Enhancing School–Home Communication Through Learning Management System Adoption: Parent and Teacher Perceptions and Practices

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Abstract

Communication is an integral component for establishing a strong school community. Learning management systems (LMSs) present new opportunities for communication and collaboration among teachers, students, and parents. This study examined parents' and teachers' perceptions and use of a newly adopted LMS for school–home communication in a rural K–12 school district. Findings indicate that most families have internet access and that parents and teachers are comfortable using digital tools to communicate. Although new tools are available, more traditional resources like email and phones continue to be used most frequently for bidirectional communication. However, results demonstrate that the LMS may provide value as a one-stop location for resources and information.

Key Words: bidirectional school–home communication, technology adoption, learning management system, LMS, community, family involvement, digital tools, teachers, parents, engagement, communicating, perceptions, practices

Introduction

School–home communication is necessary for establishing a strong school community (Epstein, 2010; Henderson & Mapp, 2002). Communication positively impacts family involvement (Galindo & Sheldon, 2012), students'

academic performance (Bergman, 2012; Galindo & Sheldon, 2012; Kraft & Dougherty, 2013; Sheldon, Epstein, & Galindo, 2010), and attendance (Sheldon, 2007; Sheldon & Epstein, 2004). Yet school–home communication is "infrequent and unsystematic in most schools" (Kraft, 2016, p. 15). Parents indicate they would like to have access to better information from teachers and schools (Epstein, 2011).

Goodall (2016) described communication as "a signal passed from one person to another; a signal which the second person is capable of understanding and to which they could, potentially, respond" (p. 119). Communication between the school and home is identified as one-way (single direction) or two-way (bidirectional; Graham-Clay, 2005). Written one-way communications, such as webpages and newsletters, share information with parents and keep them informed about classroom and school events. Communication in K–12 education is often one-way (Epstein, 2011), yet two-way communication between teachers and parents is necessary (Berger, 2000; Epstein, 2008; Graham-Clay, 2005; Sanders, 2008).

School–home communication, which includes all communication between school staff and students' parents, has evolved in recent years because of the proliferation of new technologies (Patrikakou, 2016; Thompson, Mazer, & Flood Grady, 2015). Parents, teachers, and students are receptive to using digital tools to communicate (Grant, 2011). National School Public Relations Association (NSPRA) President Ron Koehler remarked, "Consumer needs are changing. The backpack folder is no longer the primary source of information for parents. They want and prefer instant electronic communication" (NSPRA, 2011, p. 1). Parents and teachers use email most frequently to communicate (Zieger & Tan, 2012), but parents are becoming more receptive to communication with social media and text messaging (Olmstead, 2013; Thompson et al., 2015). Thompson et al. (2015) indicated that parents are likely to select these methods more frequently in the future because they can be accessed conveniently on smartphones. Parents' increased personal use of social media tools has contributed to new expectations for how they expect to receive information from schools (Project Tomorrow, 2016).

Technology allows schools to provide information to many people while allowing for individual communication with specific individuals (Goodall, 2016). Olmstead (2013) wrote, "Schools should be seeking ways to maximize emerging technological tools to promote better communication between teachers and parents" (p. 30). K–12 schools are increasingly adopting learning management systems (LMS), such as Schoology, Google Classroom, Canvas, and Moodle. However, little is known about their impact on communication between schools and parents. With parent shifts in communication preferences

and the emergence of new technology tools, Kraft and Rogers (2015) asserted that researchers should investigate the use of LMSs for direct communication between the school and home. Likewise, Goodall (2016) stated that existing research on the use of technology in schools typically examines pedagogical and teaching benefits. Further research is needed to examine the use of such tools for communication.

This article examines parents' and teachers' perceptions and use of an LMS for school–home communication in a rural Michigan school district. The National Center for Education Statistics (NCES, 2006) defines rural schools as schools that do not lie inside an urbanized area or urban cluster. An urbanized area has a population of 50,000 or more, and an urban cluster is an area that contains between 2,500 and 50,000 people. Rural schools are characterized by geographic isolation and small population size. The target district is classified as a rural district by the Michigan Department of Education (2014).

The study addresses the following research questions:

1. What tools do parents and teachers use for communication between the school and home, and how frequently do they use them?
2. How does LMS integration impact parents' and teachers' school–home communication practices and perceptions?
3. Do income and education impact parent perceptions and practices?
4. Do experience and education impact teacher perceptions and practices?

Positive Effects of Communication

Research indicates that school–home communication has many positive effects. For example, student performance is positively impacted by such communication (Bergman, 2012; Galindo & Sheldon, 2012; Kraft & Dougherty, 2013; Sheldon et al., 2010). Specifically, Bergman (2012) found that communicating with parents about missing assignments led to improved GPAs, math test scores, and student engagement. Additionally, daily written messages and phone calls home to families of students in a summer program led to increased homework completion, decreased need for student redirection, and increased class participation (Kraft & Dougherty, 2013). In a study of 16,435 kindergarten students from 864 schools across the nation, Galindo and Sheldon (2012) found that students in schools that provided more opportunities for school–home communication and interaction demonstrated greater gains in math and reading. Likewise, Sheldon et al.'s (2010) examination of 39 schools in the National Network of Partnership Schools found higher math achievement—demonstrated by the number of students who scored at passing or proficient levels on the state standardized math tests—among schools that integrated more math-related partnership activities, such as family workshops, newsletters, and math-centered face-to-face conferences during the school year.

