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The Relationship of Electronic-Grade Book Access to Student Achievement, Student Attendance, and Parent-Teacher Communication

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THE RELATIONSHIP OF ELECTRONIC GRADE BOOK ACCESS TO
STUDENT ACHIEVEMENT, STUDENT ATTENDANCE, AND PARENT–TEACHER
COMMUNICATION

BY

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Degree of Doctor of Education
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2009
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Doctoral Candidate, Mark S. Mathern, has successfully defended and made the required modifications to the text of the doctoral dissertation for the Ed.D. during this Spring Semester 2009.

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ABSTRACT

The Relationship of Electronic Grade Book Access to Student Achievement, Student Attendance, and Parent–Teacher Communication

Increasing access to online databases from home has raised the value of computer use for retrieving student achievement information. This study’s purpose was to examine the relationship of family use of an electronic reporting mechanism in the home to student achievement, attendance, and home–school communication. Using communication as a parent involvement type in Epstein’s theory of overlapping spheres of influence (OSI), the researcher applied a mixed-method approach using a nonexperimental, quantitative study with a descriptive, cross-sectional design to examine the relationships of electronic grade book access rates to (a) student grade point average (GPA) and (b) student attendance, including how the variables studied vary for low- and high-socioeconomic status (SES) families and students. In the qualitative approach, data from telephone interviews were analyzed and used to describe what evidence existed regarding the use of the electronic grade book to influence communications among parents, teachers, and students.

Data on student GPA, attendance, and grade book access rates about 1,471 students, as well as data from 13 telephone interviews were collected from a large high school in a western state. Statistical analysis indicated no significant correlations between overall access rates and student GPA or attendance for all users or for SES subgroups. Further analysis of changes in GPA and attendance from one quarter to the next indicated significant positive correlations between access rate changes and GPA changes for low-
SES students and between access rate changes and attendance rate changes for high-SES students.

Parent, student, and teacher perceptions taken from telephone interview data indicated that among and between parents, students, and teachers, (a) rates of communication increased for online grade book users and (b) access to the online grade book information improved the quality of communication, helping to generate specific questions about student activities in school. Each group reported increases in monitoring homework, turning in assignments, and keeping recorded information timely and accurate. There was a perception of increasing levels of responsibility among students and their teachers. Observations were reflective of Epstein’s OSI theory.
ACKNOWLEDGEMENTS

There are a number of people who were instrumental in politely asking, gently nudging, urging, exhorting, and even pleading with me to finish this dissertation. I can’t help but connect stages of this study with my classical education. At various times, I felt like Icarus, Sisyphus, Hercules, and even Odysseus as I pondered the study’s size, lamented setbacks, labored through tasks, and wandered my way toward project completion.

Indeed, each part of the journey was an adventure. Like Odysseus, I met many wonderful people and had great adventures. They included my Seton Hall Cohort IX family and our stay in South Orange. I can’t forget great conversations and camaraderie at Walsh Library, the dormitory, Starbucks, Cryan’s, Gaslight, Bunny’s, and The Goat. Endless appreciation and thanks go to Glen, Cherry, Mike, John, Curtis, Anna, our group-work team, and the rest of the cohort for engaging me, inspiring me, and motivating me to finish.

At home waiting was my ever-attentive partner—my Penelope—Donna. She led a support team composed of Jon, Aaron, Sabrina, Beth, and Fred—each asking, each urging, each celebrating milestones reached—qualifying, comps, Chapters I-III, and of course, my defense. Donna introduced me to Dr. Caulfield and SHU. Her faith in me and my ability brightened dark days and lifted the burden again and again.

The inspiration and guidance I received from all of my committee members—Dr. Nicholas, Dr. Collins, Dr. Rush and especially Dr. Achilles—were surpassed by no one. Dr. Achilles, always patient but urgent, gave me quick feedback, direction, correction, and encouragement. I suspect his gifts are connected to the Muses somehow. A thank-
you goes to Dr. Caulfield for building an excellent cohort program with challenging, caring, and quality professors.

My gratitude goes to Dr. Lowham and Dr. Dvorak for suggesting that I pursue an advanced degree and for incessantly asking how I was coming along with my writing. At home, too, were many family members, friends, and colleagues who gave me support and endless encouragement to finish the journey: Constance, Crystal, Cyndee, DeLaine, Emily, Keney, Kerri, Kim, Mary, Mike, Pia, Stephanie, Tim, Trevor, Vicki, Victor, and Wendy.

Would that all who supported me and all whom I love were able to join me as I marched across that stage. What a triumph that would have been, what a way to have shared memories of Seton Hall and celebrated a journey's end, what a way to have acknowledged the power of learning!

T.S. Eliot wrote, “Do I dare to eat a peach?” I am ever grateful to the Almighty for the will to dare, the tenacity to endure, and the sweetness of the fruit. I pray that others are inspired to complete their own odysseys, namely my son. There are those waiting at home for his return.
DEDICATION

At the age of 16, Christina Wolf was drafted into teaching during World War II by her uncle because no teachers could be found for a small country school in rural North Dakota. Thus, she had to end her own pursuit of formal education, but she never stopped learning; even at age 75, she embraced email as a new way to communicate with family and friends. When I reflected on this young teacher, the sacrifices she made as a mother, and that unending belief about education as a great equalizer, I realized how much of an impact she had made upon my life's course. She was living proof that communication and learning can be lifelong influencers.

And so, Mom, my personal dedication is to you. I know you can't share my march across the stage now that your influence flows with the rest of the universe—one lasting gift from you to all of us. This opus is a tribute to you, my everlasting inspiration.

My professional dedication is to a child's first teachers—parents. They love their children, wish to be involved in learning, and strive to bring school into the home and home into the school. With the dedication of this paper, I honor the role of parents and extend my hand to pull together our two circles of influence for the benefit of young learners.
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I. INTRODUCTION AND BACKGROUND

Introduction

Improving parent involvement (PI) as a means of addressing student achievement has been accepted for years (Clark, 1993; Henderson, 1987), and a parent’s role in the education of the child continues to be promoted as an important component of student success in school. The growing presence of the home computer and the steady increase of access to online databases are raising the value of computer use as a means of retrieving information about student achievement. The access to student information presents an interesting phenomenon regarding parent–teacher–child communication never before so easily available. At any given point in time, parents and students can review information about a student’s classroom achievement. By examining student achievement in the secondary grades and parent attitudes about electronic access to student information using two of Epstein’s (2002) six types of parent involvement (PI), the researcher expanded upon the current knowledge base regarding electronic access to student achievement information as a means of addressing PI components taking place in the home.

This chapter includes an overview of the influence of PI on student achievement, followed by a brief look at the impact of increasing communication between parents and teachers. Teacher–parent communication is discussed, including electronic means. Presented are the statement of the problem, purpose of the study, questions guiding the research, the significance of the study, the study’s delimitations and limitations, a
statement of the problem

Lack of communication, especially timely communication, between parents and teachers has long been identified as a problem in our educational system. The MetLife Survey of the American Teacher (Harris Interactive, 2005) indicated “two in ten new teachers (20%) and 28% of principals mention[ed] parents as causing them the most stress in their jobs” (p. 29). Parents often called for immediate feedback from teachers and wished to monitor their children’s progress regularly, yet teachers found it difficult to provide timely reports beyond those established by district policy and practice.

Even though the power of parent involvement (PI) has been known for years, the definition of PI usually has been limited to parent visits to school (Morrison, 1978), whether to participate in student activities, volunteer, or help with decision making about school matters. Researchers (J. D. Finn, 1998; Ho Sui-Chu & Willms, 1996) have found that parents volunteering, visiting school, and attending school events had less of a relationship to student achievement than did types of PI that occurred at home. Ho Sui-Chu and Willms (1996) wrote about four types of involvement including a parent focus on education while at home through discussion and supervision and PI at school through meeting and activity attendance and contact with school personnel. Their study indicated that discussion of school-related activities at home “had the strongest relationship with academic achievement. Parent participation at school had a moderate effect on
achievement” (p. 126). Wang and Haertel’s (1993) research review found that the home environment was among the top influences on school performance.

Epstein (2001a) identified six types of PI discussed by this researcher in the next chapter. Included in the six types were alternatives to activities at school. “Families care about their children’s success, but most parents need more and better information from schools and communities to become and remain productively involved in their children’s education” (p. 161). Epstein’s research, along with the analyses of Ho Sui-Chu and Willms, provided strong evidence for continuing to increase communication between the teacher and the parent as a means of addressing student achievement.

Communication as a Means of Parent Involvement (PI)

Students and teachers have disconnected perceptions of how involved parents have been in their children’s education. According to national surveys, about “70% of parents [help] children [at home] at least once a week, regardless of parents’ socioeconomic status, educational attainment, or ethnicity” (U.S. Department of Education, as cited in Pomerantz, Moorman, & Litwack, 2007). In a MetLife Survey (Harris Interactive, 2005) about parent involvement, teachers reported parent involvement with homework and other school problems to be low (19%), but student perceptions of parent help with homework monitoring were much higher (57%) than the teachers’ perceptions of parent help with homework monitoring. Moreover, 97% of the students reported asking for homework help from their parents (p. 80).

Communication Promotes Student Achievement

Keeping the doors of communication wide open between the home and school has improved student achievement. When Desimone (1999) defined student achievement as
either grades in the classroom or standardized test scores, “parent-school involvement
variables accounted for almost twice as much of the variation in grades than in test
scores,” meaning that more change in student grades than in students’ standardized
achievement test scores was attributed to parent involvement variables (p. 19). Desimone
suggested that when communication between the teacher and parent increased, the
relationship between the two grew stronger. Stronger relationships positively affected
teachers’ perceptions of students, and those positive perceptions could have affected the
grades that teachers assigned more than they affected cognitive learning (Desimone,
1999).

Increasing Communication Using Electronic Means

Moving from paper to electronic means increased opportunities to communicate
and to improve access and speed to achievement information, provided parents had
electronic access and used it for this reason. Efforts to make the communication frequent
and systematic already have been shown to be effective (Rogers, 1994). Computer use
(Durán, Durán, Perry-Romero, & Sanchez, 2001) and computer-assisted messaging
(Greninger, 1991) have been studied to assess their influences on student achievement.
Internet Web sites (Lishka, 2002), email use (Clemente, 2002; Lishka, 2002; Madrid,
1999; Otterbourg, 1998), computers in the home (deGraw, 1990), auto-dialers, voicemail,
and messaging (Bissell, 1989; Cameron & Lee, 1997) have been studied in terms of their
influences on parent communication and parent attitudes toward their use to address PI
and student achievement. Little research has been done, however, on the influence of
parent and student access to online electronic teacher grade books on student
achievement. However, opportunities to access student achievement information online
have continued to grow as more vendors (e.g., Excelsior, Pearson School Systems, Common Goal Systems, Blue Pegasus LLC, Pearson Education) have introduced products for just this purpose. *Electronic grade book* is defined later in this chapter.

The problem for the researcher was to investigate how electronic grade book access as a type of communication could address both lack of communication and timely communication about student performance, which had been identified by parents, teachers, and researchers as concerns. Research has already indicated that electronic communication is positively related to student achievement and attitudes about school. District officials need to know how much the use of electronic grade books is related to student achievement, attendance, and the quantity and quality of communication with parents. They have invested time, money, and staff in this resource, seeking to take advantage of PI at home and to increase communication about school among teachers, parents, and students.

**Purpose of the Study and Questions Guiding the Research**

Research has indicated a relationship between student achievement and (a) parent involvement, (b) student information access rates, (c) communication rates between parents and teachers, and (d) communication rates between parents and their children. In addition, the literature has shown that electronic communication between parents and teachers influenced parents’ perceptions of school and their children’s success.

This researcher’s purpose for undertaking this study was to examine the influence of family access to an electronic reporting mechanism in the home on student achievement, attendance, and home–school communication—elements identified in prior
research as solid contributions of PI to schooling efforts. The researcher investigated (a) the relationship between a family’s rate of access to an electronic grade book and student achievement, (b) the relationship between a family’s rate of access to an electronic grade book and student attendance rates, and (c) whether electronic grade book access influenced parent, teacher, and student perceptions about the quantity and quality of home–school communication. Specifically, this investigation addressed the following questions:

1. What is the relationship between the family access rates of the electronic grade book and the grade point averages (GPAs) of students?
2. What is the relationship between the family access rates of the electronic grade book and the attendance rates (ATT) of students?
3. What is the relationship between changes in family access rates of the electronic grade book between two given time periods and changes in student GPA between the same time periods?
4. What is the relationship between the changes in family access rates of the electronic grade book between two given time periods and changes in student ATT between the same time periods?
5. How do the relationships studied vary for low- or high-SES students?
6. What evidence did telephone interviews provide regarding the use of the electronic grade book as a means of improving (a) the rate of communication among parents, students, and teachers and (b) the quality of communication among parents, students, and teachers?
Significance of the Study

Since the mid-1980s, strong parental involvement has been reported as a means of improving student achievement. Evidence of parental involvement at home through monitoring homework, asking questions about school, and setting expectations about a child’s schooling beyond high school were included in Epstein’s (2001b) work as types of PI that influenced achievement. Parents' participation in school activities, volunteering, and leadership at school are no longer considered the only types of significant involvement in a child’s schooling. Research (e.g., Clark, 1993; J. D. Finn, 1993; Ho Sui-Chu & Willms, 1996) has found that parents of varying ethnic and financial backgrounds participated significantly in their children’s education when all six types of involvement were included in the definition of PI. In spite of the desire to maintain high levels of PI in student education, researchers (e.g., Adams & Christenson, 2000; Catsambis & Garland, 1997; Epstein, 2001b; Hoover-Dempsey, Walker, Sandler, & Whetsel, 2005) have confirmed diminishing levels of PI as children moved from primary to secondary education.

The steady increase of Internet availability has elevated the potential of the home computer as a means of obtaining information about student achievement. At any given point in time, more and more parents and students have the opportunity to access classroom student achievement data. Obtaining student information electronically has the potential to frame parent–teacher–child communications around student achievement data that never before have been so timely and readily available. Research on the influence of this type of access on student achievement has been minimal, and little has been known
about electronic access as a means of improving the quantity and quality of parent–
student–teacher communication around student achievement for the secondary student.

Information collected from this study should expand the knowledge base
surrounding PI in education from the home. What was learned about the influences of
electronic access to student information may have the potential to influence student
achievement and attendance, increase parent–child dialogue about education, improve
parent–school communication, and strengthen parent–teacher relationships. Results of
this study may provide additional strategies to increase communication and PI for the
secondary student population, an area of education where lessening PI is a recognized
problem (e.g., Dauber & Epstein, 1993; Epstein, 2001b; J. D. Finn, 1998; Rogers, 1994).

Delimitations and Limitations

Although many variables have affected home–school communication, PI, and
their influence on student achievement, this work was delimited to a focus on two of the
six types of PI promoted by Epstein (1995), namely (a) communicating about school
programs and student progress and (b) involvement in learning activities at home. (See
Chapter II for detailed definitions of each type of PI). No information was gathered on
contacts made during parent–teacher conferences, by teachers or other school staff, or by
parents for reasons other than those prompted by an electronic grade book.

The researcher restricted the study to access of student information using
Excelsior's (2001) Pinnacle Internet Viewer (PIV). Other companies such as
PowerSchool (Pearson School Systems, 2006) may have offered more user-friendly
parent access programs that, in turn, could have influenced parent perceptions and use of
the product. Telephone interviews were designed and conducted for high school teachers and users having high school students within the system. The researcher investigated neither perceptions nor student achievement at the kindergarten through ninth grade levels of instruction.

Standardized student achievement data such as those from the state assessment were excluded because of the state assessment’s “field test” status and because of the multiple variables that would need to be controlled when comparing perceptions with student performance on a standardized test. In addition, Desimone (1999) suggested that increases in student achievement from measures such as GPA might be more a function of increased communication among teachers, parents, and student than indicators of an increase in cognition as a function of communication.

The study was delimited to a single public school where families of students at that school accessed an electronic grade book at least one time. There was a population of parents excluded from this study whose children attended private or parochial schools or whose schools did not have access to an electronic grade book or did not use it. Telephone interviews were delimited to high-frequency users of the PIV in order for the researcher to assess perceptions of PIV use more accurately as a means of home-school communication. Data about family access rates were dependent upon a Web page counting system attached to the PIV by a company hired by the sample site’s district to provide regular access reports to district officials. Parent opportunity for access may have been limited by the system’s functionality. The researcher depended upon the company for accuracy in its reports regarding the frequency of Web page use.
The generalization of the results outside the Wyoming educational community is limited because of the sample size and imposed delimitations. The group studied was taken from PIV access information and telephone interviews from parents, students, and teachers within a large district in Wyoming where demographics indicated a relatively small ethnic population and a decreasing percentage of residents with low socioeconomic status (SES). The county’s unemployment rate was low (3.5% reported by Mast, 2005; 2.8% reported by Mast, 2007). Evidence indicated at least 71% of residents in the county had access to the Internet at home (ETC Institute, 2005), however no data were available to disaggregate Internet access by SES or by Internet accessibility at work.

Some limitations were attributable to the use of a standardized telephone interview as a data-collection method. Patton (2002) discussed the difficulties of telephone interviews related to the number and depth of questions, lack of flexibility in relating the interview to particular individuals, and limits to the naturalness and relevance of both questions and answers (p. 349).

Definition of Terms

Terms used within the context of this study include the following:

1. Attendance Rate (ATT): Average number of days a student was present during the given time periods addressed in this study.

2. Communication: A process by which information is exchanged between individuals through a common system of symbols, signs, or behavior (Merriam-Webster Online Dictionary, 2004).
3. Communication With the School: information exchanged with school representatives (administrators, secretaries, counselors, and teachers) through a system of letters, phone calls, email, notes, and personal visits.

4. Communication With the Teacher: Information exchanged with classroom teachers through a system of letters, phone calls, email, notes, and personal visits.

5. Core Subject Grades: Letter grades assigned to mathematics, science, social studies, and language arts courses each quarter and semester of an academic school year.

6. Electronic Grade Book: A record keeping system containing real-time teacher-recorded student attendance, scores for class assignments, assessment scores, and other achievement data. Family members were able to view a single student’s records on a Web page using an Internet Web browser at any time.

7. Epstein’s Framework: Using the theory of overlapping spheres of influence (OSI), Sanders and Epstein (1998) described a framework of six types of school–family–community involvement. The six types of involvement are (a) parenting—helping all families establish home environments that support children as students, (b) communicating—designing and conducting effective forms of communication about school programs and children’s progress, (c) volunteering—recruiting and organizing help and support for school functions and activities, (d) learning at home—providing information and ideas to families about how to help students at home with schoolwork and related
activities, (e) decision making—including parents in school decisions, and (f) collaborating with the community—identifying and integrating resources and services from the community to strengthen and support schools, students, and their families (p. 4).

8. Family: “A caring adult who shares an interest in the growth and development of a child. This could mean a [biological parent], grandparent, sibling, aunt, uncle, cousin, or other significant person” (Turk, 2002, p. 11).

9. Grade Book Access Rate (GBAR): The average number of times per week family members logged in to the Pinnacle Internet Viewer to review reports of individual students who were members of that household. (For further explanation of report types, see PIV definition below). Roger’s (1994) experimental study provided parents information weekly rather than quarterly.

10. Grade Point Average (GPA): Letter grades of A, B, C, D, and F assigned values of 4, 3, 2, 1, and 0, respectively, and averaged each quarter or semester in an academic year. For this study, GPA included averages of letter grades in language arts, math, science, and social studies.

11. Parent Involvement (PI): “Formal and informal ways in which family members assist with the education of their children at school or at home” (Turk, 2002, p. 11).

12. Pinnacle Internet Viewer (PIV): An Internet Web-based report generator supplied by Excelsior Software (Excelsior Software, 2001) that provided student performance and attendance information to students and parents using unique ID numbers and PIN (Personal Identification Number) codes. The
server collected data in the background as teachers entered information from their desktop computers on homework, assessments, other achievement measures, and attendance using a software product called Pinnacle. Users generated the following reports with the PIV: attendance by period, individual class performance, teacher comments, future assignments, missing assignments, assignment scores, and test scores.

14. Socio-economic Status (SES): For this study, SES refers to whether or not a child was on record as receiving free or reduced-price lunch.
15. Student Demographics: The statistical characteristics of a student including socioeconomic status, gender, and ethnicity.

Summary of Design and Methodology

The author used a mixed-method approach to address the purposes of the study with the quantitative then qualitative phases performed sequentially and the qualitative phase having dominance (Johnson & Onwuegbuzie, 2004). For the quantitative portion, the design was classified as descriptive, nonexperimental research utilizing a cross-sectional time dimension (Johnson, 2001). For the qualitative portion of the study, the researcher designed the study to have a descriptive approach because the intent was to describe what it was like to be living and working with a computer-based communication tool frequently accessed by members of the family.
Quantitative data reflecting Internet access rates of an electronic teacher grade book by family members were compared with student achievement and attendance rates from three marking periods of a school year (2006–2007). The grade book access rates were derived from average weekly PIV access for the same three periods. Student data from a high school in a large school district consisted of GPAs collected by quarter from the core areas of mathematics, science, language arts, and social studies and ATT for each marking period. Data were categorized by lower and higher socioeconomic status to account for demographic differences in the population. Ethnicity was not used as a demographic variable, as the population of non-White students was less than 6%.

Correlation coefficients were analyzed between (a) the variables of GPA and grade book access rates (GBAR) and (b) the variables of ATT and GBAR. In addition, analyses of variances (ANOVAs) were used to test for differences among the means of GPA and ATT from two quarters and the means of GBAR from those same quarters.

Qualitative data gathered through purposeful sampling using structured interviews explored this question: What evidence did telephone interviews provide regarding the use of the electronic grade book as a means of improving the quantity and quality of communications among parents, students, and teachers? Parents, students, and teachers from among high-rate PIV users were individually interviewed to gather perceptions about the electronic grade book. Themes for deductive analysis included the quantity and quality of communication about school and perceptions of improvement in grades, attendance, and attitudes about school. A more comprehensive description of the research method and procedures for this study is presented in Chapter III.
Summary of Chapter I and Organization of the Study

Chapter I included a brief overview of the impact of PI on student achievement followed by a brief description of the impact of increasing communication between parents and teachers. Teacher–parent communication was discussed, including electronic means. Also presented were the statement of the problem, questions guiding the research, a conceptual framework, the study’s limitations, and definitions of key terms, including a listing of Epstein’s typology. Presented was a rationale for studying the relationship of electronic access in the home to information about student achievement and attendance and its potential to influence parent, teacher, and student communication.

Chapter II provides a review of the research and literature related to parent and family involvement, communication between the school and home, and electronics as a means of communication between the family and school staff. It also includes a more detailed explanation of Epstein’s theory of overlapping spheres of influence as it relates to the theoretical framework for this study. In Chapter III, the researcher presents the design and procedures used to carry out the study with a mixed-method model. The design, population, sample, data collection process, and analysis strategies are presented for both quantitative and qualitative components of the study. Chapter IV details the actual analyses and results of the study. Chapter V provides a summary and discussion of the results, interpretation of findings, conclusions, and recommendations for practice, policy, and further research.
II. REVIEW OF RESEARCH, THEORY, AND LITERATURE

Introduction

The evidence is now beyond dispute. When schools work together with families to support learning, children tend to succeed not just in school, but throughout life. (Henderson & Berla, 1994, p. 1)

Even though parental socioeconomic status (SES) has long been accepted as the dominant predictor of a child's academic performance in schools (e.g., Berliner, 2008; Coleman et al., 1966; White, 1982, as cited in Haller & Kleine, 2001; Okpala, Okpala, & Smith, 2001), some factors such as parent involvement (PI) in the learning of the child can influence student achievement. In wealthy families, children are likely to be exposed to experiences that promote development, but coming from a wealthy family doesn't mean that they were born smarter (Sattes, 1985). In this chapter, the researcher focuses on literature reviewed around three areas pertaining to parent and family involvement: (a) research and analyses on PI in relation to achievement in K–12 schools, (b) communication as a means of PI, and (c) electronic means of communication between parents and school staff. Also included is a discussion of Epstein’s theory of overlapping spheres of influence as a basis for the theoretical framework of this study. At the end of each section, the the reviewed material is connected to this study.

Literature about parent involvement evolved from a look at PI as a potential influence on achievement at school to literature focused on the use of parents as a means of improving student work while both the parent and child are at home. The research fell into three categories: (a) impact of family and community involvement on improving
schools; (b) strategies to connect schools, families, and community; and (c) parent and community organizing efforts to improve schools (Henderson & Mapp, 2002). Current literature topics include not only the roles of parents as influencers of student achievement, but also the community’s role in supporting the missions of both parents and schools (e.g., Henderson & Mapp, 2002; Smrekar, Guthrie, Owens, & Sims, 2001).

Because this researcher was interested in exploring the influence of PI through electronic means as the main thesis of this study, the literature review was delimited to PI at school and at home and did not examine studies that explored the role of the community in partnering with schools (for an overview of literature on community engagement, see Schutz, 2006) or the association of the neighborhood to academic outcomes (Nettles, Caughy, & O’Campo, 2008).

Research and Analyses on Parent Involvement

The value of family getting involved in education has been studied for over three decades. Thorkildsen and Stein, (1998) cited examples of experimental (e.g., Fantuzzo & Davis, 1995; Grimmett & McCoy, 1980; Heller & Fantuzzo, 1993), quasiexperimental (e.g., Brodsky, 1994; Walberg, Bole, & Waxman, 1980), and correlational (e.g., Geyer & Feng, 1993; Paulson, 1994; Yap & Enoki, 1994) research that showed parent involvement accounted for “10% to 20% of the variance in achievement” and had “small to moderate but educationally significant effect size across many studies” (Thorkildsen & Stein, p. 20). Parents’ high expectations and supportive home environments were consistently related to higher achievement (Thorkildsen & Stein, 1998).
Parent involvement literature shifted its focus from "parent" to "family" as households took on various compositions other than the typical nuclear family (Davies, 1993, p. 214). Grandparents, siblings, or other significant persons now stand with parents in taking interest in and responsibility for the education of a child. For the sake of consistency, this literature review contains the abbreviation "PI" to signify the involvement of parents and family. Henderson and Berla's (1994) review of 66 studies dating to 1972 concluded that student success in school can be predicted when the family encourages learning, expresses realistic, high expectations about achievement and careers, and becomes involved in education at school and in the community (p. 1). Graue (1998) theorized that PI may be dependent upon school–parent interactions that strengthen relationships and responsibility, as discussed by Bahtkin (as cited in Graue, 1998), solidify partnerships (Epstein, 2001b), empower all parents (Comer, 1980), ensure middle-class status (Brantlinger, Majd-Jabbari & Guskin, 1996), or increase social and cultural capital (Lareau, 1989). Indeed, some reviewers of literature have suggested that no concerted effort to involve parents in meeting a specific goal through PI had failed (e.g., Dwyer & Hecht, 1992a; Henderson, 1987; Henderson & Berla, 1994; Henderson & Mapp, 2002).

*Factors Motivating or Limiting Parent Involvement*

Parents become involved in their children's education for a variety of reasons. PI may vary in relation to SES, ethnicity, how one defines PI, whether PI occurs at school or at home, or whether or not barriers exist that may discourage PI. Lareau (1989) concluded that social class influenced PI in schooling and depended upon the amount of cultural and social capital (Bourdieu, 1983) available to a group. Some very important
characteristics of social class were identified using a case-study method comparing school–family relationships found in a school enrolling children of working-class parents with those found in a school enrolling children of high-income parents. PI at home was much more apparent in the homes of wealthy families than in the homes of poor families. Lareau (1989) found the relationship between the school and working-class families to be one of separation; that is, parents saw education as the teacher’s responsibility, parents were never involved in the children’s academic program, home activities such as reading to children were inconsistent, and mothers were exclusively responsible for monitoring school activities.

In Lareau’s study, the relationship between the school and the wealthy families was characterized by interconnectedness; that is, parents saw education as a shared responsibility between the home and the school, parents reinforced the curriculum at home, parents of low achievers assisted with supplementing their children’s education, and fathers attended school activities. Lareau argued that the culture of wealthy parents provided more tools for the education of their children than was provided in the culture of working-class families. Lareau’s study also exposed the problem of PI at all costs or “the dark side of PI” as detrimental both to relationships within the family and with the school staff (p. 149). Parents who were too involved in their children’s education actually hindered teachers and their children from interacting effectively, thereby inflicting more stress upon the family and school staff. The researcher suggested that solutions created to encourage more PI among poor families should not be directed just to the family as if it were a simple matter of individual choice to be involved or not. Instead, interventions
directed at increasing the cultural capital of the entire social class would improve PI, provided that parents accessed the capital once it became available to them.

In a study using quantitative data gathered from surveying parents and teachers of 415 third through fifth graders, Lee and Bowen (2006) attempted to explore the cultural capital theory (Bourdieu, 1983) advanced by Lareau (1989) to determine whether the levels and effects on achievement of the major types of PI differed among families according to race–ethnicity, SES, and parent educational attainment. They found differences in levels of PI depending upon social status, especially when looking at PI occurring in school. Parents of European American descent had a culture most similar to the school’s culture, and their PI was highest among all groups. However African American parents, Hispanic–Latino parents, and parents of low-SES students concentrated more often on time management and homework than did the parents of European American students, even though their children’s academic achievement was lower. Lee and Bowen said their own findings gave partial support to Bourdieu’s theory because “dominant and nondominant groups benefited similarly from some types of PI [e.g., homework help] and differently from others [e.g., time management, discussions about school, educational expectations]” (p. 213).

In their case study of a third-grade class made up of 24 students, Lareau and Horvat (1999) concluded from interviews with parents, teachers, and members of the community that PI for black parents or working-class parents was influenced by both staff perceptions of what parents should have been doing to support their children and what opportunities children were being offered or denied. Parents struggled with accepting educator calls for partnership, cooperation, and trust when parent history
contained evidence of discrimination and denial of opportunity. The authors concluded that both staff and parents should look for “moments of inclusion and exclusion” (p. 48) to provide opportunities for children to be challenged and to achieve. These moments, if acted upon by either parents or staff, would provide advantages (e.g., placing a child in a gifted program or on a high track, encouraging college, or using networks to get a job) to the child as he continued his education or would limit disadvantages leading to failure (e.g., placement in a low reading group, being held back, or failing college gatekeeper courses).

Two studies reviewed (Chrispeels & Rivero, 2001; Pena, 2000) indicated that parents of Latino families were reluctant to become involved in their children’s education because of language and cultural barriers as well as barriers related to their own education. When parents received training from cultural coaches, Chrispeels and Rivero observed a significant improvement in parent participation, parents’ aspirations for their children, literacy, and homework completion (p. 131).

Parents’ circumstances have limited PI as well. Reasons that parents may be reluctant to get involved include lack of time, feelings of inadequacy, and fear of overstepping boundaries (Brown, 1989; Chavkin, 1993; Pena, 2000). Brown cautioned that these reasons must be taken into account rather than simply concluding as one writer (C. E. Finn, 1999) did, that parents did not care about their children’s education. Single parents and parents from families in which both parents work may not have the time to become involved in school activities (Grolnick & Benjet, 1997). Heymann and Earle’s (2000) analysis of data from 1,280 mothers in the National Longitudinal Survey of Youth found that working parents below the poverty line had significantly less paid sick leave,
paid vacation leave, and ability to leave the job site when compared to leave options for working parents above the poverty line. In a paper presented at the Annual Meeting of the Mid-Western Educational Research Association, Dwyer and Hecht’s (1992a) extensive review of literature found that parents did not see the need to get involved in the schooling of their children because professional educators were trained to do so, and parents were passing on responsibility to teachers. Parents perceived their children as doing fine in school and saw no reason to intervene unless their performance changed.

Parents have also rationalized that their role diminished when their children reached adolescence, reasoning that their children didn’t wish them to become involved in their lives as students. When children enter secondary education, the single-teacher, single-class situation from elementary school gives way to multiple teachers, all of whom parents must contact in order to get an overall picture of their children’s performance. Subject-centered teachers tend to be focused on content, which may make it more difficult for parents to feel that they are competent enough to assist their child in being successful in a particular class. Moreover, schools and teachers might be indirectly sending messages that parents should not attempt to educate their children, implying that parents are unqualified to help and that attempts to do so would be considered adversarial. Parents who were never successful in their own education might see PI as a negative experience, thus avoiding it when possible (Dwyer & Hecht, 1992b).

Using the results gathered from a qualitative study on 20 middle-class households, Brantlinger et al. (1996) interviewed middle-class mothers who saw themselves as strong supporters of the use of education to improve the condition of lower class children as part of a shared philosophy of equity for all. However, their interviews revealed that the
mothers maintained support as long as school structures continued to benefit their middle-class children. The mothers advocated for all students but also favored policies and practices that might have maintained or advanced their own children’s status in society. These mothers maintained high PI in their children’s schools secondarily to improve society and primarily to promote the interests of their own family members.

Hoover-Dempsey, Walker, Sandler, and Whetsel (2005) suggested that parents get involved in their children’s education out of a sense of obligation to help their children be successful and out of their own sense of self-efficacy regarding their ability to influence their children’s learning. Eccles and Harold (1993) framed PI by looking at factors from parents and schools that influenced the achievement of students. They discussed how characteristics of the family, community, child, teacher, and school might have influenced parenting and teaching beliefs that, in turn, influenced teacher and parenting practices around learning and achievement. Ultimately, a child’s beliefs about success, motivation, values, interests, engagement, and performance were impacted (p. 571).

Grolnick and Benjet (1997) narrowed the factors associated with levels of PI to individual, contextual, and institutional factors. Using interviews and questionnaires about PI practices and beliefs from 209 parents, their children, and teachers, Grolnick and Benjet found that efforts to improve PI beyond traditional classroom-based activities were necessary to reach all families. When parents viewed themselves as teachers, for example, they were more likely to become involved in stimulating activities with their children. Cultural factors influenced PI, as did social contexts. Parents struggling financially were less likely to get involved with school, for example, than more affluent
parents were. The researchers concluded that PI was composed of complex factors and that generating school practices that did not consider the social realities and cultural characteristics of parents could lead to widening rather than narrowing the PI gap (p. 547).

The literature reviewed indicated that factors limiting parents' involvement include lack of social and cultural capital, experiences of denial of opportunity and discrimination, language barriers, lack of time, feelings of parent inadequacy and teacher superiority, and parents' diminishing role as their children get older. Motivations for parents to become involved in education include making sure that the policies and practices of schools support the goals of middle-class families, experiencing child success, having a sense of self-worth, and parents being considered as teachers by educators. Literature indicated that factors that motivate or limit PI are complex and varied. Solutions proposed to increase PI should reflect those findings.

**Types of Parent Involvement**

The history of studying PI has provided opportunities for researchers to assess PI using varied methods in attempts to understand the influence of PI on student achievement. Henderson and Berla (1994) referenced Gordon's use of three models of PI from work in the 1970s as a means of categorizing researchers' many approaches to studying PI. One model centered on improving parent–child relationships in the context of the family, another focused on integrating parents into the school program, and still another attempted to build strong relationships among the school, families and the larger community (p. 3).
Ho Sui-Chu and Willms (1996) and others (Pomerantz et al., 2007) divided PI into two general types of involvement: (a) home involvement associated with discussing school activities at home and monitoring out-of-school activities and (b) school involvement associated with contact between parents and school personnel and volunteering or attending meetings at school. Nettles et al. (2008) used the term *positive coaching* rather than PI as a way of capturing parents’ role in engaging their children at home and within the neighborhood (p. 20).

Epstein (1995) posited six types of interaction among family, school, and community. The six types—parenting, communicating, volunteering, learning at home, decision making, and collaborating with the community—lend value and respect to the roles of all three groups and promote the idea that “involvement” can take place outside of the school building and still have an impact on student achievement. The Harvard Education Letter (1997) summarized the six types of family–school–community partnerships as follows (quote):

1. **Parenting:** Families must provide for the health and safety of children, and maintain a home environment that encourages learning and good behavior in school. Schools provide training and information to help families understand their children's development and how to support the changes they undergo.

2. **Communicating:** Schools [i.e., school personnel] must reach out to families with information about school programs and student progress. This includes the traditional phone calls, report cards, and parent conferences, as well as new information on topics such as school choice and making the transition from elementary school to higher grades. Communication must be in forms
that families find understandable and useful. For example, schools can use translators to reach parents who don't speak English well, and it must be two-way, with educators paying attention to the concerns and needs of families.

3. Volunteering: Parents can make significant contributions to the environment and functions of a school. Schools can get the most out of this process by creating flexible schedules, so more parents can participate, and by working to match the talents and interests of parents to the needs of students, teachers, and administrators.

4. Learning at Home: With the guidance and support of teachers, family members can supervise and assist their children at home with homework assignments and other school-related activities.

5. Decision-making: Schools [i.e., school personnel] can give parents meaningful roles in the school decision-making process, and provide parents with training and information so they can make the most of those opportunities. This opportunity should be open to all segments of the community, not just people who have the most time and energy to spend on school affairs.

6. Collaboration with the Community: Schools [i.e., school personnel] can help families gain access to support services offered by other agencies, such as healthcare, cultural events, tutoring services, and after-school child-care programs. They also can help families and community groups provide services to the community, such as recycling programs and food pantries (taken from Web page, Harvard Education Letter, 1997).
Marcon (1999) reported that the source of data being studied might influence one’s conclusions about various types of PI. For example, when teachers were surveyed about the types of involvement that best influenced student achievement, their responses did not correspond to those of parents. Marcon delimited PI to observable events at school to include conferences, home visits, extended class visits, and helping with a class activity (p. 397). The researcher concluded that increased PI and more active PI were positively associated with improving the skills of the preschool population studied.

PI has generally been categorized as occurring at home, at school, or in conjunction with the community. In various studies, researchers have attempted to assess PI’s influence on student success in school, on school success as a whole, on sharing governance, and on reducing bureaucracy (Fine, 1993). The research for the present study was delimited to PI occurring at home and to PI’s influence on student achievement. Some additional conclusions were drawn about relationships between parents and children after they had frequent access to electronic information about achievement and attendance while at home.

**Literature on At-School PI**

Researchers have supported the hypothesis that children do better in school when parents are attending their children’s activities, assisting in the classroom, or participating in school governance (e.g., Gutman & Midgley, 2000; Lareau, 1989; Marcon, 1999; Miedel & Reynolds, 1999; Stevenson & Baker, 1987). In a study of 62 poor African American families using a comparison of interview and survey data with the GPAs of students transitioning to middle school, Gutman and Midgley (2000) concluded that the GPAs of all students dropped on average between fifth-grade elementary and sixth-grade
middle school. When PI in combination with feelings of teacher support or feelings of school belonging were factored in, the GPAs of students were higher than for students who experienced only one or none of those factors. However, Gutman and Midgley found that if students were academically successful, there was no significant increase in grades when that academic success was combined with PI or a sense of belonging or feelings of teacher support.

Although it was surprising that PI by itself did not have a significant influence on GPA, the researchers concluded that the sample size might have been too small, thereby not possessing enough “power” for that single variable to be significant (p. 242), or that school success might only be realized when home and school factors were considered together. Poor families were reluctant and maybe less able to offer the support needed for their children’s academic success, so only combinations of PI, teacher support, and positive senses of belonging would impact the academic success of the transitioning middle-school student (p. 243).

Using a case study comparing PI at a working-class elementary school with an upper-middle-class school, Lareau (1989) found PI from the upper-middle-class parents to be greater than the PI from working-class parents, particularly fathers. Further, among upper-middle-class parents, Lareau found perceptions that schooling was a shared responsibility rather than solely the responsibility of teachers.

Miedel and Reynolds (1999) studied the lasting association of frequency and number of PI activities during preschool and kindergarten on children’s academic success in eighth grade. Parent (n = 701) recollection of attending the parent resource room, attending school meetings, attending school assemblies, going on class trips, working in
the classroom, receiving home visits, going to parent–teacher conferences, and
transporting children to and from school were used as the definition of PI. Regardless of
parent education levels and students’ eligibility for subsidized meals at school, students
whose parents were frequently involved were 38% less likely to be held back between
first and eighth grades. Frequency of PI did not affect time spent in special education
programs. Additionally, the number of PI activities was positively associated with
children’s eighth-grade reading scores.

Meidel and Reynolds (1999) concluded that using PI programs in the early years
“may continue to promote school success into high school, regardless of background
characteristics” (p. 397). Because these findings were not dependent upon certain types of
family background (i.e., parent education and low SES), this research provided support
for the notion that low-income families are able to be just as involved in their children’s
education as families from more advantaged circumstances. Marcon’s (1999) study of
708 preschoolers enrolled in Washington, DC Head Start programs also indicated that PI
was associated with increased skill levels even when adjusting for the effects of low
income.

When Stevenson and Baker (1987) studied a subset of survey data (620
households) from the TIME USE Longitudinal Panel Study, they reviewed information
from 179 children, teachers, and parents and found support for all three of the study’s
hypotheses: (a) that parents with more education were more involved than were parents
with less education, (b) that parents were more involved in school activities if the child
was younger, and (c) that parental involvement was related to the child’s school
The mother's educational level and the age of the child were stronger predictors of parental involvement in schooling for boys than for girls.

Stevenson and Baker (1987) did not find a direct effect of maternal educational status on school performance that was independent of parental involvement in school activities (p. 1348). This last finding supports research discussed later about the positive impact of PI regardless of demographic factors such as SES and ethnicity. The TIME USE Longitudinal Panel Study dataset was not specifically gathered to assess PI, and Stevenson and Baker's data on PI were reported by teachers—two limitations that diminished the conclusions of their work.

The importance of distinguishing between involvement at home and school was confirmed by Deslandes and Bertrand (2005) when studying parent motivation factors influencing PI at school and at home. Their at-school statistical models developed from surveying 770 parents of secondary students showed the importance of building teacher–parent relationships if PI at school was expected to increase. In the ninth grade, for example, parent role construction and teacher invitations accounted for approximately 30% of the variance in PI, but family background accounted for only 9% of the variance. The researchers recommended that teachers get training on involving parents in schools and building trusting relationships with parents to help parents increase their sense of obligation about getting involved at school.

Studies centering on at-school PI have shown improved feelings of belonging for students, a sense of shared responsibility for educating the child from parents and teachers, improved reading scores, and less retention. At-school PI seemed to be more frequent during the younger years of schooling and was practiced more often by parents
not categorized as low SES. Given the impact of at-school PI, recommendations from the literature have included additional training for teachers on how to tap at-school PI as a valuable resource.

**Literature About PI When PI Occurred Outside of School**

Pomerantz, Moorman, and Litwack's (2007) review of PI research concluded that PI on the home front may be quite negative and sometimes positive, yet school-based involvement "has yielded consistent positive effects" (p. 389). By the time children reach the age of 18, however, they have spent 87% of their lives outside of school, often under the guidance of parents. Given the potential of parents to be influential on the successes or failures of their children, it makes sense to take advantage of that influence in an effort to improve upon student performance at school (Walberg, 1984b; Williams, 1998).

Literature reviewed about PI in relation to high-achieving students showed that PI was related more to parent actions than to parent characteristics. When Clark (1993) studied the at-home PI strategies of over 1,100 third graders’ families, the researcher found a significant relationship between student achievement and parents checking homework, adults learning in their children’s presence, student access to materials, and parent discussion of educational expectations with the child. For a very large group of survey respondents, family-background characteristics such as the parents’ education, family structure, or ethnic background were not associated with student-achievement levels. For example, 51.3% of the mothers of high achievers held only a high school education, and 40% of high achievers came from single-parent homes. In addition, 43% of the high achievers were Hispanic and 21.8% were Black (p. 103). High achievers came from a wide variety of family backgrounds; they were not clustered within a single group.
Catsambis and Garland (1997) found significant differences in PI along ethnic lines. Black parents tended to monitor individual student performance more closely than did White or Latino parents. White parents showed the least interest in monitoring student learning and focused more on student opportunities to learn than did any other parent group. Asian parents tended to have the highest goals for their children and showed it by paying for tutoring outside of school and saving for college more than did other groups of parents. Hispanic parents showed the lowest levels of PI while their children were in middle school but showed the highest levels of academic contact as their children reached graduation age. A MetLife (Harris Interactive, 2007) survey on homework reflected Catsambis and Garland’s findings, concluding that Black and Hispanic parents have greater expectations for homework than White parents do (p. 18).

Several authors (e.g., Kohn, 2006; Cooper et al. as cited by Kohn, 2007; Marzano & Pickering, 2007) have made opposing claims about the influence of homework on student achievement, especially for younger students. Epstein (2001a) argued that homework, when specifically designed to increase parent–child interaction, increased student achievement. While there is merit in exploring the influence of homework per se on student achievement, it is beyond the scope of this literature review. PI away from school is described in the literature as having multiple forms; one form is monitoring homework.

Pena’s (2000) qualitative study centered upon barriers to PI at a single elementary school. The researcher found that cultural attitudes about the role of parents, language barriers, parent cliques, parents’ educational level, attitudes of school staff, and family issues such as a lack of day care negatively influenced the involvement of parents in the
activities organized by the school. Contrasting with that study was research done by Lopez, Scribner, and Mahitivanichcha (2001) to determine the PI of migrant families enrolled at migrant-successful schools in Texas. These successful schools carried migrant graduation rates of 80%, attendance rates of 94%, and at least 70% passing rates on all three areas (reading, writing, and math) of the state assessment.

Using 17 group interviews of school staff, community members, and parents over a 5-month period, Lopez et al. (2001) found that school staff concentrated holistically on the migrant families by getting to know their circumstances, backgrounds, needs, and interests. Before any involvement expectations could be set for parents, the members of the school community needed to involve themselves in being supportive of the social, financial, and physical needs of the migrant families. The data from the interviews showed evidence of involvement working both ways; that is, if parents were not able to get involved in the schools, then school staff would get involved with parents.

In a study of nine high-performing Hispanic schools (Scribner, Young, & Pedroza, 1999), “teachers defined parent involvement as a way of supporting the academic achievement of students, whereas parents conceptualized involvement as a means of supporting the total well-being of children” (p. 37). “These successful schools emphasized activities that focus[ed] on facilitating more direct involvement of family members in their children’s education within the home environment” (p. 38). The practices identified in these studies were similar to Epstein’s (2001b) call for more family-like schools and more school-like families. These studies (i.e., Lopez et al., 2001; Scribner et al., 1999) provided a strong argument for the value of PI outside of the school itself. When social and economic needs were attended to, families were more easily able
to concentrate on the importance of involving themselves in their children’s education than when those social and economic needs were not addressed.

An analysis of the National Education Longitudinal Study (NELS:88) data by Williams (1998) to look at the influence of PI activities outside of school showed that the mother’s or father’s PI had a significant relationship to eighth-grade student achievement regardless of the child’s gender. The data were analyzed to look for relationships among three factors that Williams modified from Walberg’s (1984b) “alterable curriculum of the home” (p. 25): (a) parent effort—contacts with school, expectations of student, and discussions with the student; (b) instruction—how much time the student spends learning outside school; and (c) environment—support for learning at home, quality of school as rated by parents, knowing student’s friends, and out-of-school activities. Using multiple regression analyses to control for family income, education and background, family structure, and district characteristics, Williams (1998) found that for every dependent variable used (math and reading test scores, GPA, and motivation to work), parents’ educational expectations and out-of-school activities were positively linked. Williams did not find a significant or positive influence on achievement from parent contact with the school or from parent discussions with the child. One might consider that parents of middle-level students tended to be involved with school contacts and child discussions only when grades dropped or there were problems at school (for similar findings, see Paulson, 1994). Williams called parents an “untapped resource” and suggested that “parent–child interactions [could] be altered to enhance in-school performance” (p. 10).

Keith and Keith (1993) analyzed the NELS:88 survey data to look into the influence of PI on student achievement for middle school students. Their analysis showed
that parental involvement had strong relationships to all academic areas considered (reading, mathematics, social studies, and science). The influence of PI centered on the amount of homework and reading parents had students accomplish. TV viewing had no significant relationship to achievement, partly because as time for homework went up, TV viewing went down. Keith and Keith did not control for previous achievement, so reciprocal influences between PI and achievement might have been present. The more students achieved, the more parents were involved, and then the more students achieved. Using their analysis of the NELS:88 data, Keith and Keith raised questions about the higher correlation of PI to achievement than the correlation of SES to achievement. They criticized research that concluded that PI was more predictive of achievement than was SES (e.g., Walberg, 1984a) as being too simplistic a conclusion. The analysts suggested that SES had an indirect effect on achievement through PI. Students in higher SES families did better in school because of higher PI, not just because of higher SES. Thus, SES had an indirect effect on achievement through parental involvement. Keith and Keith concluded that if PI were going to be used to surpass the impact of family background on student achievement, increases of PI must be greater for low-SES students than for others (Discussion section, para. 7).

Thinking of involvement as both interactive and located outside of the school building opened the door to new interpretations of PI and led to further study of family influence on education. Also using data from the NELS, Ho Sui-Chu and Willms (1996) divided involvement at school and parent actions at home into four dimensions to determine whether student achievement was related to (a) discussing school activities, (b) monitoring a child’s out-of-school activities (at-home dimensions), (c) contact between
parents and school personnel, and (d) volunteering in school, attending conferences, and attending open-house meetings (at-school dimensions).

Ho Sui-Chu and Willms (1996) showed that involvement at home—for example, discussion of school activities and program planning—had a strong relationship to student achievement. When considering at-home dimensions of involvement, there was “virtually no relationship” between the level of home supervision and family SES (p. 137). Their work indicated a higher level of home supervision for Hispanics than for Whites, and little relation between communication with school staff and family structures of varying economic status. Other studies reflected similar results (e.g., Ritter, Mont-Reynaud, & Dornbusch, 1993). Ho Sui-Chu and Willms concluded that their analysis did not support the belief that parents with low SES placed less emphasis on the importance of schooling than did parents with high SES, or that parents viewed education as the responsibility of school personnel alone.

Deslandes and Bertrand’s (2005) study, discussed earlier, illuminated further the motivational factors necessary to increase PI at home. They found that parents became involved in the schooling of their secondary students more often when asked by their children than when they perceived it to be their duty. When children asked their parents to help with homework, listen to them read, or discuss a TV program, PI went up. Family background accounted for approximately 10% of the variance of the models studied, whereas at-home PI accounted for approximately 30%.

Mapp’s (2002) case study of the O’Hearn School in Boston reflected earlier PI studies among low-SES and various ethnic populations (e.g., Clark, 1993; Ho Sui-Chu & Willms, 1996; Ritter et al., 1993; Walberg, 1984a; Williams, 1998). These studies
showed a strong desire to be involved in their children’s learning and schools—or actual involvement—among parents of various ethnic and income backgrounds. O’Hearn School parents were motivated to become more involved as their own children responded positively to parent participation, and parents wanted to be acknowledged for their work to instill the value of education outside of the school. O’Hearn staff utilized a “joining process” (p. 8) to strengthen the school community. The joining process is an invitation theory strategy built on “trust, respect, optimism, and intentionality” defined by Purkey (as cited in Achilles & Smith, 1999) as “an intentional act designed to offer something beneficial for consideration (p.9)” (p. 220). O’Hearn parents described it as a process whereby “the school community welcome[d] parents into the school, honor[ed] their participation, and connect[ed] with parents through a focus on the children and their learning” (Abstract section). Mapp’s findings refuted the argument that parents of various ethnic or SES backgrounds did not care and emphasized a need to embrace multiple forms of PI to include accessing the work of parents at home to support the mission of schools and the achievement of children.

To distinguish conclusions drawn from qualitative versus quantitative PI studies, a meta-analysis (Fan & Chen, 1999) of the quantitative studies concluded that there was a moderate relationship between PI and student achievement. Parent expectations for their children’s achievement had the strongest relationship to achievement, whereas home supervision had the weakest. Fan and Chen also found that the relationship of PI to achievement was stronger when a less subject-specific indicator was used to define achievement (e.g., overall GPA vs. math grade).
Studies and research reviews at the preschool and elementary levels showed that when parents were actively involved when their children were at these stages, their children's skills were stronger, and the effects of PI seemed to last even into secondary school (e.g., Henderson & Berla, 1994; Marcon, 1999; Miedel & Reynolds, 1999). The studies and reviews of studies on PI in secondary schools indicated that PI influenced student achievement even after students left elementary school (e.g., Catsambis & Garland, 1997; Keith & Keith, 1993; Miedel & Reynolds, 1999; Shumow & Miller, 2001; Xu, 2004), impacted the attitudes of parents about school (e.g., Prater, Bermudez, & Owens, 1997; Sanders, Epstein, & Connors-Tadros, 1999; Trusty, 1999), and strengthened or harmed relationships among teachers, parents, and children (e.g., Eccles & Harold, 1993; Simon, 2001).

Some studies documented diminishing amounts of PI as children grew older (e.g., Connors & Epstein, 1994; Dauber & Epstein, 1993; Izzo & Weissberg, 1999; Steinberg & et al., 1996). Using survey data from teachers for 1,205 kindergarten through third-grade students, Izzo and Weissberg (1999) found that frequency of parent-teacher contact, quality of parent-teacher interaction, and parent participation in activities either at home or at school declined over the length of the longitudinal study. In Beyond the Classroom: Why School Reform Has Failed and What Parents Need To Do (Steinberg, Brown, & Dornbusch, 1996), the authors discussed how their 3-year study of over 12,000 high school students and interviews with over 500 parents indicated that parents were just as disengaged in their children's learning as the students were. They called for more PI as one solution to the low levels of student achievement in America. Connors and Epstein's
(1994) survey work indicated the desire among teachers, students, and parents for more PI at the secondary level, however. To wit—only 23% of students gave notice to parents of upcoming PI activities, parents asked for more notice upfront from teachers when students were struggling, and the majority of students (53%) said they felt lost on assignments when left on their own.

Several researchers documented the changing nature of PI as students transitioned from elementary to secondary education. One small study of 60 families (Shumow & Miller, 2001) and an analysis of the NELS:88 data (Desimone, 1999) found negative correlations between grades and at-home PI for secondary students. Parents helped more with homework when students were average achievers or were struggling in school, the authors suggested, making their PI more reactionary than proactive. Shumow and Miller found a positive correlation between at-home PI and student attitudes toward school. At-school involvement by parents, however, was positively correlated to higher grades but was not related to test scores or student attitudes toward school.

Catsambis and Garland (1997) compared the survey data from the NELS:88 with the Second Follow-up Study from 1992. Their findings showed that as children progressed from 8th to 12th grade, parents monitored work less often and became less involved in monitoring students’ individual behaviors. The PI was centered more on the range of learning opportunities at school and plans for postsecondary education. The authors concluded that PI did not lessen over time; instead, it “shift[ed] its focus from individual behaviors to learning opportunities” (p. 41). However, Desimone’s (1999) analysis of the NELS:88 data showed that student-reported discussion with parents about learning was a greater predictor of achievement for White students than for Black, Asian,
or Hispanic students. It might be that topics of discussion between students and their parents varied among the reporting groups.

There was evidence from both research and data analyses around theories such as Epstein’s (1995) that PI diminished in frequency as children advanced from elementary to secondary grades. Individual student behaviors seemed to be monitored less as parents turned their focus to discussing goals and general educational direction with students. Specific monitoring of homework had a negative correlation with student grades and attitudes toward school, probably because that level of monitoring was due to a child’s poor performance in school. Parents and students reported a desire for more PI at the secondary level.

There were multiple, complex factors reported in various studies on why parents were motivated to limit or increase PI (e.g., lack of social and cultural capital, experiences of denial of opportunity and discrimination, language barriers, lack of time, feelings of inadequacy and teacher superiority, grade level of the child, a sense of self-worth, experiencing child success, requests for help from children, and being considered a child’s first teacher). Researchers categorized PI into various types, including at-home and at-school PI. The goals for each type were to improve relationships with students, teachers, and community and to improve student achievement. The literature indicated that PI was positively correlated to higher income parents, parents with higher levels of education, feelings of belonging, perceptions of shared responsibility for a child’s learning, less retention, increases in reading skills, and overall increases in student success. When researchers included at-home PI, many of these same correlations remained positive, even when controlling for SES, ethnicity, or the educational levels of
the parents. Parents of varying cultural backgrounds valued education similarly but responded differently (monitoring homework, using additional tutors, considering more than the academic needs of the child) when demonstrating that value.

The research and theories reviewed in the literature assisted in establishing a foundation for considering PI when researching methods to improve student school success. PI has been thought of as important by various groups, including families of low SES and families from various ethnic groups. A principle of particular importance that this author recognizes and other researchers have acknowledged is that PI can take place both at school and in the home. Students spend the majority of their time outside of the school, where parents have the potential to impact the successes or failures of their children greatly. One premise upon which this study was built is that improving student performance at school includes the legitimate pursuit of methods to improve PI at home.

The importance of communication between the school and family was a second premise of this study.

Communication as a Means of Parent Involvement

Communication between persons in the home and at school can impact student achievement; however, perceptions about communication, relationships of parents to their children and to their children’s teachers, barriers to communication, and how communication is defined have impacted communication’s usefulness in improving PI. Communication between the school and home was highlighted as a very important means of keeping parents involved in a child’s education (e.g., Epstein, 1995; National Parent/Teacher Association, 1997). Teachers, surveyed as recently as 2005 (Harris...
Interactive), reported that they viewed communication and involvement of parents as crucial to the success of children, even though they also viewed dealing with parents as a stressful part of their job. The MetLife Survey (Harris Interactive, 2005) also indicated that students reported PI through help with homework and other school problems, even though teacher beliefs about parents providing help were not as strong as student beliefs (p. 80). Survey and focus-group methods used by Guskey, Ellender, and Wang (2006, April) indicated that parents wanted more effective communication from both teachers and school administrators. Miretzky's (2004) qualitative study revealed a mutual desire for parent–teacher communication to transition from one-way to two-way in an environment of respect and timely collaboration: “. . . [T]eachers want[ed] parents to check in with them before believing students’ versions of events; while parents want[ed] timelier notification of concerns about student problems” (p. 828).

Dornbush (1986) reported that parenting style was a more powerful predictor of achievement than education, ethnicity, or family structure were, and that parents who practiced authoritative rather than authoritarian parenting (Baumrind, 1991; Maccoby & Martin, 1983) had higher levels and frequency of communication with their children. Authoritative parents responded to good grades with praise and bad grades with some redirection and offers of help and encouragement. Kemptner and Pomerantz (as cited in Pomerantz et al., 2007) reported similar findings about parenting style and achievement when they studied “person-focused” (e.g., “You must be smart”) and “process-focused” (e.g., “You must have worked hard”) homework assistance (p. 385). Children had enhanced perceptions of competence and mastery when parents provided process-focused assistance.
A study conducted by Search Institute (as cited in Sanders et al., 1999) found that “four practices of parental involvement; discussions about homework, discussions about school and school work, helping with homework, and attending school meetings and events—decline[d] significantly between grades six and twelve” (p. 2). Three of these practices occurred at home and involved interaction between the child and parent. It might be that communication with school staff became more difficult as the child entered secondary school because more teachers were involved in the child’s learning, each having less time to communicate with parents because of increased classes and class size, and parents might have been at a loss as to whom to go when attempting to become involved with the child’s learning (Dornbush & Glasgow, 1996).

However, parents depended upon schools to indicate what types of PI the schools needed from them to support their children (Sanders et al., 1999). Sanders et al. argued that, given such a dependency, schools had a responsibility to seek multiple means for PI to take place. Simon’s (2001) analysis of the NELS:88 data made a case in support of Sanders et al., revealing that parents responded with “greater attendance at postsecondary-planning workshops, more parent–teen discussions about postsecondary planning, more attendance at school activities, increased knowledge of teens’ progress, and more work with their teens on homework” (Abstract section) when they were asked by school staff to increase their PI. Trusty’s (1999) analysis of the same data stressed the effects of parent–student communication beginning in the eighth grade. Students who reported having parent support early on were more likely to plan for higher education 2 years after leaving high school than were students who reported having little or no parent support early on.
Increased communication between the home and school was correlated with higher student achievement. When Desimone (1999) defined student achievement as either grades in the classroom or standardized test scores, "parent–school involvement accounted for more than twice the variation of grades than of test scores," meaning that more change in student grades was attributed to parent involvement variables than was change occurring to students’ standardized achievement test scores (p. 19). The analyst suggested that when communication between teachers and parents increased, relationships between the two grew stronger, positively affecting teachers’ perceptions of students. Those positive perceptions may have affected the grades that teachers assigned more than they affected cognitive learning. The Desimone (1999) study showed a negative relationship between homework help and student achievement across all ethnic and SES groups, suggesting that PI increased when student grades already suffered (p. 24). Communication about post-high school aspirations, however, was not a significant predictor of student achievement for low-SES, Black, or Hispanic students. Desimone opined that factors in the “macro-environment” (p. 23) such as lack of job market opportunities might have diminished the impact of communication about goals after graduation for at-risk students.

J. D. Finn’s (1998) summary of research about PI at home that influenced student achievement included actively organizing the child’s time, monitoring homework, reading to the child and being read to by the child, and having discussions about school. Discussions about school, noted Finn, could be multifaceted; the impact of communication between the parent and child was stronger if it was frequent, was about both challenges and successes in school, and revolved around jointly deciding courses of
study or topics for projects. His earlier analysis (J. D. Finn, 1993) of the NELS:88 data confirmed this summary. “Unsuccessful students report[ed] talking less with their parents about school work and plans, and [had] parents who confirm[ed] that they talk[ed] less with their eighth graders about school experiences in comparison to youngsters who [were] passing or academically successful” (p. 72). The conclusions were significant regardless of the gender or ethnicity of the students.

In a literature review for the Research Committee of the Metropolitan Nashville-Davidson County Board of Public Education, Hoover-Dempsey and Walker (2002) outlined the benefits of effective family-school communication, including gains in student achievement, improvements in student behaviors that lead to achievement, increases in parent satisfaction with the quality of children’s schooling, and increased parental support for teachers and schools’ educational goals. Barriers that often interfered with families’ abilities to engage in effective communication included issues related to family status (e.g., limited educational attainment), pragmatic concerns (e.g., inflexible parental work schedules), and psychological obstacles (e.g., negative memories of personal school experiences). Barriers that often interfered with school staff abilities to engage in effective family-school communication included low levels of systemwide support for improving communications and limited teacher, principal, or system knowledge of alternative strategies to increase (and increase the effectiveness of) family-school communication (p. 2).

One vital component of dynamic school-family partnerships has been the amount of trust that teachers have in parents and that parents have in teachers. Through surveys of 1,234 parents and 209 teachers from a large school district in the Midwest, Adams and
Christenson (2000) found that trust diminished between parents and teachers from elementary to high school as opportunities to communicate decreased. Teachers trusted parents less than parents trusted teachers, partly because teachers had less at stake in maintaining a strong parent–teacher relationship. Other research (Lasky & Moore, 2000) indicated that several factors were negatively impacting any attempts to build stronger relationships between teachers and parents. They include teachers’ sense of being professionals, their low-level interactions with parents, their sense of moral purpose as teachers, and surveillance of parents as providers of a quality home life for children.

Adams and Christenson (2000) argued that school staff must lead efforts to increase trust between parents and teachers by increasing formal and informal interaction between home and school, because when problems arose with individual adolescents, they could best be solved where “information sharing and two-way communication is valued and practiced (p. 493). Ethnicity, gender, and other demographic variables were not predictors of trust levels.

Perceptions about what constitutes communication could be barriers or enhancers of communication as well. Halsey’s (2005) case study of Redmond Junior High in Texas indicated that parents and teachers perceived communication efforts differently. Using Epstein’s (2001b) distinction between institutional and individual communication, Halsey found that teachers’ institutional communicative methods (e.g., open houses, automatic phone dialers, newsletters and flyers) were perceived by parents as simply formal notices, not invitations to become involved. Parents preferred more personal, individual invitations as indications that teachers wanted them involved. Parents wanted personal invitations because these invitations usually clarified the role teachers wanted parents to
play in the event, helped parents feel appreciated, opened the door to additional
volunteering, strengthened the teacher–parent relationship, and increased parent-to-parent
interaction.

Halsey (2005), Sanders and Epstein (1998), and Adams and Christenson (2000)
each found that two-way rather than one-way communication enhanced the relationships
among teachers and parents. When that type of communication existed, it fostered
collaboration with parents as essential partners contributing to the mission of educating
the child. Through collaboration, parents and teachers shared responsibilities for the
child’s success. Vosler-Hunter (1989) described collaboration as “1) mutual respect for
skills and knowledge; 2) honest and clear communication; 3) open and two-way sharing
of information, 4) mutually agreed-upon goals; and 5) shared planning and decision
making” (p. 17). The limited time available for building relationships between the parent
and teacher, the ineffectiveness of traditional occasions to talk (e.g., parent–teacher
conferences), and the need to establish strong relationships before difficulties in a child’s
learning occurred were listed by Swap (1987) as reasons to promote increasing frequency
and quality of communication between the home and school.

