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Schoology: The Adoption of a Learning Management System

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Schoology: The Adoption of a Learning Management System

An Action Research Report
By Derek Schlager

Schoology: The Adoption of a Learning Management System

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In fulfillment of final requirements for the MAED degree

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Abstract

The purpose of this action research is to investigate the needs and opportunities for high school math teachers pertaining to the adoption of Schoology, a learning management system (LMS). Data was gathered from 98 students, 13 teachers, 24 parents/families and 8 technology integration experts in an effort to gain a multitude of perspectives relating to Schoology use at the high school level. The information gathered from these four groups was analyzed and used to make suggestions regarding how teachers or schools navigate the first year of LMS use. This data was gathered over a period of eight weeks through Google Forms questionnaires, email questionnaires, and a student focus group session. The results show that students, teachers, parents and technology integration experts have both shared and unique concerns, desires, and suggestions pertain to Schoology use in their setting.

Keywords: LMS adoption, learning management systems, technology integration, LMS

It's 2016 in Mr. Johnson's high school math class where a room of 21st century learners awaits the start of class. Like many math teachers, Mr. Johnson opens with the iconic question "Does anyone have any questions about yesterday's assignment?" Bethany responds, "I didn't understand numbers two through six, could you show another example?" Thomas casually states "I lost the assignment, so I didn't do it," as if Bethany had never said a word. After completing an example on the board, Elhan shouts out "When is the next test? I forgot to write it down..." Happy to oblige, Mr. Johnson clarifies a few final questions before having his students turn in their work and take out their notebooks for the lesson.

As the students do this, Mr. Johnson can't help but ponder how these procedures will change next year with the adoption of Schoology, an online Learning Management System. He had read about other educators linking videos to specific lessons, as well as uploading class content such as notes, assignments and formative assessments to Schoology or other learning management systems, but it all seems so foreign and daunting. How would parents and students react to this new tool? What have other districts done to ease the transition? Mr. Johnson can't help but wonder "Am I the only one who has these concerns?"

Learning Management Systems (LMSs) such as Schoology have gained traction over the years, finding use in upwards of 55% of U.S. public schools (Queen & Lewis, 2011). LMSs like Schoology promise features that can completely revolutionize the way teachers structure their classes. In the face of this change, however, many educators become nervous about the integration process and everything that surrounds the use of a new LMS like Schoology (Song, Wang & Liu, 2011).

Those that find themselves at the beginning of a learning management system adoption may relate to the feelings and concerns described by Mr. Johnson above. At the Midwestern public high school where this action research was conducted, many teachers feel unprepared and nervous about an upcoming adoption of Schoology. In response to these observations, this exploratory action research document aims to identify the needs and opportunities available to secondary mathematics teachers pertaining to Schoology. To complete this study, data was gathered from four different sources: parents, teachers, students and technology integration professionals with experience in LMS integration. The teachers, students, and parents who participated in this study were all members of the school community during the 2015/2016 school year while some of the technology integration experts who participated in this study were affiliated with this school, other LMS integration experts participating in this research worked in neighboring districts. However, all had experience working with Schoology or integrating a similar LMS. The results of this research help answer the question: What needs and opportunities exist for secondary math teachers planning the integration of an online learning management system?

Review of Literature

“Learning management systems are web-based technologies that provide instructors with a way to create and deliver content, to monitor student participation and engagement, and to assess student performance online” (Lochner, Conrad & Graham, 2015, p. 64). LMSs fall under the broader category of Web-Based Instruction (WBI), a term pertaining to any web-based computer device used for instructional purposes (Song, Wang & Liu, 2011). The use of LMSs has increased substantially over the past decade (Hashey & Stahl, 2014; Lochner et al., Lui &

Cavanaugh, 2011; 2015; Song et al., 2011), finding use in upwards of 55% of U.S. public schools (Queen & Lewis, 2011). In 2012, 31 states offered statewide full-time virtual schools, enrolling an estimated 275,000 students (Watson, Murin, Vashaw, Gemin, & Rapp, 2012).

Figure 1 (Lui & Cavanaugh, 2011) illustrates the increase in k-12 online enrollment from 2001 to 2008.

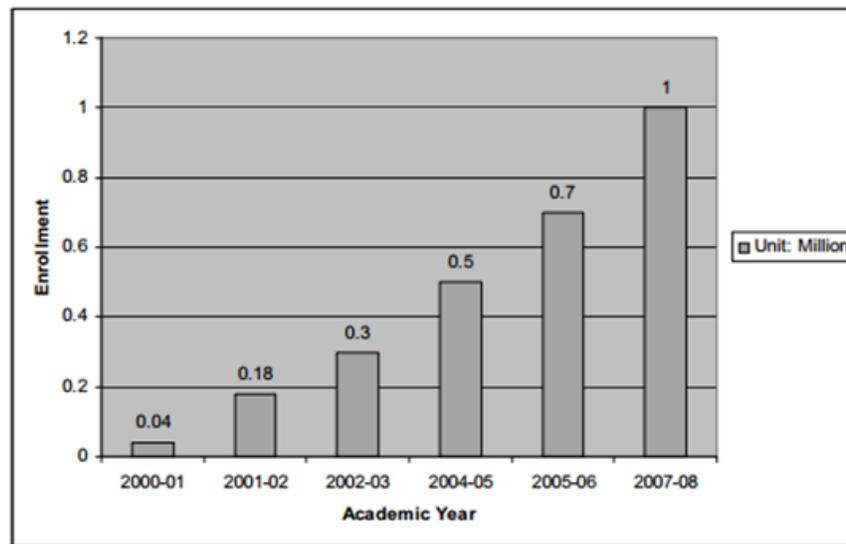


Figure 1: K-12 online enrolment in the United States. This figure illustrates the increase in k-12 online enrollment from 2001 and 2008.

LMSs come in two distinct varieties: commercial based and open source platforms (Martin-Blas & Serrano-Fernandez, 2009). Some examples of LMSs include Schoology, Blackboard, Webstudy, Desire2Learn, Caroline and Moodle (Lochner et al., 2015). Regardless of their vendor or platform, McGill & Klobas (2009) say that LMSs as a whole support e-learning (learning conducted through an electronic media). A vast majority of the existing research on LMSs pertains to their use in post-secondary education settings, while only a limited

number of published works address the use of LMSs at the secondary, primary or elementary level.

As LMSs continue to advance into U.S. middle and high schools, many educators are faced with the task of changing their practices to accommodate this new tool, a task that undoubtedly brings about concerns (Song et al., 2011). For schools to successfully integrate any new tool or system, organizational structures and adequate technological affordances are important (Saunders, 2012). If, however, teachers are not involved in the process, and their concerns are not addressed, the adoption of any innovation will remain largely unsuccessful (Lochner et al., 2015). There exist several models for interpreting concern in a context such as this (Fuller, 1969; Hall, 1978; Rogers, 2003). Hall's (1978) Concerns-Based Adoption Model (CBAM), analyzes an individual's concerns and places them one of seven categories: awareness concerns, information concerns, personal concerns, management concerns and impact concerns (Lochner et al., 2015; Song et al., 2011). Song et al. (2011) group the final three stages (consequence, collaboration, and refocusing) into one category called impact concerns.

Research has shown that some concerns remain more prevalent than others among those adopting LMSs. Lochner et al. (2015) compiled information from 2880 full-time teachers working in Arizona public secondary schools to examine their concerns regarding the adoption of LMSs. The results indicated that the top four most significant concerns were awareness, management, personnel and information concerns, in order of declining concern. They found that more intense concerns among teachers at the lower stages were correlated with resistance to implementing the technology. If not addressed, these concerns can cripple the successful integration of an LMS. It stands to reason that the distribution of concerns among staff at a

particular school is influenced not only by time but by the type and quality of factors introduced to help speed up the innovation process (Bradshaw, 2002; Lochner et al., 2015; Song et al., 2011). According to a study by Song et al. (2011), different support factors have various effects on faculty concerns. Many factors appear to contribute to technology adoption (Inan & Lowther, 2010; Ngai, Poon & Chan, 2007; Sahin & Thompson, 2007; Selim, 2007; Wang & Wang, 2009 as cited in Song et al., 2011). According to Song et al., some of these factors include:

staff development opportunities, time... incentives and positive attitudes towards the technology (Buckenmeyer, 2001), improved student learning, equipment availability (Hew & Brush, 2007), ease of use, time needed to learn the skills required to implement the new technology, compatibility with materials, training, administrative support, personal comfort and colleague use (Olapiriyakul & Scher, 2006), perceived value, available resources and communication with other adopters (Keengwe, 2007), mission statements and institutional culture, faculty development programs (Kahn & Pred, 2000), personal conviction, motivation and experience, and organizational support. (2011, p. 142)

Table 1 illustrates four of Hall's (1978) categories of concern and the associated support factors and strategies found to decrease the concerns. In response to their findings regarding Arizona secondary schools, Lochner et al. (2015) recommend that school administrators develop activities and interventions that aim to address the most significant concerns first.