Attendance also improves with increased communication between school and home (McConnell & Kubina, 2014; Sheldon, 2007; Sheldon & Epstein, 2004). Sheldon and Epstein (2004) found that communication practices contributed to improved student attendance and decreased chronic absenteeism. Sheldon (2007) similarly found that schools that reached out and attempted to involve families more frequently were more likely to see increased student attendance. In a review of literature relating to school–home connections and attendance, McConnell and Kubina (2014) found that keeping families apprised of their child's attendance helped to curb attendance issues. Phone calls were found to be particularly effective in the studies they examined.

Communication increases family involvement (Galindo & Sheldon, 2012), which in turn has been linked to higher GPAs, lower dropout rates, and improved language and reading skills (Stormshak et al., 2016). Banicky and Foss (2000) analyzed 16 research syntheses and literature reviews and found that students showed higher grades and test scores, improved social behavior, greater academic motivation, better attendance, and lower dropout rates when families became involved with their education. With increased communication, parents gained new ideas for helping their children learn, positive rapport with the school, enhanced self-confidence, and increased desire to seek further education themselves. For teachers and schools, mass communication with parents resulted in better parent and community relationships, extra help in implementing programs, and improved teacher morale (Banicky & Foss, 2000).

Communication Methods

Due to the proliferation of smartphones and other mobile technologies in recent years, communication methods in education have rapidly evolved. Smartphone ownership has spiked, with 64% of adults living in the United States indicating smartphone ownership in 2015, compared to 35% in 2011 (Pew Research Center, 2015). Smartphones and other mobile technologies are convenient (Gilgore, 2015) and are becoming viable tools for school–home communication (Ho, Hung, & Chen, 2013). Parents, teachers, and students are receptive to the use of digital tools for communication (Grant, 2011). In a study of 1,349 parents assessing the frequency and importance of communication across several modes, Thompson et al. (2015) found that parents prefer email communication. However, the authors noted that parents are increasingly interested in using methods like text messaging and social media.

Many factors contribute to parent–teacher communication preferences. Parents' desired method of communication is often dependent upon the length and complexity of the message (Thompson et al., 2015). Message urgency and sensitivity also play a role in the selection of an appropriate mode

of communication (Roman & Ottenbreit-Leftwich, 2016). For serious issues, face-to-face communication is particularly valued (Thompson et al., 2015).

Goodall (2016) mentioned that technology offers both long-standing and new methods of school–home communication. For example, nearly all schools have webpages and faculty email addresses. Many have also adopted text messaging systems, such as Remind, to inform parents of events and cancellations. LMSs are among potential methods of school–home communication (Kraft & Rogers, 2015). Also known as online learning platforms, LMSs are used to organize and deliver lessons, courses, or training programs. Many feature parent access capabilities that allow parents to view student courses, assignments, and grades and to communicate directly with school personnel. Although LMSs contain a gradebook component, they differ from student information systems (also known as SIS), which are primarily utilized to manage student records—providing data such as student demographics, grading, attendance, behavior, and achievement—which can give parents a broad overview of their child's performance. In contrast, LMSs are primarily used to deliver and manage instructional content, which can give parents a better glimpse of the day-to-day happenings in class and their child's performance on specific tasks. For example, a parent can see the student's actual work and the teacher's feedback, not just the grade received on the assignment.

LMSs have been present in K–12 settings for years; however, Herold (2014) stated, "Technology vendors and educators alike [are] wrestling with big questions about what an LMS actually is, where it should live, the functions it should perform, and how it can best fit into the larger ed-tech ecosystem" (p. 2). LMS viability as a platform for school–home communication is among these questions.

Challenges

Despite its many benefits, schools are making little progress in improving school–home communication (Kraft, 2016). Schools have a basic obligation to communicate with families about programs, activities, and their child's progress (Epstein, 2011), yet schools tend to underestimate parents' willingness to be involved in their children's education (Bennett-Conroy, 2012). Parents assert that they would like access to more current and complete information about student performance, behavior, and events and activities (NSPRA, 2011; Parker & Sparkman, 2008). Studies indicate that the frequency of communication wanes in the upper grade levels (Epstein, 2011; Harvard Family Research Project, 2007; Kraft, 2016). In a study of 1,000 school-aged children and their parents, 82% of parents indicated that they would like to be better informed about their child's education (Byron, 2009).

Numerous barriers may contribute to the lack of communication between school and home. Kraft (2016) identified three external factors that contribute to the low rate of school–home communication: implementation barriers, time costs, and the absence of schoolwide communication policies. "Without formal expectations, sufficient time, and the necessary communication infrastructure, teachers often take a passive approach to communication as they shift their attention to other tasks" (Kraft, 2016, p. 17). Kraft and Dougherty (2013) proposed reallocating time from nonacademic duties, such as hall duty or lunch duty, to provide teachers formal time to communicate with families during contracted hours.

Internal barriers also contribute to a lack of school–home communication. Handmaker (2005) cited teacher vulnerability as a potential barrier, stating that teachers are wary of parent criticisms and fear the resulting (potential) consequences from school administration. Scullin, Palan, and Christenson (2014) indicated that some teachers are hesitant to communicate with parents due to a fear of conflict.

Barriers to communication impact parent communication practices as well. Grace and Trudgett (2012) asserted that parents whose home environment is significantly different from the school environment often feel uncomfortable in the school environment. Families who perceive schools as uninviting are less likely to communicate with the school (Vera et al., 2012). Families may perceive a power imbalance between themselves and teachers, preventing them from communicating with teachers or becoming involved in their child's education (Dockett, Mason, & Perry, 2006). Language and cultural barriers may also prevent parents from communicating with schools (Graham-Clay, 2005). Wong and Hughes (2006) found that Spanish-speaking parents were less likely to be involved in their child's education because of language barriers. Colombo (2004) posited that cultural differences can create communication challenges, particularly if teachers do not seek to understand the cultural diversity of their students' families.

Because communication methods are increasingly technology-oriented, technology-related barriers may occur. Rogers and Wright (2008) stated that some families lack internet access and others lack the skills to use available technology resources. Due to limited broadband availability, families in rural settings often face greater challenges accessing reliable internet than their urban counterparts (Gordon, 2011). Digital barriers—including uneven digital competence, prejudiced attitudes toward technology, and fear—also exist (Palts & Kalmus, 2015). Practical trainings and workshops can help to minimize barriers and improve both parents' and teachers' digital literacy skills (Palts & Kalmus, 2015).

The use of newly adopted technology tools for communication present additional challenges. Because technological innovation is accepted by users at different rates (Rogers, 2003), new communication methods may proliferate slowly through the system. Rogers (2003) defined several adopter categories to demonstrate the different rates of adoption, including innovators, early adopters, early majority, late majority, and laggards. While innovators are willing to experience new ideas and adopt rapidly, later adopters tend to be more skeptical of an innovation and view others' adoption experiences before making decisions (Rogers, 2003). Examining technology adoption among teachers, Aldunate and Nussbaum (2013) found that early adopters who commit a large portion of time to incorporating the innovation into their practices are more likely to adopt the technology while teachers who are not early adopters and commit only a small portion of time are less likely to adopt and are more prone to abandon the adoption.

Rural settings pose additional challenges, especially related to funding and expenditures. Michigan is among 11 states that provide disproportionately less funding for rural school districts (Showalter, Klein, Johnson, & Hartman, 2017). Rural districts have higher fixed costs per pupil than urban districts due to lower student enrollment (Sundeen & Sundeen, 2013). As a result, rural districts may face greater challenges funding new technology-related initiatives. Many rural districts also face additional barriers to technology implementation, including lack of infrastructure, a shortage of tech-savvy staff, and a lack of community partners (Gordon, 2011).

Context

The target district for this study is a rural K–12 school, which includes one elementary school, one middle school, one traditional high school, and one alternative high school. The district recently adopted the Schoology LMS to replace its former LMS, My Big Campus. The district's student information system, Skyward, continued to serve as the official hub for student data. During the adoption process, the district determined three goals for LMS implementation: enhancing instruction, improving communication with stakeholders, and increasing student achievement. School–home communication became a leading focus for the initial LMS adoption because of the immediate impact it could have on teachers, parents, and students. District leaders indicated that they hoped Schoology would become the main location for families to access information and communicate with the school (District Superintendent, personal communication, February 26, 2016).

Prior to LMS adoption, teachers' communication practices varied significantly. Some teachers used resources like the district's student information

system, Skyward. This system primarily serves as the district's grading, attendance, and scheduling tool. Others used the behavior management tool, Class Dojo, and the online learning portfolio tool, Seesaw. Some teachers used more traditional approaches like the Friday Folder system in which students' documents and classroom communications were sent home in a folder each week.

Following Schoology adoption, numerous staff development sessions were conducted prior to and during the 2016–17 school year. The district selected a "train the trainer" method of staff development. Each building principal designated a few teachers to facilitate staff development sessions. These trainers participated in eight hours of Schoology training during the spring of 2016. They then extended this training by working to develop their own courses within Schoology. Next, they planned and conducted numerous biweekly Schoology introduction sessions for all staff within their school site. The district also ensured that trained staff were available to provide support throughout the first year of implementation. Two teaching staff were each allotted five hours per week to provide LMS adoption support for staff. One staff member primarily provided support for elementary staff, while the other primarily provided support for middle school and high school staff.

Beginning in the spring of 2016, some students received Schoology accounts and began using the LMS in their courses. This test phase was intended to help familiarize students with the LMS platform. Full student rollout occurred in the fall of 2016. Parents received access codes associated with their children in the fall and winter of the 2016–17 school year. Parent Schoology access allowed parents to view their children's courses, including announcements, assignments, resources, and grades. In addition, parents could communicate with teachers via the messaging tool. Parents also had the option to set up notifications for their smartphone or other device. Those with multiple children enrolled in the district could choose to view any announcements, courses, and grades for their children. The district originally planned to familiarize parents with Schoology through a series of events and communications; however, due to challenges establishing parent accounts, communications were typically limited to letters and emails sent by schools and individual teachers. In addition to challenges associated with establishing parent logins, the district also faced challenges with the iPad app and Skyward/Schoology integration. District administration noted that these challenges delayed student access at the middle school level and parent access at all levels.

Methodology

Communication between school and home has been shown to have many positive effects, yet studies indicate that two-way communication is frequently

lacking, particularly in the upper grade levels (Epstein, 2011; Kraft, 2016). This quantitative study examined one rural Michigan school district's approach to leverage a newly adopted LMS for communication purposes. Teachers' and parents' perceptions of the use of an LMS for school–home communication were examined.

Participant Selection

Targeted populations were parents of students currently enrolled in a public school system in Michigan and all 83 teachers employed by the school system. The term "parent" is used throughout this study; however, survey respondents may have included legal guardians or others who serve as a child's caregiver. Due to the small population of parents and teachers within the target district, the study utilized a census approach in which all members of the population were surveyed. In all, 901 families received the parent survey, and 83 teachers received the teacher survey. Because subgroups were used extensively within data analysis, the census approach helped to ensure an appropriate confidence level for those subgroups (Dillman, Smyth, & Christian, 2014). Surveys were sent to all parents and teachers within the school district, including those who participated in the pilot test of the survey instrument.

Instruments

Teacher and parent surveys contained similar questions. The teacher survey included 19 questions, while the parent survey included 22 questions. The parent survey included three additional demographic questions, described below. Both surveys asked for basic demographic information, such as gender, level of education, and availability of internet at home. Parents were also asked if their child received free or reduced lunch, the school their oldest child in the district attended, and the grade level of their oldest child in the district. Parents and teachers were then asked, on a five-point scale ranging from strongly disagree to strongly agree, to evaluate school–home communication practices. Parents and teachers were also asked to select the tools they used to communicate with each other during the school year, as well as the frequency with which they used those tools during the week prior to survey distribution. Additional Likert scale questions pertaining to the newly adopted LMS were provided to teachers and parents who responded "yes" to "Have you accessed Schoology?" Those who accessed the LMS were provided open-ended questions about perceived benefits and drawbacks of the LMS. Parents and teachers were also asked to describe what might help them use the LMS more effectively. An open-ended item asked teachers to describe effective training. Parents who had not accessed the LMS were asked what might help them to begin using the LMS.

To establish content validity, a panel of analysts—including two experienced researchers and an educational technologist—assessed the questions. Based on their feedback, several items were clarified or otherwise improved. Additionally, a pilot group of eight teachers and eight parents from the target district responded to the survey and provided feedback on survey items and directions. Feedback and results were used to further revise the instrument.

Procedures

Surveys were administered to both populations during the spring 2016–17 school year. The teacher population received the survey exclusively via email. Most of the parent population received the survey through an email listserv. However, 53 parents that noted a preference for mailed communications at the beginning of the school year received the survey via mail. To improve response rates, all potential respondents received the original survey notification followed by two reminders, each sent approximately one week apart (Dillman et al., 2014). Parents were asked to complete the survey based on communication practices and perceptions regarding their oldest child in the district.

Analysis

Quantitative data were analyzed using SPSS (version 24.0.0). Descriptive analyses were conducted to view overall trends in responses. Frequencies were analyzed to determine response trends. Valid percent frequencies, which excluded missing data, were reported. To compare subgroup responses for Likert scale items, nonparametric Mann-Whitney U and Kruskal-Wallis H tests were conducted. For the parent population, Mann-Whitney U tests were conducted to determine whether statistically significant differences existed between respondents whose children did and did not receive free or reduced lunch. Kruskal-Wallis H tests were conducted to assess whether there were significant differences in Likert and frequency item responses based on parents' levels of education. For the teacher population, Mann-Whitney U tests were conducted to determine whether statistically significant differences existed in Likert item and frequency item responses between those with a bachelor's degree and those with a master's degree. Kruskal-Wallis H tests were also conducted to examine differences in responses between teachers with varying levels of teaching experience. Only significant omnibus test results are noted in result reporting.

A constant comparative method was used to analyze the open-ended responses for recurring patterns and themes (Strauss & Corbin, 1998). The researcher read all open-ended responses to first establish a general overview of the responses. Responses within each open-ended question were then read again with an emphasis on open coding. This resulted in the categorization

of data within each question stem to locate and identify recurring themes. During this stage of coding, the researcher examined the responses, highlighted key text, and assigned codes to develop the initial coding categories. The researcher then read the responses again with a focus on comparing, refining categories, and interpreting emerging themes (Strauss & Corbin, 1998). Data were then clustered within their related codes and further examined. Finally, the researcher selected representative statements to integrate into the written report to demonstrate respondents' perceptions.

Results

Of 901 families within the district, 227 completed all or most of the survey (a 25.2% response rate). Only 4 of 52 mailed survey responses (7.7%) were returned. Respondents were primarily female (83.7%, n = 195). Of parent respondents, 33.9% (n = 79) held a high school diploma/GED or less, 26.2% (n = 61) held an associate's degree, 25.8% (n = 60) held a bachelor's degree, and 14.2% (n = 33) held a master's degree or higher. Approximately 35% (n = 78) of parent respondents indicated that their child receives free or reduced lunch. Parents were asked to complete the survey based on practices for their oldest child in the district. Of these, 35.1% (n = 81) attended elementary school, 18.6% (n = 43) attended middle school, 43.3% (n = 100) attended high school, and 3.0% (n = 7) attended an alternative high school. Consistent with the U.S. Census Bureau (2014) report on nationwide internet access, most respondents had internet access. Only 1.7% (n = 4) of parent respondents did not have internet access at home. Of these, two respondents completed the paper version of the survey, and two completed the online version. Additionally, 83.8% (n = 196) of respondents had high speed internet, and 24.8% (n = 58) of respondents had cellular data. Parents used cell phones to access the internet (81.6%, n = 191), as well as computers (64.1%, n = 150) and tablet computers (54.7%, n = 128).

Most parents accessed the internet daily, with only 4 indicating that they did not. These respondents, however, did have internet access through either their cell phone (n = 2) or high-speed internet (n = 2). Nearly half of respondents (47.4%, n = 110) accessed the internet more than 10 times per day and/or had continuous access throughout the day. A Kruskal-Wallis H test showed a statistically significant difference on this item for parents with different education levels $H(3) = 7.931$, $p = .047$. Pairwise comparisons, performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons, revealed statistically significant differences in median scores between parents with a high school diploma or less (Mdn = 3.00 / 6–10 times per day)

and those with a bachelor's degree (Mdn = 4.00 / >10 times per day or continuous access, p = .009), but not between any other group combination.

Table 1. Parent Demographics

Education	*n*
High school diploma/GED or less	79
Associate's degree	61
Bachelor's degree	60
Master's degree or higher	33
Lunch Status	
Child received free or reduced lunch	78
Child did not receive free or reduced lunch	147
Preferred not to say	8

Note. Of 233 parent respondents who started the survey, 227 completed all or nearly all of the survey.

In addition, most parents (79.8%, n = 186) are comfortable or very comfortable using digital technologies for communication purposes. However, 16.8% (n = 39) of parents are uncomfortable or very uncomfortable using digital technologies for communication purposes. Kruskal-Wallis H tests showed a statistically significant difference on this item for parents with different education levels $H(3) = 15.729$, p = .001. Pairwise comparisons revealed statistically significant differences in median scores between those with a high school diploma or less (Mdn = 4.00 / Comfortable) and those with a bachelor's (Mdn = 5.00 / Very Comfortable, p = .001) and master's degree (Mdn = 5.00 / Very Comfortable, p = .012), as well as between parents with an associate's (Mdn = 4.00 / Comfortable) and those with a bachelor's (Mdn = 5.00 / Very Comfortable, p = .006) and master's degree (Mdn = 5.00 / Very Comfortable, p = .041), but not between any other group combination.

Of 84 teachers within the district, 66 (78.6%) completed the survey. The majority (58.8%, n = 40) were female, while 39.7% (n = 27) of teachers were male. One declined to specify. On average, teachers who responded to the survey had between 11 and 15 years of teaching experience. Of teacher respondents, 44.1% (n = 30) worked primarily in the elementary school during the 2016–17 school year, while 23.5% (n = 16) worked at the middle school, 26.5% (n = 18) worked at the high school, and 5.88% (n = 4) worked at the alternative high school. Over half (54.4%, n = 37) had obtained a master's degree. All but one teacher had internet access at home, and 70.6% (n = 48) accessed the internet more than 10 times per day and/or had continuous access throughout the day. Most teachers (85.3%, n = 58) were comfortable or

very comfortable using digital technologies to communicate, while 8.9% (*n* = 6) were either uncomfortable or very uncomfortable using digital technologies to communicate. Teachers primarily used computers to access the internet (89.7%, *n* = 61), followed by tablet computers (86.8%, *n* = 59) and cell phones (70.6%, *n* = 48).

Table 2. Teacher Demographics

Education	***n***
Bachelor's degree	31
Master's degree	37
Experience	
0-5 years	3
6-10 years	9
11-14 years	12
15-20 years	24
21-25 years	12
25+ years	8

Note. Of 68 teacher respondents who started the survey, 66 respondents completed all or nearly all of the survey.

Communication Perceptions and Practices

To gauge perceptions of general communication practices, parents and teachers were asked to select levels of agreement using a five-point Likert-type scale. Overall, parent and teacher perceptions of communication practices were positive. Most parents (69.1%, *n* = 152) agreed or strongly agreed that they were provided enough information to be well informed about their child's academic progress, and most teachers (87.9%, *n* = 48) agreed or strongly agreed that parents were provided enough information to be well informed. Both parties also demonstrated a high level of comfort initiating communications with one another. Most parents (81.9%, *n* = 180) agreed or strongly agreed that they felt comfortable initiating communication with their child's teacher(s), while nearly all teacher respondents (94.0%, *n* = 63) indicated that they were comfortable initiating communication with parents. Mann-Whitney U tests showed a statistically significant difference between teachers with a bachelor's degree and teachers with a master's degree on this item U = 693.00, z = 2.204, *p* = *.028*. Distributions of scores were visually similar. Teachers with a master's degree (Mdn = 5.00 / strongly agree) demonstrated a higher comfort level than teachers with a bachelor's degree (Mdn = 4.00 / agree).

Likert scale, frequency of use, and tool selection questions were used to gauge overall communication practices. These items were used to ascertain which tools were used most frequently by each party for communication as well as how frequently each party communicated with one another. Parents and teachers were asked to select the tools they used for communication during the school year (see Table 3). Results indicated that parents most frequently communicated via email, followed by phone, Skyward, weekly or monthly folders, and text messaging. Although not listed among communication tools, parents noted the prevalence of face-to-face communication, particularly through parent–teacher conferences. Teachers most frequently communicated via email and phone, and least frequently communicated via webpage or Facebook. Like parents, several teachers indicated their use of face-to-face communication and written notes. Parents and teachers were asked whether or not they used the same communication methods this year as they used last year. Most parents who had accessed Schoology (66.3%, n = 63) and most teachers (70.8%, n = 46) indicated that they were using the same communication methods.

Table 3. Communication Tools Used This Year by Frequency Percentage

Tool	Parent	Teacher
Email	71.2	94.1
Phone	31.7	88.2
Skyward	22.6	39.7
Newsletters	0.0	36.8
Texting	12.4	30.9
Schoology	6.0	27.9
Weekly/Monthly Folder	15.8	19.1
Webpage	4.2	14.7
Facebook	4.3	10.3

Several items were used to assess communication frequency. In general, results showed that teachers communicated with parents more frequently than parents communicated with teachers. Of teacher respondents, 70.5% (n = 48) disagreed or strongly disagreed with the statement, "I rarely communicate with parents," while only 7.4% (n = 5) agreed. Meanwhile, only 36.3% (n = 85) of parents disagreed or strongly disagreed with the statement, "I rarely communicate with my child's teacher(s)," while 37.6% (n = 88) agreed or strongly agreed. A Kruskal-Wallis H test showed a statistically significant difference on this item for parents with different education levels $H(3) = 11.869$, $p = .008$. Pairwise comparisons revealed statistically significant differences in median

scores between parents with an associate's degree (Mdn = 3.00 / neither agree nor disagree) and those with a master's degree (Mdn = 2.00 / disagree, p = .001), as well as between parents with a bachelor's degree (Mdn = 3.00 / neither agree nor disagree) and those with a master's degree (Mdn = 2.00 / disagree, p = .010), but not between any other group combination. When asked if their child's teacher(s) frequently communicated school-related information using online resources, 47.4% (n = 111) of parents responded favorably to this item, while 57.3% (n = 39) of teachers agreed or strongly agreed.

Table 4. Frequency Percentage of Tool Use in Week Prior to Survey

Frequency of Initiated Communication	**Parent**	**Teacher**
0	55.1	10.3
1-3	34.6	58.8
4-6	7.8	22.1
7-9	1.5	1.5
10+	1.0	4.4
Frequency of Received Communication	**Parent**	**Teacher**
0	52.2	32.4
1-3	38.0	50.0
4-6	6.8	11.8
7-9	2.0	0.0
10+	1.0	0.0

Parents and teachers were also asked how frequently they used listed communication tools to initiate and receive communication in the week prior to survey implementation (see Table 4). Over half of parents indicated that they did not use any of the listed tools to communicate with their child's teacher(s) in the week prior to the survey. Most of the remaining respondents used a listed tool one to three times. More than half of parents also indicated that they did not receive teacher-initiated communications using a listed tool in the week prior to the survey, and most of the remaining respondents received communications one to three times.

Most teachers used a listed tool to communicate with parents in the week prior to the survey, with the majority communicating between one and six times that week. Teachers, however, did not receive communications from parents as frequently. Nearly one-third of teachers did not receive communications from parents via a listed tool during the week prior to survey implementation, while half of teachers indicated that they received communications from parents one to three times.

Although communication from parents did not occur as frequently as communication from teachers, most respondents felt that communication between the two parties was bidirectional. In response to the item, "Communication between the school and home is often two-way," 63.2% (n = 43) of teachers agreed or strongly agreed, while 13.3% (n = 9) disagreed or strongly disagreed. Meanwhile, 64.1% (n = 150) of parents agreed or strongly agreed, while 10.6% (n = 25) disagreed or strongly disagreed.

LMS Perceptions and Practices

To assess respondent perceptions of the LMS, both parties were provided several Likert scale questions relating to their general perceptions of the LMS as well as its ease of use. They were also asked whether they used Schoology for communication and, if so, how frequently. To determine how they used the LMS, both parties were asked to select specific uses from a list of options. Only parents who indicated that they accessed Schoology (n = 103) were provided questions pertaining to their perceptions and use of the LMS.

Nearly half of parents (45.3%, n = 43) and 40.9% (n = 27) of teachers agreed or strongly agreed that Schoology is a valuable addition to the district's resources. Of parents who had accessed Schoology, 63.6% (n = 62) indicated they can easily access the LMS, while 83.3% (n = 55) of teachers indicated they can easily access Schoology. Fewer than half of parents (43.2%, n = 42) and teachers (47.0%, n = 31) felt comfortable using Schoology's communication tools.

Only 27.9% (n = 19) of teachers selected Schoology as a tool they utilized for communication, and 20.6% (n = 14) of teachers used Schoology to communicate in the week prior to the survey. Parents used Schoology less frequently to communicate. Of all parent respondents, only 46.4% (n = 103) accessed Schoology during the school year. Only 12.6% (n = 13) of parents who had accessed Schoology selected the LMS as a communication tool they used during the year, and only 5.6% (n = 5) of these used the LMS to communicate in the week prior to survey implementation. However, within open-ended responses about the benefits of the LMS, 11 parents and 11 teachers specifically listed communication.

Teachers used Schoology most frequently to share educational resources (72.7%, n = 48). Kruskal-Wallis H testing showed a statistically significant difference for teachers with differing years of experience for this item (H = 12.707, p = .026). Pairwise comparisons showed that teachers with greater than 25 years of teaching experience (Mdn = 5.00 / never) shared educational resources within the LMS less frequently than teachers with 6–10 years (Mdn = 3.00 / bi-weekly, p = .009), 11–15 years (Mdn = 2.00 / weekly, p = .003), and 16–20 years (Mdn = 4.00 / monthly, p = *.009*) of experience. Teachers also

used the LMS to post student announcements (44.6%, *n* = 29), assign homework (36.9%, *n* = 24), provide information to parents (36.9%, *n* = 24), and conduct two-way communication (15.3%, *n* = 9).

Parents who had accessed Schoology used the LMS most frequently to view their child's homework (55.8%, *n* = 53) and access teacher-posted announcements (54.2%, *n* = 52). They also accessed school announcements (47.8%, *n* = 44) and educational resources shared by teachers (40.0%, *n* = 38). Parents less frequently used Schoology to communicate with teachers (31.3%, *n* = 30).

Benefits

In open-ended responses, teachers most commonly noted that the LMS was valuable for sharing resources and information with other teachers, parents, and/or students (*n* = 26). They also mentioned that the LMS was beneficial as a communication tool (*n* = 11). Additionally, teachers appreciated the district using one system (*n* = 8). As one teacher wrote, "Having a centralized 'Go To' site is beneficial for students, staff, and parents. It leaves the guesswork out of where to look for information." Additional benefits noted by teachers included the web-based nature of the platform (*n* = 3) and benefits for students who were absent (*n* = 2).

Parents also listed several benefits to using the LMS, including the ability for them to monitor their child's progress (*n* = 15). One parent wrote, "I can see the class activities fast and keep updated." Most of these responses came from parents of high school students. As noted earlier, 11 listed communication as beneficial. Parents also described the ability to access assignments, information, and/or resources as beneficial (*n* = 9), and some acknowledged several student benefits (*n* = 4), such as accessing materials at home and accessing assignments and notes when absent. Parents also took the opportunity to recommend additional potential uses, including providing Friday Folder content, building-level newsletters, and districtwide newsletters within the LMS.

Challenges

Respondents listed numerous drawbacks of the district's adoption of the LMS. Teachers pointed to technical issues—including Skyward integration issues, login issues, and challenges with the iPad app—as the biggest drawback (*n* = 15). Several teachers noted that the LMS was difficult to use (*n* = 10). One remarked, "As a teacher it can be difficult and time consuming to post things for each of my classes. I wish there were a method that was similar to Facebook where I could post anything on a class page and not have to use different 'places' on Schoology." Teachers also commented on the lack of parent use (*n* = 8) as a drawback. One teacher stated, "It allows parents the opportunity to

follow and reinforce what their children are experiencing in the classroom. It is unfortunate that (like the Skyward gradebook access) so few take advantage of the ability." Teachers also commented on their own lack of time (n = 5) as a drawback.

Parents, likewise, mentioned lack of teacher use (n = 14) as a drawback. One wrote, "I could see how this would be helpful if teachers used it to post about our children, but the current teacher doesn't use it at all." Other frequent comments centered around the navigability of the site (n = 8), the district's use of too many platforms (n = 6), and preferences for other tools (n = 8), such as email and Skyward Family Access.

Training and Support

Additional questions were used to assess the effectiveness of the formal and informal training opportunities provided to parents and teachers. Most teachers (72.3%, n = 47) agreed or strongly agreed that they know who to turn to for support when they have LMS-related questions, while 34.3% (n = 33) of parents said they know who to turn to for support. However, only 29.2% (n = 19) of teachers agreed or strongly agreed that the school district provided sufficient training for them to comfortably communicate with the other party using the LMS, while 43.1% (n = 28) disagreed or strongly disagreed. Similarly, 21.9% (n = 21) of parents agreed or strongly agreed with this item, while 32.3% (n = 31) disagreed or strongly disagreed. Only 30.9% (n = 19) of teachers agreed or strongly agreed that staff development sessions were sufficient to integrate the LMS into their teaching, while 35.4% (n = 23) disagreed or strongly disagreed. "It really is a great tool, but like any tool, proper training is a must," wrote one surveyed teacher.

In response to open-ended questions about LMS training, teachers noted several effective practices. For example, many stated that specific training sessions were helpful (n = 24). At the elementary level, teachers most frequently commented on the value of sessions relating to communication and sharing resources with colleagues. At the middle school and alternative high school levels, teachers found sessions about the basic features of the LMS to be valuable. Numerous teachers (n = 8) also found learning from peers to be an effective practice. They benefitted from having time to explore (n = 4) and also found small group and grade level sessions to be effective (n = 3).

To better support teachers' use of the LMS, teachers requested additional demonstrations from colleagues (n = 7). One teacher mentioned, "It would be useful for the frequent users of Schoology to share their tips and tricks that they use daily." Six respondents, most of whom represented the elementary level, requested level-specific trainings. Additional support desired included training

with targeted topics (n = 5), time to use the LMS (n = 5), one-on-one support (n = 3), and video tutorials (n = 3).

In the open-ended responses, parents likewise requested additional training and information to help them more effectively use the LMS (n = 8). Ideas included tutorials and videos, emailed and mailed navigation tips, and actual training sessions. One wrote, "I need to learn how to navigate around Schoology. If the school offered helpful tips to navigate through Schoology, [this] could be beneficial."

Discussion

Results suggest that respondents are comfortable using digital tools to communicate and that both parents and teachers have access to the internet on a regular basis. While digital tools, including Skyward and Schoology, are available to both parties, more traditional resources like email and phones continue to be used most frequently for bidirectional communication. Parents choose technologies that are convenient (Gilgore, 2015), and email is a resource they likely access on a regular basis. Although face-to-face communication was not among the listed tools, parents and teachers both noted its prevalence as a communication method. This suggests, as Roman and Ottenbreit-Leftwich (2016) found, that parents and teachers choose appropriate communication channels depending on the urgency and sensitivity of the information.

Differences exist between respondents' use of specific devices to access the internet. Parents primarily used cell phones to access the internet, followed by computers and tablet computers, while teachers primarily used computers to access the internet, followed by tablet computers and cell phones. This difference is likely due to teachers' access to desktop computers throughout the school day. It may suggest that some families do not have a computer at home or that parents choose to use their cell phone due to the convenience of this mobile technology.

Although both parties generally felt that communication was bidirectional, results showed that teachers most frequently initiated communication. In addition, teachers indicated that they initiated communication more frequently than parents indicated they received communications. This suggests that teachers may have communicated with only certain families, such as those whose children were struggling behaviorally or academically. Alternatively, teachers may have provided information through resources like the LMS which parents did not receive or access. Additionally, parents reported only communications pertaining to their oldest child while teachers reported communications in general. This may have also contributed to the discrepancy in reported usage.

Results showed that teachers most commonly used the LMS for single-direction communication purposes. It is evident that very few respondents were using the LMS as a bidirectional communication tool. As Bouffard (2008) found, access to communication tools does not necessarily equate to use of those tools. In addition, Ho et al. (2013) pointed out that the adoption of a new technology often takes time. A two-year follow-up study should be conducted to determine if changes have occurred in parent and teacher perceptions and use of the LMS for communication.

Analyses suggest that the LMS has the potential to serve as a one-stop location for families to access information and resources. Parents noted that the LMS allowed them to keep informed about their child's progress. In addition, it allowed them to access assignments, information, and resources. Several parents even suggested further opportunities for teachers to share information within the LMS, demonstrating the value of the LMS as a one-stop location for a variety of resources and information. However, technical challenges must be overcome and continued training must be provided in order for the LMS to be fully utilized by parents and teachers.

In the first year of adoption, the target district faced many technical challenges. Open-ended comments suggested that these challenges contributed to delayed use by teachers, students, and parents. Both parents and teachers indicated that the lack of use by the other party was a perceived drawback of the system. Additionally, parents noted a preference for other tools like Skyward Family Access. Both parties indicated a need for further training. It is unclear if parents understand the different purposes of the LMS (Schoology) and the student information system (Skyward). Training opportunities should delineate the different purposes of the two tools.

Olmstead (2013) asserted that technology professional development must be a key component of a district's staff development plan in order for teachers to stay current with technology-based communication tools. In addition, because lack of time is a barrier to implementation, districts must ensure they build time into staff development sessions and staff meetings to support the adoption of new technologies (Olmstead, 2013). Goodall (2016) remarked that school districts engaging in the use of newly adopted technologies must approach the process as they would other types of change, with clearly articulated objectives and a clear understanding of the change process. Because technical challenges were prominent in the early adoption phases, it may be beneficial to conduct research within other districts utilizing other LMSs. Results could be used to ascertain how other LMSs are utilized and if they are a viable option for school–home communication.

Although this study primarily investigated communication between parents and teachers, researchers assert that communication between parents and children is most beneficial for students (Goodall & Montgomery, 2013; Harris & Goodall, 2008). Further research should be conducted to determine if parent engagement within the LMS translates to communication opportunities between parents and their child/children at home, as well as whether these communication opportunities translate to improved student outcomes.

Limitations

Research limitations must be considered when evaluating results. Because the LMS implementation occurred at just one school district that is proximal to the researcher, the sample was limited to a very specific population. Characteristics of this population may not be representative of other districts within the United States. For example, the population is primarily White/Caucasian. Due to the ethnic homogeneity of the population studied, it may be difficult to generalize results to other populations.

Participation in this study was voluntary. Those who are more involved in their child's education may have been more likely to respond, which could impact results. To mitigate this effect, the researcher maximized response rates by using the potential respondents' preferred communication method and sending survey reminders (Dillman et al., 2014). Despite this attempt to maximize response rates, very few paper-based responses were returned. This population was therefore poorly represented in this study. As a result, it is likely that families with a lack of internet access were underreported.

In addition, parents who had not accessed Schoology prior to survey administration were not asked questions about their perceptions and use of the LMS. Some may have intentionally chosen not to access the LMS and therefore may have had valuable input to provide about their perceptions of the use of the LMS for communication.

The survey asked for self-reported information from both parents and teachers. Parents' and teachers' perceptions of reported behaviors may differ from their actual behaviors. For example, with self-reported data, respondents sometimes provide responses that they feel are socially desirable (van de Mortel, 2008). In addition, parents and teachers may have hesitated to provide negative information relating to perceptions and/or practices due to a fear of retribution. Voluntary participation and anonymous survey responses were used to mitigate these fears. Despite its limitations, this study provides insight into the viability of a learning management system as a school–home communication tool.

Conclusions

This study examined the use of the Schoology LMS for communication between the school and home. The first research question addressed the tools used for communication as well as the frequency with which they were used. From the results, it was evident that parents and teachers primarily used email and phones to communicate. Other tools, such as the student information system, newsletters, texting, and Schoology, were used less frequently. Results also indicated that teachers initiated communication more frequently than parents, with most teachers communicating with parents one to six times per week and most parents communicating with teachers zero to three times per week. The second research question addressed the impact of LMS integration on parent and teacher perceptions and practices. Despite LMS adoption, most parents and teachers continued to use the same communication tools they had been using; however, numerous parents and teachers listed communication as a benefit of the LMS. Parents also appreciated having the ability to monitor their child's progress through Schoology and recommended additional opportunities for sharing information through the LMS. The third research question assessed the impact of income and education on parent perceptions and practices. Only a few differences between parents with differing levels of education were present. Parents with a bachelor's degree had slightly higher internet use than those with a high school diploma or less, and parents with a bachelor's or master's degree had slightly higher comfort levels using digital technologies to communicate than those with an associate's degree or less. Parents with a master's degree disagreed with the statement "I rarely communicate with my child's teacher" more often than those with a bachelor's degree or less. The final research question assessed the impact of experience and education on teacher perceptions and practices. Few significant differences existed; however, those with a master's degree demonstrated a higher comfort level initiating communication with parents than those with a bachelor's, and teachers with greater than 25 years of experience shared educational resources within the LMS less frequently than teachers with fewer years of experience.

For the target district and other districts looking to adopt new technology tools, the following recommendations may be used to guide the adoption and implementation process:

1. Develop goals and objectives for the technology adoption early in the adoption process.
2. Clearly articulate the purpose, goals, and objectives of the technology adoption to all stakeholders through multiple communication channels.
3. Address technical challenges promptly.

4. Provide multiple, ongoing training opportunities for all stakeholders.
5. Include numerous avenues for training, including video tutorials, face-to-face sessions, informational documents, and opportunities for one-on-one guidance.
6. Develop a plan early in the adoption process to ensure that teachers have sufficient time to learn how to use the tool as well as sufficient time and support to integrate the tool into their practice.
7. Utilize teachers within each site as teacher-leaders to provide support and training for staff.
8. Promote and support both formal and informal opportunities for peer teaching.
9. Ensure sustained support for new users within the district, such as through a coaching model of support in which teacher-leaders work directly with new staff to train and support their use of the LMS.
10. Regularly highlight benefits of LMS use for all stakeholders. Showcase effective LMS use within the district.
11. Recognize not all stakeholders have regular internet access. Develop a plan to ensure that LMS-initiated communications also reach this population.
12. Regularly evaluate the adoption process. Build upon adoption strengths and address adoption challenges.

Researchers have long explored the impact of parent involvement on student learning. Olmstead (2013) wrote, "Because proactive involvement does not require parents to be physically at their children's school, the question of how technology can be used to keep parents involved in their academic lives becomes important" (p. 28). This study demonstrates that LMSs have the potential to provide parents with the necessary resources to engage in their children's learning. However, districts adopting this technology must move forward with clear goals and sufficient staff and parent development opportunities.

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