Communication has been identified as important by both teachers and parents,
even though problems with trust and limited two-way communication have exerted an
impact on the frequency of quality interaction between the two groups. Literature reviews
and studies centered on communication as a form of PI have shown that communication
was positively associated with student achievement and perceptions about school. Parents
who talked with their children and their children’s teachers more often had students with
higher grades and more positive attitudes about school than did parents who talked with
their children and teachers less often. There was evidence that communication diminished as the children grew older, partly because the school system expanded the number of teacher contacts for each child. Additional barriers to communication included work schedules, negative school experiences by some parents, and limited teacher knowledge about communicating with parents.

Literature about communication as a means of PI supported this author's research because it confirmed the role of communication as one important type of at-home PI that could improve student success in school. Increasing the frequency of communication and improving its quality (from one-way to two-way) improved opportunities for student success. Improving communication strengthened partnerships between home and school, and opportunities for increasing communication frequency and quality have multiplied since the advent of electronic media.

Electronic Means of Communication Between Parents and School

Moving from paper to electronic means has increased opportunities to communicate and has improved both speed and access to achievement information. Much of the research available used small sample sizes or survey techniques that limited generalizability about the influence of electronic communication between parents and teachers. However, in some studies reviewed, researchers explored various electronic communication tools and their influence on increasing communication and removing barriers for parents to be involved effectively in their children's education. Otterbourg's (1998) report to the U.S. Department of Education cited a need for increased communication opportunities because of increases in single-parent homes, dual-income
earners, parents working multiple jobs, and constraints on the time available for parents to be involved in their children's education. Bauch (1997) pitched the Transparent School Model using dial-up recordings made by the teacher as a means of increasing PI. Although the study showed high frequency of access to the daily recordings by parents, it did not indicate the amount of time added to the teacher's day to make the model successful.

Longfellow (2004) surveyed a sample of Christina (Delaware) School District parents and teachers to assess the use-rate of and attitudes about technology as a medium for communication. Teachers expressed concern about lack of time, lack of parent computer–Internet access, and parents' lack of desire to communicate. On the other hand, parents expressed a strong desire for more information from teachers and were supportive of technology-based methods such as email and Web page use (p. 76). Of particular interest was the asynchronous nature of the communication tools, which allow the parties to communicate without having to be available at the same time to exchange information, concerns, or questions. Longfellow posited that such tools could increase the frequency of communication while addressing some of the barriers to PI such as parent work schedules and language barriers.

Electronic communication forms are quickly becoming dominant in all areas of society. Referencing earlier literature (e.g., Henderson & Mapp, 2002) on the value of PI as a means of addressing student achievement, Furger (2006) made a leap of faith about electronic forms of communication as a means of improving PI. The author identified five electronic solutions: (a) email, (b) Web pages, (c) electronic newsletters, (d) access to online student data, and (e) laptops for students and families. Although these are
intriguing concepts, no evidence was cited by Furger to support these ideas as ways to improve PI.

Rogers (1994) studied frequently and systematically used electronic forms of communication using an experimental design where high school teachers increased the frequency of reports on assessments to parents (weekly) while the control group continued to receive scheduled report cards. Results supported the continuation of research into the value of pertinent classroom information provided to parents more frequently.

Uses of computer software to increase PI were explored with a qualitative study (Durán et al., 2001) where small groups of Latino families worked together on a literacy project and through an action research project (Tobolka, 2006) centered on the use of email and a principal’s Web page. The technology tools provided motivation for parents to interact with their children. Greninger (1991) used computer-assisted messaging for 600 randomly selected high school students to study its influence on student achievement. With an analysis of covariance using 2 years of Stanford Achievement Test data, Greninger found significant positive differences in test results. In addition, his PI survey indicated that “a majority of parents increased their involvement in their children’s learning activities as a result of the computer-assisted voice-messaging intervention” (Abstract section).

Internet Web sites (Lishka, 2002), email use (e.g., Clemente, 2002; Lishka, 2002; Madrid, 1999; Otterbourg, 1998), computers in the home (deGraw, 1990), auto-dialers, voicemail, and messaging (Bissell, 1989; Cameron & Lee, 1997) have been studied to assess influences of their use on parent communication and parent attitudes. Lishka
(2002) surveyed 116 parents in New York and concluded that attitudes toward the use of email were positive, with no significant differences among parents with varying work schedules. Madrid’s (1999) qualitative field study of six parents, students, and teachers found similar positive attitudes toward email use as a means of increasing communication. Clemente’s (2002) field study of 24 parents showed that even though parents found face-to-face communication and phone calls more desirable than they found email, they preferred the frequency and ease of that medium to notes sent home. Using voicemail increased both the quality and the quantity of parent–teacher communication (Bauch, 1997; Cameron & Lee, 1997).

In a research synthesis of 19 studies, Penuel et al. (2002) attempted to determine if technology use increased parent–teacher communication. Penuel et al. found that “the paucity of experimental designs, and the lack of information on implementation made it risky to attribute the improved outcomes to the use of technology” (p. 3). Also, by 2008, very little research had been done on parent and student access to online electronic teacher grade books as a means of increasing parent–teacher communication. These software products are relatively new, and studies have not been designed to test their influence (Penuel et al., 2002). Blanchard and Oliver (1999) concluded that the lack of research around the effectiveness of various types of technology communication tools on learning is due to the difficulty of agreeing on an operational definition of “connection” (p. 68). The writers drew distinctions among real or delayed-time communications that were either one-way or two-way.

Achilles, Reynolds, and Achilles (1997) wrote that whenever a change has been implemented (e.g., increasing PI levels, adding parent access to an electronic grade book,
etc.), communication played a partnership role with the change process. Clarity, cogency, and comprehensibility of communications surrounding the change must have been present in order for the change to be effective. The writers advanced a matrix containing “relation to change,” “message,” methods of sending and transmitting, “targeted audiences,” and “assessment strategies” as key communication elements when a project is going through its initiation, implementation, incorporation, and institutionalization stages (see Figure 4.3 of Achilles et al., p. 133). Perhaps the changes attempted by the use of these technology tools have been caught in the matrix with some of the key elements missing or haven’t advanced far enough along the change process stages.

The literature on using electronic means to support PI reflects society’s growing need to use multiple means of communication as conditions and circumstances change for parents. Alternative forms of electronic communication have been positive for parents occupied with increasing demands on their time. Survey results from parents have supported both the use of email and increasing frequency of access to achievement data. Some studies have indicated that additional electronic messages to parents, voice mail, and email have had an impact on student achievement and attitudes about school. The studies were few in number and offered very small sample sizes, making generalizations to other populations difficult.

Improving access to information and increasing options for parent–teacher contact improved PI, which, in turn, improved opportunities for student success. Epstein (1995) called attention to the importance of interaction among community, parents, and teachers and proposed a model that depicted the influence of the three on the success of children. This study extended that model to the application level by comparing electronic access
frequency of student information with changes in student achievement and attendance. To understand the connection between this study and Epstein’s work, a thorough grasp of Epstein’s theory is important to connect the use of electronic information tools to the value of PI. The remaining two sections of this chapter review the overlapping spheres of influence (OSI) theory and connect it to the theoretical framework of this study.

Epstein’s Theory of Overlapping Spheres of Influence (OSI)

Epstein has written about and collaborated with others on extensive research (e.g., Connors & Epstein, 1994; Dauber & Epstein, 1993; Epstein, 1995; Epstein, 2001a, 2001b; Epstein, Connors, & Salinas, 1993; Epstein, Connors-Tadros, Horsey, & Simon, 1996; Epstein & Salinas, 1993; Epstein, Salinas, & Horsey, 1994; Sanders & Epstein, 1998; Sanders et al., 1999) around the value of parent and community interaction with schools. In 1995, Epstein published the OSI theory to account for the changing roles of the school, home, and community in the effective education of children. Epstein’s (2001b) OSI model (see Figure 1) depicted the dynamic interactions that historically have occurred (and will continue to occur) among the institutions of family, school, and community.

Writing about the theory’s inception, Epstein (2001b) discussed a time when the basic goals of the home and school were alike and each organization reinforced similar teachings with children. As schools became more specialized, subjects taught became more distant from the skills needed in the home, and efforts to provide an equal, common curriculum for all began to distinguish the two institutions such that each fulfilled separate needs for the child. Parents were instructed to prepare children for school by
teaching good behavior, for example, while schools were charged with taking care of the rest of the skills necessary for a child’s eventual successful contribution to society. In the last 50 years, however, external forces have pressured both institutions to collaborate in educating the child: More mothers are graduating with college degrees, child care and awareness of the value of early learning has increased, family structures have been changing, and there has been a recognition of parents as children’s first teachers (pp.24–27).

To reflect these societal changes, Epstein (2001b) theorized that the family, school, and community interests in nurturing children overlapped with varying degrees as controlled by four external forces: (a) time, age, and grade; (b) experience, philosophy, and practices of families; (c) experience, philosophy, and practices of schools; and (d) experience, philosophy, and practices of the community (see Figure 1). Each of these forces impacted the success or failure of the three institutions to nurture and educate children successfully. For example, the spheres of family and school might overlap more greatly when a child is just entering formal schooling because of the practice of including parents in many more school activities in primary grades than when children are in intermediate or high school.

“‘[M]aximum’ overlap was reflected when families and schools operated as true ‘partners’ with frequent cooperative efforts and clear, close communication in a comprehensive program of many important types of parent involvement” (Epstein, 2001b, p. 29). Epstein proposed six types of involvement summarized earlier in this chapter. The six types—parenting, communicating, volunteering, learning at home, decision-making, and collaborating with the community—reflected value and respect for
the roles of all three groups and promoted the idea that PI could take place outside of the school building and still have an impact on attitudes and achievement. Complete overlap of the three spheres would never occur because each institution would always have some practices and functions unique to its purpose.

Figure 1. Overlapping spheres of influence (OSI) of family, school, and community on children’s learning (external structure of theoretical model).


Epstein’s (2001b) OSI theory also had an internal structure that modeled the “interpersonal relationships and influence patterns” among the teacher, parent, and child (p. 30). Included were interactions among and within the institutions for the family, parent, school, teacher, and child (see Figure 2). The interactions could be standard (e.g.,
Figure 2. Overlapping spheres of influence (OSI) of family, school, and community on children’s learning (internal structure of theoretical model).

Note: From School, Family, and Community Partnerships: Preparing Educators and Improving Schools, by J. Epstein, 2001, p. 28. Copyright 2001 by Westview Press. Reprinted with permission of the author. In the full model, the internal structure is extended, using the same key to include: c-o-C = Community and a-A = Agent from community-business.

newsletters, workshops, programs) or individualized (e.g., conferences, notes to and from home, phone calls, emails, and electronic access to grades or attendance reports).

The external (Figure 1) and internal (Figure 2) structures of the OSI model were related as well. External forces of time and experiences influenced the internal interactions and relationships among the three spheres. As these forces and experiences changed, the various forces changed, acting upon the home, school, and community to effectively educate a child. The degree of overlap changed as well. At some points in
time, schools might look increasingly like families, and families might increasingly take on characteristics of schools.

School-like families had persistent and consistent academic schedules of learning for the children from birth onward, for example, including structure for learning and playing. To create more school-like homes, Epstein (2001b) said educators needed to assist with improving (a) parents’ knowledge of how to help children at home, (b) their (i.e., educators’) own beliefs about teacher interests in having parents assist at home, and (c) the amount of guidance from teachers on how parents can help (p. 36).

Staff in family-like schools looked out for the interests of the individual child and acknowledged uniqueness and personal improvement. Certainly, common standards such as graduation requirements and codes of behavior remained in place for everyone, but staff in family-like schools put less importance on uniformity than on individuality (Epstein, 2001b, pp. 31-32). Family-like schools were dependent upon teachers’ understanding and use of child development principles, staff abilities to communicate with students as individuals, staff beliefs about the importance of PI, and a staff’s ability to partner with parents (Epstein, p. 36).

Epstein (2001b) wrote that if teachers controlled the flow of information, communication was limited and sharpened the boundary between the family and school spheres. Epstein proposed that there was more benefit in increasing the overlap among the three spheres than in decreasing it. As discussed earlier, parent desire for quality education seemed to remain constant regardless of background knowledge, social status, or ethnicity. Parents were supportive of more boundary overlap because when communication and cooperation increased, their own attitudes about school and those of
their children seemed to improve. Parents rated teachers higher on quality, principals rated teaching performance higher, and students gained more reading skills in schools where types of PI were in frequent use when compared to schools where PI was less frequent (Epstein, p. 35).

Epstein's (2001b) OSI theory summarized the forces and interaction among family, school, and community and offered a model for these institutions to use when seeking to collaborate on the successful education of children. The model depicted the dynamic change that occurred in families and schools and honored the knowledge and experiences parents, teachers, and students accumulated over time. Epstein proposed that increasing the overlap among the spheres was advantageous to motivation, attitudes, and achievement.

Theoretical Framework for the Present Study

Researchers (e.g., Adams & Christenson, 2000; Bryk & Schneider, 2003; Miretzky, 2004) have begun to look at the trust of parents and the community as assets supporting a child's success in school. Although there may be conflict between the reasons that parents are motivated to get involved in their children's learning (Brantlinger et al., 1996) and the reasons that school policy should focus on increasing the frequency and quality of PI, the theoretical framework upon which this study was based is the belief that PI in a child's schooling is sought after and respected. Rather than viewing PI as subordinate to the authority of the teacher (Lareau, 1989), parents were viewed as partners, taking their place as one of three groups in Epstein's (1995) theory of overlapping spheres of influence (OSI).
With Epstein’s (1995) OSI as the foundational component of this study, access to the teacher’s grade book via the Internet became a technology-based communication medium through which teachers, parents, and students were able to exchange information about school attendance and performance. Within the school’s sphere of influence (labeled SSI in Figure 3), a database of student grades and attendance was created and maintained by schoolteachers and other staff using an electronic grade book. Between the family and school spheres was a device called the Pinnacle Internet Viewer (PIV) that offered an additional opportunity to all families with access to the Internet to pursue communication between the family and school (see Figure 3). Data about formative performance (e.g., assignments, quizzes, projects, and participation), attendance, and summative performance (i.e., assessments) were entered by the teacher, and the PIV sent data reports about individual children to parents who requested this information.

Within the family sphere of influence (labeled FSI in Figure 3), multiple opportunities for intrainstitutional interactions occurred when parents and students accessed the PIV information and were able to discuss data reports. Those parent–child interactions influenced both the child’s performance and the parent’s attitude about the school (see Figure 3). Epstein (2001b) characterized objective environments like this as “school-like” homes (p. 32). The intrainstitutional interaction of the family, in turn, increased the interinstitutional interactions between the family and school.
Using a theoretical structure that valued the input of parents and communities in the education of a child, Epstein (1995) framed the interactions of the three as partnerships rather than one-way directives sent from the school to the parent or community. Student success, the researcher postulated, depended upon three spheres of influence that might or might not overlap. When overlap occurred, messages about hard work, the value of education, attending school, and graduating were heard at home, in school, and
throughout the community. Those messages, when common in all three spheres, increased the likelihood that students would be successful. Epstein’s (1995) OSI theory emphasized the value of partnerships among the three entities in order “to engage, guide, energize, and motivate students to produce their own successes” (p. 701). This researcher used Epstein’s model as the basis for this study’s conceptual framework, because access to the PIV had the potential to increase the overlap between the family and school spheres of influence.

Summary

In this chapter, the researcher reviewed studies, surveys, theories, and other literature centered around three areas pertaining to PI: (a) research and analyses on PI, (b) communication as a means of PI, and (c) electronic means of communication between parents and school. There was strong research support for the role that parents and family play in influencing the success of children in school. Parents and families perform this role both at school and at home. Some of the evidence indicated that monitoring and discussion about school at home have a heavy influence on student achievement. Other evidence indicated a strong connection between parent–teacher communication and student success in the classroom. Relationships became stronger, partnerships were formed between the school and family, and support for student success increased from both spheres within Epstein’s (1995) OSI theory and model. Parents reported a desire to increase the amount of PI with schools, but barriers of several types must be overcome to see the desire realized.

Finally, empirical evidence about electronic communication was sparse and difficult to generalize. However, available studies and analyses indicated positive
attitudes regarding increases in communication between the school and family using electronic means, especially asynchronous means. Additional studies are needed to address the influences of more recent electronic communication products such as Web-based student information systems and online grade books. In Chapter III, the author presents the design and procedures using a mixed-method model to conduct a study comparing frequency of access to an online grade book with changes to student achievement and attendance rates.
III. DESIGN AND METHODOLOGY

Introduction

A parent’s role in the education of the child has been promoted as a very important component of student success (e.g., Clark, 1993; Henderson, 1987; Henderson & Berla, 1994; Henderson & Mapp, 2002). Even though the power of parent involvement has been known for years, the definition has often been limited to parent visits to school (e.g., Morrison, 1978). Ho Sui-Chu and Willms (1996), and others (e.g., Epstein, 1995; J. D. Finn, 1998; Wang & Haertel, 1993) have written about types of PI at home as positively related to school performance regardless of family income, education level, or ethnic background. Types of PI addressed include talking about school with the student, monitoring homework, and setting expectations about a child’s schooling beyond high school.

The lack of communication between parents and teachers and the lack of timely communication about school activities, homework expectations, and school performance have been concerns for our educational system (Adams & Christenson, 2000; Halsey, 2005; Harris Interactive, 2005). Some persons and groups (e.g., Desimone, 1999; Epstein, 1995; Guskey et al. 2006; National Parent/Teacher Association, 1997) have called for increases in communication as one means of involving parents. Others (e.g., Halsey, 2005; Heymann & Earle, 2000; Hoover-Dempsey & Walker 2002) have studied and recommended the removal of barriers that prevent parents from becoming involved and communicating with teachers.
(c) "development," by using the findings from one method to inform the other (p. 22).

The researcher chose the qualitative phase as dominant because the data gathered illuminated not only the results from the quantitative analyses, but also confirmed previous theoretical work and the researcher's current conceptual framework connected to Epstein's (2001b) Theory of Overlapping Spheres of Influence.

In this chapter, the researcher presents the design for the research and methods or procedures used to conduct each phase of the study. The research design, population and sample, data collection process, and analysis strategies are presented for the quantitative approach first. Qualitative components presented next include the research design; assumptions, ethical considerations, and the role of the researcher; and the data collection strategy, data collection process, instrumentation, data analysis methods, and a description of how findings were communicated—that is, data interpretation and legitimation (Johnson & Onwuegbuzie, 2004). The chapter concludes with a summary of the whole study's design and methodology.

Quantitative Approach

Research Design

This applied research focused on parent involvement as its principal investigation using a mixed-methods model with the quantitative phase performed first but taking a subordinate role to the qualitative phase (Johnson & Onwuegbuzie, 2004). Using the two-dimensional classification model for nonexperimental correlational studies proposed by Johnson (2001), the research objective was descriptive, using cross-sectional data to address the following quantitative questions:
1. What is the relationship between the family access rates of the electronic grade book and the grade point averages (GPAs) of students?
2. What is the relationship between the family access rates of the electronic grade book and the attendance rates (ATT) of students?
3. What is the relationship between the changes of family access rates of the electronic grade book between two given time periods and changes in student GPAs between those same time periods?
4. What is the relationship between the changes of family access rates of the electronic grade book between two given time periods and changes in student ATT between those same time periods?
5. How do the relationships studied vary for low- or high-SES students?

The research design was categorized as "nonexperimental" because the researcher did not have direct control over the independent variables (Kerlinger, 1986) and was looking for "inferences about relations among the variables . . . without direct intervention" (p. 348). The study's objective was descriptive because the researcher was primarily describing the phenomena (GBAR and its relation to GPA and ATT) without attempting to "forecast" an event or "explain causes" for the phenomena (see Johnson, 2001, p. 9). The research was classified as "cross-sectional" because the data were collected during a "relatively brief time period" (Johnson, 2001, p. 9).

The dependent variables were student grade point averages (GPAs) in core subjects and attendance (ATT). The independent variable was the grade book access rate (GBAR) of the Pinnacle Internet Viewer (PIV) by family members. For Research Question 5, an additional quantifiable variable studied for influence was socioeconomic
status (SES). In correlational studies, variables must be quantifiable and expressed in numerical form (Johnson, 2000). The variables of GPA, ATT, and GBAR were composed of numerical data (discussed later in this chapter). Correlational studies by themselves provide only a foundation for further study until additional evidence for causality is added (e.g., replication with other data, content validity; Johnson, 2000). This study was a first step in establishing the types and strengths of the relationships between variables.

Population and Sample

The population for this study included the families of all 10th through 12th grade students of a large high school in a school district located in a western state. The demographic characteristics of the school’s student population, summarized in Table 1, indicated that 16.52% (n = 243) of the student population had registered for free or reduced lunch. Ethnicity demographics indicated a Hispanic population of 4.69% (n = 69). For the 2006–2007 school year, 1,471 students were enrolled at the school in Grades 10 through 12.

The sampling method was one of convenience; that is, the sample was made up of all students whose families accessed the electronic grade book at least one time during the second semester of 2006–2007 and were enrolled in the high school during that school year. Families of 772 students accessed student information during that time period. This sample (n = 772) represents 52.48% of the population (N = 1,471).

Table 1 includes both the percentage of users of the PIV in the sample when compared to the building population and percentages within the sample itself. For
example, users of the PIV having students with free or reduced lunch status \((n = 96)\) represented 6.53\% of the building’s population and 12.44\% of the PIV-User sample.
Table 1

Population (High School) and Sample (Users of PIV) Sizes by Demographic

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Population</th>
<th></th>
<th>Sample</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Enrollment</td>
<td>1,471</td>
<td>100.00</td>
<td>772</td>
<td>52.48</td>
</tr>
<tr>
<td>Female</td>
<td>727</td>
<td>49.42</td>
<td>408</td>
<td>27.74</td>
</tr>
<tr>
<td>Male</td>
<td>744</td>
<td>50.58</td>
<td>364</td>
<td>24.75</td>
</tr>
<tr>
<td>Free–Reduced Lunch</td>
<td>243</td>
<td>16.52</td>
<td>96</td>
<td>6.53</td>
</tr>
<tr>
<td>Not Free–Reduced Lunch</td>
<td>1,228</td>
<td>83.48</td>
<td>676</td>
<td>45.96</td>
</tr>
<tr>
<td>Grade (2006–2007)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>593</td>
<td>40.31</td>
<td>301</td>
<td>20.46</td>
</tr>
<tr>
<td>11</td>
<td>393</td>
<td>26.72</td>
<td>247</td>
<td>16.79</td>
</tr>
<tr>
<td>12</td>
<td>485</td>
<td>32.97</td>
<td>224</td>
<td>15.23</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>1,363</td>
<td>92.66</td>
<td>727</td>
<td>49.42</td>
</tr>
<tr>
<td>Hispanic</td>
<td>69</td>
<td>4.69</td>
<td>27</td>
<td>1.84</td>
</tr>
<tr>
<td>Native American</td>
<td>10</td>
<td>0.68</td>
<td>1</td>
<td>0.07</td>
</tr>
<tr>
<td>Black</td>
<td>18</td>
<td>1.22</td>
<td>11</td>
<td>0.75</td>
</tr>
<tr>
<td>Asian</td>
<td>11</td>
<td>0.75</td>
<td>6</td>
<td>0.41</td>
</tr>
</tbody>
</table>

Source: Office of Assessment and Research, Natrona County School District, 2007
Further review of the data in Table 1 reveals the following information regarding gender: 52.85% of PIV-Users had female students, whereas within the overall school population, 49.42% of the students were female. Additionally, the percentage of families whose students were enrolled in the free or reduced lunch program was lower in the PIV-Users sample (12.44%) than in the overall school population (16.52%). Finally, the percentage of families with students identified as White was higher (94.17%) than the percentage of White students within the overall building population (92.66%).

Criteria for Sample Inclusion

Several criteria needed to be met in order for a student record to be included in one or more of the samples used for the comparison of variables. First, the sample included all students having a record of a family member logging onto the PIV at least one time during the third (Q3) or fourth (Q4) quarters of the 2006–2007 school year. Company software tracked PIV use by counting log-ins from November 1, 2006 to June 30, 2007. The researcher required at least one log-in record to minimize the potential of finding a floor effect from nonnormal distribution of data (Helberg, 1995).

Second, each student in the sample had a record of having either an attendance rate (ATT) or a GPA during Q3 and Q4. To be considered for comparisons in Research Questions 1 and 2, students had to have GPAs calculated on the basis of letter grades in math, science, social studies, and languages for the second semester. To be considered for Research Question 3, students had to have both Q3 and Q4 GPAs. To be included in the sample for Research Question 4, students had to have both Q3 and Q4 attendance rates. The same criteria were applied for each comparison of Question 5 as the SES subgroup was studied for its relationship to the variables. Low-users were those students whose
families accessed the PIV less than one time per week, and high-users were those students whose families accessed the PIV one or more times per week. Sample sizes for each of the comparisons resulting from application of the filtering criteria are included in Tables 2 and 3. Comparisons are identified with analysis numbers such as 1.1, 2.1, 3.1, 3.2, and so forth.

To grasp the information contained in the table, consider Analysis 4.1, for example. Analysis 4.1 was a comparison of the changes of grade book access rates from Quarter 3 to Quarter 4 (GBAR_{Q4-Q3}) with the changes in attendance rates for Quarter 3 to Quarter 4 (ATT_{Q4-Q3}). Data from 630 students met the criteria for Analysis 4.1.

Table 2 indicates some noticeable features about the sample sizes identified for addressing Questions 1 through 4. Sample sizes for comparisons of GBAR with GPA were about half as large (n = 343) as those comparing GBAR with ATT (n = 670). For Analyses 3.2 and 4.2, Quarter 3 high-users who were later identified as low-users in Quarter 4 (GBAR_{Q3H}/GBAR_{Q4L}) made up the smallest sample size of the four categories. The sample size was 12 for Analysis 3.2 and 19 for Analysis 4.2. Users who were identified as low-users in Quarter 3 and remained low-users in Quarter 4 (GBAR_{Q4L}/GBAR_{Q3L}) were the largest of the four user-types for both Question 3 (n = 229) and Question 4 (n = 456).
Table 2

Sample Sizes for Each Data Analysis, Organized by Research Questions 1–4

<table>
<thead>
<tr>
<th>Research question</th>
<th>Analysis type</th>
<th>Test Variables</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.1</td>
<td>Pearson’s r GBAR$<em>{S2}$ GPA$</em>{S2}$</td>
<td>343</td>
</tr>
<tr>
<td>2</td>
<td>2.1</td>
<td>Pearson’s r GBAR$<em>{S2}$ ATT$</em>{S2}$</td>
<td>670</td>
</tr>
<tr>
<td>3</td>
<td>3.1</td>
<td>Pearson’s r GBAR$<em>{Q4-Q3}$ GPA$</em>{Q4-Q3}$</td>
<td>343</td>
</tr>
<tr>
<td></td>
<td>3.2</td>
<td>ANOVA GBAR$<em>{Q4L}/$GBAR$</em>{Q3H}$ GPA$_{Q4-Q3}$</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>GBAR$<em>{Q4H}/$GBAR$</em>{Q3H}$ GPA$_{Q4-Q3}$</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GBAR$<em>{Q4H}/$GBAR$</em>{Q3L}$ GPA$_{Q4-Q3}$</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GBAR$<em>{Q4L}/$GBAR$</em>{Q3L}$ GPA$_{Q4-Q3}$</td>
<td>229</td>
</tr>
<tr>
<td>4</td>
<td>4.1</td>
<td>Pearson’s r GBAR$<em>{Q4-Q3}$ ATT$</em>{Q4-Q3}$</td>
<td>630</td>
</tr>
<tr>
<td></td>
<td>4.2</td>
<td>ANOVA GBAR$<em>{Q4L}/$GBAR$</em>{Q3H}$ ATT$_{Q4-Q3}$</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>GBAR$<em>{Q4H}/$GBAR$</em>{Q3H}$ ATT$_{Q4-Q3}$</td>
<td>89</td>
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<tr>
<td></td>
<td></td>
<td>GBAR$<em>{Q4H}/$GBAR$</em>{Q3L}$ ATT$_{Q4-Q3}$</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GBAR$<em>{Q4L}/$GBAR$</em>{Q3L}$ ATT$_{Q4-Q3}$</td>
<td>456</td>
</tr>
</tbody>
</table>

Note: Q3 = Quarter 3; Q4 = Quarter 4; Q3L = Quarter 3, Low User of PIV; Q4L = Quarter 4, Low User of PIV; Q3H = Quarter 3, High User of PIV; Q4H = Quarter 4, High User of PIV.

Table 3 indicates some salient features of the sample sizes identified for addressing Research Question 5. Sample sizes varied greatly when data were composed of either Low- or High-SES sets. For example, when comparing GBAR and GPA data, the High-SES sample ($n = 310$) was almost 10 times larger than the Low-SES sample ($n = 33$). Similar differences in sample sizes were seen for attendance analyses as well (cf. 5.3 and
5.4). As discussed in the preceding paragraph, Quarter 3 high-users who were later identified as low-users in Quarter 4 (GBAQQ4Q3H) made up the smallest sample size of the four categories, and users who were identified as low-users in Quarter 3 and remained low-users in Quarter 4 (GBAQQ4Q3L) were the largest of the four user types. This observation holds true whether one is considering the Low-SES or High-SES group.

**Data Collection Process**

The district's staff advertised on billboards and in local movie theatres to promote access to student grades through the PIV (see Appendix A). All parents from this school were mailed a letter from the school administration in August 2006 explaining the Parent Internet Viewer (PIV) system and were provided with student identification (ID) numbers and passwords for access to the PIV. Personnel in the high school had been using the electronic grade book and the PIV for one year prior to data collection for this study.

The data collection process began when teachers, as part of their daily assigned record-keeping duties, recorded attendance, scores for class assignments and assessments, and other achievement data from their desktop computers using an electronic grade book called Pinnacle (Excelsior Software, 2001). Teachers assigned letter grades according to their own grading policies and recorded attendance according to the school attendance policy. Teacher grading policies were approved by the building administrators. Guidance for grading was provided through a district regulation recommending 93%, 85%, 76%, and 70% cut-off scores for A, B, C, and D designations, respectively.
Table 3

*Sample Sizes for Each Data Analysis for Research Question 5*

<table>
<thead>
<tr>
<th>Research question</th>
<th>Analysis type</th>
<th>Variables 1</th>
<th>Variables 2</th>
<th>Sample size</th>
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</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Pearson’s r</td>
<td>GBAR&lt;sub&gt;S2LowSES&lt;/sub&gt;</td>
<td>GPA&lt;sub&gt;S2LowSES&lt;/sub&gt;</td>
<td>33</td>
</tr>
<tr>
<td>5.2</td>
<td>Pearson’s r</td>
<td>GBAR&lt;sub&gt;S2HighSES&lt;/sub&gt;</td>
<td>GPA&lt;sub&gt;S2HighSES&lt;/sub&gt;</td>
<td>310</td>
</tr>
<tr>
<td>5.3</td>
<td>Pearson’s r</td>
<td>GBAR&lt;sub&gt;S2LowSES&lt;/sub&gt;</td>
<td>ATT&lt;sub&gt;S2LowSES&lt;/sub&gt;</td>
<td>81</td>
</tr>
<tr>
<td>5.4</td>
<td>Pearson’s r</td>
<td>GBAR&lt;sub&gt;S2HighSES&lt;/sub&gt;</td>
<td>ATT&lt;sub&gt;S2HighSES&lt;/sub&gt;</td>
<td>589</td>
</tr>
<tr>
<td>5.5</td>
<td>Pearson’s r</td>
<td>GBAR&lt;sub&gt;Q4-Q3LowSES&lt;/sub&gt;</td>
<td>GPA&lt;sub&gt;Q4-Q3LowSES&lt;/sub&gt;</td>
<td>33</td>
</tr>
<tr>
<td>5.6</td>
<td>Pearson’s r</td>
<td>GBAR&lt;sub&gt;Q4-Q3HighSES&lt;/sub&gt;</td>
<td>GPA&lt;sub&gt;Q4-Q3HighSES&lt;/sub&gt;</td>
<td>310</td>
</tr>
<tr>
<td>5.7</td>
<td>ANOVA</td>
<td>GBAR&lt;sub&gt;Q3H/GBARQ4L&lt;/sub&gt;</td>
<td>GPA&lt;sub&gt;Q4-Q3LowSES&lt;/sub&gt;</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GBAR&lt;sub&gt;Q3H/GBARQ4H&lt;/sub&gt;</td>
<td>GPA&lt;sub&gt;Q4-Q3LowSES&lt;/sub&gt;</td>
<td>4</td>
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<tr>
<td></td>
<td></td>
<td>GBAR&lt;sub&gt;Q3L/GBARQ4H&lt;/sub&gt;</td>
<td>GPA&lt;sub&gt;Q4-Q3LowSES&lt;/sub&gt;</td>
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<td></td>
<td></td>
<td>GBAR&lt;sub&gt;Q3L/GBARQ4L&lt;/sub&gt;</td>
<td>GPA&lt;sub&gt;Q4-Q3LowSES&lt;/sub&gt;</td>
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<td>ANOVA</td>
<td>GBAR&lt;sub&gt;Q3H/GBARQ4L&lt;/sub&gt;</td>
<td>GPA&lt;sub&gt;Q4-Q3HighSES&lt;/sub&gt;</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GBAR&lt;sub&gt;Q3H/GBARQ4H&lt;/sub&gt;</td>
<td>GPA&lt;sub&gt;Q4-Q3HighSES&lt;/sub&gt;</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GBAR&lt;sub&gt;Q3L/GBARQ4H&lt;/sub&gt;</td>
<td>GPA&lt;sub&gt;Q4-Q3HighSES&lt;/sub&gt;</td>
<td>40</td>
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<tr>
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<td></td>
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<td>GPA&lt;sub&gt;Q4-Q3HighSES&lt;/sub&gt;</td>
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*(table continues)*
<table>
<thead>
<tr>
<th>Research Analysis Test Question</th>
<th>#</th>
<th>Type</th>
<th>Variables</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5.9</td>
<td>Pearson’s r</td>
<td>GBARQ4-Q3LowSES ATTQ4-Q3LowSES</td>
<td>66</td>
</tr>
<tr>
<td>5.10</td>
<td></td>
<td>Pearson’s r</td>
<td>GBARQ4-Q3HighSES ATTQ4-Q3HighSES</td>
<td>564</td>
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<td>5.11</td>
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<td>ANOVA</td>
<td>GBARQ3H/GBARQ4L ATTQ4-Q3LowSES</td>
<td>2</td>
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<td></td>
<td></td>
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<td>6</td>
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<td></td>
<td></td>
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<td>GBARQ3L/GBARQ4H ATTQ4-Q3LowSES</td>
<td>7</td>
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<td>51</td>
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<td>ANOVA</td>
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<td></td>
<td>GBARQ3H/GBARQ4H ATTQ4-Q3HighSES</td>
<td>83</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>GBARQ3L/GBARQ4H ATTQ4-Q3HighSES</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GBARQ3L/GBARQ4L ATTQ4-Q3HighSES</td>
<td>405</td>
</tr>
</tbody>
</table>

Note: LowSES = Low Socioeconomic Status; HighSES = High Socioeconomic Status; Q3 = Quarter 3; Q4 = Quarter 4; Q3L = Quarter 3, Low User of PIV; Q4L = Quarter 4, Low User of PIV; Q3H = Quarter 3, High User of PIV; Q4H = Quarter 4, High User of PIV.

State law required students under 11th grade to attend school, and this district had no mandatory attendance policy for number of days missed to retain school membership for class enrollment or successful course completion.

Data were collected from three data sources: (a) static files created from Pinnacle that held information about student grades, (b) static files about user log-in rates from the PIV exported by staff members from Interyx, a company whose programmers had created
a software solution allowing statistical data in the form of user log-ins to be counted, and (c) exported static files from the district's student information system (SIS) that contained demographic and attendance information.

Pinnacle provided the avenue for collection of grades posted 4 times during 2006–2007 at the end of each quarter (Q1, Q2, Q3, and Q4). For this study, GPA included grades in the core areas of math, science, language arts, and social studies. GPAs were determined by summing letter-grade values for A, B, C, D, and F (4, 3, 2, 1, and 0, respectively) and averaged. If a student did not have all four grades on file, that student was excluded from the sample. Pinnacle was also the software teachers used to record student course absences. Absence data were aggregated into the district SIS to create a full-day or half-day attendance rate (ATT).

Interyx software tracked family use of the PIV, and the system stored the data, thereby providing the avenue for this researcher to gather data for analyses. Family members participated voluntarily, and data were collected using student IDs instead of student names. Interyx software tracked PIV user access frequency including counts of requests for reports on student achievement and attendance as itemized in Table 4. If a family member accessed any of the reports listed in Table 4 as part of a log-in event, that event was considered as one log-in count for that student. (PIV access was gained using identification and password code combinations which permitted family members to access student information particular to students from that household). The static file containing access counts was sent by Interyx staff members to district staff for merging with district SIS and Pinnacle data.
### Table 4

**Descriptions of Reports Available From the Pinnacle Internet Viewer (PIV)**

<table>
<thead>
<tr>
<th>Report name</th>
<th>Report description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance</td>
<td>Daily class-by-class report of absences</td>
</tr>
<tr>
<td>Class Grades</td>
<td>Assignments and grades from a single class</td>
</tr>
<tr>
<td>Class Information</td>
<td>Teacher and course names for all courses in the student’s schedule</td>
</tr>
<tr>
<td>Missing Assignments</td>
<td>Missing assignments for a student in a single class</td>
</tr>
<tr>
<td>NCSD #1 Dual Report Card</td>
<td>Most recently updated student grades and performance on content standards</td>
</tr>
<tr>
<td>Objectives Based Report Card</td>
<td>Most recently updated report on performance on content standards</td>
</tr>
<tr>
<td>Discipline</td>
<td>*Teacher notes about a student’s behavior</td>
</tr>
<tr>
<td>Progress Report</td>
<td>Most recent grades in all courses in one report</td>
</tr>
</tbody>
</table>

*Not part of a student’s permanent discipline record. Source: Information provided from Natrona County School District Technology Department.

The district SIS held the third file for use in the researcher’s analysis. It contained information about attendance, student demographics, and official records of final grades entered by teachers into Pinnacle. Through dynamic electronic exchange, information gathered by Pinnacle was ultimately stored in the SIS as part of a student’s permanent record. The researcher received from district staff a single dataset merged from these sources: (a) student core area grades and attendance rates from Pinnacle, (b) access counts from the PIV, and (c) student demographics and attendance from the SIS. The
files were able to be merged because of the use of a single set of unique student IDs for all three databases. All identifiers were stripped from the dataset before the data were provided to the researcher.

Data Analysis Strategies

Statistical analyses were conducted for the variables of GPA and ATT to determine the strength and type (positive or negative) of their relationships with access rates. Pearson’s correlation coefficient, $r$, was used to determine the relationships between GBAR and the variables GPA and ATT. Tests of significance (2-tailed) were part of the data analyses to determine the degree of rarity of the correlation (Witte & Witte, 2007). Finally, levels of variance ($R^2$) or the “coefficient of determination” (Leedy & Ormrod, 2005, p. 266) were determined to quantify the percentage of the variation accounted for by the relationship of GBAR to either GPA or ATT. Analyses of variance (ANOVA) were used to determine whether changes in either variable (ATT or GPA) were related to changes in the variable GBAR when GBAR was categorized into four groups of high-frequency (GBAR Hi) and low-frequency (GBAR L) users.

For the first research question, family members must have accessed the PIV at least one time during second semester for the access rate to be included in the sample. Pearson’s $r$ was used to determine the strength and type of relationship between GBAR and GPA. Pearson’s $r$ was also used to determine the strength and type of relationship between GBAR and ATT in Research Question 2.

The third and fourth research questions addressed what the relationship was between changes in GBAR and changes in either GPA or ATT from two quarters (Q4-Q3). The results of those analyses yielded information about correlation direction and
Internet access has the potential to become a primary means of communicating attendance and achievement, but is a relatively new phenomenon to be used on-demand to monitor a child’s performance or lack thereof. That level of access may have implications regarding perceptions about communication quantity and quality between the home and school. The researcher chose a qualitative approach performed after the quantitative data had been analyzed to study perceptions from parents, teachers, and students on the quantity and quality of communication between the family and school as well as the quality and quantity of communication at home following access to the PIV. The intent was to “elucidate” the quantitative research by providing some “depth, detail, and meaning to the findings” (Patton, 2002, p. 193).

The researcher chose a qualitative approach to gain insights about Internet grade access and to connect those insights to Epstein’s (1995) theoretical perspectives regarding partnerships between the home and school. Stratified, purposeful, intensity sampling (Miles & Huberman, as cited in Marshall & Rossman, 1999) was used to determine parent, student, and teacher participants for telephone interviews where open-ended qualitative interviews provided the data collection strategy to explore these questions: (a) What evidence did telephone interviews provide regarding the use of the electronic grade book as a means of improving the rate of communication among parent, students, and teachers, and (b) what evidence did telephone interviews provide regarding the use of the electronic grade book as a means of improving the quality of communication among parent, students, and teachers? Quality of communication
examples included types of PI described by Epstein (1995) as communicating about school programs and student progress (Type 2) and involvement of the family in learning activities at home (Type 4). Table 5 contains a summary of all six types of PI.

Data from telephone interviews were categorized and interpreted in terms of similarities and differences among parent, teacher, and student responses. The researcher described the data related to frequency and quality of communications among parents, students, and teachers. "Deductive analysis" was used to apply the findings to an existing framework, namely, Epstein's (1995) OSI theory, and "inductive analysis" was used to discover other themes and patterns in the data, (Patton, 2002, p. 452).
Table 5

Descriptions of Epstein’s Six Types of Parent Involvement

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Parenting: Basic parenting obligations for the child’s health, safety, and preparedness for school and for providing positive home conditions that support educational progress.</td>
</tr>
<tr>
<td>2</td>
<td>*Communicating: Basic obligations of schools to communicate with families regarding school programs and student progress.</td>
</tr>
<tr>
<td>3</td>
<td>Volunteering: Parents’ participation at school and participation in school activities and events.</td>
</tr>
<tr>
<td>4</td>
<td>*Learning at Home: Family involvement with learning activities at home, including homework and other curriculum-related activities and decisions.</td>
</tr>
<tr>
<td>5</td>
<td>Decision Making: Family involvement in school decisions, governance, and advocacy through PTA–PTO, committees, and other parent organizations.</td>
</tr>
<tr>
<td>6</td>
<td>Collaborating With the Community: Coordinating community resources and services for students, families, and the school that enhance the learning opportunities of children and provide services to the community.</td>
</tr>
</tbody>
</table>

Assumptions, Ethical Considerations, and the Role of the Researcher

From this study's beginning, the researcher hypothesized that access to the PIV would be welcomed by parents and students, with some reluctance exhibited by teachers. The PIV was an add-on benefit to an electronic grade book pilot made available to parents after a year of grade book implementation. Given teachers' frustration with implementing the electronic grade book within the classroom, the researcher assumed no less frustration among teachers with the implementation of the PIV in the home.

The researcher also made some assumptions about parent interest in the PIV. It seemed logical that parents would look forward to having immediate access to their child's grade and attendance records. The researcher also assumed that PIV use would be regular and common for all parents and students as they sought feedback on performance and attendance.

The ethical guidelines of the study were addressed by using the informed consent forms and maintaining confidentiality of the data. After the researcher secured permission to use data and telephone interviews from the district's superintendent and the building's principal (Appendix B), Seton Hall's Institutional Review Board (IRB) reviewed and approved the study's design and methodology (Appendix C). Prior to any participation in telephone interviews, parents and teachers received letters of solicitation (Appendix D) and signed consent forms (Appendix E) authorizing the researcher's assistants to conduct the telephone interviews and collect information produced during the interviews. Parents or guardians provided permission for their students to participate (Appendix F) prior to the students' self-assent (Appendix F). All interviews were conducted over the telephone at a time convenient to the participants.
USB memory key (rather than on a computer internal drive) accessible by a password known only to the researcher. The drive itself was locked in the same filing cabinet and destroyed after 3 years.

To inform the reader of the potential for bias, it is important to reveal connections the researcher had to the PIV and district studied. The researcher was an employee of the school district from which the data and samples were taken. Three years prior to the use of the PIV, the district and researcher became involved in the acquisition of Pinnacle as part of a project piloting the use of an electronic grade book by the legislature and the state’s Department of Education. With the piloting of Pinnacle came the use of PIV as an ancillary software.

**Data Collection Strategy**

To parallel the members in two of the three spheres in Epstein’s OSI theory, the categories of parent, student, and teacher were used as units of analysis. Fifteen telephone interviews were sought—five each with parents, students, and teachers—to capture perceptions about the use of the PIV as a tool for improving communications between parents and their own children, parents and teachers, and students and teachers. The researcher reasoned that five intense users of the PIV from each user group would provide rich information to compare PIV use and would reveal strengths or weaknesses of the tool as a means of increasing understanding of its use.

To identify potential participants for the telephone interviews, grade book access rate (GBAR) data from the 2006–2007 and 2007–2008 school years were reviewed. Families with access rates among the top 20% of users of PIV were chosen by a district staff member having access to parent names and addresses.
The researcher's assistants contacted 54 parents by mail (Appendix D) to create a list of five assenting participants. Telephone interviews with parents utilizing the PIV at the highest rates (top 20%) provided "intensity sampling" where members were "information-rich" (Patton, 2002, p. 243) and best able to discuss the PIV and its influence on communication. Parents signed forms that detailed the use of the information gathered for the study prior to the beginning of the interview and were given copies. Ultimately, five parents agreed to participate, and three actually completed the interviews, which took place at times convenient to them.

To create a list of potential participants for the student interviews, a district staff member used the same list of high-rate PIV users to generate a contact and call list of parents or guardians having students enrolled in that high school. First, the research assistants contacted 54 students through a letter mailed to parents or guardians (Appendix F) and then sent that letter to another set of 38 parents-guardians until a list of five assenting students having consenting parents was created. To participate, students signed their own assent forms after turning in forms signed by their parent(s)-guardian(s). Students 18 years old or older did not provide parent-guardian permission forms to participate. Five students agreed to participate, and three actually completed the interviews at times convenient to them. One student cited time as a factor in the decision not to participate. After repeated attempts, the research assistant was unable to make contact with the fifth student for the interview.

The teacher interviews were generated by seeking permission from the school's administrator to invite teachers via letter of solicitation (Appendix D). Teachers who taught any of the four core areas at any time during the 2006–2007 and 2007–2008
school years and supervised a homeroom of students were invited to participate. A research assistant contacted teachers by email with follow-up phone calls until at least five teachers were confirmed for participation in interviews. When five teachers had volunteered, the research assistants conducted telephone interviews at times convenient to the participants. Teachers signed consent forms that detailed the use of the information gathered for the study prior to the beginning of the interviews and were given copies. Ultimately, five teachers participated in the telephone interviews.

Data Collection Process

After participants were selected through the solicitation process and all consent–assent forms were confirmed as signed, two research assistants trained to deliver the open-ended questions interviewed participants over the telephone using a one-to-one format until all interviews were completed. The research was conducted over the telephone at a time convenient for each participant and from an office in the district where telephones and recording devices were readily available for use by the research assistants.

Each research assistant began the interview session by reviewing the informed consent form with the participant (i.e., purpose of this research, a description of procedures, voluntary nature of participation, permission to record the interview, confidentiality of participants and collected data). Next, the research assistant used an interview script (Appendix G) to ask prescribed questions. Questions were worded in a completely open-ended format to capture participant perceptions and experiences. During the session, the research assistant used a consistent set of questions, paying attention to the wording and sequence of questions so that all participants were asked the same basic
questions in the same order to reduce interviewer effects and bias. The script ensured “that the same basic line[s] of inquiry [were] pursued with each” person (Patton, 2002, p. 343).

Every session ended with this question: “If there were something about the PIV that I didn’t ask you today, but you want me to know, what would that be?” After each participant was given the opportunity to respond, the research assistant thanked the participant for his–her feedback and provided a phone number and mailing address for consultation at any time during or after the study. The telephone interviews took approximately 8 minutes for the adult participants and 5 to 7 minutes for student participants. Each interview was audio-recorded and transcribed. Although no research equipment came in contact with any participant, an Olympus VN-4100PC audio-tape recorder was used to obtain interview data.

Instrumentation

The researcher created three interview scripts (Appendix G) developed around five a priori categories (see Table 6) covering two general areas of information: (a) perceptions of the PIV’s impact on the quantity of communications among parents, students, and teachers and (b) perceptions of the PIV’s impact on the quality of communications among parents, students, and teachers. Quality of communication examples included the types of PI described by Epstein (1995) as communicating about school programs and student progress (Type 2) and involvement in learning activities at home (Type 4).
Table 6

*A Priori Categories Used for Interview Script Design and Participant Response Analyses*

<table>
<thead>
<tr>
<th>A Priori Category</th>
<th><em>Question Numbers from Interview Script</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parent</td>
</tr>
<tr>
<td>1. Quantity of Communication among Parents, Students, and Teachers</td>
<td>5, 11</td>
</tr>
<tr>
<td>2. Quality of Communication among Parents, Students, and Teachers</td>
<td>7, 9</td>
</tr>
<tr>
<td>3. Communicating About School Programs and Student Progress</td>
<td>4, 6, 9, 10</td>
</tr>
<tr>
<td>4. Involvement in Learning Activities at Home</td>
<td>8</td>
</tr>
<tr>
<td>5. Other</td>
<td>12</td>
</tr>
</tbody>
</table>

*Note: Actual questions for each a priori category can be found in Appendix G.*

To assess each interview script's design for face validity—that is, "does it look and feel right?” (Babbie, as cited in Achilles & Finn, 2006, p. 259)—two parents and two teachers known to use the PIV in addition to two members of the district’s communication office trained in interview strategies reviewed the instruments for clarity in wording to represent the intent of the research questions accurately.
Data Analysis Method

The researcher categorized transcripts from the telephone interviews to look for similarities and differences in responses among parents, teachers, and students. The researcher analyzed the descriptive data, looking for meaningful content about communication that matched two of Epstein’s (1995) six types of PI: (a) communicating about school programs and student progress (Type 2) and (b) involvement in learning activities at home (Type 4).

Miles and Huberman (1994) defined data analysis as consisting of three “concurrent flows of activity”: (a) data reduction, (b) data display, and (c) conclusion drawing/verification (pp. 10-11). Data captured from the transcribed audio tapes were processed (reduced) by reading and rereading, then coded around a priori and other meaningful categories, themes, patterns, relationships between variables, and distinct differences among the three types of participants (Miles & Huberman, 1994; Patton, 2002). Themes for a priori deductive analysis included identifying and coding information around (a) quantity of communications among parents, students, and teachers; (b) quality of communications among parents, students, and teachers; (c) communicating about school programs and student progress; (d) involvement in learning activities at home; and (e) other.

Communication of Findings

Data from these reduction methods were organized into a data display to help the reader (and researcher) learn about the experiences of the individuals interacting with the PIV. The researcher created tables to organize the data to reflect the data types and frequencies emerging from the coding exercise. Using such a design and mixed
methodology helped to limit the possibility of overweighing a single vivid piece of information or underestimating the value of information contained in lengthy portions of the transcriptions (Miles & Huberman, 1994).

The researcher’s approach to communicating the findings from the data analysis was based upon Taylor and Bogdan’s suggestion to relate practice to theory (as cited in Marshall & Rossman, 1999, p. 158). Once the data reduction methods had been applied and data displays (tables) had been created depicting the types and frequencies gathered from coding the descriptive data, the researcher identified similarities and differences reflected in the data. Those findings along with the findings from the quantitative phase of this study were compared and linked to the conceptual framework (depicted in Chapter II, Figure 3, p. 72). The summarized data were then linked to the more general theoretical constructs of Epstein’s (2001b) OSI theory.

Summary

In this chapter, the researcher presented the design and procedure used to conduct a mixed-method applied research study where the quantitative phase was performed first and the qualitative phase was dominant. Advantages of this design included triangulation of data sources and the opportunity for the analysis of results from one approach to inform the other. Research design, population and sample, data collection process, and analysis strategies were presented for the quantitative study. Components of the quantitative portion included a nonexperimental research design utilizing the variables of GPA, ATT, and GBAR and studying the nature of the relationships among the variables when disaggregating by SES subgroups. Sample data from one semester were collected from a large high school in a western state using static files stripped of student
identification codes. Pearson’s $r$ correlations were conducted to establish relationship direction and strengths between variables. ANOVA procedures were used to compare differences among dependent variables derived from four categories of the independent variable.

Qualitative components discussed include research design, telephone interview design, data collection process, instrumentation, and data analysis methods. Specifically, the researcher used a stratified purposeful sampling method on high-rate users of the PIV to secure participants for parent, student, and teacher telephone interviews. The researcher conducted the interviews with a structured interview process kept on topic by the use of an interview script. Data were coded with a priori themes. Those findings along with the findings from the quantitative data were summarized and linked to the conceptual framework and Epstein’s (2001b) OSI theory.

Chapter IV details the actual analyses and results of both the quantitative and qualitative components of the study.
IV. PRESENTATION AND ANALYSES OF THE DATA

Introduction

Since the advent of the Internet, parents and students have had increasing opportunities to obtain information electronically about student achievement and attendance. Research on the relationship of this type of access to student achievement has been minimal, and little is known about electronic access improving the quantity and quality of parent, student, and teacher communication around achievement and attendance for the secondary student.

The problem for the researcher was to investigate whether access to an electronic grade book could address both lack of communication and lack of timely communication identified by parents, teachers, and researchers about student performance and communication's relationship to attendance and achievement. School officials needed to understand whether the use of an electronic grade book was related to student achievement, attendance, and the quantity and quality of communication with parents. Time, money, and staff have been invested in this resource to take advantage of parental involvement (PI) at home and to increase communication about school among teachers, parents, and students.

The purpose of this study was to examine the influence of family access to an electronic reporting mechanism in the home on student achievement, attendance, and home-school communication. The researcher investigated (a) the relationship between family electronic grade book access (GBAR) and student achievement (GPA), (b) the relationship between GBAR and student attendance (ATT) rates, and (c) perceptions
quantifiable variable studied was socioeconomic status (SES). A mixed-method approach was used to address the purposes of the study, with the quantitative phase and then the qualitative phase performed sequentially.

In this chapter, the researcher presents the data used for the study and the analyses of the data for each phase of the study. For the quantitative phase, descriptive statistics, analyses of correlation coefficients, and ANOVAs are presented to answer Research Questions 1 through 5. Using the methods of analysis described in Chapter III for the qualitative phase of the study, analyses of data and their results are presented that answer Question 6. This chapter concludes with a summary of results.

Results and Analyses of Data from the Quantitative Phase

Descriptive and Contextual Information

The population for this study included the families of all 10th through 12th grade students of a large western state high school in the 2006–2007 school year. For the 2006–2007 school year, 1,471 students were enrolled at the school in Grades 10 through 12.

Of the population’s families eligible to use the Parent Internet Viewer (PIV), families of 772 students accessed student information from the PIV during that time period. This self-selected group of PIV users represented 52.48% (n = 772) of the population (N = 1,471). Since the actual group size changed for each of the questions explored, descriptive statistics are provided for each of the research questions. Though the researcher hereafter refers to the self-selected group as a “sample” for ease of discussion, the sample is not a representative portion of the entire school population.
Descriptive data indicated the school had a small ethnic population, the county had a low unemployment rate (2.8% reported by Mast, 2007), and at least 71.00% of county residents had access to the Internet at home (ETC Institute, 2005). The sample was taken from the population of families who had students enrolled in the high school and accessed the PIV at least one time during the second semester of that school year. Even though the PIV was available to families for the entire 2006–2007 school year, data about access frequency were gathered only during the second semester due to problems with the PIV frequency counter.

Research Question 1

What is the relationship between the family access rates of the electronic grade book in a given semester and the core course GPAs of students for that semester? As data were collected from November 1, 2006 forward, a dataset for the entire second semester was used for comparison. Data from students having core course GPAs were first categorized by frequency of grade book access. The mean grade book access rate for students having a GPA in core courses was .73 times per week (n = 343), and the standard deviation was .88 (statistics not tabled).

The histogram (see Figure 4) showing the count for GPAs within the sample indicates a greater frequency of students having GPAs of 2.00 or higher accessing the online grade book. The mean GPA of the entire sample (n = 343) was 2.62 with a standard deviation of .94.
Figure 4. Frequency distribution of GPAs for users of the online grade book.

To provide insight into the relationship between the variables of GPA and GBAR, a scatterplot (Figure 5) was used to represent the pairing of the two variables for each student in the sample. The pattern of points within the scatterplot indicates neither an upward nor a downward trend, suggesting that the relationship between GPA and GBAR may be near-zero.
Pearson's correlation coefficient, $r$, was used to determine the strength and type of the relationship between GBAR and GPA. The sample returned a positive but nonsignificant correlation of .06 ($p > .05$). There was no evidence of a relationship between grade book access rates and the GPAs of students whose families accessed the electronic grade book.

Research Question 2

What is the relationship between the family access rates of the electronic grade book in a given semester and the attendance rates of students for that semester? A dataset for the entire second semester was used for comparison in which data were categorized
by frequency of grade book access per week. The mean grade book access rate by students having attendance records for the entire second semester was 0.62 times per week ($n = 670$), and the standard deviation was 0.79 (statistics not tabled).

The histogram (see Figure 6) showing the count for attendance rates within the sample indicates a greater frequency of students having an average daily attendance of 90% or higher accessing the online grade book. The mean attendance rate of the entire sample ($n = 670$) was 0.93 with a standard deviation of 0.08.

![Figure 6. Frequency distribution of attendance rates for online grade book users.](image)

To provide insight into the relationship between the variables of GBAR and ATT, a scatterplot (Figure 7) was used to represent the pairing of the two variables for each
student in the sample. The pattern of points within the scatterplot indicates neither an upward nor a downward direction, suggesting that the relationship between grade book access and ATT may be near-zero.

\[ \text{Figure 7. Pairing of grade book use with attendance rate for each student in the sample.} \]

Pearson’s correlation coefficient, $r$, was used to determine the strength and type of the relationship between GBAR and ATT. The entire sample returned a positive but nonsignificant correlation of $0.03 (p > 0.05)$. There was no evidence of a relationship between GBAR and the ATT of students whose families accessed the electronic grade book.

[Although not necessitated by any of the research questions, this researcher wanted to confirm that the dataset was reflective of what is generally known about the]
relationship between achievement and attendance rates of students—that there is a positive correlation between the two variables (e.g., Easton & Engelhard Jr, 1982; Koshal, Koshal, & Gupta, 2004; Roby, 2004). Analyzing the relationship between the variables of GPA and ATT for 392 users of the online grade book having both a GPA and ATT for second semester, through Pearson’s correlation coefficient, \( r \), the researcher found a positive correlation of .36 that was significant \( (p < .05) \). There was a moderate relationship between GPA and the ATT of students whose families accessed the electronic grade book.

Research Question 3

What is the relationship between the changes in family access rates of the electronic grade book between two given time periods and changes in student GPA between those same time periods? The third research question addressed differences in grade book access and differences in GPA from Quarter 3 to Quarter 4 (Q4-Q3). The researcher used two approaches to address this question. First, Pearson’s \( r \) correlation coefficient was used to examine the direction and strength of the correlation between differences in grade book access across time and differences in GPA across time (i.e., change from Quarter 3 to Quarter 4). Second, the researcher used an ANOVA to test for differences among low- and high-use categories, where low use of the grade book (GBAR\(_L\)) and high use of the grade book (GBAR\(_H\)) acted as two groups of one variable (GBAR), and the time periods of Quarter 3 (Q3) and Quarter 4 (Q4) acted as levels for the other variable (GPA).
Correlation Coefficient

Descriptive statistics for GBAR and GPA are summarized in Table 7. In Analysis 3.1, where the change in grade book access rate was compared to the change in GPA from Quarter 3 (.65) to Quarter 4 (.83), the mean change was .18 for grade book access; the change in GPA for those same quarters was slight (.05).

Table 7
Descriptive Statistics for Changes to Means and Standard Deviations of GBAR and GPA

<table>
<thead>
<tr>
<th>Quarters analyzed</th>
<th>n</th>
<th>GBAR change Mean</th>
<th>GBAR change SD</th>
<th>GPA change Mean</th>
<th>GPA change SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4-Q3</td>
<td>343</td>
<td>.18</td>
<td>.53</td>
<td>.05</td>
<td>.57</td>
</tr>
</tbody>
</table>

Note: Q3 = Quarter 3; Q4 = Quarter 4; GBAR change = Mean of grade book access rate for Quarter 3 subtracted from mean of Quarter 4. GPA change is derived similarly.

Pearson’s $r$ correlation coefficient was used to examine the relationship of change in grade book access (GBAR) and change in GPA for students ($n = 343$) from Quarter 3 to Quarter 4. The analysis for changes in GBAR$_{Q4-Q3}$ related to changes in GPA$_{Q4-Q3}$ returned a low positive, nonsignificant ($p > .05$) correlation of .07. There was no evidence of a relationship between the change in GBAR and the change in GPA for students whose families used the electronic grade book.

ANOVA

A one-way analysis of variance was used to address Research Question 3 to determine whether or not the change in GPAs (dependent variable) from Quarter 3 to Quarter 4 ($Q_4-Q_3$) were significantly different for each group established as the between-
subjects independent variable GBAR. The GPAs of students from four different grade
book user types were compared to test whether differences in GPA were attributable to
more than chance. The four types were coded as (0) HL, online grade book users who
began as high-frequency users (GBARQ3H) and ended as low-frequency users
(GBARQ4L); (1) HH, online grade book users who began as high-frequency users
(GBARQ3H) and ended as high-frequency users (GBARQ4H); (2) LH, those who began as
low-frequency users (GBARQ3L) and ended as high-frequency users (GBARQ4H); and (3)
LL, users who began as low-frequency users (GBARQ3L) and ended as low-frequency
users (GBARQ4L). Descriptive statistics (Table 8) indicate changes in the means from
Quarter 3 to Quarter 4 that were used in the analysis.

Table 8

Descriptive Statistics for Grade Book Access (GBAR) Categories Featuring GPA for
Quarter 3 and Quarter 4 and Changes to GPA From Quarter 3 to Quarter 4

<table>
<thead>
<tr>
<th>GBAR type</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GBARQ3H/GBARQ4L HL</td>
<td>12</td>
<td>2.60</td>
<td>.60</td>
<td>2.52</td>
<td>.59</td>
<td>-0.08</td>
<td>0.42</td>
</tr>
<tr>
<td>GBARQ3H/GBARQ4H HH</td>
<td>61</td>
<td>2.69</td>
<td>.98</td>
<td>2.68</td>
<td>1.04</td>
<td>-0.01</td>
<td>0.47</td>
</tr>
<tr>
<td>GBARQ3L/GBARQ4H LH</td>
<td>41</td>
<td>2.60</td>
<td>.94</td>
<td>2.71</td>
<td>.78</td>
<td>0.10</td>
<td>0.65</td>
</tr>
<tr>
<td>GBARQ3L/GBARQ4L LL</td>
<td>229</td>
<td>2.55</td>
<td>.98</td>
<td>2.61</td>
<td>.98</td>
<td>0.06</td>
<td>0.59</td>
</tr>
<tr>
<td>Total</td>
<td>343</td>
<td>2.58</td>
<td>.96</td>
<td>2.63</td>
<td>.96</td>
<td>0.05</td>
<td>0.57</td>
</tr>
</tbody>
</table>

Note: HL = Families whose grade book access rate per week was => 1 in Quarter 3 and became < 1 in Quarter 4.
Mean difference may not be exact due to rounding.
Two observations from Table 8 indicate that the HL user type showed a negative change in student GPA of .08 from Quarter 3 to Quarter 4; however, HL had a very small sample size ($n = 12$). Additionally, the LH user type showed the most positive change in GPA from Quarter 3 to Quarter 4 ($M = .10$). The researcher used an ANOVA to determine whether or not the changes in GPA from Quarter 3 to Quarter 4 (Q4-Q3) were significantly different for each group established for the variable GBAR. These analyses yielded information about a later marking period (Q4) after parents and students had opportunities to address GPA deficiencies from the earlier marking period (Q3). See Table 9 for ANOVA results.

Table 9

One-Way ANOVA Results for Grade Book Access Categories Comparing Changes to Student GPA From Quarter 3 to Quarter 4

<table>
<thead>
<tr>
<th>Analysis #</th>
<th>GPA</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2</td>
<td>Q4-Q3</td>
<td>3, 339</td>
<td>.58</td>
<td>.63</td>
<td>NS</td>
</tr>
</tbody>
</table>

Note: Analysis 3.2 compared changes to the means from Quarter 3 to Quarter 4.

Analysis 3.2 tested for differences among changes to student GPA from Quarter 3 to Quarter 4 (Q4-Q3) in the four user types ($H_0$: $\mu_{HH} = \mu_{HL} = \mu_{LH} = \mu_{LL}$). Differences among the means were not significant, $F(3, 339) = .58, p > .05$. The probability that the changes to GPA would have occurred by chance is greater than .05. No post hoc tests were carried out to determine significant mean differences among the four user types, as the overall test was not statistically significant.
Research Question 4

What is the relationship between the changes in family access rates of the electronic grade book between two given time periods and changes in student ATT between those same time periods? The researcher used two approaches to address this question. First, Pearson’s $r$ correlation coefficient was used to find the direction and strength of the correlation between differences in GBAR and ATT. Second, the researcher used an ANOVA to determine whether or not the changes were significantly different among low- and high-use categories where low use of the grade book (GBAR_L) and high use of the grade book (GBAR_H) acted as two groups of one variable (GBAR), and the time periods of Quarter 3 (Q3) and Quarter 4 (Q4) acted as levels for the other variable (ATT).

Correlation Coefficient

Descriptive statistics (not tabled) indicated a change in GBAR of .16 ($SD = .52$) and a change in ATT of .01 ($SD = .07$) from Quarter 3 to Quarter 4 ($n = 630$). Pearson’s $r$ correlation coefficient was used to examine the relationship of differences of GBAR and ATT. Analysis 4.1 returned a low positive, nonsignificant ($p > .05$) correlation of .08. There is no evidence of a relationship between changes in grade book access rates and changes in student ATT.

ANOVA

ANOVA was used to address Research Question 4 to determine whether average changes in student ATT (dependent variable) from Quarter 3 to Quarter 4 (Q4-Q3) were statistically different for each group established for the between-subjects variable GBAR. Student ATT rates from four different GBAR types were compared to test whether
differences in ATT were attributable to more than chance. The four types were coded as
(0) HL, online grade book users who began as high-frequency users (GBARQ3H) and
ended as low-frequency users (GBARQ4L); (1) HH, online grade book users who began as
high-frequency users (GBARQ3H) and ended as high-frequency users (GBARQ4H); (2) LH, those who began as low-frequency users (GBARQ3L) and ended as high-frequency users
(GBARQ4H); and (3) LL, users who began as low-frequency users (GBARQ3L) and ended
as low-frequency users (GBARQ4L).

In Table 10, descriptive statistics display changes in the means from Quarter 3 to
Quarter 4. One can observe from the table that attendance rates changed very little among
all four groups.

Table 10

Descriptive Statistics for Grade Book Access Categories Featuring ATT for Quarter 3
and Quarter 4 and Changes to ATT From Quarter 3 to Quarter 4

<table>
<thead>
<tr>
<th>GBAR type</th>
<th>n</th>
<th>ATT</th>
<th>Quarter 3</th>
<th>Quarter 4</th>
<th>Q4 - Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>GBARQ3H/GBARQ4L</td>
<td>HL 19</td>
<td>.92</td>
<td>.09</td>
<td>.93</td>
<td>.07</td>
</tr>
<tr>
<td>GBARQ3H/GBARQ4H</td>
<td>HH 89</td>
<td>.94</td>
<td>.07</td>
<td>.95</td>
<td>.07</td>
</tr>
<tr>
<td>GBARQ3L/GBARQ4H</td>
<td>LH 66</td>
<td>.91</td>
<td>.08</td>
<td>.93</td>
<td>.07</td>
</tr>
<tr>
<td>GBARQ3L/GBARQ4L</td>
<td>LL 456</td>
<td>.93</td>
<td>.08</td>
<td>.94</td>
<td>.08</td>
</tr>
<tr>
<td>Total</td>
<td>630</td>
<td>.93</td>
<td>.08</td>
<td>.94</td>
<td>.08</td>
</tr>
</tbody>
</table>

Note: HL = Families whose grade book access rate per week was >= 1 in Quarter 3 and became < 1 in Quarter 4.

Mean difference may not be exact due to rounding.
Using an ANOVA to determine whether or not the changes in ATT from Quarter 3 to Quarter 4 (Q₄-Q₃) were significantly different for each group established for the variable GBAR, these analyses yielded information about a later marking period (Q₄) after parents and students had opportunities to address attendance deficiencies from the earlier marking period (Q₃). Table 11 provides ANOVA results.

Table 11
One-Way ANOVA Results for Grade Book Access Categories Analyzing ATT for Quarter 4 and Changes to ATT From Quarter 3 to Quarter 4

<table>
<thead>
<tr>
<th>Analysis #</th>
<th>DEP - ATT</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2</td>
<td>Q₄-Q₃</td>
<td>3, 626</td>
<td>.36</td>
<td>.79</td>
<td>NS</td>
</tr>
</tbody>
</table>

Note: Analysis 4.2 compared changes to the mean from Quarter 3 to Quarter 4.

Analysis 4.2 tested for differences among changes in student ATT rates from Quarter 3 to Quarter 4 (Q₄-Q₃) in the four user types (H₀: μ_HH = μ_HL = μ_LH = μ_LL). The differences among the groups were not significant, F(3, 626) = .36, p > .05. No post hoc tests were carried out to determine significant mean differences among the four user types, as the overall test was not statistically significant.

Research Question 5

How do the relationships studied vary for low- or high-SES students? Low-SES students were those enrolled for free or reduced lunch, and high-SES students were those not enrolled for free or reduced lunch. To address this question, the researcher studied the nature of the relationship of both high- and low-SES student scores when comparing student GPA or ATT with frequency of access to the online grade book (GBAR).
Relationship of Grade Book Access (GBAR) to Student GPA When Considering SES

A dataset for the second semester was used for comparing the relationship between the family access rates of the electronic grade book and the core course grade point averages (GPAs) of students for that semester. Data were categorized into GBAR for either low- or high-SES students having GPAs in core courses. Figure 8 depicts the frequency distribution for GBAR per week of families with low-SES students, and Figure 9 depicts the frequency distribution for GBAR per week of families with high-SES students. The mean GBAR for low-SES student families was 0.47 times per week ($n = 33$), and the standard deviation was 0.64.

Figure 8. Frequency distribution of grade book access by families of low-SES students having GPAs in core courses (depicted in intervals of 0.10/week).
The mean GBAR for high-SES student families was 0.76 times per week \((n = 310)\), and the standard deviation was 0.90. The mean GBAR for all families was 0.73 times per week \((n = 343)\), and the standard deviation was 0.88.

![Figure 9. Frequency distribution of grade book access by families of high-SES students having GPAs in core courses (depicted in intervals of 0.10/week).](image)

Descriptive statistics (Table 12) indicate GPAs are lower for low-SES students \((M = 2.07)\) than GPAs are for high-SES students \((M = 2.68)\). The means for the two groups differed by .61 \((SD = .10)\). A \(t\) test for independent samples was used to compare means of the two groups, and the difference was found to be significant \((t = 3.330, p < .000)\). The probability that a difference in the means of .61 would have occurred by chance is
less than .05. GPAs of high-SES students were higher than the GPAs of low-SES students.

Table 12

*Descriptive Statistics of Grade Book Access Rate (GBAR) and Grade Point Average (GPA) for SES of Students*

<table>
<thead>
<tr>
<th>Student category</th>
<th>n</th>
<th>GBAR Mean</th>
<th>GBAR SD</th>
<th>GPA Mean</th>
<th>GPA SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low SES</td>
<td>33</td>
<td>.47</td>
<td>.64</td>
<td>2.07</td>
<td>1.01</td>
</tr>
<tr>
<td>High SES</td>
<td>310</td>
<td>.76</td>
<td>.90</td>
<td>2.68</td>
<td>.91</td>
</tr>
<tr>
<td>All users</td>
<td>343</td>
<td>.73</td>
<td>.88</td>
<td>2.62</td>
<td>.94</td>
</tr>
</tbody>
</table>

Statistical analyses were conducted for both low- and high-SES student samples. Pearson’s correlation coefficient, $r$, was used to determine the strength and direction of the relationships between the variables GBAR and GPA. Table 13 contains the results of comparisons.

Table 13

*Correlation Coefficients for Grade Book Access Rate (GBAR) and GPA by Student SES*

<table>
<thead>
<tr>
<th>Analysis #</th>
<th>Variables</th>
<th>Pearson’s $r$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GBAR</td>
<td>GPA</td>
</tr>
<tr>
<td>5.1</td>
<td>GBAR$_{Low	ext{SES}}$</td>
<td>GPA$_{Low	ext{SES}}$</td>
</tr>
<tr>
<td>5.2</td>
<td>GBAR$_{High	ext{SES}}$</td>
<td>GPA$_{High	ext{SES}}$</td>
</tr>
</tbody>
</table>
Users having low SES ($n = 33$) returned a nonsignificant ($p > .05$), positive correlation with GPA of $0.14$. High-SES students using the online grade book returned a nonsignificant ($p > .05$), positive correlation with GPA of $0.04$. There is no evidence of a relationship between GBAR and the GPAs of students when disaggregated by SES.

**Relationship of Grade Book Access (GBAR) to Attendance Rate (ATT) When Considering Student SES**

A dataset from the entire second semester was used for comparing the relationship between the family access rates of the electronic grade book (GBAR) and student ATT for that semester. Data were categorized by frequency of GBAR for low- and high-SES students. The mean access rate for low-SES students was $0.45$ times per week ($n = 81$), and the standard deviation was $0.62$. The mean access rate for high-SES students was $0.64$ times per week ($n = 589$), and the standard deviation was $0.81$.

Counts of attendance rates for low- and high-SES students indicated a higher frequency of lower attendance rates for low-SES students ($M = 0.91$, $SD = 0.09$) when compared with attendance rates for high-SES students ($M = 0.93$, $SD = 0.08$). The attendance rate means for the two groups differed by $0.02$ ($SD = 0.01$). A test for independent samples ($t = -1.621$) showed that the difference in means was not significant ($p > .05$). There was no evidence of a significant difference in attendance between low- and high-SES students. Statistics are summarized in Table 14.
Table 14

**Descriptive Statistics of Grade Book Access Rate (GBAR) and Attendance Rate (ATT) for Student SES**

<table>
<thead>
<tr>
<th>Student category</th>
<th>n</th>
<th>GBAR</th>
<th>ATT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Low SES</td>
<td>81</td>
<td>.45</td>
<td>.62</td>
</tr>
<tr>
<td>High SES</td>
<td>589</td>
<td>.64</td>
<td>.81</td>
</tr>
<tr>
<td>All users</td>
<td>670</td>
<td>.62</td>
<td>.63</td>
</tr>
</tbody>
</table>

Pearson’s correlation coefficient, $r$, was used to determine the strength and direction of the relationships between the variables GBAR and ATT for both low- and high-SES student samples. Table 15 shows the results of comparisons.

Table 15

**Correlation Coefficients for Grade Book Access Rate (GBAR) and Attendance Rate (ATT) by Student SES**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pearson’s $r$</th>
</tr>
</thead>
<tbody>
<tr>
<td>GBAR&lt;sub&gt;LowSES&lt;/sub&gt; ATT&lt;sub&gt;LowSES&lt;/sub&gt;</td>
<td>.07 .54 NS 81</td>
</tr>
<tr>
<td>GBAR&lt;sub&gt;HighSES&lt;/sub&gt; ATT&lt;sub&gt;HighSES&lt;/sub&gt;</td>
<td>.02 .62 NS 589</td>
</tr>
</tbody>
</table>

Users having low SES ($n = 81$) returned a positive but nonsignificant ($p > .05$) correlation with ATT of .07. Families of high-SES students using the online grade book returned a positive, nonsignificant ($p > .05$) correlation with ATT of .02. There was no
evidence of a relationship between GBAR and student ATT when data were
disaggregated by SES.

The Relationship of Changes in Grade Book Access (GBAR) to Changes in Grade Point
Average (GPA) When Considering SES

Correlation coefficients for GBAR and GPA.

This section addressed the relationship between changes in GBAR and GPA from
Quarter 3 to Quarter 4 (Q4-Q3) when disaggregating the data by student SES. Descriptive
statistics are summarized in Table 16. In each comparison, frequency of GBAR
increased; GPAs increased for students in the high-SES category, and low-SES students
experienced a loss in mean GPA.

Table 16

<table>
<thead>
<tr>
<th>Student category</th>
<th>Quarters analyzed</th>
<th>n</th>
<th>GBAR change Mean</th>
<th>SD</th>
<th>GPA change Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low SES</td>
<td>Q4-Q3</td>
<td>33</td>
<td>.05</td>
<td>.42</td>
<td>-.05</td>
<td>.63</td>
</tr>
<tr>
<td>High SES</td>
<td>Q4-Q3</td>
<td>310</td>
<td>.20</td>
<td>.54</td>
<td>.05</td>
<td>.57</td>
</tr>
</tbody>
</table>

Note: Q3 = Quarter 3; Q4 = Quarter 4; GBAR change = Mean of grade book access rate for Quarter 3 subtracted from
mean for Quarter 4; Other variable changes are derived similarly.

To provide insight into the relationship between the variables of GPA and GBAR
for the low-SES subgroup, a scatterplot (Figure 10) was used to represent the pairing of
the two variables for each student in the sample. The pattern of points within the scatterplot indicates an upward trend, suggesting that the relationship between GPA and GBAR may be positive.

![Scatter plot](image)

**Figure 10.** Comparison of changes to GBAR and GPA from Quarter 3 to Quarter 4.

Correlation coefficients comparing changes in GBAR from Quarter 3 to Quarter 4 with changes in GPA for those same quarters are summarized in Table 17. Pearson’s $r$ showed a positive correlation of .51 (Analysis 5.5) for low SES and was significant ($p < .05$). For low-SES students, there was a positive significant relationship between changes
in GBAR and changes in GPA. The correlation was positive, showing that as GBAR increased, so did GPA. The sample size was large enough for this correlation coefficient to be within the critical value range cited in Hinkle, Wiersma, and Jurs (2003). The high-SES subgroup showed a low, positive, but nonsignificant ($p < .05$) correlation of .03. There was no evidence of a relationship between changes to frequency of GBAR and GPA for the high-SES subgroup.

Table 17

*Correlation Coefficients Examining Differences of GBAR and GPA When Disaggregating by Student SES*

<table>
<thead>
<tr>
<th>Analysis #</th>
<th>Variables</th>
<th>Pearson's</th>
<th>Correlation</th>
<th>$p$</th>
<th>Sig</th>
<th>$n$</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.5</td>
<td>Q4-Q3LowSES</td>
<td>Q4-Q3LowSES</td>
<td>.51**</td>
<td>.002</td>
<td>Yes</td>
<td>33</td>
</tr>
<tr>
<td>5.6</td>
<td>Q4-Q3HighSES</td>
<td>Q4-Q3HighSES</td>
<td>.03</td>
<td>.60</td>
<td>NS</td>
<td>310</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed).**

ANOVA tests between GBAR and GPA by Student SES.

ANOVA was used to assess whether or not the changes in GPA (dependent variable) from Quarter 3 to Quarter 4 (Q4-Q3) were the same for each of the groups established for the between-subjects variable GBAR. GPAs of students from four different GBAR user types were compared to test whether GPA differences were attributable to more than chance. (For a full explanation of coding for the four groups, see the discussion under Question 4 in this chapter.)
Descriptive statistics for low-SES students displayed in Table 18 indicate changes in GPA from Quarter 3 to Quarter 4 and are used for Analysis 5.7. User type LL ($n = 27$) had a decrease in GPA of -.06 ($SD = .58$). The HL, HH, and LH user types resulted in samples so small ($n = 1, 4,$ and 1 respectively) that any tests of significance would be outside the range necessary for statistical significance.

Table 18

*Descriptive Statistics for Low-SES Students: GBAR Categories Showing GPA for Quarter 3 and Quarter 4 and Changes to GPA From Quarter 3 to Quarter 4*

<table>
<thead>
<tr>
<th>GBAR type</th>
<th>$n$</th>
<th>Q3 GPA</th>
<th>Q4 GPA</th>
<th>Q4 - Q3 GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>GBARQ3H/GBARQ4L</td>
<td>HL</td>
<td>1</td>
<td>3.25</td>
<td>2.25</td>
</tr>
<tr>
<td>GBARQ3H/GBARQ4H</td>
<td>HH</td>
<td>4</td>
<td>2.38</td>
<td>2.25</td>
</tr>
<tr>
<td>GBARQ3L/GBARQ4H</td>
<td>LH</td>
<td>1</td>
<td>.50</td>
<td>2.00</td>
</tr>
<tr>
<td>GBARQ3L/GBARQ4L</td>
<td>LL</td>
<td>27</td>
<td>2.06</td>
<td>2.01</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>33</td>
<td>2.09</td>
<td>2.05</td>
<td>.99</td>
</tr>
</tbody>
</table>

Note: HL = Low-SES students whose grade book access rate per week was $\geq 1$ in Quarter 3 and became $< 1$ in Quarter 4. The total mean change and mean change for LL user type reflect rounding effects.

Descriptive statistics for high-SES students displayed in Table 19 indicate changes in mean GPA from Quarter 3 to Quarter 4 and are used for Analysis 5.8. For the HL and HH user types, no change in GPA occurred, and for the LH and LL user types, a positive GPA change of .07 occurred. ANOVA was used to determine whether or not the
changes in GPA from Quarter 3 to Quarter 4 (Q4-Q3) were significantly different for each group established for the variable GBAR. Table 20 contains ANOVA results.

Table 19

*Descriptive Statistics for High-SES Students: Grade Book Access Categories Showing GPA for Quarter 3 and Quarter 4 and Changes to GPA From Quarter 3 to Quarter 4*

<table>
<thead>
<tr>
<th>GBAR</th>
<th>User</th>
<th>n</th>
<th>Quarter 3</th>
<th>Quarter 4</th>
<th>Q4 - Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>GBARQ3H/GBARQ4L</td>
<td>HL</td>
<td>11</td>
<td>2.55</td>
<td>.59</td>
<td>2.55</td>
</tr>
<tr>
<td>GBARQ3H/GBARQ4H</td>
<td>HH</td>
<td>57</td>
<td>2.71</td>
<td>.99</td>
<td>2.71</td>
</tr>
<tr>
<td>GBARQ3L/GBARQ4H</td>
<td>LH</td>
<td>40</td>
<td>2.66</td>
<td>.89</td>
<td>2.73</td>
</tr>
<tr>
<td>GBARQ3L/GBARQ4L</td>
<td>LL</td>
<td>202</td>
<td>2.61</td>
<td>.95</td>
<td>2.69</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>310</td>
<td>2.64</td>
<td>.94</td>
<td>2.69</td>
</tr>
</tbody>
</table>

*Note:* HL = High-SES students whose grade book access rate per week was $\geq 1$ in Quarter 3 and became $< 1$ in Quarter 4. The mean change for LL user type reflects rounding effects.
Table 20

*One-Way ANOVA Results for GBAR Categories Showing Low and High Student SES*

**GPAs for Quarter 4 and Changes to GPA From Quarter 3 to Quarter 4**

<table>
<thead>
<tr>
<th>Analysis #</th>
<th>DEP - GPA</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.7</td>
<td>Q4-Q3LowSES</td>
<td>3, 29</td>
<td>3.39*</td>
<td>.03</td>
<td>Yes</td>
</tr>
<tr>
<td>5.8</td>
<td>Q4-Q3HighSES</td>
<td>3, 306</td>
<td>.31</td>
<td>.82</td>
<td>NS</td>
</tr>
</tbody>
</table>

*Significant at the 0.05 level (2-tailed). ANOVA for Analysis 5.7 is misleading. Two of the four groups compared had to be eliminated because of n sizes of 1.

Analysis 5.7 shows differences in the changes in low-SES student GPAs from Quarter 3 to Quarter 4 among the four user types (H0: μHH = μHL = μLH = μLL). For low-SES students, the overall ANOVA was found to be significant, \( F(3, 29) = 3.39, p < .05 \), but no post hoc tests were carried out to determine significant mean differences among the four user types, as at least two of the groups had only one case in the sample set.

Independence, randomness, normality, and homogeneity of variance are assumptions for accurate use of ANOVA, yet unbalanced and small group sizes raise questions about those assumptions. The variances are different from each other in the descriptive data (HL, HH, LH, and LL groups had means of -1.00, -.13, 1.50, and -.06, respectively), and Levene's Test of Equality of Error Variances revealed that the homogeneity-of-variance assumption was met (\( F(1, 29) = .04, p = .85 \)), but only after the two groups containing one sample were ignored in computing the test. Ignoring the two groups that are \( n = 1 \) reduces this to a 2-sample test. Post hoc tests were not performed because comparison groups were reduced to fewer than three. One remaining group had
an $n$ of 4; group sizes that small may negate any results because of the lack of statistical power associated with small samples.

Analysis 5.8 shows differences among the changes in high-SES student GPAs from Quarter 3 to Quarter 4 using four user types ($H_0$: $\mu_{HH} = \mu_{HL} = \mu_{LH} = \mu_{LL}$). For high-SES students, the mean differences were not found to be significant, $F(3, 306) = .31, p > .05$. There was not enough evidence to indicate a difference among GPAs for the four high-SES groups. No post hoc tests were carried out.

The Relationship of Changes in Grade Book Access (GBAR) to Changes in Attendance Rates (ATT) When Considering SES

Correlation coefficients for online grade book access and attendance.

This section addresses relationships to changes in GBAR and ATT from Quarter 3 to Quarter 4 (Q4-Q3) by student SES. Descriptive statistics for GBAR and student ATT are summarized in Table 21. Changes in GBAR from Quarter 3 to Quarter 4 were compared with changes in student ATT for those same quarters. In each comparison, GBAR increased by a similar amount, but change to ATT was different by .02; that is, low-SES students’ attendance rate increased by .03, and high-SES students’ attendance rate increased by .01.
Table 21

*Descriptive Statistics for Changes to Means and Standard Deviations of GBAR and ATT When Disaggregating by Student SES*

<table>
<thead>
<tr>
<th>Student category analyzed</th>
<th>n</th>
<th>GBAR</th>
<th>ATT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Low SES</td>
<td>66</td>
<td>.15</td>
<td>.55</td>
</tr>
<tr>
<td>High SES</td>
<td>564</td>
<td>.16</td>
<td>.51</td>
</tr>
</tbody>
</table>

*Note: Q3 = Quarter 3; Q4 = Quarter 4; GBAR change = Mean of grade book access rate for Quarter 3 subtracted from mean for Quarter 4; Other variable changes are derived similarly.*

The Pearson’s *r* correlation coefficients were calculated to examine the relationship of change in GBAR and change in ATT when considering SES and are summarized in Table 22. Analyses 5.9 and 5.10 tested for significant relationships when disaggregating for student SES.

Pearson’s *r* showed a negative, low, nonsignificant (*p* > .05) correlation of -.003 for low SES. The high-SES subgroup (*n* = 564) showed a low but significant (*p* < .05) correlation of .09. The correlation was positive, meaning that as GBAR increased for high-SES students, so did student ATT.
Table 22

*Correlation Coefficients Examining Differences in GBAR With Differences in ATT When Disaggregating by Student SES*

<table>
<thead>
<tr>
<th>Analysis #</th>
<th>Variables</th>
<th>Pearson's</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GBAR</td>
<td>ATT</td>
</tr>
<tr>
<td>5.9</td>
<td>Q4-Q3\text{LowSES}</td>
<td>Q4-Q3\text{LowSES}</td>
</tr>
<tr>
<td>5.10</td>
<td>Q4-Q3\text{HighSES}</td>
<td>Q4-Q3\text{HighSES}</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed).

ANOVA tests between GBAR and ATT by SES.

ANOVA was used to assess whether or not the changes in ATT from Quarter 3 to Quarter 4 (Q₄-Q₃) were the same for each of the groups established for the variable GBAR. Student ATT from four different online GBAR user types were compared to test whether ATT differences were attributable to more than chance. (For a full explanation of coding for the four groups, see the discussion under Question 4 in this chapter.)

Descriptive statistics for low-SES students displayed in Table 23 indicate changes in mean attendance rates from Quarter 3 to Quarter 4 and are used for Analysis 5.11. The HL user type showed the most change in mean (.07) from Quarter 3 to Quarter 4; however, group HL had a very small sample size ($n = 2$), as did HH ($n = 6$) and LH ($n = 7$). The small $n$ sizes precluded powerful statistical results generated from any analysis.
Table 23

*Descriptive Statistics for Low-SES Students: GBAR Categories Showing Student ATT for Quarter 3 and Quarter 4 and Changes to Student ATT From Quarter 3 to Quarter 4*

<table>
<thead>
<tr>
<th>GBAR</th>
<th>User Type</th>
<th>n</th>
<th>ATT Quarter 3</th>
<th>ATT Quarter 4</th>
<th>Q₄ − Q₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>GBAR₉₃H/GBAR₉₄L</td>
<td>HL</td>
<td>2</td>
<td>.79</td>
<td>.86</td>
<td>.07</td>
</tr>
<tr>
<td>GBAR₉₃H/GBAR₉₄H</td>
<td>HH</td>
<td>6</td>
<td>.94</td>
<td>.97</td>
<td>.03</td>
</tr>
<tr>
<td>GBAR₉₃L/GBAR₉₄L</td>
<td>LH</td>
<td>7</td>
<td>.92</td>
<td>.92</td>
<td>.01</td>
</tr>
<tr>
<td>GBAR₉₃L/GBAR₉₄L</td>
<td>LL</td>
<td>51</td>
<td>.92</td>
<td>.95</td>
<td>.03</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>66</td>
<td>.92</td>
<td>.95</td>
<td>.03</td>
</tr>
</tbody>
</table>

*Note: HL = Low-SES students whose grade book access rate per week was ≥ 1 in Quarter 3 and became < 1 in Quarter 4.*

Descriptive statistics for high-SES students displayed in Table 24 indicate changes in mean ATT from Quarter 3 to Quarter 4 and are used for Analysis 5.12. Changes to the means for any of the user types were positive but very small.
### Table 24

**Descriptive Statistics for High-SES Students: GBAR Categories Showing Student ATT for Quarter 3 and Quarter 4 and Changes to Student ATT From Quarter 3 to Quarter 4**

<table>
<thead>
<tr>
<th>GBAR</th>
<th>User</th>
<th>Att</th>
<th>Quarter 3</th>
<th>Quarter 4</th>
<th>Q4 - Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>type</td>
<td>n</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>GBARQ3H/GBARQ4L</td>
<td>HL</td>
<td>17</td>
<td>.93</td>
<td>.06</td>
<td>.94</td>
</tr>
<tr>
<td>GBARQ3H/GBARQ4H</td>
<td>HH</td>
<td>83</td>
<td>.94</td>
<td>.07</td>
<td>.95</td>
</tr>
<tr>
<td>GBARQ3L/GBARQ4H</td>
<td>LH</td>
<td>59</td>
<td>.91</td>
<td>.07</td>
<td>.94</td>
</tr>
<tr>
<td>GBARQ3L/GBARQ4L</td>
<td>LL</td>
<td>405</td>
<td>.93</td>
<td>.08</td>
<td>.94</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>564</td>
<td>.93</td>
<td>.08</td>
<td>.94</td>
</tr>
</tbody>
</table>

Note: HL = High-SES students whose grade book access rate per week was $\geq 1$ in Quarter 3 and became $< 1$ in Quarter 4. Mean difference may not be exact due to rounding effects.

ANOVA was used to assess whether or not differences among student ATT for the four user types were the same for the variable GBAR. The results of these analyses yielded information about a later marking period (Q4) after parents and students had opportunities to address attendance deficiencies from the earlier marking period (Q3).

Table 25 contains ANOVA results.
Table 25

One-Way ANOVA Results for GBAR Categories Showing Low and High Student SES Attendance for Quarter 4 and Changes to Student Attendance From Quarter 3 to Quarter 4

<table>
<thead>
<tr>
<th>Analysis #</th>
<th>DEP - ATT</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.11</td>
<td>Q4-Q3&lt;sub&gt;Low SES&lt;/sub&gt;</td>
<td>3, 62</td>
<td>.38</td>
<td>.77</td>
<td>NS</td>
</tr>
<tr>
<td>5.12</td>
<td>Q4-Q3&lt;sub&gt;High SES&lt;/sub&gt;</td>
<td>3, 560</td>
<td>.58</td>
<td>.63</td>
<td>NS</td>
</tr>
</tbody>
</table>

Note: For Analysis 5.11, Levene's Test of Equality of Error Variances revealed that the homogeneity-of-variance assumption was not met (F(3, 62) = 10.02, p < .01). Thus, a nonparametric ANOVA (Kruskal-Wallis test) was also performed. Results were not significant, χ²(3, n = 66) = .32, p > .05.

Analysis 5.11 shows differences among the changes in low-SES student attendance rates from Quarter 3 to Quarter 4 using four user types (H₀: μ_HH = μ_HL = μ_LH = μ_LL). For low-SES students, the differences between the means were found not to be significant, F(3, 62) = .38, p > .05. Attendance rate differences could have occurred by chance; there was not enough evidence to indicate a difference among the ATT rates for the four low-SES groups.

Independence, randomness, normality, and homogeneity of variance are assumptions for accurate use of ANOVA, yet unbalanced and small group sizes raise questions about those assumptions. Although some of the variances are different from each other in the descriptive data (HL, HH, LH, and LL groups had means of .07 [SD = .31], .03 [SD = .05], .01 [SD = .09], and .03 [SD = .06], respectively), Levene's Test of Equality of Error Variances revealed that the homogeneity-of-variance assumption was
not met, $F(3, 62) = 10.02, p < .01$. The Levene test suggested that the differences among the standard deviations for the groups were significant. Thus, a nonparametric ANOVA (Kruskal-Wallis test) was performed. Results were not significant, $(\chi^2(3, n = 66) = .32, p > .05)$. No post hoc tests were carried out.

Analysis 5.12 shows differences among the changes in high-SES student ATT from Quarter 3 to Quarter 4 using four user types ($H_0: \mu_{HH} = \mu_{HL} = \mu_{LH} = \mu_{LL}$). For high-SES students, the mean differences in ATT were not found to be significant, $F(3, 560) = .58, p > .05$. There was not enough evidence to indicate a difference among the four high-SES groups. No post hoc tests were carried out, as mean differences were not statistically significant.

Results and Analyses of Data from the Qualitative Phase

**Data Analysis Method**

Data, reduced in form to monothematic “chunks” (Miles & Huberman, 1994, p. 64), were captured from telephone interviews, then transcribed from audio tapes and coded using five a priori categories: (a) quantity of communications among parents, students, and teachers; (b) quality of communications among parents, students, and teachers; (c) communicating about school programs and student progress; (d) involvement in learning activities at home; and (e) other.

Data are displayed using a separate table for each of the five a priori categories. After each table, the researcher describes the similarities and differences among parent, student, and teacher responses. Table 6 from Chapter III is repeated here as Table 26 to
allow the reader to see the link between the interview questions (Appendix G) and the a priori categories.

*Research Question 6(a)*

What evidence did telephone interviews provide regarding the use of the electronic grade book as a means of improving the rate of communication among parents, students, and teachers?

<table>
<thead>
<tr>
<th>Table 26</th>
</tr>
</thead>
</table>

*A Priori Categories Used for Interview Script Design and Participant Response Analyses*  

<table>
<thead>
<tr>
<th>A priori category</th>
<th>Parent</th>
<th>Student</th>
<th>Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Quantity of Communication among Parents, Students, and Teachers</td>
<td>5, 11</td>
<td>4, 11</td>
<td>4, 5, 11</td>
</tr>
<tr>
<td>2. Quality of Communication among Parents, Students, and Teachers</td>
<td>7, 9</td>
<td>7, 9</td>
<td>7, 9</td>
</tr>
<tr>
<td>3. Communicating About School Programs and Student Progress</td>
<td>4, 6, 9, 10</td>
<td>5, 6, 9, 10</td>
<td>6, 9, 10</td>
</tr>
<tr>
<td>4. Involvement in Learning Activities at Home</td>
<td>8</td>
<td>8, 9</td>
<td>8</td>
</tr>
<tr>
<td>5. Other</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

*Note: Actual questions for each a priori category can be found in Appendix G.*
Table 27 displays a summary of responses from students, teachers, and parents regarding the quantity of communication among parents, students, and teachers. Responses for this category came from two questions about the amount of use of the Parent Internet Viewer (PIV). One question asked participants directly how often the PIV was used, while the other question asked whether participants thought that there was a connection between how much the PIV was used and attendance, grades, or attitudes.
Table 27

*Participant Response Summary: Quantity of Communication*

<table>
<thead>
<tr>
<th>Interview Unit of response</th>
<th>Parent</th>
<th>Student</th>
<th>Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Weekly use</td>
<td>No quantifiable amount,</td>
<td>Depends on parent:</td>
<td></td>
</tr>
<tr>
<td>Parent and child talk</td>
<td>for upcoming</td>
<td>some daily if at-risk</td>
<td></td>
</tr>
<tr>
<td>more often about assignments</td>
<td>then often</td>
<td></td>
<td></td>
</tr>
<tr>
<td>grades and consequences</td>
<td>To maintain grades</td>
<td>There is a connection</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Hardly used (two times), kid use: semi-weekly</td>
<td>Used “a lot” for grades</td>
<td>10–20% monitor daily,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No talk about grades,</td>
<td>50% infrequently,</td>
<td></td>
</tr>
<tr>
<td>Kids look often to fix errors in grades</td>
<td>attendance, attitudes</td>
<td>majority never</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>More use = more buy in</td>
<td></td>
</tr>
<tr>
<td>3 Two to three times/week</td>
<td>Two times/week, when gone for sports</td>
<td>Involved parents use the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For attendance, grades</td>
<td>PIV</td>
<td></td>
</tr>
<tr>
<td>4 Teacher: Some parents daily, Honors regularly, at-risk didn’t know it existed</td>
<td>Used more if teacher takes daily grades</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Teacher: Depends on parents, daily, weekly, at-risk not at all</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Interviewees 4 and 5 were teachers only. Only three parents and three students were interviewed.*

The participants generally used the PIV regularly for access to grades and missing assignments. They seemed to use the PIV at least one time per week, with some using it more often. Students and parents generally discussed the frequency of PIV use based
upon either missing work or assignments, whereas teachers reported the use rate based upon the type of student being discussed. Teacher responses indicated general agreement that very few parents or students monitored grades frequently.

Some of the differences in response had to do with teacher perceptions about PIV use by at-risk students and their parents. The majority of teachers saw successful students using the PIV regularly and maintained that at-risk students and parents of at-risk students did not go online. "I know my honor kids’ parents are on there regularly, and my lab school kids’ parents didn’t even know it existed,” said one teacher. Another teacher commented with an opposing opinion by saying that parents of at-risk students checked often if their children missed school because “I’ll get an email, you know, from parents that they have checked . . . and they have a question.” One student checked the PIV as often, as he anticipated being out of town for sports activities and wanted to “see what assignments [were] coming up.”

**Research Question 6(b)**

What evidence did telephone interviews provide regarding the use of the electronic grade book as a means of improving the quality of communication among parents, students, and teachers? Tables 28, 29, and 30 display summaries of responses from students, teachers, and parents for (a) quality of communication among parents, students, and teachers; (b) communicating about school programs and student progress; and (c) involvement in learning activities at home. Table 28 displays a summary of responses from students, teachers, and parents regarding quality of communication among parents, students, and teachers.
Table 28

*Participant Response Summary: Quality of Communication*

<table>
<thead>
<tr>
<th>Interview #</th>
<th>Parent Response</th>
<th>Student Response</th>
<th>Teacher Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>More positive attitude</td>
<td>Parents keep track more, students not angry</td>
<td>Parents question PIV accuracy</td>
</tr>
<tr>
<td></td>
<td>Teachers reassure and problem-solve issues</td>
<td>about that</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>No impact on quality</td>
<td>Parents and student talked more</td>
<td>Teachers accountable more for accurate and</td>
</tr>
<tr>
<td></td>
<td>unless PIV errors or student has Fs</td>
<td>positively; contract to keep car</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Child doesn’t talk much, so helps parent know progress</td>
<td>PIV has increased</td>
<td>Parent more aware of class activity</td>
</tr>
<tr>
<td></td>
<td>Lack of response and PIV errors have caused quality issues</td>
<td></td>
<td>Student tries harder</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Student more positive with teacher</td>
</tr>
<tr>
<td>4*</td>
<td>Detailed conversation when parents call (e.g., test scores, missing assignments). Parents expect rapid postings and accurate PIV. Parents question grading policy (e.g., participation points)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5*</td>
<td>Parent’s interest in child’s work increases.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Interviewees 4 and 5 were teachers only. Only three parents and three students were interviewed.*
Responses for this category came primarily from two questions about the quality of communication among parents, students, and teachers. One question asked participants about attitudes toward school, school staff, parents, or students while the other question asked participants about the nature of conversations between and among these various groups.

Generally, the participants from all three groups reported that PIV use resulted in a more positive quality of communication. Parents reported that teachers were willing to provide feedback and reassurance regarding a child’s progress. Teachers reported that parents were more aware of class activity, asked more specific questions about what their children were learning, and took greater interest in their children’s work. Students reported quality of communication with parents as being more positive. One teacher summarized the impact in the quality of communication as follows: “[The PIV] impacts me as a teacher because any of those parents that call I know that they’re involved, and I probably become more aware of that student and what they’re doing and am better about noticing what they’re doing and probably talking to them about it, too.”

Another similarity in responses had to do with holding one another accountable both for the accuracy of the PIV and the frequency with which accurate information was posted. Parents reported the quality of communication eroding when grades or attendance reports were inaccurate, especially when teachers never returned emails or phone calls in a timely fashion after being made aware of errors. Students felt a higher level of accountability because with the PIV, they always knew what work was missing and could easily contact the teacher to address deficiencies before official grades were posted.
There were very few differences among the three groups except for accountability-related issues. One teacher reported that as parents became more aware of class activities and grading policies, they questioned in greater detail grading procedures, asking detailed questions about participation points, for example.

Table 29 summarizes responses from students, teachers, and parents regarding communication about school programs and student progress. Responses came from four questions that asked participants how they used the PIV, how they perceived its impact on attendance and grades, what conversations they had held regarding PIV information, and how the PIV might have influenced their conversations about school programs.

For parents and students, similarities in responses included the observation that it was common to use the PIV in order to communicate about grades, absences, and attendance in general, as well as to locate missing work. One parent summarized family PIV use as follows: “they’re always on there to see if maybe they missed an assignment or maybe a grade was entered incorrectly. Or maybe they were supposed to turn something in, but they were gone on a trip, so they realize they got a zero, and then they have to go in and talk to the teacher about it.” Teachers reported that students and parents used it more for grades than for attendance, yet one teacher said, “I do get emails if a parent is concerned because their child has missed class or whatever.”

All three groups reported communication around grades and missing assignments as being both positive and proactive. Parents and teachers described students as more responsible because they were using the PIV to identify and complete missing work prior to their parents finding out about that missing work. Students responded similarly.
Table 29

Response Summary: Communicating About School Programs and Student Progress

<table>
<thead>
<tr>
<th>#</th>
<th>Parent</th>
<th>Student</th>
<th>Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PIV for grading</td>
<td>PIV for self-planning</td>
<td>PIV for grades, absences, progress, attendance, Eligibility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>PIV for grades, missing work, and early intervention</td>
<td>Used for grades</td>
<td>PIV for grades, absences, assignments. No impact on attendance.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Missing work</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No school program talk</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>PIV for grades, tardies, Missing work</td>
<td>Missing work</td>
<td>PIV for grades, absences, assignments. Parents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No school program talk</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No school program talk</td>
<td></td>
</tr>
<tr>
<td>4*</td>
<td>PIV for grades, assignments, absences. Impact on attendance if linked to grades.</td>
<td>No talk of school programs</td>
<td>No talk of school programs</td>
</tr>
<tr>
<td>5*</td>
<td>PIV for grades. Not much impact at all. No talk of school programs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Interviewees 4 and 5 were teachers only. Only three parents and three students were interviewed. P/T = parent-teacher. P/S = parent/student.*
One student even described the PIV as a planning tool that enabled students to complete assignments before leaving town rather than waiting for the assignment to be posted as missing. That student described the PIV as a way to “talk [with parents] about things going on in class, or . . . to show [parents] how I’m doing.” Similarly, teachers reported using it to help students keep track of whether or not they would be getting their course credits or to meet the goal of receiving the Hathaway Scholarship (a state initiative to pay for college).

Another similarity among teachers, parents, and students was a set of clear negative responses about the use of the PIV as a tool to advance discussion about school programs. One teacher summarized the responses, saying, “Parents don’t call me after looking at the PIV and say, ‘Should my daughter take this or take that?’ That doesn’t seem to be a discussion prompted by [the PIV].”

Differences among responses centered on PIV use for attendance. Parents reported its use for attendance, grades, and missing work, yet teachers reported “no impact on attendance.” Only one interviewee described PIV as a tool for advance planning. Others reported it as useful only after an absence, poor grade, or missing assignment was reported on the PIV. Such reports prompted communication (via email, phone call, or in-person conversation) between parent and teacher, student and parent, and teacher and student to address the deficiency. It was not commonly reported that the PIV was used as an advance-planning tool. Teachers saw it primarily used by motivated, older, “A” students.

In summary, interviewee responses within the a priori category of communicating about school programs and student progress centered on the use of the PIV as a
mechanism for reporting student progress related to attendance, grade, and assignment deficiencies. The information reported through the PIV generally became a prompt for further discussions among parents, students, and teachers. Most reported that the PIV led to positive rather than negative interactions among the three groups because the PIV was helping students take responsibility for keeping up with their work and grades. The PIV was not seen as a tool that prompted communication about school programs.

Table 30 displays a summary of responses from students, teachers, and parents regarding involvement in learning activities at home. Responses for this category came primarily from one question, which asked participants how the PIV changed studying or learning support at home. Similarities in responses for parents, students, and teachers included a common practice of using the PIV to check on missing work or to verify whether assignments had been turned in. There was a larger agreement on the PIV not impacting how learning at home was supported by parents, except for the act of checking the PIV to monitor missing work. Most reported not knowing how learning support changed at home or stated that the learning support had not changed. Noticeably absent from all interviewee transcripts were comments about punitive measures being introduced or enforced at home as a result of monitoring the PIV.

There were some differences among interviewees regarding home learning support, however. One student reported that parents used the PIV to monitor the student's grades and used positive feedback more often because the student was keeping up grades to maintain automobile privileges. One parent said that the PIV was the tool used to determine whether "we need to sit down and help with [homework] . . . ." Some teachers
reported that calls from parents about missing homework resulted in parents then talking with their kids.

Table 30

Response Summary: Involvement in Learning Activities at Home

<table>
<thead>
<tr>
<th>#</th>
<th>Parent</th>
<th>Student</th>
<th>Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PIV has not done</td>
<td>Self-use to keep up with assignments</td>
<td>Parents checking grades, calling if work missing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>involvement in learning at home</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Show work to parents to gain their understanding</td>
<td>Parents watch PIV if graduation issue</td>
</tr>
<tr>
<td>2</td>
<td>PIV doesn’t affect</td>
<td>Self-use to catch up on assignments. Parents use to monitor</td>
<td>Parents talk more with teacher and student</td>
</tr>
<tr>
<td></td>
<td>relationship at home</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>PIV shows whether</td>
<td>Self-use to be aware, catch up on work</td>
<td>Parents calling with questions, then talking with their child</td>
</tr>
<tr>
<td></td>
<td>parent needs to help with homework</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4*</td>
<td>No idea on home learning involvement, monitoring if homework turned in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5*</td>
<td>Not sure of any home learning involvement</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Interviewees 4 and 5 were teachers only. Only three parents and three students were interviewed.
The last interview response set (Table 31) reflects themes and findings not connected to the previous categories but volunteered by the telephone interview participants. Additional themes emerging from the comments reflect barriers to communication, struggles with technical aspects of the PIV, and the PIV being a positive addition to increasing two-way communication. Teacher and parents made comments about the various barriers to communicating with one another about student performance. Some cited struggles to synchronize times to speak in person about performance. Teachers identified reluctance to call parents at work and the difficulty of finding time when both parties were available to talk. One parent identified an additional barrier of unanswered email sent to teachers after a PIV viewing.

Technical difficulties with using the PIV were a common theme emerging from the interviews. Parents and teachers commented on the inaccuracies of information on the PIV. Difficulties with keeping accurate attendance and keeping track of turned-in work were two examples. One teacher identified the PIV as unfriendly to the user, citing difficulty with logging in and keeping track of passwords as part of the problem.

Both parents and teachers found the PIV to be a positive tool for enhancing communication about student performance. Some parents said that they never used the PIV because their children were good students yet expressed appreciation for the option to access the PIV if necessary. Teachers in general commented on the PIV being a positive tool for parents to use, but one teacher cautioned that the PIV was negative for parents of Honors students because these parents zeroed in on a single assignment among a list of assignments, with the assignment becoming “all they could focus on” even though the student had an A for the marking period as a whole.
Table 31

Response Summary: Other Comments Gathered From Telephone Interviews

<table>
<thead>
<tr>
<th>#</th>
<th>Parent</th>
<th>Student</th>
<th>Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Parent appreciative of</td>
<td>PIV may prevent</td>
<td>Time to talk with parent</td>
</tr>
<tr>
<td></td>
<td>chance to look at grades and attendance</td>
<td>teachers and parents from talking</td>
<td>is barrier</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Technical PIV issues</td>
</tr>
<tr>
<td>2</td>
<td>Parent trusts kids to keep up their grades</td>
<td>No other comments</td>
<td>Barrier is availability to connect with parent</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wonderful that PIV exists</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Technical PIV issues, but PIV is wonderful</td>
</tr>
<tr>
<td>3</td>
<td>PIV not accurate on completed work</td>
<td>PIV could prevent teachers from talking</td>
<td>Time is barrier. Don’t want to call work</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PIV calls negative; Parents are single-assignment-focused</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PIV prevents teachers from actually handing out grades</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Email with PIV is two-way; PIV is good</td>
</tr>
<tr>
<td>4*</td>
<td>Not all have Internet access, phones; PIV is not user-friendly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5*</td>
<td>Communication goes two ways</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Interviewees 4 and 5 were teachers only. Only three parents and three students were interviewed.*
There was agreement that having another asynchronous option such as email was important for completion of a two-way communication loop. A teacher summarized the value of the asynchronous option as follows. “You play phone tag with parents all day long, but if you can, if they email you, it’s always easy at some point, at the night or whatever [sic], to email back, and so communication has become much better that way.” Another emerging theme expressed only by students was the concern that electronic access to grades via the PIV was actually diminishing parent–teacher and student–teacher discussion about grades. “I think that the PIV could prevent teachers from talking to parents as much, and that teachers should be handing out grades and stuff,” said one student.

Summary

The purpose of this study was to examine the influence of family use of electronic reporting mechanisms in the home on student achievement, attendance, and home–school communication. The researcher investigated (a) the relationship between family electronic grade book access (GBAR) and student achievement (GPA), (b) the relationship between GBAR and student attendance (ATT) rates, and (c) perceptions about quantity and quality of communications among parents, students, and teachers related to GBAR.

Using Pearson’s $r$, the researcher found few relationships between GBAR and either GPA or ATT. None of the correlations was significant ($p < .05$) at the accepted level for social science research. When the researcher further explored the relationship between changes of GBAR with either GPA or ATT for two quarters within the spring
semester, the analyses revealed no significant ($p < .05$) correlations among variables. Any changes to GPA or ATT from Quarter 3 to Quarter 4 were not related to changes in family use of the PIV from Quarter 3 to Quarter 4.

Additionally, the researcher used ANOVA to compare low and high use categories where low use of the grade book (GBAR$_L$) and high use of the grade book (GBAR$_H$) acted as two groups of one variable (GBAR), and the time periods of Quarter 3 (Q3) and Quarter 4 (Q4) acted as levels for the other variables of GPA or ATT. In neither case did the researcher find significant ($p < .05$) relationships among the user groups for either GPA or ATT.

When studying how these same relationships varied for low- and high-SES students, the researcher found no evidence of a relationship between GBAR and either GPA or ATT for either low- or high-SES students. None of the correlations was significant ($p < .05$).

Changes in GBAR from Quarter 3 to Quarter 4 were compared with changes in GPA for those same quarters. A positive correlation of .51 for low SES was significant ($p < .05$). ANOVA results for the low-SES subgroup also showed that differences among the four user types were significant ($F(3, 29) = 3.39, p < .05$). Mean differences among the four user types were not able to be determined, however, as two of the groups had fewer than two cases in the sample set. The high-SES subgroup showed no evidence of a relationship between changes to GBAR and GPA, and that relationship was not significant.

Pearson’s $r$ was also used to compare changes in GBAR from Quarter 3 to Quarter 4 with changes in ATT for those same quarters. A correlation of .09 for the high-
SES subgroup was significant ($p < .05$). The correlation was positive, showing that as grade book access increased, so did ATT. ANOVA results for the high-SES subgroup, however, did not show significant differences among the four user types ($F(3,560) = .58$, $p > .05$). The low-SES subgroup showed no significant evidence of a relationship between changes to GBAR and ATT.

In order to inform the quantitative results, qualitative data were gathered from telephone interviews of students, parents, and teachers using five a priori categories: (a) quantity of communications among parents, students, and teachers; (b) quality of communications among parents, students, and teachers; (c) communicating about school programs and student progress; (d) involvement in learning activities at home; and (e) other.

Interviewees generally used the PIV regularly at least one time per week, with some using it more often than that. Students and parents discussed the frequency of PIV use based upon whether or not there was missing work or assignments to be finished, while teachers saw the PIV use rate fluctuate depending upon the type of student being discussed. Teacher responses were generally in agreement that very few parents or students monitored grades frequently and that students and parents monitored attendance even less frequently than they monitored grades.

The participants from all three groups reported that PIV use resulted in a positive quality of communication. More specific questions about student activities resulted from discussions about assignments reported on the PIV, and each group reported a higher accountability level for monitoring work, turning in assignments, and keeping recorded information timely and accurate than when the PIV was not available. Parents described
their students as responsible because they were using the PIV to identify and complete missing work prior to their parents finding out about that missing work. Some described the PIV as a planning tool to complete assignments even before the teacher included them in a grading list. None of those interviewed described the PIV as a tool that drove deep discussion about long-term program planning or course selection. Teachers reported that they found the PIV useful for counting credits, especially for students struggling with earning credits.

Parent involvement occurring at home was summarized by those interviewed as including the practice of actually using the PIV to check on missing assignments. Most did not discuss changing other types of involvement at home such as monitoring homework, discussing goals, or imposing additional disciplinary measures.

Finally, additional themes emerging from the interviews included acknowledging barriers to communication such as common telephone time, work schedules, and reluctance to “bother” the other at work. Technical difficulties and accuracy of PIV data were generally commented on by all three groups. Regardless of the difficulties, there was solid agreement on the value of the PIV as an additional tool used by all three groups to better communicate student performance results.

Chapter V provides a discussion of the results reported in Chapter IV, an interpretation of findings, conclusions, and recommendations for practice, policy, and further research.
V. SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter presents a summary of findings, a discussion of conclusions, and recommendations for changes to policy and practice regarding the use of electronic grade books. In addition, recommendations are offered for future research on electronic grade book use. The purpose for doing this study was to examine the influence of family use of an electronic reporting mechanism in the home on student achievement, attendance, and home–school communication—elements identified in prior research as solid parent involvement (PI) contributions to schooling success.

A parent’s role in the education of the child has been promoted as a very important component of student success (e.g., Clark, 1993; Henderson, 1987; Henderson & Berla, 1994; Henderson & Mapp, 2002), and improving parent involvement as a means of addressing student achievement has been accepted for years (Clark, 1993; Henderson, 1987). The lack of communication, especially of timely communication, between parents and teachers has long been identified as a problem in our educational system, yet immediate access to student information is an interesting phenomenon available to strengthen parent–teacher–child communication. The home computer and the steady increase of access to the Internet have raised the potential value of computers for communicating about student achievement (Otterbourg, 1998; Rogers, 1994).

By examining student achievement and attendance in the secondary grades and exploring attitudes about electronic access to student information using two of Epstein’s (1995) six types of parent involvement (PI), the researcher contributed to the current
knowledge base regarding electronic access to student achievement information as a form of PI taking place in the home. As discussed in Chapter II, researchers and reviewers (e.g., Bissell, 1989; Cameron & Lee, 1997; Clemente, 2002; deGraw, 1990; Desimone, 1999; Durán et al., 2001; Epstein, 2001a; J. D. Finn, 1998; Greninger, 1991; Harris Interactive, 2005, 2007; Ho Sui-Chu & Willms, 1996; Lishka, 2002; Madrid, 1999; Otterbourg, 1998; Pomerantz et al., 2007; Rogers, 1994) have reported on types of PI that occurred at home as beneficial to student success.

The researcher investigated how electronic grade book access as a type of communication could address both lack of communication and timely communication about student performance identified by parents, teachers, and researchers. Specifically, the researcher investigated (a) the relationship between family electronic grade book access rates (GBAR) and student achievement (GPA), (b) the relationship between GBAR and student attendance (ATT) rates, (c) the relationship between differences of GBAR and ATT or GPA between two time periods, and (d) whether there was evidence from telephone interviews that access to an electronic grade book influenced perceptions about quantity and quality of communications among parents, students, and teachers.

This applied research focused on parent involvement as the principal investigation using a mixed-method model with the quantitative phase performed first but taking a subordinate role to the qualitative phase. Using the two-dimensional classification model proposed by Johnson (2001), the researcher employed a descriptive, cross-sectional design to address six questions. Components of the quantitative portion included a nonexperimental research design utilizing the variables of GPA, ATT, and GBAR and studying the nature of the relationships among the variables for the subgroup SES.
Correlation coefficients were calculated between (a) the variables GPA and grade book access rate (GBAR) and (b) the variables ATT and GBAR. A summary of all correlations comparing GBAR and GPA groups is found in Table 32. Discussion of results is organized by research question in the sections that follow.

Table 32

Summary of Correlation Coefficients for GBAR and GPA

| Analysis | Variables compared | Pearson’s r | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| # | | | r | p | Sig | n | |
| 1.1 | GBAR$_S2$ | GPA$_S2$ | .06 | .24 | NS | 343 | |
| 3.1 | GBAR$_{Q4-Q3}$ | GPA$_{Q4-Q3}$ | .07 | .17 | NS | 343 | |
| 5.1 | GBAR$_{LowSES}$ | GPA$_{LowSES}$ | .14 | .45 | NS | 33 | |
| 5.2 | GBAR$_{HighSES}$ | GPA$_{HighSES}$ | .04 | .49 | NS | 310 | |
| 5.5 | GBAR$_{Q4-Q3LowSES}$ | GPA$_{Q4-Q3LowSES}$ | .51** | .002 | Yes | 33 | |
| 5.6 | GBAR$_{Q4-Q3HighSES}$ | GPA$_{Q4-Q3HighSES}$ | .03 | .60 | NS | 310 | |

Note: **Correlation is significant at the 0.01 level (2-tailed).

A summary of all correlations comparing GBAR and ATT groups is found in Table 33. Discussion of results is organized by research question in the sections that follow.
Table 33

Summary of Correlation Coefficients for GBAR and ATT

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Variables compared</th>
<th>Pearson’s r</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>r</td>
<td>p</td>
<td>Sig</td>
<td>n</td>
</tr>
<tr>
<td>2.1</td>
<td>GBARs2</td>
<td>ATTs2</td>
<td>.03</td>
<td>.43</td>
<td>NS</td>
</tr>
<tr>
<td>4.1</td>
<td>GBARQ4-Q3</td>
<td>ATTQ4-Q3</td>
<td>.08</td>
<td>.06</td>
<td>NS</td>
</tr>
<tr>
<td>5.3</td>
<td>GBARs2LowSES</td>
<td>ATTs2LowSES</td>
<td>.07</td>
<td>.54</td>
<td>NS</td>
</tr>
<tr>
<td>5.4</td>
<td>GBARs2HighSES</td>
<td>ATTs2HighSES</td>
<td>.02</td>
<td>.62</td>
<td>NS</td>
</tr>
<tr>
<td>5.9</td>
<td>GBARQ4-Q3LowSES</td>
<td>ATTQ4-Q3LowSES</td>
<td>-.003</td>
<td>.98</td>
<td>NS</td>
</tr>
<tr>
<td>5.10</td>
<td>GBARQ4-Q3HighSES</td>
<td>ATTQ4-Q3HighSES</td>
<td>.09*</td>
<td>.04</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Note: *Significant at the 0.05 level (2-tailed).

In addition, analyses of variance (ANOVAs) were used to test for differences among the means of GPA using four GBAR categories from the same marking terms. Table 34 summarizes all ANOVAs comparing GBAR user types and GPA groups.

Table 34

Summary of One-Way ANOVA Results for GBAR Categories and GPA

<table>
<thead>
<tr>
<th>Analysis #</th>
<th>GPA</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2</td>
<td>Q4-Q3</td>
<td>3, 339</td>
<td>.58</td>
<td>.63</td>
<td>NS</td>
</tr>
<tr>
<td>5.7</td>
<td>Q4-Q3LowSES</td>
<td>3, 29</td>
<td>3.39*</td>
<td>.03</td>
<td>Yes</td>
</tr>
<tr>
<td>5.8</td>
<td>Q4-Q3HighSES</td>
<td>3, 306</td>
<td>.31</td>
<td>.82</td>
<td>NS</td>
</tr>
</tbody>
</table>

*Significant at the 0.05 level (2-tailed). ANOVA for Analysis 5.7 is misleading. Two of the four groups compared had to be eliminated because of n sizes of 1.
Table 35 summarizes all ANOVAs comparing GBAR user types and ATT groups.

Discussion of results is organized by research question in the sections that follow.

Table 35

Summary of One-Way ANOVA Results for GBAR Categories and ATT

<table>
<thead>
<tr>
<th>Analysis #</th>
<th>GPA</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2</td>
<td>Q&lt;sub&gt;4&lt;/sub&gt;-Q&lt;sub&gt;3&lt;/sub&gt;</td>
<td>3, 626</td>
<td>.36</td>
<td>.79</td>
<td>NS</td>
</tr>
<tr>
<td>5.11</td>
<td>Q&lt;sub&gt;4&lt;/sub&gt;-Q&lt;sub&gt;3&lt;sub&gt;Low SES&lt;/sub&gt;&lt;/sub&gt;</td>
<td>3, 62</td>
<td>.38</td>
<td>.77</td>
<td>NS</td>
</tr>
<tr>
<td>5.12</td>
<td>Q&lt;sub&gt;4&lt;/sub&gt;-Q&lt;sub&gt;3&lt;sub&gt;High SES&lt;/sub&gt;&lt;/sub&gt;</td>
<td>3, 560</td>
<td>.58</td>
<td>.63</td>
<td>NS</td>
</tr>
</tbody>
</table>

Note: For Analysis 5.11, Levene’s Test of Equality of Error Variances revealed that the homogeneity-of-variance assumption was not met ($F(3, 62) = 10.02, p < .01$). Thus, a nonparametric ANOVA (Kruskal-Wallis test) was also performed. Results were not significant ($\chi^2(3, n = 66) = .32, p > .05$).

For this study’s qualitative portion, the researcher used a stratified purposeful sampling method (telephone interviews) on high-rate users of the PIV to secure parent ($n = 3$), student ($n = 3$), and teacher ($n = 5$) participants. A structured interview process using an interview script provided data later coded with a priori themes: (a) quantity of communications among parents, students, and teachers; (b) quality of communications among parents, students, and teachers; (c) communicating about school programs and student progress; (d) involvement in learning activities at home; and (e) other.

The sample for the entire study was taken from a high school in a western state where the demographic characteristics indicated that 17% ($n = 243$) of the student population had registered for free or reduced lunch. For 2006–2007, 1,471 students were enrolled at the school in Grades 10 through 12. Data were collected from three data sources: (a) the electronic grade book, (b) a user log-in count, and (c) the district’s
student information system. Attendance data were reported as full-day or half-day rate increments. GPAs were collected by quarter from the core areas of math, science, language arts, and social studies. The sample included data from the population of families who had students enrolled during 2006–2007 and who accessed the electronic grade book at least one time between November 1, 2006 and July 1, 2007. This sample \( (n = 772) \) represented 52.48% of the population \( (N = 1,471) \). Pearson’s \( r \) and ANOVAs were used to analyze the data from the second semester (January 2007–July 2007) of that school year.

**Summary of Findings and Implications**

**Research Question 1**

What is the relationship between the family access rates of the electronic grade book in a given semester and the core course grade point averages (GPAs) of students for that semester? The purpose of this research question was to determine whether there was a relationship between how often grade books were accessed online and the GPAs of students whose families accessed them. In terms of the results of the data analyses for this question, second-semester data showed that the mean GBAR was 0.73 times per week \( (n = 343) \) and that the mean GPA of the entire sample \( (n = 343) \) was 2.62. The scatter plot of the paired variables showed no increasing or decreasing slope, and Pearson’s \( r \) showed no significant relationship between GBAR and GPA. Descriptive data did show that there was a greater frequency of students having GPAs of 2.00 or higher accessing the online grade book.

The lack of a significant relationship can be attributed to many factors. Students were accessing the PIV about once every 10 days (0.73 times per week), which may have
not been a high enough frequency to reflect any meaningful changes in GPA. In addition, the PIV contained information about daily assignments, whereas GPA is generally based upon performance for an entire marking period. Given the subjectivity of determining letter grades (Marzano, 2000), students may not have seen an immediate connection between addressing deficiencies on daily assignments and the ultimate letter grade for the quarter or semester. A less subject-specific indicator might have shown a stronger correlation if student GPA had consisted of all course grades rather than grades in math, English, history, and science (Fan & Chen, 1999). Additionally, teacher posting of the daily assignment scores may not have been timely, a problem identified in MetLife Surveys (Harris Interactive, 2005, 2007), possibly leading students and their parents to see the PIV as a regularly inaccurate report. Further, the mean GPA of PIV users (2.62) may have been reflective of a mostly successful user group who found little reason to use the PIV.

Research Question 2

What is the relationship between the family access rates of the electronic grade book in a given semester and the attendance rates (ATT) of students for that semester? The purpose of this research question was to determine whether there was a relationship between how often grade books were accessed online and the attendance rates of students whose families accessed them. Families who used the PIV logged in approximately every 11 days (0.62 times per week) and had students with an average attendance rate of 92.61%. There was no significant correlation between the frequency of log-in and attendance rates. The correlation (.03) was positive, however.
The lack of significant correlation may be attributed to a number of factors. Students or their parents might not have logged in frequently enough to see any value in monitoring attendance. Moreover, the high attendance rate of the sample size may have provided a lack of incentive to log in to check attendance, as this group of students and their families had no need to monitor attendance. This finding is consistent with the finding of Catsambis and Garland (1997) that as students progressed to 12th grade, there was less PI focused on monitoring individual behaviors such as attendance and homework. One might suspect that log-in frequency was inversely related to attendance rates. When attendance problems were brought under control, it would be less important to log in regularly to monitor the attendance record. No negative correlation was found.

**Research Question 3**

What is the relationship between the changes in family access rates of the electronic grade book between two given time periods and changes in student GPA between those same time periods? The purpose of this research question was to determine whether there was a relationship between changes in how often grade books were accessed online and changes to the GPAs of students whose families accessed them. One might presume that families of students experiencing low grades in one grading period would increase the frequency of online access in order to monitor changes to grades during the next grading period.

Access rates increased 0.18 times per week from Quarter 3 to Quarter 4, and the GPA of the students accessing the PIV also improved by a small amount (.05), but the relationship between the two increases was not significant. Families had changed their PIV access from about once every 11 days to once every 8 days, but the change in access
was not significantly related to the increase in GPA for those students. This finding may be consistent with both Desimone’s (1999) and J. D. Finn’s (1993) findings. Desimone found that PI increased when student grades suffered, and Finn found that “unsuccessful students report[ed] talking less with their parent about school work . . .” (p. 72). Even though the changes from Quarter 3 to Quarter 4 were positive, the changes could be explained by the tendency of students to improve over the course of a semester whether they used the PIV or not. Moreover, students who left school were excluded from the data if they did not have grades for both quarters. Those “drop outs,” by their absence from the sample, could have positively affected both GBAR and GPA mean values.

An additional purpose for this research question was to determine whether certain categories of online access might show significantly different changes to GPA. Would third-quarter low users of the grade book, for example, have a significant change in GPA if their use rate went up during the fourth quarter? The researcher saw the widest change in GPA (.10) for those students who were categorized as low users and then moved to high-user status by accessing the PIV at least one time per week. Even though their GPA changed by .10, the change in GPA for the group whose PIV access stayed low throughout both quarters changed by almost as much (.06). GPA change was higher during the second half of a semester than during the first half, regardless of whether or not families accessed the PIV and regardless of how often they accessed it.

Some of the explanation for the lack of significant differences may be the same for this question as for Research Question 1. Grade subjectivity (Marzano, 2000), the definition of GPA used in this study’s design (Fan & Chen, 1999), and lack of timely
posting of assignments (Harris Interactive, 2005, 2007) may have led students and their parents to see the PIV as an inconsistent tool for raising GPA.

The GPAs (2.58 for Quarter 3 and 2.62 for Quarter 4) were reflective of a mostly successful user group. As reported by Gutman and Midgley (2000), if students were already academically successful, no change in grades would be expected when PI was added as a factor.

Research Question 4

What is the relationship between the changes in family access rates of the electronic grade book between two given time periods and changes in student ATT between those same time periods? The purpose of this research question was to determine whether there was a relationship between changes in how often grade books were accessed online and any changes to the student attendance rates. If accessing attendance data were an easier endeavor online than through some other method, one might presume that families of students experiencing low attendance in one quarter might utilize this tool to monitor changes to attendance during the next quarter. Even though the size of the sample for this question increased from 343 to 630 students, the PIV access rate increased at about the same rate as it did GPA data (see Question 3). Access rates increased 0.16 times per week from Quarter 3 (GBAR = 0.55) to Quarter 4 (GBAR = 0.71), but the attendance rates of the students accessing the PIV improved by a very small amount (.01). Families had changed their PIV access from about once every 13 days to once every 10 days, but the change in access was not significantly related to a change in attendance for those students. The correlation (.08) between the two changes was not significant ($p = .06$). Changes from Quarter 3 to Quarter 4 were positive but could be
explained by the tendency of students to improve their attendance over the course of a semester.

An additional purpose of this research question was to determine whether certain categories of online access might have significantly different changes in attendance rates. Would third-quarter low users of the grade book, for example, show a significant change in attendance if they became high users during the fourth quarter? The researcher saw very little change in attendance rates (.02) for those students who were classified as low users and then moved to high-user status by accessing the PIV at least one time per week. That change was only slightly higher than the overall change in attendance for the entire sample. Attendance improved for all students in the sample, but not at a rate significantly different among various PIV user categories. Essentially, the attendance rates among the four user types were the same, which could be explained by the high attendance rates of each user group. With rates among each of four user types so high (ranging from 91% to 95%), the chances of showing significant differences among them would be unlikely. Lack of significance would be consistent with others’ (Dwyer & Hecht, 1992a; e.g., Paulson, 1994; Stevenson & Baker, 1987) findings that parents who perceived their children doing fine saw no reason to intervene until performance changed. Additionally, general links between PI and performance on day-to-day types of achievement (i.e., attendance, homework) were found mainly in studies about elementary students (e.g., Clark, 1993; Greninger, 1991), while studies of secondary students (Catsambis & Garland, 1997; Epstein, 1995; Shumow & Miller, 2001) described relationships between PI and achievement when topics focused on discussions about goal setting and program planning, for example.
Research Question 5

How do the relationships studied vary for low- or high-SES students? Research does show strong negative correlations between student achievement and poverty rates. The purpose of this question, therefore, was to look into whether any of the relationships between grade book access and either GPA or attendance might be different for groups enrolled in the free or reduced lunch program. Comparing grade book access rates with GPAs for the second semester showed no significant relationships for either low- or high-SES categories, even though correlations for both groups were positive (.14 and .04). Similar results were found when comparing grade book access rates with attendance rates. Correlations for both low (.07) and high (.02) SES subgroups were positive but not significant. Research has supported this finding, in that family economic status had a low impact on parents emphasizing the importance of schooling (Clark, 1993; Deslandes & Bertrand, 2005; Ho Sui-Chu & Willms, 1996; Mapp, 2002).

Significant findings began to emerge from the data when comparing changes to rates of access with changes to either GPA or attendance for SES subgroups. When comparing changes to GPA with changes to grade book access for the low-SES sample, a significant positive correlation of .51 was found. Although the low-SES group experienced an average loss in GPA (-.05) from Quarter 3 to Quarter 4, further analysis revealed a positive relationship between GPA change and change in grade book access rate. ANOVA for the low-SES subgroup showed that differences among four user types were significant. Results could not be used due to the sample sizes of two user types. The low-SES subgroup showed no evidence of a relationship between changes to GBAR and ATT, and that relationship was not significant.
The high-SES subgroup showed no evidence of a relationship between changes to GBAR and GPA. However, when comparing changes in attendance data with changes in GBAR from the third to the fourth quarter, a low (.09) correlation for the high-SES subgroup was significant (p < .05). ANOVA results for the high-SES subgroup, however, did not show significant differences among the four grade book user types.

Several explanations can be attributed to these observations and analysis. Some researchers (e.g., Desimone, 1999; Paulson, 1994; Williams, 1998) found that the relationship between PI and achievement was negative for some students because parents became more involved as the performance of the students was discovered to be declining. It seems likely that whether a student or parent was checking the PIV, the act of checking became a way of confirming whether assignments had been turned in and whether missing exams or retakes had been completed. Lee and Bowen (2006) found that low-SES parents seemed to concentrate on assignments and other day-to-day tasks to a greater extent than concentrated on more global kinds of PI. The PIV would support that level of academic focus.

Regarding the significant relationship between changes to PIV use and attendance rates for high-SES students, Lareau (1989) reported that students and their parents have high expectations for their children and their attendance rates. High-SES students tend to have high GPAs and attendance rates. It follows that their increasing use of the PIV would be related to their increasing attendance rate.

Research Question 6(a)

What evidence did telephone interviews provide regarding the use of the electronic grade book as a means of improving the rate of communication among parents, students,
and teachers? The purpose of this question was to explore the online grade book as a medium for increasing communication between parents and school representatives. Data gathered from the telephone interviewees showed that PIV use occurred generally at least one time per week. Students and parents discussed the frequency based upon either missing work or assignments. Parents and students were appreciative of the option to access grade book information whenever they wished and saw the tool as a positive addition to increasing amounts of communication between the home and school. That concept is consistent with literature honoring parents as major contributors to the education of children (Epstein, 1995; Mapp, 2002) and reporting electronic tools as a means of increasing communication (Bauch, 1997; Cameron & Lee, 1997; deGraw, 1990; Furger, 2006; Greninger, 1991; Lishka, 2002; Longfellow, 2004; Otterbourg, 1998). Like Penuel et al. (2002) concluded, however, the contributions drawn from the interviews are small enough that one should not generalize about using electronic tools as a means of increasing communication.

Teachers reported that PIV use reflected the type of student using it; that is, the more serious student tended to use the PIV more often than some of the less serious or lower achieving students. That teacher report was consistent with studies (e.g., Marcon, 1999; Scribner et al., 1999) showing that teacher and parent perceptions were conflicting even when considering the same data. Teacher data indicated that very few parents or students monitored grades frequently and that students and parents monitored attendance even less frequently—a finding that was inconsistent with parent and student feedback from the telephone interviews.
Research Question 6(b)

What evidence did telephone interviews provide regarding the use of the electronic grade book as a means of improving the quality of communication among parents, students, and teachers? The purpose of this question was to explore the online grade book as a medium for addressing communication quality. Epstein (1995) and others (e.g., Guskey et al., 2006; Miretzky, 2004; National Parent/Teacher Association, 1997; Swap, 1987) reported on the value of increasing both the quality and quantity of communication between the school and home.

All three groups interviewed reported improved quality of communication with the PIV. It helped parents and students generate specific questions about student activities as assignments were being discussed, and each group reported more monitoring of homework, turning in assignments, and keeping recorded information timely and accurate than monitoring that occurred when the PIV was not available. Parents noted an increasing level of responsibility among their students, as the students were using the PIV to identify and complete missing work prior to their parents being notified. One student described the PIV as a planning tool for completing assignments even before the teacher finalized the due dates, used the PIV to show parents evidence of success in school, and appreciated the positive encouragement from parents. No one reported that the PIV was a catalyst for deep discussion about long-term program planning or goal setting. Teachers reported that they found the PIV useful for students struggling with earning credit.

These findings are consistent with the literature about PI in home environments. Epstein (1995) reported that PI can take place outside of the school building and still have an impact on student achievement. Thorkildsen and Stein (1998) and Henderson and
Berla (1994) found that high expectations and supportive home environments were related to high achievement. Both student and parent interview responses were consistent with ideas that authoritative parenting (Baumrind, 1991; Maccoby & Martin, 1983) and process-focused feedback (Kemptner and Pomerantz, as cited in Pomerantz et al., 2007) resulted in more positive perceptions about being successful in school.

Parent involvement occurring at home was summarized by those interviewed as checking on missing assignments. Other types of involvement at home such as discussing goals or imposing additional disciplinary measures were not mentioned by either parents or students as a consequence of PIV access at home. This finding would be consistent with Lareau’s (1989) study about PI at all costs being detrimental both to relationships within the family and with the school staff (p. 149). As already demonstrated by the quantitative data, these users of the PIV were high achievers and high attenders. If the PIV had been used to impose authoritarian control over the child, reports of strained relationships might have been gathered from the telephone interviews.

Other themes emerging from the interviews are reflective of the literature discussed in Chapter II. Parents and teachers acknowledged barriers to communication such as lack of synchronous telephone time, incompatible work schedules, and reluctance to “bother” the other at work (e.g., Brown, 1989; Chavkin, 1993; Grolnick & Benjet, 1997; Hoover-Dempsey & Walker, 2002; Otterbourg, 1998; Pena, 2000). Technical difficulties and accuracy of PIV data were generally commented on by all three groups. Longfellow (2004) reported similar concerns.
This study was based upon a belief that PI was not subordinate to the authority of the teacher (Lareau, 1989), and families were viewed as partners in focusing on the success of the student at school. This researcher used Epstein’s (1995) overlapping spheres of influence (OSI) model as the basis for this study’s conceptual framework, because access to the PIV had the potential for increasing the overlap between the family and school spheres of influence. Epstein proposed that student success occurred when the spheres of influence overlapped. That overlap resulted in students hearing messages both at home and in school about hard work, the value of education, attending school, and graduating. Epstein’s (1995) OSI theory emphasized the value of partnerships in order “to engage, guide, energize, and motivate students to produce their own successes” (p. 701).

Epstein and Sanders (1998) and others (e.g., Adams & Christenson, 2000; Halsey, 2005; Vosler-Hunter, 1989) claimed that for effective PI to occur, the information could not be one-way communication. Achilles, Reynolds, and Achilles (1997) argued that communication could not be called communication unless it contained both sending and receiving elements. The PIV lacked the two-way concept, which may explain why most of the analyses of the quantitative data showed such small (and nonsignificant) correlations. If families were using the PIV but not making a return contact to teachers or other members of the school, that information remained one-way—that is, sent from the school to the parent.

Epstein’s (2001b) OSI model was composed of an internal structure depicting “interpersonal relationships” among the teacher, parent, and child (p. 30). Included were
interactions among and within the institutions for the family, parent, school, teacher, and child. The interactions could be standard or individualized. Without two-way interaction, the PIV functioned merely as a standard message board, sending one-way information from the school to the home. But when high-frequency PIV users took the step of using email or a phone call to complete the communication cycle, the action became individualized, which may be why high-PIV-use parents and students viewed the PIV as an important addition to their interactions with teachers. Without the return email or phone call, the PIV may have looked more like a one-way directive sent from the school to the parent than it did a communication device.

The external structure of Epstein's OSI theory was confirmed in this study as well. Epstein (2001b) postulated that varying family and school experiences, philosophies, and practices would have an impact on how much overlap occurred between the family and school circles of influence, and each of these forces impacted the success or failure of the effort to nurture and educate children. High-frequency users of the PIV discussed the forces of age and time as being contributing factors in their use of PIV. Parents and teachers talked about schedules and the difficulty of contacting each other during the day and were happy about having the PIV to rely on as an information tool. Parents talked about the PIV being used more by their students than by themselves, as they had high-achieving, responsible students; thus, they did not feel the need to intervene in daily issues such as checking on assignments and attendance.

Students discussed the value of the PIV as a tool to address time issues. They knew quickly which assignments they were missing and addressed them before their grades dropped. Teachers relayed that the high-achieving student was more apt to use the
PIV than the low-achieving student, as exemplified by those enrolled in lab school who "didn't even know it existed." Quantitative analysis showed that frequency of PIV use for checking GPA and attendance was higher for high-SES students than was PIV use by low-SES users. These examples affirm Epstein's theory about external forces manifesting themselves in PIV use.

Data from the telephone interviews about the PIV confirmed the interaction that Epstein claimed was important to the success of students. Parents and students accessed the PIV and discussed what was reported in the grade book. The response to having such open access to the information reflected a partnership where students were motivated to "produce their own successes" (Epstein, 1995, p. 701). One student said that the PIV provided an opportunity to know assignments ahead of time; another described it as a way to show work to parents in order for them to "gain an understanding"; and still another described it as a way to maintain a parent–student agreement on the use of the student's car. One parent claimed that the PIV increased the interaction the parent had with the student; that is, the PIV reduced the difficulty of talking to a teenager. Each of these responses indicated motivation and energy to build self-success. Epstein would have called these types of interaction "intra-institutional" because they took place within the family sphere of influence.

The PIV increased the cycle of interinstitutional interactions as depicted in the conceptual framework (see Figure 3, page 72), because when PIV reports were viewed by members of the family, discussions occurred between the students and parents, the parents and teachers, and the teachers and students. Students and teachers claimed interaction increased through a discussion of missing assignments and credits earned,
interactions Epstein (2001b) would have identified as evidence of the school becoming family-like. Parents and students interacted with teachers more often both to correct errors on the PIV and to seek clarification for missing work or poor grades. Teachers and parents described increasing levels of accountability for both students (to keep up their grades and attendance) and teachers (to keep information accurate in the PIV). Teachers reported higher student motivation, more positive attitudes, and more shared accountability than had occurred without the PIV. Additionally, parents reported that email, access to PIV, and relative ease of contacting teachers improved their attitudes about school.

Though this study affirmed Epstein’s discussion about interaction between members of the home and school (for high-frequency PIV users), the qualitative data confirmed the quantitative data’s lack of correlation among variables. Teachers overwhelmingly suggested that at-risk students and their parents rarely used the PIV. Teachers concluded that the PIV had little impact on grades or attendance because the students who used it were already honors or “A” students. Yet one analysis of the low-SES student data sample showed a moderate correlation between changes in GPA and changes in PIV access. As this was a correlation, however, one cannot determine whether one change produced the other. It is intriguing to consider the possibility of PIV access influencing GPA, especially because it would be contrary to the qualitative data from the teacher interviews indicating that at-risk students probably did not use the PIV.

(Generally, the correlation between low SES and at-risk students is considered strong.)

The PIV was related to Epstein’s six types of PI, namely Type 2 (Communicating) and Type 4 (Learning at Home). The PIV became a form of communication about grades,
absences, attendance, and missing work. The PIV reports were used at home as
discussion points about school and for monitoring grades. It was not a valuable
component, however, for prompting discussion about school programs, an important
component of parent involvement identified by Epstein for this student age group. There
was agreement on not knowing how the PIV impacted learning at home except for the act
of checking the PIV to monitor missing work.

Conclusions

The purpose of this study was to explore relationships between access to an
electronic grade book and grades and attendance. Using a mixed-method approach for
this study provided a deeper understanding of how the qualitative portion clarified the
correlation and ANOVA findings from the quantitative analyses. One method informed
the other (Johnson & Onwuegbuzie, 2004) and confirmed previous theoretical work and
the researcher’s current conceptual framework connected to Epstein’s (2001b) theory of
overlapping spheres of influence.

The first major conclusion was that no evidence of a relationship existed between
access to an electronic grade book and student GPAs. For the second semester of the
2006–2007 school year, 23.32% of families (n = 343/N = 1,471) met the criteria for
analysis, including accessing the grade book online at least once, but the positive
correlation between student GPA and amount of access was only a .06 and was not
significant. Student GPAs of those accessing the grade book averaged 2.62 on a four-
point scale. Families of those students accessed the online grade book about once every
10 days.
The second major conclusion was that no evidence of a relationship existed between access to an electronic grade book and student attendance rates. About 45.55% of families ($n = 670/N = 1,471$) met the criteria for analysis, including accessing the grade book online at least once, but the positive correlation between student ATT and amount of access was only a .03 and not significant. Student attendance rates of those accessing the grade book averaged 92.61%, with families of those students accessing the online grade book about once every 11 days.

The third major conclusion was that there was no evidence of a relationship between changes to grade book access and changes to student GPA from one quarter to the next. Even though grade book access rates changed from about once every 11 days in the third quarter to once every 8 days during the fourth quarter and there was a small increase in average GPA (.05), the positive relationship ($r = .07$) between the two was not significant. A further conclusion drawn from ANOVA showed no significant differences in GPAs among various types of PIV user. Changes to GPA for those families using the PIV at least once per week showed no significant difference in GPA from those using the PIV less than once per week.

The fourth major conclusion was that there was no evidence of a relationship between changes to grade book access and changes to student attendance from one quarter to the next. Even though grade book access rates changed from about once every 13 days in the third quarter to once every 10 days during the fourth quarter and there was a small increase in the rate of attendance (.01), the positive correlation ($r = .08$) between the two was not significant. Further conclusions drawn from ANOVA showed no significant differences in attendance rates among various types of PIV user. Changes to
attendance rates for those families using the PIV at least once per week showed no significant difference in attendance from those using the PIV less than once per week.

The fifth major conclusion was that when considering SES, relationships between grade book access and either GPA or attendance were small, positive, and not significant. Comparing grade book access rates with GPAs for the second semester showed no significant relationships for either low- or high-SES categories, even though correlations for both groups were positive (.14 and .04). Similar results were found when comparing grade book access rates with attendance rates. Correlations for both low (.07) and high (.02) SES subgroups were positive, but not significant.

A sixth major conclusion from this study was drawn from the relationships between changes to grade book access for subgroups of SES and changes to GPA or attendance. There was a significant, positive relationship between changes to GPA and grade book access from Quarter 3 to Quarter 4 when the sample was disaggregated by SES. For low-SES students, changes in rates of grade book access were related to changes in GPA ($r = .51$). For high-SES students, changes in rates of grade book access were related to changes in attendance ($r = .09$) and that relationship was significant.

These conclusions should be interpreted with extreme caution, however, for at least two reasons: (a) the percentage of grade book users on free or reduced lunch was lower for the sample ($n = 12.44\%$) than it was for the population ($N = 16.52\%$), and (b) the sample of low-SES students analyzed for GPA change included only 33 students. Any attempt to generalize findings should be limited.

Another major conclusion from this study concerned the relationship of grade book access to parent involvement. Did the PIV increase the overlap between the school
and family spheres of influence? Yes. Communication among and between parents, students, and teachers increased for PIV users. Students and parents checked grades and attendance more often and communicated with teachers more often. Did the quality of communication increase? Yes. The online grade book helped parents and students generate specific questions about student activities in school; each group reported increases to monitoring of homework, turning in assignments, and keeping recorded information timely and accurate. There was a perception of increasing levels of responsibility among students and their teachers. These observations are reflective of Epstein’s theory of overlapping spheres of influence (OSI) and contributed to the body of work surrounding that theory. Online grade book access, a form of PI occurring at home, is able to increase student, parent, and teacher perceptions about the quantity and quality of communication.

As referenced earlier, there are problems with the number of students in the samples that limit the ability of these conclusions to be generalized. Moreover, in the qualitative portion of the study, only high-frequency users of the PIV were targeted for interviews. There may be inconsistencies between the qualitative and quantitative results for that reason. Quantitative data were more representative of the entire population while qualitative interviews reflected only extremely high users. The contrast between the two types of data is informative in itself. The interactions that took place among teachers, students, and parents in situations of high-frequency use were personal rather than institutional (Halsey, 2005) because of the follow-up phone calls, emails, and personal exchanges prompted by the PIV. It may be that the perceptions of the high-frequency user are perceptions that can become targets for the entire population.
Recommendations for Practice and Policy

Use of the PIV and other online grade access programs may become more important and effective for parents, students, and teachers if changes to practice and policy are considered. Those changes include targeted training when addressing specific issues of attendance or work completion, orientation for parents and students to promote proactive self-monitoring and two-way communication, and involvement of the entire school community in electronic grade book implementation.

There are some intriguing results within this study’s quantitative portion for the low-SES user and the qualitative portion gathered from interviews, the combination of which forms a basis for recommending changes in practice. If the quality and quantity of discussion, monitoring, advanced planning, and assignment completion could be enhanced by increased use of the PIV, there would be some benefit to looking further into using the PIV for certain groups of students. Use of the PIV is recommended for students struggling to raise their GPA for a specific time period, as well as their parents and teachers. Additional training would be needed for students and parents on PIV existence and use, checking it at least one time per week, encouraging regular conversation about progress toward assignment completion, and two-way conversation with teachers through email, telephone calls, or personal contact. In addition, teachers should be trained on the use of PIV reports to reinforce students’ efforts to change their GPAs.

Given the relationship between changes to attendance and changes to PIV access for high-SES students and responses from parents and students interviewed, some additional training is recommended for students, parents, and teachers on the use of the
PIV for proactive rather than reactive reasons. Instead of waiting for dropping grades or attendance problems, students should be trained to use the PIV for monitoring their own attendance and planning for anticipated absences. Parents should be encouraged to highlight a student's responsible behavior using process-focused (Kemptner & Pomerantz as cited in Pomerantz et al., 2007) feedback (e.g., finishing assignments, attending school, and getting good grades) that can be taken from PIV reports. Literature reviewed about PI in the case of high-achieving students showed that PI (Clark, 1993) was related to parent actions that supported achievement. Teacher grading policies should be changed to require electronic posting of assignments in advance to support student planning.

Another recommended change in practice for principals and teachers is to establish a policy of record accuracy for the online grade book. Regular updating and monitoring of the PIV should be built into teacher expectations around grading and attendance. Such a policy would fulfill parent and student desires to access accurate information at any time, thereby honoring and respecting them as partners in the education process (Epstein, 2001b).

Lareau and Horvat (1999) suggested that any recommendations made to encourage more PI among poor families should not be directed just to the family as if it were a simple matter of individual choice to be involved or not. Instead, interventions directed at increasing the cultural capital of the entire social class would improve PI, provided that parents accessed the capital once it became available to them. This reference leads to a final recommendation for change in practice—that is, online grade book access should be promoted as allowable for parents during the working day. Grade book access, if embraced by an entire school community, may be a “moment of
inclusion” (p. 48) providing advantages to students, as it would promote parent involvement in student learning.

Recommendations for change in policy and/or practice include use of the PIV for those struggling to raise their GPA for a specific time period; training students to monitor their own attendance and plan for anticipated absences; training parents to use the PIV reports to highlight responsible behavior in students; requiring teachers to post upcoming assignments; establishing procedures to maintain accurate and timely grade book records; encouraging the use of email, phone calls, or personal contact in combination with the online grade book to complete the two-way communication cycle; and allowing parents access to the grade book during business hours.

Recommendations for Future Research

This researcher must conclude, as others (e.g., Blanchard & Oliver, 1999; Penuel et al., 2002; Rogers, 1994) have, that more research is needed on the role of electronic communication systems in promoting PI and student achievement. Studies that contain larger sample sizes, analyze other subgroups, are longitudinal, and include different methodologies are suggested for additional research.

The small size of the sample used in this study limited options to generalize any conclusions or implications. Efforts to replicate this study should include sample sizes that are representative of larger high school populations. With a larger sample size, other subgroup data might be considered, including male, female, Black, and Hispanic. Multiple focus groups would increase the variety of perceptions about the electronic
grade book and perhaps expand an understanding of why access may be important for some and not for others.

Variables for study might include expanding the definition of GPA to reflect all student coursework. Another variable could include standardized test scores, as there has been such a large focus on this type of achievement through NCLB legislation.

Given that letter grades are reflective of long-term efforts by students, a longitudinal study might better contribute to a definition of “regular access” than the current study has, furthering the understanding of which long-term electronic habits (if any) would be necessary to yield long-term results.

The amount of data gathered from an ex post facto data source seemed unwieldy at times. Further research is necessary using a control group to limit effects from extraneous sources and to explore the impact of actual electronic data access. With control groups, research tests for improvement can be carried out in addition to any analyses of relationships, thus contributing to arguments for causality.

Final Notes

The relationship of electronic access to student achievement remains elusive. It seems counterintuitive to think that there was no significant relationship between electronic access and grades or attendance when the responses about access from parents and students were so positive. Teacher responses about the absolute chasm between those who are motivated and those who are not must be a contributing factor to why these variables have no significant correlations.
Epstein's theory of overlapping spheres of influence is a model symbolizing the valuable contributions of a whole community to the successful education of students. Electronic access to online grade books contributes to only two types of parent involvement. There is much more study and collaboration necessary to develop the habit of partnering with parents to improve student success in school.
References
Achilles, C. M., & Finn, J. D. (2006). Education administration professor's role to assure that preparation programs address validy and critique skills. In F. L. Dembowski & L. K. Lemasters (Eds.), Unbridled spirit: Best practices in educational administration, the 2006 yearbook of the national council of professors of educational administration (pp. 257–265). Lancaster, PA: Destech.


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Appendix A. MyKidsGrades.org Billboard to Solicit Parent Use of PIV
Figure 11. MyKidsGrades.org Billboard to Solicit Parent Use of PIV

Source: Natrona County Office of Communications. Reprinted with permission of the owner.
Appendix B. Letters of Request and Approval From District Officials
Mark Mathern  
c/o Dr. Charles Achilles  
Jubilee Hall  
Seton Hall University  
400 South Orange Avenue  
South Orange, NJ 07079-2671  

January 26, 2008

Superintendent Jim Lowham  
Natrona County School District  
970 N. Glenn Road  
Casper, WY 82601

Dear Dr. Lowham:

I wanted to update you on recent changes to my dissertation study design and ask permission from you to contact students, parents, and teachers using telephone interviews instead of focus groups.

For various reasons, I have made changes to the study design to address my position of authority within this district and to resolve confidentiality issues regarding the use of focus groups. I have hired two research assistants to carry out the solicitation process for students, parents, and teachers as a way to limit my contact with them because of my position of authority in the district.

In addition, I have changed my data gathering technique from using focus groups to carrying out telephone interviews for a minimum of five parents, five students, and five teachers. The remainder of my plan with regard to the quantitative portion of my study remains as stated in my August, 2007 letter to you.

To secure participants for the student telephone interviews, a district staff member from IT will randomly generate a contact and call list of parents or guardians who are both high-frequency users of mykidsgrades.org and have students enrolled at NCHS. My research assistants will contact those parents/guardians through a letter seeking permission to invite their child to participate. Follow up calls will be made until a minimum of five consenting parents with assenting students is created. Signatures must be obtained from a parent/guardian and student, or the student will not be allowed to participate in the study. These student interviews will take place after school hours sometime in March of 2008.

To gather parent volunteers for interviews, my research assistant will contact by mail those parents who have a high use rate of mykidsgrades.org with follow up calls to create minimum of five consenting participants. Parents will provide signed forms which detail the use of the information gathered for the

Jim Lowham, Ed. D. • Superintendent of Schools
study prior to the beginning of the interview and will be given copies. These parent interviews will take place sometime in March of 2008.

Teachers from any of the four core areas will be solicited for a telephone interview by my assistants using email. Using follow up calls to gather a minimum of five teacher volunteers, my research assistants will conduct the telephone interviews during an after-school time slot sometime in March of 2008. Teachers will be asked to sign consent forms that detail the use of the information gathered for the study prior to the beginning of the interview.

I will secure approval for changes to this study from Seton Hall University's Institutional Review Board (IRB) and notify you of that approval prior to any contact with parents, students, or teachers. I must include your consent letter as part of my resubmission to the IRB. If changes to my plan meet with your approval, please incorporate the following passage on District letterhead paper, sign, and return it to me at your earliest convenience.

Thank you very much for your continued support and encouragement.

Sincerely,

[Signature]

Mark Mathern

Contingent upon approval of changes to this study by the Seton Hall IRB, I grant Mark Mathern and his assistants permission to solicit for interviews Natrona County High School teachers, students enrolled in grades 10-12 during the 2006-2007 and 2007-2008 school years, and their parents.

[Signature]

Dr. Jim Lowham, Ed.D.
Superintendent
Natrona County School District
Casper, WY
Approval Request Letter to Building Principal

Mark Mathern  
c/o Dr. Charles Achilles  
Jubilee Hall  
Seton Hall University  
400 South Orange Avenue  
South Orange, NJ 07079-2671  

January 26, 2008

Principal Dean Kelly  
Natrona County High School  
930 S. Elm  
Casper, WY 82601  

Dear Principal Kelly,

I wanted to update you on recent changes to my dissertation study design and ask permission from you to contact students, parents, and teachers using telephone interviews rather than focus groups.

For various reasons, I have made changes to the design of my study to address my position of authority within this district and to resolve confidentiality issues regarding the use of focus groups. I have hired two research assistants to carry out the solicitation process for students, parents, and teachers as a way to limit my contact with them because of my position of authority in the district.

In addition, I have changed my data gathering technique from focus groups to using telephone interviews for a minimum of five parents, five students, and five teachers.

My research assistants will contact parents/guardians through a letter seeking permission to invite their child to participate in a phone interview. Follow up calls will be made until a minimum of five consenting parents with assenting students is created. The student will not be allowed to participate in the study without parent permission. These student interviews will take place after school hours sometime in March of 2008.

To gather parent volunteers for interviews, my research assistant will contact by mail those parents who have a high use rate of mykidsgrades.org with follow up calls to create minimum of five consenting participants. Parents will provide signed forms which detail the use of the information gathered for the study prior to the beginning of the interview and will be given copies. These parent interviews will take place sometime in March of 2008.
Teachers from any of the four core areas will be solicited for a telephone interview by my assistants using email. Using follow up calls to gather a minimum of five teacher volunteers, my research assistants will conduct the telephone interviews during an after-school time slot sometime in March of 2008. Teachers will be asked to sign consent forms that detail the use of the information gathered for the study prior to the beginning of the interview.

I have met with Superintendent Lowham to discuss the changes to this study, and I will meet with you to discuss this information as well.

I will secure approval for changes to this study from Seton Hall University’s Institutional Review Board (IRB) and notify you of that approval prior to any contact with parents, students, or teachers. I must include your consent letter as part of my resubmission to the IRB. If changes to my plan meet with your approval, please incorporate the following passage on Natrona County High School letterhead paper, sign, and return it to me at your earliest convenience.

Thank you very much for your continued support.

Sincerely,

Mark Mathern

Contingent upon approval of changes to this study by the Seton Hall IRB, I grant Mark Mathern and his assistants permission to solicit for interviews Natrona County High School teachers, students enrolled in grades 10-12 during the 2006-2007 and 2007-2008 school years, and their parents. Also, I am aware that teachers, parents, and students contacted and agreeing to be participants in the interviews can withdraw without penalty at any time.

_____________________
Dean Kelly
Principal of Natrona County High School
February 8, 2008

Contingent upon approval of changes to this study by the Seton Hall IRB, I grant Mark Malvern and his assistants permission to solicit for interviews Natrona County High School teachers, students enrolled in grades 10-12 during the 2006-2007 and 2007-2008 school years, and their parents. Also, I am aware that teachers, parents, and students contacted and agreeing to be participants in the interviews can withdraw without penalty at any time.

[Signature]
Dean Kelly
Principal of Natrona County High School
Appendix C. Institutional Review Board Approval
Mark S. Mathern
4546 E 21st. Street
Casper WY, 82609

Dear Mr. Mathern,

The Seton Hall University Institutional Review Board has reviewed the information you have submitted addressing the concerns for your proposal entitled "The Influence of Electronic Grade Book Access on Student Achievement, Student Attendance, and Parent/Teacher Communication." Your research protocol is hereby approved as revised through expedited review. The IRB reserves the right to recall the proposal at any time for full review.

Enclosed for your records are the signed Request for Approval form, the stamped Assent Form, and the stamped original Consent Forms. Make copies only of these stamped forms.

The Institutional Review Board approval of your research is valid for a one-year period from the date of this letter. During this time, any changes to the research protocol must be reviewed and approved by the IRB prior to their implementation.

According to federal regulations, continuing review of already approved research is mandated to take place at least 12 months after this initial approval. You will receive communication from the IRB Office for this several months before the anniversary date of your initial approval.

Thank you for your cooperation.

*In harmony with federal regulations, none of the investigators or research staff involved in the study took part in the final decision.*

Sincerely,

Mary F. Ruzicka, Ph.D.
Professor
Director, Institutional Review Board
Appendix D. Letters of Solicitation for Parents and Teachers
Letter of Solicitation for Parent Interview

Dear NCHS Parent/Guardian,

My name is Cyndee Guthmiller, and the School District’s Superintendent has given me permission to help a researcher do a study about electronic grade books. The researcher, Mark Mathern, is a doctoral student enrolled at Seton Hall University.

The purpose of the study is to learn about how NCHS students, parents, and teachers use the District’s online grade book called the Pinnacle Internet Viewer (PIV).

I am asking you to volunteer to participate in a 10 minute telephone interview that will occur in March.

During the interview, I will ask questions which I have included with this letter. The interview will be audio-recorded and transcribed. Transcripts will be used to look for similarities and differences in replies among parents, teachers, and students.

Participation is voluntary, and you may withdraw at any time, even during the interview. There are no penalties for withdrawing.

Even though identifying information will be known, your responses will be kept confidential. Efforts will be made to guard your identity. Coded numbering (P1, P2, S1, S2, T1, T2, etc. . . ) will be used so no one can link the data to any individual. No names will be part of the audio-tape or the transcriptions. Research assistants will code the data before the researcher gets it.

The researcher will safely secure information in a locked filing cabinet in a private office for three years and then destroy it.

If you agree to help with this study then sign both copies of the enclosed Informed Consent Form for Telephone Interview. Return one copy using the self-addressed envelope, and drop it in the mail. Please return the form within the next week. I will be in touch by telephone to confirm a date and time for the interview. If you have questions, please call me at (307) 577-0200.

I greatly appreciate your time and consideration. The researcher plans to share the results of the study with Natrona County School District where you will be able to review it when it’s finished. Thank you very much for your support of this research.

Sincerely,

Cyndee Guthmiller
Research Assistant
Letter of Solicitation for Teacher Interview

Dear NCHS Teacher,

My name is Cyndee Guthmiller, and the School District's Superintendent has granted me permission to assist a researcher in conducting a study titled “The Influence of Electronic Grade Book Access on Student Achievement, Student Attendance, and Parent/Teacher Communication.” The researcher, Mark Mathern, is a doctoral student enrolled in the College of Education and Human Services, Department of Education Leadership, Management and Policy, at Seton Hall University. His experience in education includes service as a teacher, assistant principal, and principal for the past 25 years.

The study is part of a doctoral dissertation and is specific to students enrolled in Natrona County High School whose family members have gone online to use the District’s electronic grade book called the Pinnacle Internet Viewer. The purpose of the study is to examine the use of the Pinnacle Internet Viewer on communication among parents, teachers, and students and its influence on student performance and attendance.

I am asking you to volunteer to participate in a 10 minute telephone interview that will occur in March.

As a volunteer, you will be asked a predetermined set of questions about the electronic grade book, including how communication with parents and students has been impacted by its use.

Participation in this interview is voluntary, and you may withdraw at any time. Participating will not affect your status as an employee of the District or member of the NCHS staff in any way.

Even though identifying information will be known, please be assured that your responses will be kept confidential. A research assistant will be conducting the interview and transcribing the audio-tape before giving the documents to the researcher for analysis. No names will be included on any part of the audio-tape or transcript.

The audio-recordings and transcripts will be safely secured in the researcher’s locked filing cabinet for three years after the completion of the study and then destroyed.

Teachers can provide a great deal of information about the use of the electronic grade book as a communication tool. The information that will evolve from this study will be extremely valuable to teachers, administrators, parents, and students in developing programs to better use electronic tools for increasing communication between the home and school.
If you agree to help with this study, then I request that you sign both copies of the enclosed Informed Consent Form for Teacher Telephone Interview. Return one copy using the enclosed self-addressed envelope and drop it in the mail. Please return the form within the next week. I will be in touch by telephone to confirm a date and time for the interview. If you have questions, please call me at (307) 577-0200.

I greatly appreciate your time and consideration. The researcher plans to share the results of the study with Natrona County School District staff, so you will be able to review it upon its completion. Thank you very much for your support of this research.

Sincerely,

Cyndee Guthmiller
Research Assistant
Appendix E: Parent and Teacher Consent Forms
Parent Informed Consent Form for Telephone Interview

Researcher's Affiliation
Mark Mathern is a doctoral student enrolled at Seton Hall University.

Purpose
The purpose of the study is to learn about how NCHS students, parents, and teachers use the District's online grade book called the Pinnacle Internet Viewer (PIV). The study includes a 10 minute interview of parents.

Procedures
The researcher's assistant will begin the interview by going over the Consent Form. She will ask to tape-record the phone call, and then ask questions about the electronic grade book. After asking all of the questions, the research assistant will give a phone number and mailing address in case the parent has any questions later on.

The interview will be audio-recorded and typed out. Transcripts will be used to look for similarities and differences in responses among parents, teachers, and students.

Instruments
The research assistant will use a form called the Interview Script for Telephone Interview. It has questions about using the PIV. Some questions are: 1) How has the PIV had an impact on the attendance and grades of students; and 2) Do you think there is any connection between how often the PIV is used and attendance, grades or attitudes? Why or why not?

Voluntary Nature
Participation is voluntary, and a person may withdraw at any time, even during the interview. There are no penalties for withdrawing.

Anonymity
Identifying information will be known, but efforts will be made to guard the participant's identity. Coded numbering (P1, P2, S1, S2, T1, T2, etc...) will be used so no one can link the data to any individual. No names will be part of the audio-tape or the transcriptions. The research assistants will code the data before the researcher gets it.

Confidentiality
Identifying information will be kept as confidential. The research assistants, the researcher, and the researcher's dissertation committee will have access to all hard copy and electronic information. The researcher will safely secure information in a locked filing.

Seton Hall University
Institutional Review Board

Expiry Date
FEB 12 2008

Approval Date
FEB 12 2009

College of Education and Human Services
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Tel. 973.275.2728
400 South Orange Avenue • South Orange, New Jersey 07079-2685
cabinet in a private office for three years and then destroy it. The information will not be used in any other study.

**Risks**
Participation poses no anticipated risks for the participant.

**Benefits**
There are no direct benefits to the participant other than a sense of helping the public increase knowledge about home/school communication.

**Payment**
There is no pay for taking part in this study.

**Contact Information**
If parents have questions about the study, they can contact:
1. Mark Mathern by telephone at (307) 577-0253, or by email at matherma@shu.edu
2. Dr. Charles Achilles at (973) 275-2728.
3. Seton Hall University Institutional Review Board, President’s Hall, Seton Hall University, South Orange, NJ, 07079, (973) 313-6314.

**Permission to use Audio Tape Recorder**
A recorder will be used to tape the interview. Codes, P1, P2, S1, S2, T1, T2, etc., will be used in place of names on the tape. The research assistant will transcribe the tape into written format. The tapes and transcripts will be locked in a secure cabinet available only to the researcher, the research assistants, and the researcher's dissertation committee; then destroyed three years after the study is completed.

**Informed Consent**
Consent to participate in the telephone interview and permission to audio-tape the interview is given by signing and returning this Informed Consent Form to the researcher’s assistant.

Participant Name

Participant Signature ___________________________ Date __________________

Phone number to call for research assistant to confirm interview date and time __________________

The researcher’s assistant will be in touch by telephone to confirm the date and time for the interview. You will be given a signed and dated copy of the consent form.
Informed Consent Form for Teacher Telephone Interview

Researcher’s Affiliation
Mark Mathern is a doctoral student enrolled in the College of Education and Human Services, Department of Education Leadership, Management and Policy, at Seton Hall University.

Purpose of Research
The purpose of this study is to examine the influence of family access of an electronic grade book on communication among parents, teachers, and students and on student performance and attendance. A telephone interview is part of the study, and the researcher estimates participation to take 10 minutes.

Procedures
The researcher’s assistant will conduct a telephone interview and ask teachers a predetermined set of questions about experiences with the electronic grade book. The research assistant will begin the interview session by reviewing the informed consent form. Next, the research assistant will ask prescribed questions of the participant. After the participant is given an opportunity to respond to all questions, the research assistant will provide a phone number and mailing address for consultation at any time during or after the study.

The interview will be audio-recorded and transcribed. Transcripts from the telephone interviews will be categorized to look for similarities and differences in responses among parents, teachers, and students.

Instruments
An instrument called the Interview Script for Teacher Telephone Interview will be used by the research assistant to ask a set of questions about using the electronic grade book including how often it is used and how it impacts communication with others. Examples of questions on the interview script include: 1) How has the PIV had an impact on the attendance and grades of your students; and 2) Do you think there is any connection between how often the PIV is used and attendance, grades or attitudes? Why or why not?

Voluntary Nature of the Participation
Participation is voluntary, and the teacher may withdraw at any time, even during the interview itself. There are no penalties for withdrawing or stopping.
Anonymity
Identifying information will be known, but efforts will be made to guard the participant’s identity. Coded numbering (P1, P2, S1, S2, T1, T2, etc. . . ) will be used so no one can link the data to any individual. No names will be part of the audio-tape or the transcriptions. The research assistants will code the data before the researcher gets it.

Confidentiality
Identifying information will be kept as confidential. The research assistants, the researcher, and the researcher’s dissertation committee will have use of all hard copy and electronic information. The researcher will safely secure information in a locked filing cabinet in a private office for three years and then destroy it. The information will not be used in any other study.

Risks
Participation poses no anticipated risks for the participant.

Benefits
There are no direct benefits to the participant other than a sense of helping the public increase knowledge about home/school communication.

Compensation
There is no pay for taking part in this study.

Contact Information
If teachers have questions about the study, they can contact:
1. Mark Mathern by telephone at (307) 577-0253, or by email at matherma@shu.edu
2. Dr. Charles Achilles at (973) 275-2728.
3. Seton Hall University Institutional Review Board, President’s Hall, Seton Hall University, South Orange, NJ, 07079, (973) 313-6314.

Permission to use Audio Tape Recorder
A recorder will be used to tape the interview. Codes, P1, P2, S1, S2, T1, T2, etc. . . , will be used in place of participant names on the tape. The research assistant will transcribe the tape into written format. The tapes and transcripts will be locked in a secure cabinet available only to the researcher, the research assistants, and the researcher’s dissertation committee; then destroyed three years after the study’s completion.
Informed Consent

Consent to participate in the telephone interview and permission to audio-tape the interview is given by signing and returning this Informed Consent Form to the researcher's assistant.

Participant Name ____________________________

Participant Signature _________________________ Date __________

Phone number to call for research assistant to confirm interview date and time _______

The researcher’s assistant will be in touch by telephone to confirm the date and time for the interview. You will be given a signed and dated copy of the consent form.

Seton Hall University
Institutional Review Board

FEB 12 2008

Approval Date

Expiration Date

FEB 12 2009
Appendix F. Student Letters of Solicitation, Parent Consent, and Student Assent Forms
March 6, 2008

Dear NCHS Parent/Guardian,

My name is Kerri Wills, and the School District’s Superintendent has given me permission to help a researcher do a study about electronic grade books. The researcher, Mark Mathem, is a doctoral student enrolled at Seton Hall University.

The purpose of the study is to learn about how NCHS students, parents, and teachers use the District’s online grade book called the Pinnacle Internet Viewer (PIV).

I am looking for approval to ask your high school student to take part in a telephone interview in March. During that phone call, I will ask your child questions which I have included with this letter. The interview will be audio-recorded and transcribed. Transcripts will be used to look for similarities and differences in replies among parents, teachers, and students.

Participation is voluntary, and your child may withdraw at any time.

Even though I will know your student’s name, responses will be kept confidential. I will use coded numbering (P1, P2, S1, S2, T1, T2, etc. . . .), so no one can link the data to any individual. No names will be part of the audio-tape or the transcriptions. Research assistants will code the data before the researcher gets it.

The researcher will safely secure information in a locked filing cabinet in a private office for three years and then destroy it.

If you agree to allow me to ask your child to take part in the study, please sign both copies of the Parent’s Informed Consent for Student Participation in Telephone Interview, and give the attached information to your child to read and sign. Return one copy of the consent form and one copy of the Student Assent Form within a week. If you have questions, please call me at (307) 577-0200.

The researcher plans to share the results of the study with Natrona County School District where you will be able to review it when it’s finished. Thank you very much for your support of this research.

Sincerely,

Kerri Wills
Research Assistant
Letter of Solicitation for Student Participation in Telephone Interview

March 6, 2008

Dear NCHS Student,

My name is Kerri Wills, and the School District’s Superintendent gave me the okay to help a researcher do a study. The researcher’s name is Mark Mathern, and he is a doctoral student at Seton Hall University.

The purpose of the study is to learn about how NCHS students, parents, and teachers use the District’s online grade book called the Pinnacle Internet Viewer (PIV).

I am asking you to volunteer to take part in a 10 minute phone call sometime in late March.

I will ask you a set of questions about how talking with your parents and teachers is the same or different because of the PIV. I will tape-record our phone call to make sure I don’t miss any big ideas. The questions I will ask are included with this letter.

Taking part is up to you, and you can quit before or even during the phone call if you don’t want to finish. There will be no penalties for doing so.

Even though I will know your name, I will not use it on any part of the audio-tape or on what I type out. I will keep your answers confidential, and I will type out what you say before I give it to the researcher.

The researcher will lock all the audio-tapes and papers in a drawer so no one else can get them, then destroy all the items after three years.

If you agree to help, sign both copies of the Student Assent Form, and have your parents sign them too. Return one copy along with the Parent’s Informed Consent for Student Phone Interview. Return the forms within this next week. I will call to set a date and time for the phone call. If you have questions, call me at 577-0200.

I hope you decide to take part. When the study is done, the researcher will give it to the Superintendent of the School District so you can find out about the results. Thank you very much for your help.

Sincerely,

Kerri Wills
Research Helper
Parent's Informed Consent for Student Phone Interview

Researcher's Affiliation
Mark Mathern is a doctoral student enrolled at Seton Hall University.

Purpose
The purpose of the study is to learn about how NCHS students, parents, and teachers use the District's online grade book called the Pinnacle Internet Viewer (PIV). The study includes a 10 minute interview of students.

Procedures
The researcher's assistant will begin a student interview by going over the Assent Form. She will ask to tape-record the phone call, and then ask questions about the electronic grade book. After asking the questions, the research assistant will give a phone number and mailing address in case the student has any questions later on.

The interview will be audio-recorded and typed out. Transcripts will be used to look for similarities and differences in the responses of parents, teachers, and students.

Instruments
The research assistant will use a form called the Interview Script for Student Telephone Interview. It has questions about using the PIV. Some questions are: 1) How has the PIV had an impact on your attendance; and 2) Do you think there is any connection between how often the PIV is used and attendance, grades or attitudes? Why or why not?

Voluntary Nature
Participation is voluntary, and a student may withdraw at any time, even during the interview itself. There are no penalties for withdrawing or stopping.

Anonymity
Identifying information will be known, but efforts will be made to guard the student's identity. Coded numbering (P1, P2, S1, S2, T1, T2, etc.) will be used so no one can link the data to any individual. No names will be part of the audio-tape or the transcriptions. The research assistants will code the data before the researcher gets it.

Confidentiality
Identifying information will be kept as confidential. The research assistants, the researcher, and the researcher's dissertation committee will have use of all hard copy and electronic information. The researcher will safely secure information in a locked filing cabinet in a private office for three years and then destroy it. The information will not be used in any other study.

Seton Hall University
Institutional Review Board
FEB 12 2008

College of Education and Human Services
Executive Ed.D. Program
Tel. 973.275.2728
400 South Orange Avenue • South Orange, New Jersey 07079-2685

Expiration Date
FEB 12 2009

Approval Date
Risks
Participation poses no anticipated risks for the participant.

Benefits
There are no direct benefits to the student other than a sense of helping the public increase knowledge about home/school communication.

Payment
There is no pay for taking part in this study.

Contact Information
If parents have questions about the study, they can contact:
1. Mark Mathern by telephone at (307) 577-0253, or by email at matherma@shu.edu
2. Dr. Charles Achilles at (973) 275-2728.
3. Seton Hall University Institutional Review Board, President’s Hall, Seton Hall University, South Orange, NJ, 07079, (973) 313-6314.

Permission to use Audio Tape Recorder
A recorder will be used to tape the interview. Codes, P1, P2, S1, S2, T1, T2, etc., will be used in place of names on the tape. The research assistant will transcribe the tape into written format. The tapes and transcripts will be locked in a secure cabinet available only to the researcher, the research assistants, and the researcher’s dissertation committee; then destroyed three years after the study’s completion.

Informed Consent
Consent to allow the research assistant to ask your child to participate in the telephone interview is indicated by signing and returning this form in the enclosed self-addressed envelope. You will be given a signed and dated copy of the consent form before your child’s participation in the interview begins.

Student Name

Parent/Guardian Name

Parent/Guardian Signature __________________________ Date ________

Seton Hall University Institutional Review Board

College of Education and Human Services
Executive Ed. D. Program
Tel. 973.275.2728
400 South Orange Avenue • South Orange, New Jersey 07079-2685

Approval Date FEB 12 2008

Expiration Date FEB 12 2009
Student Assent Form

Researcher's Affiliation
The researcher's name is Mark Mathern, and he is a doctoral student at Seton Hall University.

Purpose of Research
The purpose of the study is to learn about how NCHS students, parents, and teachers use the District’s online grade book called the Pinnacle Internet Viewer (PIV). The study includes a 10 minute interview of the students.

Procedures
The researcher's helper will begin the interview by going over the Student Assent Form. She will ask to tape-record the phone call. Then, she will ask questions about how talking with parents and teachers is the same or different because of the PIV. She will also ask about how often the student uses the PIV. After asking the questions, the research helper will give a phone number and mailing address in case the student has any questions later on.

The audio-tape of the interview will be typed out for the researcher to study.

Instruments
The research helper will use a form called the Interview Script for Student Phone Interview. It has questions about using the PIV. Some of the questions are: 1) How has the PIV had an impact on your attendance; and 2) Do you think there is any connection between how often the PIV is used and attendance, grades, or attitudes? Why or why not?

Voluntary Nature of the Participation
Taking part is up to the student, and stopping before or even during the phone call is okay. There will be no penalties for stopping or not taking part in the interview.

Anonymity
Names will be known, but will not be used on the tape recording. Code names will be used instead. All student answers are confidential.

Confidentiality
The researcher will lock all the audio-tapes and papers in a drawer so no one else can get them except the researcher, his helpers, and his college teachers. Then he will destroy all the items after three years.

Seton Hall University
Institutional Review Board

Expiration Date
FEB 1 2 2009

Approval Date
FEB 1 2 2009
Risks
Taking part in the phone interview is not a likely risk.

Benefits
Taking part in the phone interview has no direct benefit to the student.

Pay
There is no pay to the student for taking part in the interview.

Contact Information
If students have questions, they can contact:
1. Mark Mathern by telephone at (307) 577-0253, or by email at matherma@shu.edu
2. Dr. Charles Achilles at (973) 275-2728.
3. Seton Hall University Institutional Review Board for Human Subjects Research,
   President’s Hall, Seton Hall University, South Orange, NJ, 07079, (973) 313-6314.

Permission to use Audio Tape Recorders
During the phone call, the research helper will use a tape recorder to make sure to get
everything the student says. She will use codes in place of names on the tape. The
researcher will lock all the audio-tapes in a drawer so no one else can get them, then
destroy all the items after three years.

Assent
Signing and returning this Student Assent Form in the envelope means that the student
is:
1. Willing to take part in the phone interview and
2. Giving the research assistant the okay to tape record the phone call.

Student Name ________________________________

Student Signature ___________________________ Date ______________

Parent/Guardian Name __________________________

Parent/Guardian Signature ______________________ Date ______________

Phone number for research helper to call to set up interview __________________________

Students and parents will receive a copy of the signed and dated Student Assent Form.
Appendix G. Oral Confirmation and Telephone Interview Scripts for Parents, Students, and Teachers
Oral Confirmation Script for Telephone Interviews

[Script will be delivered by the researcher’s assistants to participants targeted as high frequency users of the Pinnacle Internet Viewer (PIV) electronic grade book.

Introduction:]

Hello, this is [Cyndee Guthmiller or Kerri Wills]. I am a research assistant for a doctoral student from Seton Hall University, Mark Mathern. He is working on the study of the electronic grade book, Pinnacle Internet Viewer. I sent you a letter few weeks ago. I received your

[if parent of participating student] child’s Assent Form and the Parent’s Informed Consent Form;

[if parent or teacher] Informed Consent Form in the mail. Thank you for returning them. I’m calling today to confirm your participation in the telephone interview and to set up a time to hold the interview.

[Explanation of Process and Duration of Participation]:

The interview should take about ten minutes. I will be the person asking you a set of questions about the use of the electronic grade book called the Pinnacle Internet Viewer. I call it the PIV. The questions will be about the amount of use you believe the PIV gets and how that use relates to a student’s progress in school. I will also ask some questions about the types of communication that the PIV generates.

[if a student] between you and your parents and teachers.

[if a teacher] between you and parents of your students.

[if a parent] between you and your child and teachers.
I can schedule any time that is convenient for you. [Schedule a time with participant, and record it for your use later].

[Opportunity for Further Clarification]:

Do you have any questions about the interview or the study that I can answer at this time?

[Contact Information and Closing]:

I want to thank you for helping us out with the study. I look forward to our interview which you and I have scheduled for _______________. If you have any questions, feel free to call me at 577-0200. Thank you. Good bye.
Interview Script for Parent Telephone Interview

Thank you for agreeing to participate in this interview. My name is Cyndee Guthmiller, and I am a research assistant for a doctoral student at Seton Hall University. He is doing this study to examine the use of the electronic grade book called the Pinnacle Internet Viewer.

You have been selected for this interview because district records indicate that you or a member of your household has used the Pinnacle Internet Viewer in the past. As a parent, you can provide a great deal of information about the use of the electronic grade book as a communication tool.

In front of me, I have a copy of the consent form you signed. I would like to review it before we begin.

- This interview will last about 10 minutes. I will be using an interview form to ask you 12 questions to capture your opinions and experiences about using the electronic grade book.

- Participation in this interview is voluntary, and you may stop at any time if you feel uncomfortable. There are no penalties for stopping.

- I would like to audio tape our conversation today in order to capture all that is said. I will be transcribing the audio-tape before giving the documents to the researcher. No real names will be included on any part of the audio-tape or transcript. I am going to call you Parent (1, 2, 3, 4, or 5) unless you have another name you want me to use during the interview.

- The audio-recordings and transcripts will be safely secured in the researcher’s locked filing cabinet for three years after the completion of the study and then destroyed.

[Start the tape recorder now]

Thank you for agreeing to participate. To start out,

1) Tell me how long you have been connected to NCHS and what grades your child(ren) is/are in.

2) People say that it’s important to communicate with the school and about school. In your opinion, what causes you to talk with teachers or your children about school?
3) What barriers get in the way of allowing you to communicate about school with your children or their teachers?

Thank you for your comments about communication. These next few questions are about the use of the online grade book called the Pinnacle Internet Viewer. Some people call it mykidsgrades.org. During this interview, I will call it the P - I - V.

4) NCHS and the school district have a Web site called mykidsgrades.org or the Pinnacle Internet Viewer (PIV). What information have you used from that website?

5) How often have you used it?

6) How has the PIV had an impact on the attendance and grades of students?

7) How has the PIV impacted your attitudes about NCHS, administrators, or teachers?

8) How has the PIV changed how you support your children at home? [Make these suggestions: monitoring homework, discipline, privileges, rewards?]

9) After you see information on the PIV, what conversations do you have with the school staff or your children’s teachers?

10) How has information from the PIV prompted you to talk with your kids about programs in school, like the courses they are in or what their plans are for next year?

We are down to the last two questions. Thank you for hanging in there with me as we near the end of the interview.

11) Do you think there is a connection between how often the PIV is used and attendance, grades, or attitudes? Why or why not?
12) If there were something about the PIV that I didn’t visit with you about today, but you want me to know, what would that be?

[Turn off the tape recorder]

Thank you very much for your time. If you think of ideas you want to add later on or if you have other questions about the study, please give me a phone call. My name is Cyndee Guthmiller and I can be reached at 577-0200 or you can write to me at the school district address – 970 N. Glenn Road, Casper, WY 82601.
Interview Script for Student Phone Interview

Thank you for agreeing to participate in this interview. My name is Kerri Wills, and I am a research helper for a doctoral student at Seton Hall University. He is doing this study to learn about how NCHS students, parents, and teachers use the District's online grade book called the Pinnacle Internet Viewer (PIV).

You have been selected for this interview because district records show that you or someone in your home has used the Pinnacle Internet Viewer in the past. Because you are a student at NC, you can provide a lot of information about the use of the online grade book.

In front of me, I have a copy of the assent form you and your parents signed. I would like to go over it before we start.

- This interview will last about 10 minutes. I am using an interview script to ask you 12 questions to get your opinions and experiences about using the online grade book.

- Taking part in this interview is voluntary, and you can stop at any time if you feel uncomfortable. There are no penalties for stopping.

- I would like to audio tape our conversation today to make sure that I capture all that is said. No real names will be included on any part of the audio-tape. I am going to call you Student (1, 2, 3, 4, or 5) unless you have another name you want me to use during the interview. I will be typing out what is on the tape and give that to the researcher.

- The researcher will lock all the audio-tapes and papers in a drawer so only he and his doctoral committee can have access to them, then destroy all the items after three years.

[Start the tape recorder now]

Thank you for agreeing to participate. To start out,

1) Tell me what grade you are in and how long you have been at NCHS.

2) As you think about all the years you have spent in school, what do you think causes teachers, parents, and students to talk to each another about school?

3) What do you think might stop you or your parents from talking with each other or with teachers about whether you are on track, succeeding, or growing in school?
Thank you for your comments so far. These next few questions are about using the online grade book called the Pinnacle Internet Viewer. Some people call it mykidsgrades.org. During this interview, I will call it the P-I-V.

4) Your school has a Web site called mykidsgrades.org or the Pinnacle Internet Viewer (PIV). What information have you used from the Web site? How often?

5) How has the PIV affected your attendance?

6) How has the PIV affected your grades?

7) Think about a person's attitude toward school, principals, teachers, parents, or yourself. How has the PIV affected the attitudes of any of these people?

8) How has the PIV changed your studying or learning at home?

9) After your parents have seen information on the PIV, what are their conversations about with you, your teachers, or other school staff?

10) How has information from the PIV caused your parents to visit with you about programs in school, like the courses or activities you are in or what your plans are for the future?

We are down to the last two questions. Thank you for hanging in there with me as we near the end of the interview.

11) Do you think there is a connection between how much the PIV is used and attendance or grades or attitudes? Why?

12) If there were something about the PIV that I didn't visit with you about today, but you want me to know, what would that be?

[Turn off the tape recorder]
Thank you very much for your time. If you think of ideas you want to add later on or if you have other questions about the study, please give me a phone call. My name is Kerri Wills, and I can be reached at 577-0200 or you can write to me at the school district address – 970 N. Glenn Road, Casper, WY 82601.
Interview Script for Teacher Telephone Interview

Thank you for agreeing to participate in this interview. My name is Cyndee Guthmiller, and I am a research assistant for a doctoral student at Seton Hall University. He is doing this study to examine the use of the electronic grade book called the Pinnacle Internet Viewer on communication among parents, teachers, and students and its influence on student performance and attendance.

You have been selected for this interview because district records indicate that you teach or have taught Language Arts, Math, Science, or Social Studies at NCHS.

In front of me, I have a copy of the consent form you signed. I would like to review it before we begin.

- This interview will last about 10 minutes. I will be using an interview form to ask you 12 open ended questions to capture your opinions and experiences about the electronic grade book.

- Participation in this interview is voluntary, and you may withdraw at any time if you feel uncomfortable. There are no penalties for stopping.

- I would like to audio-tape our conversation today in order to capture all that is said. I will be transcribing the audio-tape before giving the documents to the researcher for analysis. No real names will be included on any part of the audio-tape or transcript. I am going to call you Teacher (1, 2, 3, 4, or 5) unless you have another name you want me to use during the interview.

- The audio-recordings and transcripts will be safely secured in the researcher’s locked filing cabinet for three years after the completion of the study and then destroyed.

[Start the tape recorder now]

Thank you for agreeing to participate. To start out,

1) Tell me how long you have been connected to NCHS and what subjects you teach.

2) People say that it’s important to communicate with the school and about school. In your opinion, what causes you to talk with parents or your students about school?
3) What barriers get in the way of allowing you to communicate about school with your students or their parents?

Thank you for your comments about communication. These next few questions are about the use of the online grade book called the Pinnacle Internet Viewer. Some people call it mykidsgrades.org. During this interview, I will call it the P-I-V.

4) NCHS and the school district have a Web site called mykidsgrades.org or the Pinnacle Internet Viewer (PIV). What information have your students or parents taken from the Website?

5) How often did they seem to use it?

6) How has the PIV had an impact on the attendance and grades of your students?

7) How has the PIV impacted parents’, students’, administrators’, or teacher attitudes toward school?

8) How do you think the PIV has prompted parents to change how they support their children at home? [Make these suggestions: monitoring homework, discipline, privileges, rewards?]

9) After parents have accessed information from the PIV, what has been the nature of the conversations you have with them and your students?

10) How has information from the PIV prompted you to talk with your students and their parents about programs in school, like the courses they are in or what their plans are for next year?

We are down to the last two questions. Thank you for hanging in there with me as we near the end of the interview.
11) Do you think there is a connection between how often the PIV is used by students and parents and attendance, grades, or attitudes? Why or why not?

12) If there were something about the PIV that I didn’t visit with you about today, but you want me to know, what would that be?

[Turn off the tape recorder]

Thank you very much for your time. If you think of ideas you want to add later on or if you have other questions about the study, please give me a phone call. My name is Cyndee Guthmiller, and I can be reached at 577-0200 or you can write to me at the school district address – 970 N. Glenn Road, Casper, WY 82601.
Appendix H. Permissions to Reprint and Adapt From Epstein
9-4-07

To: Mark Mathern

From: Joyce Epstein

Re: Permission to reprint

This is to grant you permission to reprint Figure 2.1 and 2.2: Model of Overlapping Spheres of influence from our book:

I understand this will be used in your dissertation for Seton Hall University.

Your modifications of the model are part of your work. You will reference the original theoretical model and show what you want for your study.

Best of luck with your project.

Joyce L. Epstein, Ph.D.
Director, Center on School, Family, and Community Partnerships

and the National Network of Partnership Schools
Research Professor of Sociology
Johns Hopkins University

3003 North Charles Street, Suite 200
Baltimore, MD 21218

tel: 410-516-8807
fax: 410-516-8890
From: Mark Mathern [mailto:Mark_Mathern@ncsd.k12.wy.us]  
Sent: Sunday, November 04, 2007 9:28 PM  
To: nnps  
Subject: Permission to adapt from copyright  

Mark Mathern  
4546 E. 21st St.  
Casper, WY 82609  
November 4, 2007  
National Network of Partnership Schools  
Johns Hopkins University  
3003 N. Charles Street, Suite 200 Baltimore, MD 21218nnps@csos.jhu.edu  

Dear Publisher, I am seeking your permission to adapt into a table the six types of parent involvement described in Promising Partnership Practices, edited by K. C Salinas, M. Maushard, J. I. Brownstein, and S. Waxman, for use in my dissertation.  

I am a doctoral student at Seton Hall University, and I plan to reference the six types of involvement as part of a discussion surrounding Epstein's theory of overlapping spheres of influence. I have attached a draft of the table to this missive. Thank you for taking the time to consider my request. I can be reached at the above address, or you can email me with your decision at matherma@shu.edu or at mark_mathern@ncsd.k12.wy.us  

Sincerely,  

Mark Mathern  
Doctoral Candidate  
Seton Hall University
From: "Joyce Epstein" <jepstein@CSOS.jhu.edu>
Tuesday, November 27, 2007 11:27:55 AM

Subject: Permission to adapt from copyright

To: Mark Mathern
From: Joyce Epstein
Re: Permission

This is to grant permission to you to use and adapt the framework of six types of involvement for your study and dissertation at Seton Hall.

Although we use the framework in the annual book that you note below, the correct reference on the chart and in your bibliography to show readers where the framework originated and how it is used in practice is:


Best of luck with your project.

Joyce L. Epstein, Ph.D.

Director, Center on School, Family, and Community Partnerships and the National Network of Partnership Schools

Research Professor of Sociology

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