Faculty Concerns	Support Factors	Strategies
Faculty Unaware (Information Concerns)	Basic training	Basic application software, use of the Internet resources, email and simple course- management software features
	Technology support	Support for hardware and software, access to technical staff, and other equipment availability
Faculty Aware (Personal Concerns)	Intermediate training	Effective use of web-based technology in the classroom, of course management software, and troubleshooting
	Instructional support	Working with an instructional designer to learn more about the instructional use of technology
Faculty Adopter (Management Concerns)	Peer tutoring	Working with faculty mentors on their projects on an as needed basis
	Faculty incentives	Funding for technology purchases (hardware and software), financial compensation
Faculty Implementer (Impact Concerns)	Advanced training	Assessment training (how to analyze student performance and evaluation strategies)
	Administrative support	Institutional climate for technology, providing external motivation (e.g., promotion or releasing a course)

Note. Adapted from *Educational Technology & Society*, p. 143, Song et. al., 2011.

LMSs are considered to have many features that benefit the learning of their users (Cavanaugh et al., 2005; Hashey & Stahl, 2014; Lochner et al., 2015; Lui & Cavanaugh, 2011; Rocha, 2007; Rubin, Fernandez, Avgerinou, & Moore, 2010). As mentioned above, little research has been done on LMSs pertaining to secondary, primary or elementary grade levels. One study, however, completed by Lui and Cavanaugh (2011), aims to address the effect of LMS use on academic achievement in the context of a Midwestern virtual high school biology class.

The results of the study show that the time students spend in the LMS affected their overall score in the class. This, however, does not speak to the effectiveness of the LMS when compared to traditional face to face teaching, among other things. More research should be done on the effectiveness of LMSs at the pre-college level. Regardless, other non-quantitative studies have identified several key, positive attributes of LMSs

LMSs have the potential to increase the quantity and quality of communication in a variety of ways. First, teachers can communicate and store course information, such as syllabi, assignment instructions, and instructional materials (Rubin et al. 2010). Consequently, students have ongoing access to this information and are able to review and ask questions regarding course material outside of the classroom walls (Lochner et al., 2015). In addition to this, teachers can use the LMS platform to provide comments and feedback to students, two crucial features of the online learning process (Cavanaugh et al., 2005; Hashey & Stahl, 2014; Liu & Cavanaugh, 2011; Lochner et al., 2015). Communication between students and teachers occurs in a variety of ways. Hashey and Stahl (2015) explain that “online interactions between teachers and students is either *synchronous*, with teacher-student interactions occurring in real time (e.g., video chat), or *asynchronous*, with interactions occurring at different times (e.g., email)” (p. 70). Having this open line of communication is very important to students according to Lochner et al. (2015), who explain that student’s value having an open line of communication with a teacher more than access to content. Various web-based communication tools, such as discussion forums, Really Simple Syndication (RSS) feeds, chats, emails, podcasts, and video-sharing sites foster a collaborative learning environment and prompt learning to take place after school hours and outside the classroom (Cavanaugh et. al., 2004; Lochner et al., 2015). These are quality

factors of LMSs because, according to Cavanaugh (2007), increased time spent engaged in academic activities results in increased academic performance of students in online education, as well as face-to-face instruction (Rocha, 2007) and blended programs (Cavanaugh, 2009) (as cited in Liu & Cavanaugh, 2011).

LMSs provide unique opportunities for instructional activities (Hashey & Stahl, 2014; Hodgson & Pang, 2012; Lochner et al., 2015; Revere & Kovach, 2011). In addition to the tools mentioned above, combinations of audio, video and text can be used to communicate content to students. This provides educators with the opportunity to create materials that meet the needs of a variety of learners at different levels of achievement (Hashey & Stahl, 2014; Hodgson & Pang, 2012) and support a learner-centered environment (Lochner et al., 2015; Revere & Kovach, 2011). Hashey and Stahl (2014) said it well in stating:

the combination of audio, video, text, and other means to convey meaning has the potential to provide students, with a range of abilities and disabilities, greater access to curricula and learning opportunities and additional ways to demonstrate their understanding when multiple options for student expression are made available (Bruce, Cesare, Kaczorowski, Hashey, Boyd, Mixon, & Sullivan, 2013).” (p. 71)

LMSs allow teachers to integrate multimedia tools to create engaging activities that increase student interaction with content (Wang, 2010).

Despite this opportunity to create engaging instructional material, as well as do all the things mentioned above, some (Hashey & Stahl, 2014; Revere & Kovach, 2011) acknowledge that many teachers do not utilize LMSs to their fullest potential. Revere and Kovach (2011)

explain that many teachers fail to create online learning scenarios with the traits mentioned above. What is getting in the way? Two things: the lack of functionality of course management systems and the rate in which online technologies and related resources grow and change. Revere and Kovach (2011) state “the speed at which technology grows and changes makes it difficult for educators to identify, test and integrate tools to form truly engaging online work” (p.114). Researchers have identified several other problems relating to LMSs. First, students who frequently travel or have limited access to the internet or a computer would face significant obstacles undergoing an LMS integrated course (Hashey & Stahl 2014; Revere & Kovach 2011). In addition, teachers of classes with LMSs face the pressure of being made available 24/7, resulting in additional time being spent checking emails/discussing boards and responding to students (Keeton & Scholar, 2004). The static nature of much online learning material today raises concern regarding educator’s ability to engage students and meet the needs of a variety of learners (Romero & Ventura, 2007). As discussed above, opportunities exist for this to be done, they just need to be discovered and utilized by LMS users.

As LMSs continue expanding into middle and high schools across the U.S., educators find themselves needing to make essential decisions regarding their use in their settings. This literature review addressed the key topics of concerns, advantages, and limitations regarding LMSs in U.S. schools. In most U.S. schools, faculty concerns regarding the adoption of an LMS have been identified as “early stage” concerns, specifically those pertaining to *awareness* and *management* (Lochner et al.2015). If not addressed, these concerns can cripple the successful integration of an LMS. Lochner, et al. (2015) recommends that school administrators develop activities and interventions specific to the most severe stages of concern present. Despite the

concerns, LMSs appear to possess many positive traits. They offer students and teachers a platform to share work and communicate in a variety of ways. Although it is common for LMSs to be used ineffectively (Revere & Kovach, 2011), educators have the opportunity to create multimedia (Hashey and Stahl, 2014; Wang, 2010), engaging learning activities that meet the needs of a variety of learners (Hashey & Stahl, 2014; Hodgson & Pang, 2012) and support a learner-centered environment (Lochner et al., 2015; Revere & Kovach, 2011).

Description of the Research Process

The aim of this study is to identify the needs and opportunities pertaining to Schoology available in the setting of a Midwest public high school with the ultimate goal of recommending how to best implement the LMS in this setting. The information revealed in this literature study has already discussed many of the opportunities associated with an LMS like Schoology. The research in this project was gathered from four separate groups: parents, teachers, technology integration experts and students. Prior to the start of this project, these four groups received either an assent or consent form (see Appendices A-D). These forms were designed to explain the purpose of the research and the role in which the recipient would play in the project. If participants desired to opt out of participating, their form included a section in which they were able to indicate this. All questions or concerns held by participants were answered via email or in person. Table 2 shows the number of individuals or groups asked to participate compared to the number of parties who actually participated.

Table 2

Number of individuals asked to participate (inquiries) v. final number of participants

<u>Participant groups</u>	<u>Number of Inquiries</u>	<u>Number of Participants</u>
Parents/Guardians	165	24
Teacher	13	9
Students	166	98
Technology Experts	11	8

After participants were notified of the research project and all questions were clarified, the individuals within each group were sent a questionnaire specific to their group. The parent questionnaire (see Appendix E), teacher questionnaire (see Appendix F), and student questionnaire (see Appendix G) were created using Google Forms. Synergy, a grading and student information management system, was used to distribute the questionnaire to all 166 students and their parents/guardians. Students and parents who chose not to participate simply ignored the email, while those intending to participate followed the link to complete the questionnaire. Hard copies of the questionnaire were also made available to those who expressed concern about completing the Google Forms online. Teachers participating in this project were emailed a link to their Google Forms questionnaire through the schools google email account.

All technology experts who participated in this study had experience with Schoology or had experience with a school wide adoption of a similar LMS. Some members of this group were leading the Schoology integration efforts at this particular Midwest high school, while others worked in neighboring districts. This group stood to offer a unique set of information pertaining to Schoology integration, namely advice grounded in experience and best practices.

To gain insight from these experts, individuals were asked to respond via email to a set of questions or prompts (see Appendix H).

In addition to the questionnaire data gathered in this project, two student focus groups were formed in an effort to gain additional information from students. The focus groups were comprised of students from my classes. First, all students were asked if they would be interested in participating in a focus group. Of those that expressed interest, six students had both one of my math classes and my 5th period study hall. These six students were chosen to form the first focus group because of this opportunity. The second focus group was comprised of another ten students from this same study hall. Together, these focus groups included participants from all three grades (10th – 12th). Once the groups were formed, a date to conduct the focus group sessions was agreed upon. When this day arrived laptop computers were checked out and made available to group members. At the beginning of the session students logged in to various Schoology websites currently being used by teachers in the social studies department at this school. Recall that the social studies department at this school was chosen to pilot Schoology during the 2015/2016 school year, a year before the rest of the school would integrate. Students in the focus groups were instructed to analyze the Schoology sites for 5-8 minutes. During this time students were told to discuss how their teachers used Schoology, as well as what they liked and disliked about the LMS. This was done to prepare the students to provide more thoughtful responses later on in the session. After 5-8 minutes of individual group discussion, both groups combined to form one large group. The focus group was then asked to respond to a series of questions (see Appendix I). Their responses were recorded and later analyzed. These questions aimed to reveal what students found useful about Schoolgy, what students found difficult, and

what future uses of Schoology excited and/or worried the group. This information, in addition to the information gathered from the others groups mentioned above, was analyzed for meaning. Free response questionnaire questions were coded by similarity in responses and translated into frequency tables. The findings of all gathered information are discussed below.

Analysis of Data

The purpose of this action research was to investigate the needs and opportunities for high school math teachers pertaining to the adoption of Schoology, a learning management system (LMS). Data was gathered from 98 students, 13 teachers, 24 parents/families and 9 technology integration experts in an effort to gain a multitude of perspectives relating to Schoology use at the high school level.

Student Data Analysis

When asked to rate their experience with Schoology in a questionnaire, students indicated moderate experience, with an average response of 3.1 out of 5 with 1 being low and 5 being high. When presented a list of tasks able to be completed through Schoology, over 40% of students indicated they used Schoology to access notes or articles, post on discussion boards, download and turn in assignments, and take quizzes. Within the questionnaire, students were also asked to rate their level of concern using Schoology to perform a number of basic tasks similar to those described above. They responded using a number from one to five, one indicating concern and five indicating no concern. Student concern levels regarding tasks such as accessing and turning in homework assignments (Figure 2) were uniformly distributed with an average response of 3.1 out of 5. Thirty-four percent of students responded with a one or a two, suggesting they have concerns accessing and turning in assignments on Schoology. Student

concerns with taking quizzes during and outside of the class were also uniformly distributed with average concern levels of 2.9 and 3.1 respectively (Figures 3-4). Similarly, 36% of students indicate having concern with taking quizzes during or outside of school on Schoology.

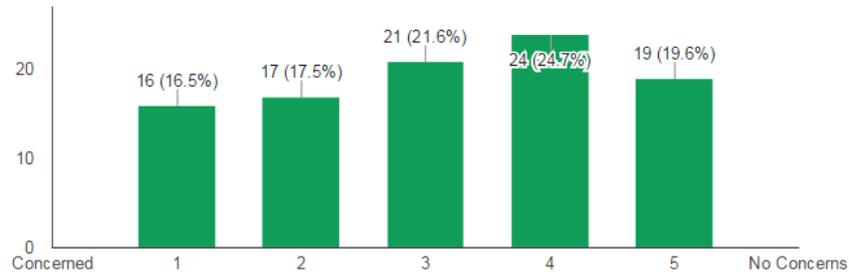


Figure 2. Students’ concern using Schoology to access and turn in homework
 Note. Average = 3.1

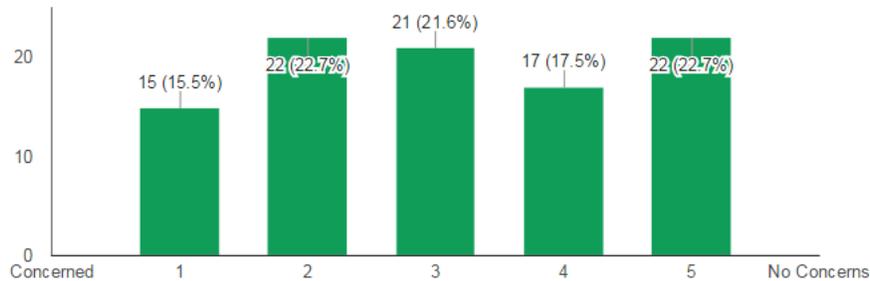


Figure 3. Students’ concern using Schoology to take quizzes & tests during school
 Note. Average = 2.9

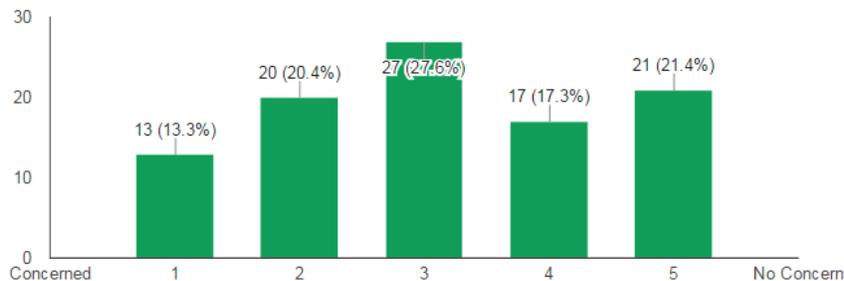


Figure 4. Students’ concern using Schoology to take quizzes outside of school
 Note. Average = 3.1

In contrast, when asked to rate Schoology’s ease of use on a scale from one to five, one being difficult and five being easy, most students believed using Schoology to find materials (Figure 5)

and complete and submit work (Figure 6) is relatively easy, with averages responses of 3.6 and 3.4 respectively. The fact that students have concern about using Schoology while at the same time suggesting it is relatively easier to use suggests they are apprehensive about its school wide use. One possible reason for this contrast, offered by a student focus group member, is that:

Many students are nervous about this change because it forces them to do something they aren't used to do. Change can be scary. Most students think Schoology is pretty easy to use, so a lot of the push back probably comes from the fact that we don't like change.

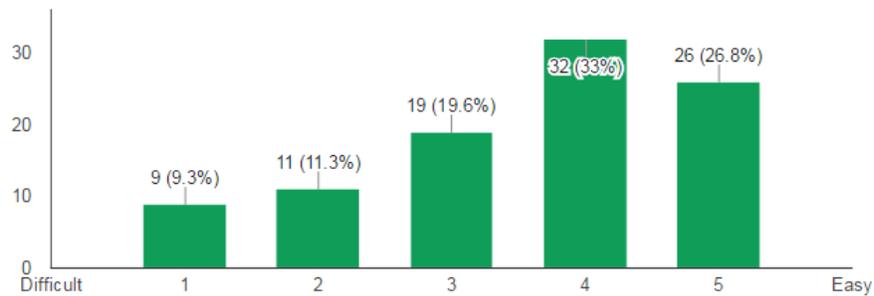


Figure 5. Student difficulty finding class material (videos, notes, assignments) on Schoology Note. Average = 3.6

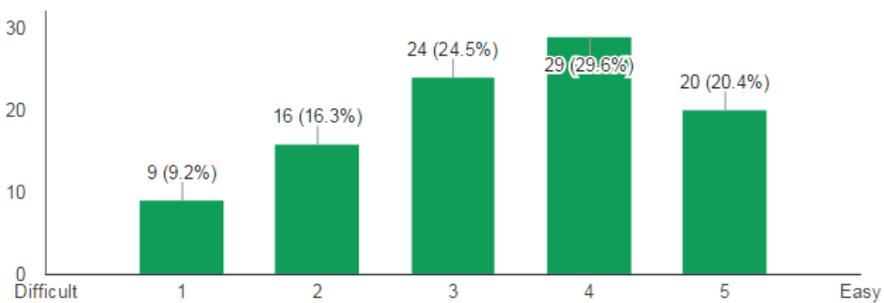


Figure 6. Student difficulty completing tasks and submitting work on Schoology Note. Average = 3.4

When asked in a questionnaire to describe their top three favorite qualities of Schoology, students suggested a number of positive assets as seen in Table 3.

Table 3

Students' favorite qualities of Schoology

<u>Responses</u>	<u>Frequency</u>	<u>Percentage</u>
Accessibility	24	27%
Ease of use/simple layout/fast	21	24%
Important materials are posted (assignments, worksheets, links)	12	14%
It is organized/Helps me become more organized	11	13%
Paperless/no textbook	10	11%
All course work in one place	10	11%
Ability to view and communicate with teachers & class member	9	10%
Turning in work	8	9%
Nothing	8	9%
Schedule/Dates/Calendars	7	8%
Helps when absent from class	7	8%
Not enough experience to answer	7	8%
Discussion board use/Group work	6	7%
Simpler Quizzing and Test	6	7%
Ability to download materials	4	5%
Checking grades	2	2%
Able to work at your own pace	1	1%
Materials cannot be misplaced	1	1%
Compatible with Google Docs	1	1%
Notifications	1	1%
n=88		

The three most frequent positive qualities of Schoology mentioned by students were accessibility, ease of use, and the opportunity to access important class materials, such as notes, worksheets and links to helpful resources, at any time. In addition, more than 10% of students also praised Schoology for aiding in organization, reducing the use of paper or textbooks, and keeping all important course materials in one place. The student focus group session offered similar ideas regarding the benefits of Schoology. On multiple occasions the focus groups mentioned organization and accessibility as key advantages provided by Schoology. The group praised features such as notification alerts, the folder organization system and the presence of important class information such as pdf class notes, worksheets, links to videos, extra copies of assignments and answer keys. They also appreciated the “one stop shop” approach to school work. Students in both the focus groups and the survey mentioned the advantage Schoology offers to those who are absent from school. One student explained that “[The use of Schoology] streamlines the make-up process.”

Students also raised a number of concerns pertaining to Schoology use as seen in Table 4, many of which contrasted the advantages mentioned above. The most frequently mentioned concerns raised by students were difficulty navigating Schoology, worries about excessive computer use, concerns pertaining to turning in work, and general lack of experience. Student focus group members explained that other students have resisted learning how to use Schoology. In response to this, they suggested that, if students remain open minded and are willing to learn, the transition to school wide use will go smoothly. One student concluded the focus group session by saying “Schoology will help those that adapt to it, and hurt those who do not, teachers and students both.”

Table 4

Students' least favorite qualities of Schoology

<u>Response</u>	<u>Frequency</u>	<u>Percentage</u>
Unorganized/Hard to Navigate	15	17%
Too much computers use/Screen-time	11	13%
Lack of Experience/Understanding	10	12%
Turning in Homework/Things	10	12%
Confusing/Complicated/Hard to use	8	9%
Prefer paper/physical copy	8	9%
Take tests/quizzes	8	9%
None	8	9%
Inconsistent levels of use between classes	7	8%
Technical Difficulties (Glitches/Password/Broken links/Touchy scroll bar)	7	8%
Not enough experience to comment	6	7%
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n=86		
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Students in both the questionnaire and the focus group mentioned issues revolving around paper use and screen time. While 11% of students mentioned the paperless aspect of Schoology as an advantage, 9% voiced the shift away from physical paper work as a concern. Even more telling, the student focus groups acknowledged that reducing the amount of paper used by teachers is a good thing, but if given the option of choosing a paper copy or an electronic copy, 11 out of 13 focus group members would choose the paper copy. They commented that using online documents can be difficult because “it’s not actually there.” All 13 focus group members agree the teacher should also provide a paper copy option when assigning a computer based

worksheet of some kind. This conversation alludes to additional questions regarding how teachers expect students to organize class materials. The use of Schoology does not require electronically based learning exclusively. Regardless, it is clear that students involved in the initial integration of Schoology want the option of doing things the way they have in the past: using pencil and paper.

In summary, students applaud Schoology for its accessibility, ease of use, ability to make important class materials readily available, enhance organization, reduce the use of paper or textbooks, and serve as a coursework “one stop shop.” Students expressed concern over navigating Schoology, using computers excessively, turning in work, and their general lack of experience with the LMS. Student focus group members supported all of the advantages and concerns mentioned above. They raised significant concern over a perceived migration away from paper copies of course material, asking that these things continue to be made available to students during the integration process. The focus group also suggested that a change like this will bring about some resistance. A focus group member summarized this in saying “Schoology will help those that adapt to it, and hurt those who do not, teachers and students both.”

Parent Data Analysis

The data gathered from 24 families yielded both similar and disparate findings when compared to information gathered from students. When asked in a questionnaire to rate their level of experience with Schoology, parents offered an average response of 1.7 out of 5, 1 being inexperienced and 5 being experienced. This was expected; little communication had been offered to parents prior to this and only one or two of their child’s classes were using the tool. Similarly, parents indicated they had little experience navigating a site like Schoology (Figure 9).

When asked to rate their level of experience on a scale from 1 to 5, 1 being not experienced and 5 being experienced, parents responded with an average rating of 1.9 out of 5. Even without direct experience, however, parents suggest that they are relatively confident in their ability to help their child navigate the site (Figure 10). When asked to rate their level of confidence on a scale from 1 to 5, 1 being not confident and 5 being confident, parents responded with an average of 3.3 out of 5.

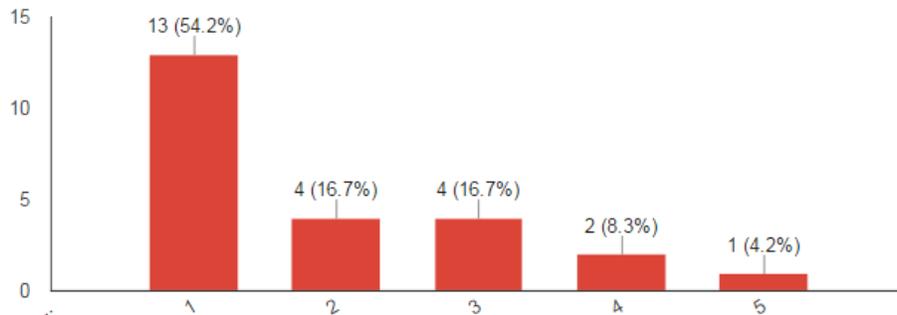


Figure 9. Parents’ experience navigating Schoology or similar learning management system
 Note. Average = 1.9

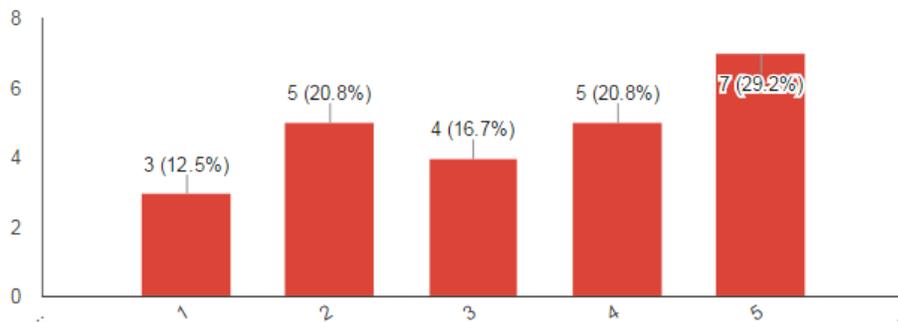


Figure 10. Parents’ confidence in their ability to help their child navigate a site like Schoology
 Note. Average = 3.3

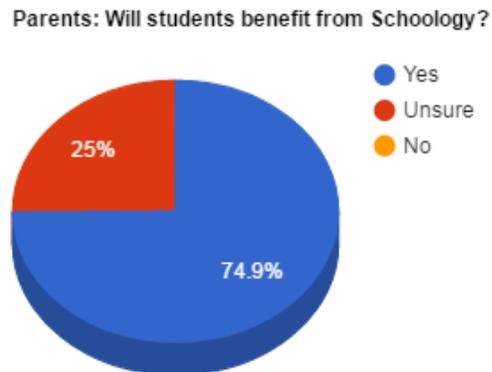


Figure 11. Parents' opinion regarding Schoology's ability to benefit students

Parents are largely in support of Schoology integration at this school. Seventy-five percent of parents believe students will benefit from the adoption of this LMS (Figure 11). In a questionnaire, parents were asked to identify characteristics of Schoology they were most looking forward to as seen in Table 5. Over a fifth of parents liked that Schoology can help them or their child better monitor their work and/or grades. Thirteen percent of parents also applauded the use of technology in general. One parent wrote “[Web-based technology] is more what this generation is using.” Another parent writes “[Schoology] will help them get used to working with technology in the future.”

In the same questionnaire parents were also asked to identify what type of information they value having access to online as seen in Table 6. Again, the most frequent response, offered by 50% of parents, was the desire to access grades and scores. The next two most responses were missing assignments and exam/assignment due dates with frequencies of 33% and 13% respectively. Fortunately, the top three things parents desire to have online access to are features available through Schoology. However, if a school uses a separate grading system, such as Synergy, as does the school in this action research project, parents may be required to visit two

separate sites to acquire all the information pertaining to their child's grade. This could very well cause some confusion for parents and students alike. The severity of this issue depends on the way teachers choose to organize their gradebook and what grading information they choose to display in Schoology, if any at all. According to one teacher, the problem does not lie with Schoology, but rather with Synergy, the original and primary grading system used by this school. This teacher writes "Synergy is not playing nice with Schoology. Right now Schoology is open to a two way communication with Synergy, but Synergy is not being helpful." Another teacher explained that he would like setup quizzes on Schoology that grade themselves upon completion. Ideally, the scores students earn on these quizzes would automatically export to Synergy. Schoology has the capability to send information like this, but Synergy does not.

Table 5

Parents' favorite qualities of using an LMS like Schoology

<u>Response</u>	<u>Frequency</u>	<u>Percentage</u>
Can help students/parents monitor grades and work	5	21%
Added experience with technology	3	13%
Increased accessibility of information	3	13%
Helps with organization	2	8%
Prompts student to take greater charge of learning	2	8%
n=24		

Table 6

Information parents would like to access online

<u>Responses</u>	<u>Frequency</u>	<u>Percentage</u>
Grades/Scores	12	50%
Missing Assignments	8	33%
Future Exam Dates/Assignment Due Dates	3	13%
Additional educational resources/extra credit	2	8%
Attendance	2	8%
Link to assignments	2	8%
Methods of communicating with teacher separate from email	2	8%
Behavior reports	1	4%
Social/emotional information	1	4%
Transcripts	1	4%
Standardized Test Results	1	4%
Progress report pertaining to Graduation Standards	1	4%
Letter grade in addition to point values for assessments	1	4%
Lunch Transactions	1	4%
n=24		

Parents were asked to provide concerns they had regarding their child use of an LMS like Schoology. A frequency table summarizing their responses can be seen in Table 7. Thirty percent of parents expressed no concerns with their child's use of Schoology. Fifteen percent of parents were concerned that the use of Schoology would lead to a lack of teacher centered, or face-to-face, activities. Parents who expressed these concerns believed that the presentence of an

online LMS may cause teachers to teach less in a traditional sense (i.e. direct instruction). One parent wrote “I think the best tool for teaching is a good teacher, not online stuff. [Students] still need that human interaction.” Another parent wrote “[I] do not want [Schoology] to be a primary teaching tool.” The implication here is that parents want Schoology to serve as a resource that enhances the learning experience of their children, coming alongside the preexisting positive teaching strategies already utilized by teachers rather than replacing them. Every parent possesses some preconceived idea of what successful teaching looks like. Setting the details aside, the desire of parents to have a balanced variety of educational experiences for their children is notable. Another parent explains this desire in writing “If all assignments are on Schoology, we will lose engaging activities in the classroom. It's important for kids to communicate face to face with peers and teachers. 100% online learning doesn't seem healthy, so a balance would be important.” Other concerns expressed by parents include an inconsistent use among teachers or a lack of training, keeping sites up-to-date, too much screen time, loss of information, students not understanding how to use Schoology, and the risk that Schoology may increase the number of unexcused absences by making it easier for students to skip class and get caught up.

Table 7

Parent concerns regarding their child's use of an LMS like Schoology

<u>Responses</u>	<u>Frequency</u>	<u>Percentage</u>
No Concern	6	30%
Not enough teacher centered activities or “face to face” learning	3	15%
Inconsistent use among teachers or lack of training	2	10%
Keeping sites up-to-date	2	10%
Too much screen time	2	10%
Loss of information	2	10%
Students not understanding how to use it	2	10%
Risks encouraging students to miss class	1	5%
n=20		

In summary, parents are relatively inexperienced with Schoology, rating their experience at a 1.7 out of 5 on a scale from 1 to 5 with 1 being inexperienced and 5 being experienced. When asked to rate their level of confidence helping their child use Schoology on a scale from 1 to 5, 1 being not confident and 5 being confident, parents responded with an average of 3.3 out of 5. Seventy-five percent of parents believe students will benefit from the adoption of this LMS. Parents desire to have online access to grades and scores, missing assignments and exam/assignment due dates, all features able to be offered by Schoology or an online grading management system such as Synergy. Parents applaud Schoology for its ability to help them monitor their students work, provide their student experience working with technology, and increase the accessibility of information. Regarding concerns, thirty percent of parents expressed

no concerns with their child's use of Schoology, while fifteen percent of parents or less expressed concern including Schoology leading to a lack of teacher centered, or face-to-face, learning activities, an inconsistent use among teachers or a lack of training, teachers not keeping sites up-to-date, too much screen time for students, loss of information, students not understanding how to use Schoology, and Schoology increasing the number of unexcused absences by making it easier for students to skip class and get caught up.

Teacher Data Analysis

Nine high school math teachers provided information via a Google Forms questionnaire. Upon analyzing their feedback, several key observations can be made. The teachers who participated felt they have low experience with Schoology, providing an average rating of 2.4 out of 5 on a scale from 1 to 5, 1 indicating no experience and 5 indicating high experience. It's important to note that the administration at this particular school had not yet required teachers to reach any type of benchmark in their Schoology integration process. When asked what tasks teachers could perform on Schoology, answers ranged from "nothing" to "All student handouts, blank worksheets, solution keys, daily class board notes are on Schoology. The calendar is up to date with every worksheet and handout attached to the correct calendar date." Eight out of nine teachers had set up their classes on Schoology and understood how to make basic adjustments to their site. When asked how they planned to use Schoology next fall, over fifty percent of teachers indicated they planned to share class information such as assignments, notes, videos, and formative assessments, communicate with students and provide feedback. Zero teachers indicated they planned to use the discussion feature, a feature the student focus group admired.

When asked what features of Schoology will most help improve their students' learning experience, 62% of teachers praised the "one stop shop" aspect of this tool. Through Schoology, students are able to access all their classes in one place, thus they will "No longer... need to go to six different websites for six different teachers." Several teachers also mentioned the homework calendar feature on Schoology, which is synced with all of their classes. Teachers have the ability to attach things to their calendar, such as electronic copies of assignments, notes, keys or rubrics, providing students one central location for most of their needs.

When asked in a questionnaire to identify their ideal use for Schoology, as seen in table 8, 56% of teachers responded that they would use Schoology to better communicate with students, 44% said they would like to use Schoology to give formative assessments or other assignments, and 22% indicated they would like to share resources with students.

Table 8

Teachers' ideal use of Schoology

<u>Response</u>	<u>Frequency</u>	<u>Percentage</u>
Communication	5	56%
Formative Assessment/Assignments	4	44%
Provide resources	2	22%
Flip Classroom	1	11%
Take Attendance	1	11%
Track grades	1	11%
Use as platform for self-paced, self-guided learning	1	11%
<hr/>		
n=9		

When teachers were asked in a questionnaire to provide 3-4 concerns they have regarding their use of Schoology as seen in Table 9, 33% of teachers felt they did not have enough training, 22% said they were concerned about Schoology's lack of compatibility with Synergy, their students not using it, other teachers not using it and not understanding how to use it themselves.

Table 9

Teachers' top concerns regarding Schoology use or implementation

<u>Response</u>	<u>Frequency</u>	<u>Percentage</u>
Not enough training	3	33%
Not compatible with Synergy	2	22%
Not understanding how to use	2	22%
Students not using it	2	22%
Other teachers not using it/getting frustrated	2	22%
Students using it as an excuse to skip class	1	11%
Not being able to use math symbols	1	11%
Unable to keep up with entering information	1	11%
<hr/>		
n=9		

In summary, teachers at this specific school have low experience with Schoology, providing an average rating of 2.4 out of 5 on a scale from 1 to 5, 1 indicating no experience and 5 indicating high experience. When asked how they planned to use Schoology next fall, over fifty percent of teachers indicated they planned to share class information such as assignments, notes, videos, and formative assessments, communicate with students and provide feedback. When asked to identify their ideal use for Schoology, teachers most frequently responded that

they would use Schoology to communicate, formatively assess, and provide resources for students. Concerns expressed by teachers regarding their use of Schoology included not having enough training, Schoology's lack of compatibility with Synergy, students not using it, other teachers not using it and a lack of understanding on how to use it themselves.

Analysis of Technology Expert Data

Eight individuals with experience navigating the first year of an LMS integration provided many key ideas pertain to this topic. When asked why his or her school adopted an LMS in a questionnaire, two technology experts said delivering content in a digital format was a key reason for the decision. Three technology experts also praised the "one stop shop" quality of Schoology as a motivating factor. Upon being asked to identify the top three reasons a school should adopt an LMS in a questionnaire, technology integration experts offered a long list of positive qualities offered through Schoology as seen in Table 10.

Table 10

Technology experts top reasons a school should adopt an LMS

<u>Responses</u>	<u>Frequency</u>
Easy for students to access information and resources from any teachers 24/7	1
Easy to share information with students	1
Students can turn in assignments in multiple forms (docs, photos, voice recordings, video recordings, etc.)	1
Increased digital access and use	1
Increased collaboration	1
Consistent location and experience	1
Easy for teachers to create and share information between colleagues and use materials from semester to semester	1
Increase use of digital features such as discussions or formative quizzes (with immediate feedback)	1
Could save school money by reducing paper copies	1
Helps students manage makeup work when absent	1
Clear communication with students and parents	1
Great storage place to organize and set up class with agenda and units	1
<hr/>	
n=8	
<hr/>	

When completing the questionnaire, technology experts described a number of struggles they had witnessed or experienced themselves during the integration of an LMS like Schoology. Two experts felt they were not given adequate time and training to understand how to use Schoology. One individual said that this forced him and others to learn by “trial and error.”

Four of the eight technology experts expressed concern over the wide range of comfort levels and uses of Schoology at their school. One individual explained that both the numerous features of Schoology and the newness of the tool can overwhelm new users, leading some to give up where others persevere. This creates a gap in knowledge and uses, which another expert explains will make learning how to use Schoology more difficult for students.

Technology integration experts were asked in a questionnaire to provide potential drawbacks associated with Schoology. One expert explained that their school's grading system, Synergy, did not work well with Schoology, posing a major drawback for teachers hoping to use Schoology to post grades. Because the systems do not communicate with one other, materials graded in Schoology have to be manually entered into Synergy. Another integration expert raised concern over teachers underutilizing Schoology and treating it as simply "another place to store worksheets." Similarly, 22% of math teachers expressed concerned over their colleagues not using Schoology properly or at all. Yet another technology integration expert explained that Schoology can be "a little clunky for parents to use" initially. This individual went on to explain that some teachers communicate with parents through Schoology while others continue to use Google. As mentioned by parents, teachers, and students, Schoology ought to be used consistently across classrooms and content areas. One teacher expressed the same type of concern when saying

If a couple of teachers force students to use their old Google websites, then they are forcing students to do more work. It's like telling someone to buy milk at Cub, eggs at Target, and cheese at Rainbow. Schoology gives students one location to get everything they need.

This line of thinking applies to the retrieving/submitting of materials and communication among teachers, parents and students. Another technology integration expert applauded Schoology for the 24/7 access it offers students to materials, but warned that this 24/7 access also pertained to teachers. Schoology opens the door for communication with students after school hours, could extend the work day if clear guidelines are not communicated and practiced. Also, another expert warned that students may become upset if materials are not updated quickly or errors are made in posting assignments or due dates. If students use Schoology as a planner rather than keeping their own planner, a teacher's mistake can quickly become the students' mistake as well. This can be, as the individual puts it, "dangerous."

When completing a questionnaire, technology integration experts provided recommendations to those integrating an LMS like Schoology for the first time as seen in Table 11. The suggestions varied, showing very little repetition among the eight technology integrations experts who participated. One teacher recommended starting small, updating Schoology with essential materials first before learning how to use some of Schoology more advanced features. This individually suggested it takes two or three years to "use [Schoology] to its fullest potential." Two technology experts recommended learning from what others have done, collaborating with other teachers and creating resources together. Another expert recommended "getting teachers on board with using Schoology in the same way." This suggestion seems wise in light of the fact that 8% of students who completed the questionnaire for this research and members of the student focus group raised concerns over their teacher's inconsistent use of Schoology.

Table 11

Technology integration experts recommendations for teachers using Schoology for the first time

<u>Recommendations</u>	<u>Frequency</u>
Start small; just try it; play around with it	2
Reference pages and organizational tools of others	1
Connect with colleagues; creating resources together	1
Communicate with students and parents; ask them what they like/dislike	1
View it from the students perspective	1
Store everything in your resources	1
Be patient	1
Train students to use it right away	1
Organize your folders (by unit or by month) and stick to it so students learn your system	1
Get teachers on board with using Schoology in the same way	1
n=8	

In summary, technology integration experts said delivering content in a digital format and Schoology's "one stop shop" approach to education were two key factors in their school's decision to adopt the LMS. When asked to identify other reasons a school should adopt an LMS like Schoology, technology integration experts referenced qualities such as accessibility of class resources, ease in communication among students and teachers, and the ability to turn in work in a greater variety of formats (video, audio, digital, etc.). Technology integration experts mentioned a number of struggles associated with schoolwide LMS integration, some of which

include a lack of time and training for teachers, teachers feeling overwhelmed, and teachers using the LMS in too many different ways with an enormous difference in ability levels. Several key recommendations provided by technology integration experts to teachers going through a similar LMS integration include starting small and “playing around” with the tool, learning from and collaborate with others, organizing information clearly and consistently, training students to use it properly, and training teachers to use Schoology in similar ways.

Analysis of All Groups: Compare and Contrast

Upon analyzing the data gathered from students, parents, teachers, and technology experts many important trends relating to LMS integration surfaced. All four groups praised Schoology for its accessibility, ability to help students access class materials, stay organized and get caught up when absent. All four groups also used the phrase “one stop shop” when describing Schoology, admiring how students are able to access materials from every one of their courses in a single, web-based location. All four groups expressed concern over having a lack of experience with Schoology and the negative effect it could have on the integration process. This concern is a factor likely indicative of this particular school’s early status in the integration process. Parents and students both raised concern over excessive computer use and the potential shift away from teacher centered learning. Generally speaking, the feedback gathered from parents emphasized how Schoology would help them monitor their child’s work and performance, while students offered feedback focused more on uses of Schoology pertaining to their course work. Teachers who participated in this research said they planned to use Schoology to share relevant course material and extra resources, update a calendar, and communicate with students, all features of Schoology desired by students.

Teachers and technology integration experts both mentioned that Schoology will allow them to more effectively communicate with students and turn in work in a variety of formats, actions that would enhance the learning experience of the students. Technology integration experts sympathized with some teachers' concerns with Schoology being used in inconsistent ways among teaching staff. Integrationists suggested that if teachers use Schoology in similar ways, students will adapt to using the new tool more quickly and easily. This recommendation should be received well as students also expressed concern over this very issue.

Action Plan

The purpose of this action research is to investigate the needs and opportunities for high school math teachers pertaining to the integration of Schoology. The results show that students, teachers, parents, and technology integration experts have both shared and unique concerns, desires, and suggestions pertaining to Schoology. I have identified five needs and opportunities from this research.

Students need to be taught how to use Schoology. 36% of students who participated in this research expressed concern about using Schoology to perform basic tasks. Only 40% of students have used Schoology to access notes or articles, post on a discussion boards, download and turn in an assignments, and take quizzes. Three student focus group members felt that their teacher had not done an adequate job explaining how to use Schoology, leaving the students confused and frustrated. Teachers need to show students how to perform the tasks they expect them to perform. These tasks should be scaffolded, beginning with simple tasks such as accessing information, and lead up to more complex tasks such as submitting a voice note or

completing an online worksheet. Explicitly teaching students how to use Schoology will help alleviate some of the various concerns students expressed in this research.

Teachers need to be trained to use Schoology. This must happen before teachers are expected to use Schoology in their classes. As suggested by students and technology integration experts, teachers should aim to use Schoology in relatively similar ways to help students more quickly and easily gain comfort with the tool. One technology integration expert suggested at least three Schoology training sessions per year happen. These would provide teachers a chance to collaborate, learn new skills, and have their questions answered. If implementation is scheduled to happen before there is time to receive adequate training, teachers should start small, connect and collaborate with colleagues, and get their site organized first.

Parents need to be involved in the integration process. Parents should be informed about teachers' intended use of Schoology and provided instructions on how to access the information essential to their full participation. If parents desire to have access to grades and scores, missing assignments and exam and assignment due dates, then teachers should inform parents on how to do these things. An ongoing form of dialogue should be made available with parents and students so they can make suggestions or ask questions if needed.

Schoology offers many opportunities to students, teachers and parents. All three of these groups applauded Schoology for its ability to keep materials organized. Teachers should utilize Schoology's calendar feature to post the class schedule and due dates. Students also suggested that teachers attach worksheets, keys and rubrics directly to the calendar. Alternative resources such as links to videos, articles or websites, voice notes, and extra worksheet can be linked to the calendar or placed in an appropriately labeled folder. Students, parents and teachers all see

Schoology as a “one stop shop” that has the potential to keep everyone organized; therefore it is imperative that teachers begin by developing a logical organizational system and continually improve on it if necessary.

Schoology allows a teacher to share resources and create educational experiences in a manner that has never been seen before. Discussions, formative assessment, video assignments, and electronic worksheets are just a few of the resources now at a teacher’s disposal. In light of this, teachers should experiment with these different tools. Other research (Shuggel, 2016) suggests that the use of frequent formative assessments can improve student learning. Teachers, especially math teachers, should consider setting up frequent formative assessment quizzes on Schoology. The assessments can open and close when desired, as well as grade themselves if set up properly. If asked to take these outside of class, students can receive immediate feedback and teachers can receive data before the start of the next lesson. Teachers should also consider setting up a discussion board, at the very least to give students a place to ask questions and communicate with one another. All of these opportunities can seem overwhelming to some. On the contrary, if Schoology or other LMSs are here to stay for a while, teachers will have plenty of time master the tool and allow it to influence their classroom structures as needed.

References

- Bruce, D., Di Cesare, D. M., Kaczorowski, T., Hashey, A., Boyd, E. H., Mixon, T., & Sullivan, M. (2013). Multimodal composing in special education: A review of the literature. *Journal of Special Education Technology, 28*(2), 25–42.
- Buckenmeyer, J. A. (2001). *Conditions influencing the adoption of selected technology in high school teachers in a suburban district*. Unpublished doctoral dissertation, University of Toledo, Ohio.
- Cavanaugh, C., Gillan, K., Kromrey, J. Hess, M. & Blomeyer, B. (2004). *The effects of distance education on K–12 student outcomes: A meta-analysis*. Naperville, IL: Learning Point Associates. Retrieved from <http://www.ncrel.org/tech/distance/k12distance.pdf>
- Cavanaugh, C. (2007). Student achievement in elementary and high school. In M. G. Moore, *Handbook of Distance Education* (2nd ed., pp.157-168). Mahwah, NJ: Erlbaum.
- Cavanaugh, C. (2009). *Getting students more learning time online: Distance education in support of expanded learning time in K-12 schools*. Washington, DC: Center for American Progress.
- Fuller, F. (1969). Concerns of teachers: A developmental conceptualization. *American Educational Research Journal, 6*(2), 207–226.
- Hall, E. (1978). *The study of teachers' concerns and consequent implications for staff development*. Austin, TX: The University of Texas, Research Development Center for Teacher Education.

- Hashey, A. I., & Stahl, S. (2014). Making Online Learning Accessible for Students with Disabilities. *Teaching Exceptional Children, 46*(5), 70-78.
doi:10.1177/0040059914528329
- Hodgson, P., & Pang, M. Y. (2012). Effective formative e-assessment of student learning: a study on a statistics course. *Assessment & Evaluation In Higher Education, 37*(2), 215-225. doi:10.1080/02602938.2010.523818
- Inan, F., & Lowther, D. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational Technology Research and Development, 58*, 137-154.
- Kahn, J., & Pred, R. (Eds.). (2000). Proceedings from SITE: *Society for Information Technology and Teacher Education International Conference*. Chesapeake, VA: Association for the Advancement of Computing in Education.
- Keeton, M. T., & Scholar, S. (2004). Best online instructional practices: Report of phase I of an ongoing study. *Journal of Asynchronous Learning Networks, 8*(2), 75-100.
- Liu, L., & Cavanaugh, C. (2011). SUCCESS IN ONLINE HIGH SCHOOL BIOLOGY Factors Influencing Student Academic Performance. *Quarterly Review of Distance Education, 12*(1), 37-54.
- Lochner, B., Conrad, R., & Graham, E. (2015). Secondary Teachers' Concerns in Adopting Management Systems: A U.S. Perspective. *Techtrends: Linking Research & Practice To Improve Learning, 59*(5), 62-70. doi:10.1007/s11528-015-0892-4
- McGill, T. J., & Klobas, J. E. (2009). A task–technology fit view of learning management system impact. *Computers and Education, 52*(2), 496-508.
doi:10.1016/j.compedu.2008.10.002

- Ngai, E. W. T., Poon, J. K. L., & Chan, Y. H. C. (2007). Empirical examination of the adoption of WebCT using TAM. *Computers and Education, 48*(2), 250—267.
- Queen, B., & Lewis, L. (2011). *Distance education courses for public elementary and secondary school students: 2009–10* (NCES 2012-008). U.S. Department of Education, National Center for Education Statistics. Washington, DC: Government Printing Office.
- Revere, L., & Kovach, J. V. (2011). *ONLINE TECHNOLOGIES FOR ENGAGED LEARNING A Meaningful Synthesis for Educators*. Quarterly Review of Distance Education, *12*(2), 113-124.
- Rocha, E. (2007). *Choosing more time for students: The what, why, and how of expanded learning*. Washington, DC: Center for American Progress.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th Ed.). New York: The Free Press.
- Romero, C., & Ventura, S. (2007). Educational data mining: A survey from 1995 to 2005. *Expert Systems with Applications, 33*(1), 135-46.
- Rubin, B., Fernandez, R., Avgerinou, M. D., & Moore, J. (2010). The effect of learning management systems on student and faculty outcomes. *The Internet and Higher Education, 13*(1), 82-83. Doi:10.1016/j.jheduc.2009.10.008
- Saunders, R. (2012). Assessment of professional development for teachers in the vocational education and training sector: An examination of the concerns based adoption model. *Australian Journal of Education* (ACER Press), *56*(2), 182-204.
- Song, H.-D., Wang, W.-T., & Liu, C.-Y. (2011). A simulation model that decreases faculty concerns about adopting web-based instruction. *Educational Technology & Society, 14*(3), 141-151.

Wang, Q. (2010). Using online shared workspaces to support group collaborative learning.

Computers and Education, 55(3), 1270-1276. doi 10.1016/j.compedu.2010.05.023

Watson, J., Murin, A., Vashaw, L., Gemin, B., & Rapp, C. (2012). *Keeping pace with K-12*

online learning: An annual review of policy and practice. Retrieved from <http://kpk>

[12.com/cms/wp-content/uploads/KeepingPace2012.pdf](http://kpk12.com/cms/wp-content/uploads/KeepingPace2012.pdf)

Appendix A

Schoology: The Adoption of a Learning Management System
Active Consent Form

Dear Parents,

As you may know, I am a St. Catherine University student pursuing a Masters of Education degree. An important part of my program is the Action Research project.

As the mathematics teacher of students at Burnsville high school, I have chosen to learn about the needs and opportunities relating to Schoology, an online learning management system Burnsville is currently adopting. More specifically, my aim is to better understand the feelings and desires students have relating to Schoology so I can learn how to best use this tool to improve the learning of BHS students. I am working with a faculty member at St. Kate's and an advisor to complete this particular project.

I will be writing about the results that I get from this research, however none of the writing that I do will include the name of this school, the names of any staff, administration, parents, or students, or any references that would make it possible to identify outcomes connected to a particular individual. Only I will have access to the identifiable data for this study; I will keep in confidential.

When I am done, my work will be electronically available online at the St. Kate's library in a system called Sophia, which holds published reports written by faculty and graduate students at St. Kate's. The goal of sharing my final research study report is to help other teachers who are also trying to improve the effectiveness of their teaching.

There are no risks involved in gathering this information. Teachers and students at Burnsville high school stand to benefit from your participation in this study through the outcomes of the information you provide in light of the unique perspective you have to offer. By better understanding the needs of parents, teachers and students, the opportunities available through Schoology, and the experience of technology integration experts in the area I will be able to better understand how to best implement Schoology in my classroom, thus improving the learning experience of my students. This information will then be shared to other departments, benefiting Burnsville high school as a whole.

Procedures:

If you decide to participate, you will be asked to complete a 5-10 minute questionnaire created to gather information on the attitudes, needs and opportunities associated with Schoology. If you are willing to have a short follow-up conversation with me, via phone, email, voicemail, or in person, you will have the opportunity to indicate this on the questionnaire. Follow up conversations will take approximately 5-10 minutes.

This study is voluntary. If you decide you do want to be a participant and have your anonymous questionnaire data included in my study, you need to sign this form and return it by April 15, 2016. If at any time you decide you do not want to continue participation or allow your data to be included in the study, you can notify me and I will remove included data to the best of my ability.

If you decide you do not want to participate or have your data included in my study, you do not need to do anything. There is no penalty for not participating in the study.

If you have any questions, please feel free to contact me through email at dschlager@isd191.org. You may ask questions now, or if you have any additional questions later, you can ask me or my advisor David Hedenstrom (davehedenstrom@gmail.com) who will be happy to answer them. If you have other questions or concerns regarding the study and would like to talk to someone other than the researcher(s), you may also contact Dr. John Schmitt, Chair of the St. Catherine University Institutional Review Board, at (651) 690-7739.

Opt In

I DO want to [participate / have my data included] in this study. Please respond by May 29th, 2016.

Signature of Participant in Research

Date

Signature of Researcher

Date

Appendix B

Schoology: The Adoption of a Learning Management System
Active Consent Form

Dear Teacher,

As you may know, I am a St. Catherine University student pursuing a Masters of Education degree. An important part of my program is the Action Research project.

As a mathematics teacher of students at Burnsville High School, I have chosen to learn about the needs and opportunities relating to Schoology, an online learning management system Burnsville is currently adopting. More specifically, my aim is to better understand the opportunities and needs pertaining to Schoology so I can learn how to best integrate this tool to improve my practice and the practice of others. I am working with a faculty member at St. Kate's and an advisor to complete this particular project.

I will be writing about the results that I get from this research, however none of the writing that I do will include the name of this school, the names of any staff, administration, parents, or students, or any references that would make it possible to identify outcomes connected to a particular individual. Only I will have access to the identifiable data for this study; I will keep it confidential.

When I am done, my work will be electronically available online at the St. Kate's library in a system called Sophia, which holds published reports written by faculty and graduate students at St. Kate's. The goal of sharing my final research study report is to help other teachers who are also trying to improve the effectiveness of their teaching.

There are no risks involved in gathering this information. Teachers and students at Burnsville High School stand to benefit from your participation in this study through the outcomes of the information you provide in light of the unique perspective you have to offer. By better understanding the needs of parents, teachers and students, the opportunities available through Schoology, and the experience of technology integration experts in the area I will be able to better understand how to best implement Schoology in my classroom, thus improving the learning experience of my students. This information will then be shared to other departments, benefiting Burnsville High School as a whole.

Procedures:

If you decide to participate, you will be asked to complete a 5-10 minute questionnaire created to gather information on the attitudes, needs and opportunities associated with Schoology. If you are willing to have a short follow-up conversation with me, via phone, email, voicemail or in person, you will have the opportunity to indicate this on the questionnaire. Follow up conversations will take approximately 5-10 minutes.

This study is voluntary. If you decide you do want to be a participant and have your anonymous questionnaire data included in my study, you need to sign this form and return it by June 10, 2016. If at any time you decide you do not want to continue participation or allow your data to be included in the study, you can notify me and I will remove included data to the best of my ability.

If you decide you do not want to participate nor have your data included in my study, you do not need to do anything. There is no penalty for not participating in the study.

If you have any questions, please feel free to contact me through email at dschlager@isd191.org. You may ask questions now, or if you have any additional questions later, you can ask me or my advisor David Hedenstrom (davehedenstrom@gmail.com) who will be happy to answer them. If you have other questions or concerns regarding the study and would like to talk to someone other than the researcher(s), you may also contact Dr. John Schmitt, Chair of the St. Catherine University Institutional Review Board, at (651) 690-7739.

You may keep a copy of this form for your records.

Opt In

I DO want to [participate / have my data included] in this study. Please respond by June 10th, 2016.

Signature of Participant in Research

Date

Signature of Researcher

Date

Appendix C

Schoology: The Adoption of a Learning Management System
Active Consent Form

Dear Technology Integration Expert,

As you may know, I am a St. Catherine University student pursuing a Masters of Education degree. An important part of my program is the Action Research project.

As a mathematics teacher of students at Burnsville High School, I have chosen to learn about the needs and opportunities relating to Schoology, an online learning management system Burnsville is currently adopting. More specifically, my aim is to better understand the opportunities and needs pertaining to Schoology so I can learn how to best integrate this tool to improve my practice and the practice of others. I am working with a faculty member at St. Kate's and an advisor to complete this particular project.

I will be writing about the results that I get from this research, however none of the writing that I do will include the name of this school, the names of any staff, administration, parents, or students, or any references that would make it possible to identify outcomes connected to a particular individual. Only I will have access to the identifiable data for this study; I will keep in confidential.

When I am done, my work will be electronically available online at the St. Kate's library in a system called Sophia, which holds published reports written by faculty and graduate students at St. Kate's. The goal of sharing my final research study report is to help other teachers who are also trying to improve the effectiveness of their teaching.

There are no risks involved in gathering this information. Teachers and students at Burnsville High School stand to benefit from your participation in this study through the outcomes of the information you provide in light of the unique perspective you have to offer.

Procedures:

If you decide to participate, you will be asked to complete a 5-10 minute questionnaire created to gather information on the attitudes, needs and opportunities associated with Schoology. If you are willing to have a short follow-up conversation with me, via phone, email, voicemail, or in person, you will have the opportunity to indicate this on the questionnaire. Follow up conversations will take approximately 5-10 minutes.

This study is voluntary. If you decide you do want to be a participant and have your anonymous questionnaire data included in my study, you need to sign this form and return it by June 1, 2016. If at any time you decide you do not want to continue participation or allow your data to be included in the study, you can notify me and I will remove included data to the best of my ability.

If you decide you do not want to participate nor have your data included in my study, you do not need to do anything. There is no penalty for not participating in the study.

If you have any questions, please feel free to contact me through email at dschlager@isd191.org. You may ask questions now, or if you have any additional questions later, you can ask me or my advisor David Hedenstrom (davehedenstrom@gmail.com) who will be happy to answer them. If you have other questions or concerns regarding the study and would like to talk to someone other than the researcher(s), you may also contact Dr. John Schmitt, Chair of the St. Catherine University Institutional Review Board, at (651) 690-7739.

You may keep a copy of this form for your records.

Opt In

I DO want to [participate / have my data included] in this study. Please respond by June 1st, 2016.

Signature of Participant in Research

Date

Signature of Researcher

Date

Appendix D

Schoology: The Adoption of a Learning Management System
Assent Form

3/21/2016

Dear Parents,

In addition to being your child's mathematics teacher, I am a St. Catherine University (St. Kate's) student pursuing a Masters of Education. As a capstone to my program, I need to complete an Action Research project. I am going to study the needs and opportunities associated with Schoology, a learning management systems being adopted by Burnsville High School. For those that are not familiar, online learning management systems are like online classrooms. Schoology will offer teachers the opportunity to share instructional materials (notes, lessons, videos), communicate with students, set up discussion boards, offer assessments (quizzes and/or tests), in addition to many other things, all online. I have chosen to conduct this action research study with the goal of helping my department learn how to best implement this tool to meet the needs in our environment.

In the coming weeks, I will be asking all students to provide me information regarding their experiences and attitudes toward Schoology. This will be communicated through a Google Forms questionnaire shared through email. I plan to analyze the results of these questionnaires to determine student attitudes toward Schoology, current levels of experience with the tool, and their desired uses of this technology in their education setting. In addition to gathering questionnaire data I will be asking 4-6 students to volunteer to participate in a student focus group to provide additional information regarding Schoology. These students will meet either before or after school and have an opportunity to analyze a sample Schoology site. They will be asked to discuss their likes, dislikes, concerns and any other opinions regarding what they see. The meeting will last approximately 45 minutes.

The purpose of this letter is to notify you of this research and to allow you the opportunity to exclude your child's questionnaire data from my study.

If you decide you want your child's data to be in my study, you don't need to do anything at this point.

If you decide you do NOT want your child's data included in my study, please note that on this form below and return it by April 15th, 2016. In this case, when the questionnaire is shared with students, your child will not need to complete the questionnaire.

In order to help you make an informed decision, please note the following:

- I am working with a faculty member at St. Kate’s and an advisor to complete this particular project.
- There are minimal risks to students involved in this study. Teachers and students at Burnsville High School stand to benefit from students’ participation in this study through the outcomes of the information students provide in light of the unique perspective they have to offer. By better understanding the needs of parents, teachers and students, the opportunities available through Schoology, and the experience of technology integration experts in the area I will be able to better understand how to best implement Schoology in my classroom, thus improving the learning experience of my students. This information will then be shared to other departments, benefiting Burnsville High School as a whole.
- I will be writing about the results that I get from this research. However, none of the writing that I do will include the name of this school, the names of any students, or any references that would make it possible to identify outcomes connected to a particular student. Other people will not know if your child is in my study.
- The final report of my study will be electronically available online at the St. Kate’s library. The goal of sharing my research study is to help other teachers who are also trying to improve their teaching.
- There is no penalty for not having your child’s data involved in the study; I will simply delete his or her responses from my data set.

If you have any questions, please feel free to contact me through email at dschlager@isd191.org. You may ask questions now, or if you have any additional questions later, you can ask me or my advisor David Hedenstrom (davehedenstrom@gmail.com) who will be happy to answer them. If you have other questions or concerns regarding the study and would like to talk to someone other than the researcher(s), you may also contact Dr. John Schmitt, Chair of the St. Catherine University Institutional Review Board, at (651) 690-7739.

You may keep a copy of this form for your records.

Derek Schlager

Date

OPT OUT: Parents, in order to exclude your child’s data from the study, please sign and return by April 15th, 2016.

I do NOT want my child’s data to be included in this study.

Signature of Parent

Date

Appendix E

Parent Questionnaire:

Next year Burnsville will be adopting an online learning management system called Schoology. Schoology is a subscription-based online learning management software. Schoology will offer teachers the opportunity to share instructional materials (notes, lessons, videos), communicate with students, set up discussion boards, offer assessments (quizzes and/or tests), all online.

Consider visiting Schoology's website for more information: <https://www.schoology.com/>. I'm writing to gain some information regarding your perspective on this new and upcoming innovation.

1. How much time do you currently spend using online software/tools such as email, search engines, word or xcel documents during the day? Multiple choice answers.
 - a. 0-10 minutes
 - b. 10-20 minutes
 - c. 20-30 minutes
 - d. 30-40 minutes
 - e. 40-50 minutes
 - f. 50-60 minutes
 - g. 60-70 minutes
 - h. 70-80 minutes
 - i. 80 or more
 - j. Once a month
 - k. Twice a month
 - l. Weekly
 - m. Several times a week
 - n. Daily
2. How confident or concerned do you currently feel about the education your child is receiving? Likert scale.
3. When you go online or use email currently to follow up on your students' learning, what are the activities you are most likely to do? Check boxes.
 - a. Check class grades
 - b. Check assignment completion
 - c. Email teachers
 - d. Other:
4. What information do you most wish you could access online about your student's learning activities or progress in school? Written answer.
5. Do you have any experience navigating a learning management system like Schoology? Multiple choice.
 - a. None

- b. Heard of Schoology or other learning management systems, but never navigated
 - c. Some experience
 - d. