%)</td>
<td>28 (15.1%)</td>
<td>53 (28.5%)</td>
<td>94 (50.5%)</td>
</tr>
<tr>
<td>11. The online curricular programs at my child’s school are visually pleasing.</td>
<td>2 (1.1%)</td>
<td>6 (3.2%)</td>
<td>11 (5.9%)</td>
<td>122 (65.6%)</td>
<td>45 (24.2%)</td>
</tr>
<tr>
<td>12. The online curricular programs at my child’s school are free of technical problems.</td>
<td>12 (6.5%)</td>
<td>65 (34.9%)</td>
<td>28 (15.1%)</td>
<td>66 (35.5%)</td>
<td>15 (8.1%)</td>
</tr>
<tr>
<td>13. The educational content of the online curricular programs are of high content.</td>
<td>3 (1.6%)</td>
<td>4 (2.2%)</td>
<td>16 (8.6%)</td>
<td>125 (67.2%)</td>
<td>38 (20.4%)</td>
</tr>
<tr>
<td>14. Logging on to the online curricular programs at my child’s school is efficient.</td>
<td>3 (1.6%)</td>
<td>8 (4.3%)</td>
<td>17 (9.3%)</td>
<td>117 (62.9%)</td>
<td>49 (26.2%)</td>
</tr>
<tr>
<td>15. The online curricular programs at my child’s school are easy to navigate.</td>
<td>2 (1.1%)</td>
<td>5 (2.7%)</td>
<td>18 (9.7%)</td>
<td>111 (59.7%)</td>
<td>49 (26.3%)</td>
</tr>
<tr>
<td>16. The online curricular program allows my child to work independently.</td>
<td>3 (1.6%)</td>
<td>18 (9.7%)</td>
<td>8 (4.3%)</td>
<td>106 (57.0%)</td>
<td>51 (27.4%)</td>
</tr>
<tr>
<td>17. The social opportunities available through my school are adequate in quality.</td>
<td>9 (4.8%)</td>
<td>23 (12.4%)</td>
<td>36 (19.4%)</td>
<td>95 (51.1%)</td>
<td>21 (11.3%)</td>
</tr>
<tr>
<td>18. The social opportunities available through my child’s school are adequate in quality.</td>
<td>8 (4.3%)</td>
<td>16 (8.6%)</td>
<td>31 (16.7%)</td>
<td>101 (54.3%)</td>
<td>27 (14.5%)</td>
</tr>
<tr>
<td>19. My child feels like part of a school community at his/her school.</td>
<td>10 (5.4%)</td>
<td>30 (16.1%)</td>
<td>36 (19.4%)</td>
<td>76 (40.9%)</td>
<td>32 (17.2%)</td>
</tr>
<tr>
<td>20. My child has made friends through his/her school.</td>
<td>13 (7.0%)</td>
<td>43 (23.1%)</td>
<td>32 (17.2%)</td>
<td>75 (40.3%)</td>
<td>23 (12.4%)</td>
</tr>
<tr>
<td>21. My child does not miss going to school every day.</td>
<td>7 (3.8%)</td>
<td>17 (9.5%)</td>
<td>10 (5.4%)</td>
<td>78 (41.9%)</td>
<td>90 (48.4%)</td>
</tr>
<tr>
<td>22. My child is able to learn at his/her own pace at this school.</td>
<td>7 (3.8%)</td>
<td>10 (5.4%)</td>
<td>8 (4.3%)</td>
<td>78 (41.9%)</td>
<td>90 (48.4%)</td>
</tr>
<tr>
<td>23. My child is able to work at his/her appropriate level at this school.</td>
<td>2 (1.1%)</td>
<td>2 (1.1%)</td>
<td>12 (6.5%)</td>
<td>79 (42.5%)</td>
<td>91 (48.9%)</td>
</tr>
<tr>
<td>24. I feel comfortable providing assistance to my child when a teacher is not available.</td>
<td>4 (2.2%)</td>
<td>19 (10.2%)</td>
<td>56 (30.1%)</td>
<td>30 (16.1%)</td>
<td>55 (29.6%)</td>
</tr>
<tr>
<td>25. My child is learning as much or more than if he/she was in a traditional school setting.</td>
<td>4 (2.2%)</td>
<td>8 (4.3%)</td>
<td>28 (15.1%)</td>
<td>91 (48.9%)</td>
<td>55 (29.6%)</td>
</tr>
<tr>
<td>26. Administrative support at my child’s school is adequate.</td>
<td>5 (2.7%)</td>
<td>3 (1.6%)</td>
<td>19 (10.2%)</td>
<td>69 (37.1%)</td>
<td>90 (48.4%)</td>
</tr>
<tr>
<td>27. I would suggest an online school to other parents for their children.</td>
<td>4 (2.2%)</td>
<td>1 (0.5%)</td>
<td>21 (11.3%)</td>
<td>62 (33.3%)</td>
<td>9 (5.1%)</td>
</tr>
</tbody>
</table>

87
Item Reliability

Each of the dimensions identified in the first phase of the study were tested for item reliability. Items were tested as a group for each dimension and individually within its dimension. Cronbach's alpha was calculated for each of the five dimensions (e.g., school-level technology support, school-level instructional support, online curriculum programs, social interactions, and overall satisfaction) identified in the first phase of this study (See Table 14). Each dimension had an alpha score above .80, which is in the acceptable range (Gable & Wolf, 1993). This means that all dimensions were deemed to be acceptable. Items were also analyzed to see if the alpha score would improve dramatically if an item was removed from its dimension. For most items, alpha scores went down just slightly if an item was removed. In some cases the alpha score went up but only marginally. Based on these reliability analyses, no items were removed from their dimensions before doing the factor analyses.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Number of Cases</th>
<th>Alpha Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>School-level Technology Support</td>
<td>186</td>
<td>.9233</td>
</tr>
<tr>
<td>School-level Instructional Support</td>
<td>186</td>
<td>.9481</td>
</tr>
<tr>
<td>Online Curriculum Programs</td>
<td>185</td>
<td>.8550</td>
</tr>
<tr>
<td>Social Interactions</td>
<td>180</td>
<td>.8450</td>
</tr>
<tr>
<td>Overall Educational Program</td>
<td>183</td>
<td>.8834</td>
</tr>
</tbody>
</table>

Table 14: Alpha Coefficients for Dimensions Identified in Phase One

Exploratory Factor Analyses

Exploratory factor analyses were carried out to statistically substantiate the dimensions identified in the first phase of this study. Principal component analysis (PCA) and maximum likelihood (ML) methods were used to determine the factor structure that
best described the data. A varimax (orthogonal) and direct oblimin (oblique) rotation were employed for both extractions. The criterion used for each combination of extraction and rotation methods was eigenvalue greater than one. The extraction combination that produced the factor structure that was the clearest and also best matched the hypothesized five-factor structure was ML extraction with direct oblimin (oblique) rotation. The results of the pattern matrix are provided in the following text.

Five factors were identified by the ML extraction with nearly every item loading on its hypothesized factor. The first factor identified was the dimension concerning school-level instructional support. All six items (e.g., my child’s teacher is available for assistance when needed; my child’s teacher gives prompt feedback; my child’s teacher gives appropriate, helpful feedback; my child’s teacher adequately measures and reports academic progress; my child’s teacher shows respect to students’ individual differences; and my child’s teacher knows his/her strengths and weaknesses) that were hypothesized to load most heavily on this factor did so. Only one item in this dimension, (my child’s teacher shows respect to students’ individual differences), also loaded on an additional factor (overall satisfaction).

The second factor identified contained the items concerning school-level technical support. All four items (e.g., technology support at my child’s school is prompt; technology support at my child’s school is courteous; technology support at my child’s school is effective; and technology support at my child’s school is available when we need it) hypothesized to load on this factor did so. The lowest loading of the items in this dimension was .784 and the highest was .893. None of the items in this dimension loaded on any of the other factors.
The third factor identified in this extraction was overall satisfaction. Six of the seven hypothesized items (e.g., my child is able to learn at his or her own pace in this school; my child is able to learn at his/her appropriate own level in this school; I feel comfortable providing assistance to my child when a teacher is not available; my child is learning as much or more than if he/she was in a traditional school setting; administrative support at my child's school is adequate; overall, I am satisfied with my child's experience in online education at this school; and I would suggest an online school to other parents for their children) loaded on this factor. Item 27 (overall, I am satisfied with my child's experience in online education in this school) loaded on the social interactions factor. Item 21 (my child does not miss going to school every day), which was hypothesized to load on the social interaction factor, loaded on the overall satisfaction factor.

The fourth factor identified by the factor analysis was the social interactions factor. Four of the five items (e.g., the social opportunities available through my child's school are adequate in quantity; the social opportunities available through my child's school are adequate in quality; my child feels like part of a community at his/her school; my child has made friends through his/her school; and my child does not miss going to school every day) hypothesized to load on this factor did so. As mentioned previously, Item 21 loaded on the overall satisfaction factor and not on the social interaction factor.

The fifth factor extracted by the analysis was the curriculum programs factor. This factor came out very clean as all six items (e.g., the online curricular programs at my child's school are visually pleasing; the online curricular programs at my child's school are free of technical problems; the educational content of the online curricular programs is of high quality; logging on to the online curricular programs at my child's school is efficient; the online curricular programs at my child's school are easy to navigate; and the
online curricular programs allow my child to work independently) that were hypothesized to load on it did so. None of the six loaded on any additional factors. See Table 15 for five-factor pattern matrix.

After determining that the factor structure hypothesized in the first phase of this study was supported by the ML exploratory factor analysis with oblimin rotation, a second factor analysis was conducted excluding the items that were hypothesized to load on the overall satisfaction factor. This analysis was done using ML with oblimin (oblique) rotation as well, based on the fact that this extraction method gave the best results in the five-factor solution. See Table 16 for the four-factor pattern matrix. Factor scores from this four-factor solution were used to determine if there were any relationships between the four area-specific factors (e.g., school-level technology support, school-level instructional support, curriculum programs, and social interactions) and overall satisfaction with the online program.
<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
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</thead>
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<td>Social Interaction</td>
<td>Curricular Programs</td>
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<td></td>
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Table 15: Pattern Matrix Derived Through ML with Direct Oblimin (Oblique) Rotation (Five Factors)

* Hypothesized Factors: (TS) = School-level Instructional Support, (IS) = School-level Instructional Support, (CS) = Curriculum Programs, (SI) = Social Interaction, (OS) = Overall Satisfaction. Loadings smaller than .30 were not included in the table.
<table>
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<tr>
<th>Item</th>
<th>Factor 1 (Instructional Support)</th>
<th>Factor 2 (Technology Support)</th>
<th>Factor 3 (Social Interactions)</th>
<th>Factor 4 (Curriculum Programs)</th>
</tr>
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</table>

Table 16: Pattern Matrix Drived Through ML with Direct Oblimin (Oblique) Rotation (Four Factors)

* Hypothesized Factors: (TS) = School-level Instructional Support, (IS) = School-level Instructional Support, (CP) = Curriculum Programs, (SI) = Social Interaction. Loadings smaller than .30 were not included in the table.

**Multiple Regression**

A multiple regression analysis was conducted to answer the following research questions:

3. What factors are associated with parent satisfaction with online education at the secondary level?

4. What factors are associated with parent satisfaction with online education at the elementary level?

93
Factor scores from the four-factor solution were used to determine if there were any relationships between the four area-specific factors (e.g., school-level technology support, school-level instructional support, curriculum programs, and social interactions) and overall parent satisfaction with the online program. This was done by doing a multiple regression analysis in which factor scores derived from the four-factor ML extraction: (a) school-level technology support, (b) school-level instructional support, (c) curriculum programs, and (d) social interactions were the independent variables. The dependent variable for the multiple regression analysis was overall satisfaction. The factor score for overall satisfaction was not from the five-factor solution and was not used as the measurement for overall satisfaction because there were some items that did not load as hypothesized. Based on the item and scale reliability analysis and a ML extraction, including only the items from the overall satisfaction dimension that extracted only one factor, it was determined that the mean of these items could be used as the dependent variable measurement for overall satisfaction for the multiple regression.

The multiple regression analysis determined that the four factors (e.g., technology support, instructional support, curriculum programs, and social interactions) accounted for 63.3% of the variance in overall parent satisfaction, $F (4,171) = 73.77, p < .005$. This indicates a statistically significant relationship between the four factor scores and overall parent satisfaction. The standard solution indicated that instructional support was the most important variable in explaining the variance in overall parent satisfaction, $b = .238$, $P = .332, t = 5.905, p < .005$. Social interaction was the next most important variable in explaining the variance in overall parent satisfaction, $b = .238, P = .325, t = 5.428, p < .005$. The curriculum program factor was the next most important variable in explaining the variance in overall parent satisfaction, $b = .212, P = .286, t = 4.367,$
$p < .005$. This means that individually, three of the four area-specific factors (e.g., instructional support, curriculum programs, and social interactions) are significantly associated with overall parent satisfaction. Technology support did not contribute to the explanation of variance in overall parent satisfaction, $b = 2.280E-02$, $P = .032$, $t = .546$, $p>.50$ (See Table 17).

<table>
<thead>
<tr>
<th>Factor</th>
<th>b</th>
<th>p</th>
<th>t</th>
<th>p</th>
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<td>4.367</td>
<td>.000*</td>
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<tr>
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<td>.325</td>
<td>5.428</td>
<td>.000*</td>
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<td>Instructional Support</td>
<td>2.280E-02</td>
<td>.032</td>
<td>.546</td>
<td>.586</td>
</tr>
</tbody>
</table>

Table 17: Summary of Regression Analysis for Factor Scores Predicting Overall Parent Satisfaction

*Significance level set at $p<.05$
CHAPTER 5

DISCUSSION

Distance education began in the 1840s with the introduction of correspondence study via the mail and has evolved to include several technology-based methods, including radio, television, and most recently asynchronous computer interaction (Cambre, 1991; Matthews, 1999; Rumble, 1999). As technology such as the personal computer and the Internet becomes more accessible, it is being used in an increasing number of educational institutions to provide education to a growing number of students who are not in the same room as the instructor (Lewis & Greene, 1997; U.S. Department of Commerce, 2002).

Although most of the research into distance and online education has focused on the post-secondary level, recently researchers have begun to study the use of online education at the elementary and secondary level (Clark, 2001; Kellogg & Politoski, 2002; Roblyer & Marshall, 2003). Research into the use of distance education at the elementary and secondary level has focused on demographic studies attempting to determine the extent to which distance education is being used at this level. A few studies have examined student learning as well as the characteristics of students who select distance education options (Roblyer & Marshall, 2003; Weiner, 2003).

The purpose of this study was to develop a parent questionnaire and a student questionnaire to determine factors that affect both parent and student satisfaction with online education at the elementary and secondary level. Items were created through a
review of current literature concerning distance and online education and with the assistance of administrators and teachers working in the field.

Student Satisfaction with Online Education

Students enrolled full-time in three programs of online education at the elementary and secondary level were surveyed to determine the factors relating to their satisfaction with their online education experiences. Based on the exploratory factor analyses and the multiple regression analysis conducted in this study, the following findings concerning student satisfaction with online education at the elementary and secondary levels emerged.

Four factors (e.g., school-level technology support, school-level instructional support, curriculum programs, and social interactions) were hypothesized to be associated with student satisfaction with online education at the elementary and secondary levels. The multiple regression analysis indicated that all four of these factors were significantly associated with student satisfaction with online education in this study.

School-Level Technology Support

All four items (e.g., technology support at my school is prompt; technology support at my school is courteous; technology support at my school is effective; and technology support at my school is available when I need it) loaded on the school-level technology support factor. Based on the multiple regression analysis, school-level technology support was significantly associated with student satisfaction with online education at the elementary and secondary levels. Student responses to these items indicated that at least 70% of the students answered agree or strongly agree to each item. This indicates, at the
three programs participating in this study, students appear to be satisfied with the level of technology support provided.

School-Level Instructional Support

The multiple regression analysis indicated that school-level instructional support also was significantly related to overall student satisfaction with online education. The six items (e.g., my teacher is available for assistance when needed; my teacher gives prompt feedback; my teacher gives appropriate, helpful feedback; my teacher adequately measures and reports academic progress; my teacher shows respect to individual differences; and my teacher knows my strengths and weaknesses) all loaded on the school-level instructional support factor. Again, a majority (at least 75%) of the students answered agree or strongly agree to these items on the questionnaire. It can be assumed from these data that overall the students were satisfied with the level of support provided by their teachers in their online instruction.

Online Curriculum Programs

According to the multiple regression analysis, the quality of the curriculum programs also was significantly associated with overall student satisfaction with online education. The five items (e.g., the online curriculum programs at my school are visually pleasing; the online curriculum programs at my school are free of technical problems; logging on to the curriculum programs at my school is efficient; the online curriculum programs at my school are easy to navigate; and the online curriculum programs at my school allow me to work independently) all loaded on the online curriculum factor. Only one of these items (the online curriculum programs at my school are free of technical problems) did not elicit a majority (37.2%) of agree or strongly agree responses from the students. This could be attributed to problems with some of the curriculum programs used at the schools.
surveyed or it may be that students who do not have a high-speed Internet connection are not able to use the programs without some technical difficulties (e.g., program crashes, slow access, losing Internet connection). Most of the online curriculum programs require high-speed access to function optimally.

**Social Interactions**

The multiple regression analysis also indicated that the opportunity for social interactions was significantly related to overall student satisfaction. Four of the five items (e.g., the social opportunities available through my school are adequate in quantity; the social opportunities available through my school are adequate in quality; I feel like part of a community at my school; I have made friends at my school; and I don’t miss going to school every day) hypothesized to load on the social interactions factor did so. One item (I don’t miss going to school every day) did not load on this factor, but rather loaded on overall satisfaction. This could be because not missing going to school every day may be related with the students’ level of satisfaction with the online program rather than socialization. At least 70% of the students responded agree or strongly agree to the items in this factor.

**Conclusions**

Four conclusions concerning student satisfaction with online education at the elementary and secondary levels can be made based on the exploratory factor analysis on the student questionnaire and the multiple regression analysis done on the factors identified.

1. School-level technology support is related to overall student satisfaction with online education at the elementary and secondary levels. If online schools can
maintain a technology support help desk to ensure that students are not frustrated by the inability to access their assignments due to technical problems, student satisfaction can be enhanced.

2. School-level instructional support has an effect on student satisfaction with online education at the elementary and secondary levels. This emphasizes the importance of prompt, appropriate teacher feedback, timely communication regarding progress, and respect for individuality to student satisfaction.

3. The quality of the online curricular programs is associated with student satisfaction with online education at the elementary and secondary levels. The development and use of high quality online courses that are free of technical problems is important to student satisfaction.

4. Opportunities for social interaction are related to student satisfaction with online education at the elementary and secondary levels. Although online students do not interact with their peers at the same level as in traditional classrooms, providing some opportunities for peer interactions is important to student satisfaction.

Recommendations for Further Study

Very little research has been conducted concerning online education at the elementary and secondary levels. Based on the results of this study, the following areas are suggested for further study.

1. Further studies into student satisfaction with online education at the elementary and secondary level should include larger sample sizes and include students from online programs from across North America.
2. This study only included full-time students in online education. The majority of elementary and secondary students who take online classes do so on a part-time basis. Future research into student satisfaction with online education at the elementary and secondary level should include these students as well.

3. Studies comparing student satisfaction with online education at the elementary and secondary level across various program delivery models (e.g., online only, some face-to-face) needs to be conducted to determine if delivery models have an effect on student satisfaction with online education.

4. Future studies should examine student learning in an online school (full time or part time) when compared to traditional education programs. Researchers need to determine if students in online education have similar learning outcomes as students in traditional classroom settings.

5. There are various methods by which online education is offered at the elementary and secondary levels. Student learning across these various delivery models of online education should be compared to determine if characteristics of appropriate instruction can be identified.

6. Seventeen percent of the students who participated in this study had special education needs. Because students with special disabilities are participating in online education, research as to how to meet the needs of these students in an online environment must be explored.

7. It may be that certain types of learners are more successful in online education. Research to determine the learning characteristics that can predict student success in online education at the elementary and secondary level needs to be conducted.
8. Programs offering online education at the elementary and secondary levels use many different online curriculum programs. Research concerning which, if any of these, programs provide better learning opportunities is needed.

Parent Satisfaction with Online Education

In this study, parents of elementary and secondary students enrolled full-time in online education were surveyed concerning their satisfaction with various aspects of their child’s online education. Based on the exploratory factor analyses and the multiple regression analysis conducted in this study, the following findings concerning parent satisfaction with online education at the elementary and secondary levels emerged.

Four factors (e.g., school-level technology support, school-level instructional support, curriculum programs, and social interactions) were hypothesized to be associated with parent satisfaction with online education at the elementary and secondary levels. The multiple regression analysis indicated that three of these factors (e.g., school-level instructional support; online curriculum programs; and social interactions) were significantly associated with parent satisfaction with online education in this study. School-level technology support was not significantly associated with overall parent satisfaction with online education.

School-Level Technology Support

All four items (e.g., technology support at my child's school is prompt; technology support at my child's school is courteous; technology support at my child's school is effective; and technology support at my child's school is available when I need it) loaded
on the school-level technology support factor. At least 75% of the parents answered agree or strongly agree to each item. This indicates, at the three programs participating in this study, parents appear to be satisfied with the level of technology support provided to their child in the online school. However, based on the multiple regression analysis, school-level technology support was not significantly associated with parent satisfaction with online education at the elementary and secondary levels.

**School-Level Instructional Support**

The multiple regression analysis indicated that school-level instructional support also was significantly related to overall parent satisfaction with online education. The six items (e.g., my child’s teacher is available for assistance when needed; my child’s teacher gives prompt feedback; my child’s teacher gives appropriate, helpful feedback; my child’s teacher adequately measures and reports academic progress; my child’s teacher shows respect to students’ individual differences; and my child’s teacher knows his/her strengths and weaknesses) all loaded on the school-level instructional support factor. Again, over 75% of the parents answered agree or strongly agree to these items on the questionnaire. It can be assumed from these data that the parents were satisfied with the level of support provided by their child’s teachers.

**Online Curriculum Programs**

According to the multiple regression analysis, the quality of the curriculum programs also was significantly associated with overall parent satisfaction with online education. The six items (e.g., the online curriculum programs at my child’s school are visually pleasing; the online curriculum programs at my child’s school are free of technical
problems; the educational content of the online curriculum programs are of high quality; logging on to the curriculum programs at my child's school is efficient; the online curriculum programs at my child's school are easy to navigate; and the online curriculum programs allow my child to work independently) all loaded on the online curriculum factor. Only one of these items (the online curriculum programs at my child's school are free of technical problems) did not elicit a majority of agree or strongly agree responses from the parents. Only 46% of the parents responded agree or strongly agree to this item. Again, this may be because of technical problems in the online curriculum programs or delays caused by slow Internet access.

Social Interactions

The multiple regression analysis also indicated that the opportunity for social interactions was significantly related to overall parent satisfaction. Four of the five items (e.g., the social opportunities available through my child's school are adequate in quantity; the social opportunities available through my child's school are adequate in quality; my child feels like part of a community at his/her school; and my child has made friends at his/her school) hypothesized to load on the social interactions factor did so. Only one item (my child does not miss going to school every day) did not load on this factor, but rather loaded on the overall satisfaction factor.

Conclusions

Four conclusions concerning parent satisfaction with online education at the elementary and secondary levels can be made based on the exploratory factor analysis on the student questionnaire and the multiple regression analysis done on the factors identified.
1. School-level instructional support was found to have an effect on parent satisfaction with online education at the elementary and secondary levels. Online education at the elementary and secondary levels requires that parents be involved daily with their children's education, yet families still rely on the support offered by the teachers working with them to be successful.

2. The quality of the online curricular programs also is associated with parent satisfaction with online education at the elementary and secondary levels. Because of the high level of parent involvement with the day-to-day education of their children, parents have intimate knowledge of the online curriculum programs their children use. It is understandable that high quality online curriculum programs would lead to higher levels of parent satisfaction with online education.

3. Opportunities for social interaction are related to parent satisfaction with online education at the elementary and secondary levels. Parents are cognizant of their children's need to have social interaction with their peers. If an online education program can help provide these opportunities, it may lead to higher parent satisfaction.

Recommendations for Further Study

Little to no research has been conducted concerning the parents of students who enroll in online education at the elementary and secondary levels. Based on the results of this study, the following areas are recommended for further study.

1. Further studies concerning parent satisfaction with online education at the elementary and secondary level should include larger sample sizes and include
parents whose children are enrolled in other types of online education programs (e.g., state-operated, private, consortium). There are several programs across North America offering different delivery models in online education. The perspective of parents in those programs would add more data to this line of research.

2. Many of the students taking online education at the elementary and secondary levels do so on a part-time basis only. Factors relating to the satisfaction of their parents with this learning environment may be different from those of parents whose children are enrolled full-time in online education. Research should be conducted that includes these parents as well.

3. It would seem that parent support and involvement with their children’s online education is necessary if students are to be successful. Future research should examine the amount of parent support needed to ensure student success at different age and grade levels.

4. The online education programs that participated in this study serve students with disabilities. Research into what aspects of online education are important to the parents of these students needs to be conducted.

5. Research concerning why parents choose online education as an option for the elementary and secondary children needs to be conducted.

6. Because school-level technology support was not significantly associated with overall parent satisfaction in this study, further research into this area needs to be explored.
Summary

Although researchers have studied distance and online education at the post-secondary level for many years, very little research has been conducted concerning online education at the elementary and secondary levels. Most of the existing research concerning online education at the elementary and secondary levels focuses on demographic data and delivery models.

This study is important to the field of online education at the elementary and secondary levels because it identifies several factors that contribute to parent and student satisfaction with online education. These include: (a) school-level technology support, (b) school-level instructional support, (c) online curriculum programs, and (d) social interactions. These factors are similar to those that have been identified with online education at the post-secondary level. Administrators of programs that offer online education at the elementary and secondary levels must examine their programs in terms of how well they address these factors within their programs. Student and parent satisfaction will be vital to the continued growth of online education at the elementary and secondary levels.

This study is an initial step in what should become an expanding research base concerning online education at the elementary and secondary levels. As online education becomes a viable option for more students in more places, research needs to focus on ways to improve this delivery medium to ensure student learning, student socialization, and student participation.
APPENDIX A

STUDENT QUESTIONNAIRE
Welcome and thank you for participating in our on-line questionnaire.

You are logged in as an Odyssey K-8 student.  
(If this is incorrect, please click here)

**Personal Information:**

- Age
- Gender
- Grade
- Years in online education
- Ethnicity
- IEP

[Start Survey]
School Level Technology Support

Technology support at my school is prompt.
◯ Strongly Disagree ◯ Disagree ◯ Undecided ◯ Agree ◯ Strongly Agree

Technology support at my school is courteous.
◯ Strongly Disagree ◯ Disagree ◯ Undecided ◯ Agree ◯ Strongly Agree

Technology support at my school is effective.
◯ Strongly Disagree ◯ Disagree ◯ Undecided ◯ Agree ◯ Strongly Agree

Technology Support at my school is available when I need it.
◯ Strongly Disagree ◯ Disagree ◯ Undecided ◯ Agree ◯ Strongly Agree

Submit
School Level Instructional Support

My teacher is available for assistance when needed.
☐ Strongly Disagree  ☐ Disagree  ☐ Undecided  ☐ Agree  ☐ Strongly Agree

My teacher gives prompt feedback.
☐ Strongly Disagree  ☐ Disagree  ☐ Undecided  ☐ Agree  ☐ Strongly Agree

My teacher gives appropriate, helpful feedback.
☐ Strongly Disagree  ☐ Disagree  ☐ Undecided  ☐ Agree  ☐ Strongly Agree

My teacher adequately measures and reports academic progress.
☐ Strongly Disagree  ☐ Disagree  ☐ Undecided  ☐ Agree  ☐ Strongly Agree

My teacher shows respect to students' individual differences.
☐ Strongly Disagree  ☐ Disagree  ☐ Undecided  ☐ Agree  ☐ Strongly Agree

My teacher knows my strengths and weaknesses.
☐ Strongly Disagree  ☐ Disagree  ☐ Undecided  ☐ Agree  ☐ Strongly Agree

Submit
Online Curriculum Programs

The online curricular programs at my school are visually pleasing.
☐ Strongly Disagree  ☐ Disagree  ☐ Undecided  ☐ Agree  ☐ Strongly Agree

The online curricular programs at my school are free of technical problems.
☐ Strongly Disagree  ☐ Disagree  ☐ Undecided  ☐ Agree  ☐ Strongly Agree

Logging on to the online curricular programs at my school is efficient.
☐ Strongly Disagree  ☐ Disagree  ☐ Undecided  ☐ Agree  ☐ Strongly Agree

The online curricular programs at my school are easy to navigate.
☐ Strongly Disagree  ☐ Disagree  ☐ Undecided  ☐ Agree  ☐ Strongly Agree

The online curricular program allows me to work independently.
☐ Strongly Disagree  ☐ Disagree  ☐ Undecided  ☐ Agree  ☐ Strongly Agree
Social Interactions

The social opportunities available through my school are adequate in quantity.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

The social opportunities available through my school are adequate in quality.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

I feel like part of a school community at my school.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

I have made friends at my school.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

I don't miss going to school every day.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

Submit
Overall Educational Program

I am able to learn at my own pace at this school.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

I am able to work at my own level at this school.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

I feel comfortable working independently when a teacher is not available.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

I am learning as much or more than if I was in a traditional school setting.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

The administrators at my school are supportive of my needs.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

Overall, I am happy with my online education at this school.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

I would recommend an online school to my friends.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree
Survey Complete!

Thank you for participating.
Welcome and thank you for participating in our on-line questionnaire.

You are logged in as an Odyssey K-8 parent.
(If this is incorrect, please click here)

Personal Information:

Number of children enrolled in on-line education

K 1 2 3

Grade level of students

4 5 6 7 8
(for multiple children hold <ctl> button and make selections)

Years involved in on-line education

Gender

Age

Highest educational degree

Ethnicity

Start Survey
School Level Technology Support

Technology support at my child’s school is prompt.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

Technology support at my child’s school is courteous.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

Technology support at my child’s school is effective.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

Technology support at my child’s school is available when we need it.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

Submit
School Level Instructional Support

My child's teacher is available for assistance when needed.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

My child's teacher gives prompt feedback.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

My child's teacher gives appropriate, helpful feedback.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

My child's teacher adequately measures and reports academic progress.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

My child's teacher shows respect to students' individual differences.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

My child's teacher knows his/her strengths and weaknesses.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree
Online Curriculum Programs

The online curricular programs at my child's school are visually pleasing.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

The online curricular programs at my child's school are free of technical problems.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

The educational content of the online curricular programs are of high quality.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

Logging on to the online curricular programs at my child's school is efficient.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

The online curricular programs at my child's school are easy to navigate.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

The online curricular program allows my child to work independently.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

Submit
Social Interactions

The social opportunities available through my child’s school are adequate in quantity.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

The social opportunities available through my child’s school are adequate in quality.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

My child feels like part of a school community at his/her school.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

My child has made friends through his/her school.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

My child does not miss going to school every day.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

Submit
Overall Educational Program

My child is able to learn at his or her own pace at this school.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

My child is able to work at his/her appropriate level at this school.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

I feel comfortable providing assistance to my child when a teacher is not available.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

My child is learning as much or more than if he/she was in a traditional school setting.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

Administrative support at my child's school is adequate.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

Overall, I am satisfied with my child's experience in online education in this school.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

I would suggest an online school to other parents for their children.
○ Strongly Disagree ○ Disagree ○ Undecided ○ Agree ○ Strongly Agree

Submit
Survey Complete!

Thank you for participating.
APPENDIX C

SCHOOL A CONSENT LETTER
To whom it may concern:

I have reviewed the research proposal submitted to my office by Craig Butz and am comfortable with having students and parents from our school participate in this study on a volunteer basis. I will provide assistance that may be needed in order to access student information such as email to help Mr. Butz move forward with this research. I feel that research focusing on parent and student satisfaction with online education at the elementary and secondary levels will be valuable in assisting our efforts to provide a high quality education to our students.

I understand that all personal information gathered in this study will be confidential and student and parent anonymity will be protected at all times.

Sincerely,

Mary Jean Sandall
Principal
Salem-Keizer Online School
APPENDIX D

SCHOOL B CONSENT LETTER
To whom it may concern:

I have reviewed the research proposal submitted to my office by Craig Butz and am comfortable with having students and parents from our school participate in this study on a volunteer basis. I will provide assistance that may be needed in order to access student information such as email to help Mr. Butz move forward with this research. I feel that research focusing on parent and student satisfaction with online education at the elementary and secondary levels will be valuable in assisting our efforts to provide a high quality education to our students.

I understand that all personal information gathered in this study will be confidential and student and parent anonymity will be protected at all times.

Sincerely,

Michele Robinson
Principal
Odyssey Charter Schools(K-8)
September 4, 2003

To whom it may concern:

I have reviewed the research proposal submitted to my office by Craig Butz and am comfortable with having students and parents from our school participate in this study on a volunteer basis. I will provide assistance that may be needed in order to access student information such as email to help Mr. Butz move forward with this research. I feel that research focusing on parent and student satisfaction with online education at the elementary and secondary levels will be valuable in assisting our efforts to provide a high quality education to our students.

I understand that all personal information gathered in this study will be confidential and student and parent anonymity will be protected at all times.

Sincerely,

Susan D’aniello
Principal
Odyssey Charter Schools (High School)
APPENDIX F

PARENT PERMISSION FORM
Informed Parent Permission Form

General Information:

I am Craig Butz, a doctoral student at the University of Nevada, Las Vegas in the Department of Special Education. I am requesting your child’s participation in a research project about student satisfaction with online education at the elementary and secondary level. The purpose of the research is to determine what factors affect student satisfaction with online education.

Procedure:

Your child’s participation will involve answering questions about his or her online school and his or her level of satisfaction with the program. The expected length of time of his or her participation is approximately 15 minutes.

Benefits of Participation:

A benefit from this research is an increase in knowledge about the factors affecting your child’s satisfaction with his or her online education program.

Risks of Participation:

Potential risk is minimum as your child will be asked to answer simple questions regarding his or her online education program. Your son or daughter may experience some level of pressure from answering the questionnaire.

Contact Information:

For questions concerning this research study, you may contact Craig Butz at (702) 257-0578, or my faculty advisor, Dr. Higgins, at 895-3205. If you have questions regarding the rights of research subjects, please contact the UNLV Office for the Protection of Research Subjects at 895-2794. Please feel free to ask any questions you may have about the information being provided to you about this study.

Voluntary Participation:

Your child’s participation is completely voluntary, and your child may withdraw from participation at any time during the study without prejudice.

Confidentiality:

Your child’s anonymity will be protected through the use of numbers to identify participants instead of names, and only the summarized data will be reported. All records
will be retained for at least three years after the completion of the study in a locked filing cabinet at UNLV.

By signing below, you are acknowledging your receipt and understanding of the information provided to you and agree to participate. You will be given a copy of this form.

______________________________  ________________
Signature of Participant        Date

______________________________  ________________
Signature of Researcher         Date

Email Address ____________________________

Page ___ of ___
University of Nevada, Las Vegas

Informed Parent Consent Form

General Information:

I am Craig Butz, a doctoral student at the University of Nevada, Las Vegas in the Department of Special Education. I am requesting your participation in a research project about parent satisfaction with online education at the elementary and secondary level. The purpose of the research is to determine what factors affect parent satisfaction with online education.

Procedure:

Your participation will involve answering questions about your child’s online school and your level of satisfaction with the program. The expected length of time of your participation is approximately 15 minutes.

Benefits of Participation:

A benefit from this research is an increase in knowledge about the factors affecting parent satisfaction with your child’s online education program.

Risks of Participation:

Potential risk is minimum as you will be asked to answer simple questions about your child’s online education program. You may experience some level of pressure from answering the questionnaire.

Contact Information:

For questions concerning this research study, you may contact Craig Butz at (702) 257-0578, or my faculty advisor, Dr. Higgins, at 895-3205. If you have questions regarding the rights of research subjects, please contact the UNLV Office for the Protection of Research Subjects at 895-2794. Please feel free to ask any questions you may have about the information being provided to you about this study.

Voluntary Participation:

Your participation is completely voluntary, and you may withdraw from participation at any time during the study without prejudice.

Confidentiality:

Your anonymity will be protected through the use of numbers to identify participants instead of names, and only the summarized data will be reported. All records will be
retained for at least three years after the completion of the study in a locked filing cabinet at UNLV.

By signing below, you are acknowledging your receipt and understanding of the information provided to you and agree to participate. You will be given a copy of this form.

____________________________  _________________________
Signature of Participant      Date

____________________________  _________________________
Signature of Researcher       Date

Email Address__________________________

Page ___ of ___
APPENDIX H

STUDENT ASSENT FORMS
University of Nevada, Las Vegas

Child Assent Form

My name is Craig Butz, and I am a student at UNLV, Department of Special Education. I am trying to find out how well you like your school. You are being asked to answer some questions about your school and what you like or dislike about it.

As part of this study you will be asked to answer some questions about your school. The information I get from these questions will be used to help make your school a better place to learn.

You may worry that your answers will be shared with your teachers. Please know that all information you provide will be used only for this study and will not be shared with anyone. Nobody will know your answers but me.

Before you agree to participate and sign below, I want you to talk about it with your parents so that they know you are taking part in this study. You do not have to participate if you do not want to. If you do decide to participate, you may stop at any time.

Your parents will be asked for their permission for you to participate also.

I will be happy to answer all your questions regarding this research.

By signing below, you are agreeing to participate in this research.

__________________________  _________________________
Signature of Child          Date

__________________________  _________________________
Signature of Researcher (Please Print)  Date

Email Address
University of Nevada, Las Vegas

Informed Youth Assent Form

General Information:

I am Craig Butz, a doctoral student at the University of Nevada, Las Vegas in the Department of Special Education. I am requesting your participation in a research project about how well you like your school. The purpose of the research is to determine what you like about going to a school like yours.

Procedure:

Your participation will involve answering questions about your online school and your level of satisfaction with the program. The expected length of time of your participation is approximately 15 minutes.

Benefits of Participation:

A benefit from this research is an increase in knowledge about what you like or dislike about your school's online education program.

Risks of Participation:

You will be asked to answer simple questions regarding your school. You may experience some level of pressure from answering the questionnaire.

Contact Information:

For questions concerning this research study, you may contact me at (702) 257-0578, or my faculty advisor, Dr. Higgins, at 895-3205. If you have questions regarding your rights while participating in this study, please contact the UNLV Office for the Protection of Research Subjects at 895-2794. Please feel free to ask any questions you may have about the information being provided to you about this study.

Voluntary Participation:

Your participation is completely voluntary, and you may withdraw from participation at any time during the study without prejudice.

Confidentiality:

Your anonymity will be protected through the use of numbers to identify participants instead of names, and only the summarized data will be reported. All records will be retained for at least three years after the completion of the study in a locked filing cabinet at UNLV.
By signing below, you are acknowledging your receipt and understanding of the information provided to you and agree to participate. You will be given a copy of this form.

____________________________________  ______________________
Signature of Participant                  Date

____________________________________  ______________________
Signature of Researcher                   Date

Email Address____________________________

Page ___ of ___
APPENDIX I

TEACHER AND ADMINISTRATOR ASSENT FORM
APPENDIX J

FINAL STUDENT QUESTIONNAIRE
Student Questionnaire

Personal Information
Age
Gender
Grade
Years in online education
Ethnicity
IEP

School-Level Technology Support
1. Technology support at my school is prompt.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree
2. Technology support at my school is courteous.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree
3. Technology support at my school is effective.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree
4. Technology support at my school is available when I need it.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

School-Level Instructional Support
1. My teacher is available for assistance when needed.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree
2. My teacher gives prompt feedback
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree
3. My teacher gives appropriate, helpful feedback.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree
4. My teacher adequately measures and reports academic progress.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree
5. My teacher shows respect to students’ individual differences.  
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

6. My teacher knows my strengths and weaknesses.  
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

**Online Curriculum Programs**

1. The online curricular programs at my school are visually pleasing.  
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

2. The online curricular programs at my school are free of technical problems.  
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

3. Logging on to the online curricular programs at my school is efficient.  
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

4. The online curricular programs at my school are easy to navigate.  
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

5. The online curricular program allows me to work independently.  
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

**Social Interactions**

1. The social opportunities available through my school are adequate in quantity.  
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

2. The social opportunities available through my school are adequate in quality.  
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

3. I feel like part of a school community at my school.  
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

4. I have made friends at my school.  
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

5. I don’t miss going to school every day.  
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree
Overall Satisfaction

1. I am able to learn at my own pace at this school.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

2. I am able to work at my own level at this school.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

3. I feel comfortable working independently when a teacher is not available.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

4. I am learning as much or more than if I was in a traditional school setting.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

5. The administrators at my school are supportive of my needs.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

6. Overall, I am happy with my online education at this school.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

7. I would recommend an online school to my friends.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree
APPENDIX K

FINAL PARENT QUESTIONNAIRE
Parent Questionnaire

Personal Information
Number of children enrolled in online education
Years involved in online education
Gender
Age
Highest educational degree
Ethnicity

School-Level Technology Support
1. Technology support at my child’s school is prompt.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

2. Technology support at my child’s school is courteous.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

3. Technology support at my child’s school is effective.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

4. Technology support at my child’s school is available when we need it.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

School-Level Instructional Support
1. My child’s teacher is available for assistance when needed.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

2. My child’s teacher gives prompt feedback
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

3. My child’s teacher gives appropriate, helpful feedback.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

4. My child’s teacher adequately measures and reports academic progress.
   1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree
5. My child’s teacher shows respect to students’ individual differences.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

6. My child’s teacher knows his/her strengths and weaknesses.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

Online Curriculum Programs

1. The online curricular programs at my child’s school are visually pleasing.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

2. The online curricular programs at my child’s school are free of technical problems.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

3. The educational content of the online curricular programs are of high quality.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

4. Logging on to the online curricular programs at my child’s school is efficient.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

5. The online curricular programs at my child’s school are easy to navigate.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

6. The online curricular program allows my child to work independently.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

Social Interactions

1. The social opportunities available through my child’s school are adequate in quantity.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

2. The social opportunities available through my child’s school are adequate in quality.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

3. My child feels like part of a school community at his/her school.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

4. My child has made friends through his/her school.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree
5. My child does not miss going to school every day.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

Overall Educational Program

1. My child is able to learn at his or her own pace at this school.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

2. My child is able to work at his/her appropriate level at this school.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

3. I feel comfortable providing assistance to my child when a teacher is not available.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

4. My child is learning as much or more than if he/she was in a traditional school setting.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

5. Administrative support at my child’s school is adequate.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

6. Overall, I am satisfied with my child’s experience in online education in this school.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree

7. I would suggest an online school to other parents for their children.
1=strongly disagree 2=disagree 3=undecided 4=agree 5=strongly agree
REFERENCES


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Master of Arts, Educational Administration, 1994
California State University, Dominguez Hills

Dissertation Title: Student and Parent Satisfaction with Online Education at the Elementary and Secondary Levels

Dissertation Examination Committee:
Chairperson, Dr. Amanda Higgins, Ph.D.
Committee Member, Dr. Thomas Pierce, Ph.D.
Committee Member, Dr. Susan Miller, Ph.D.
Graduate Faculty Representative, Dr. Eunsook Hong, Ph.D.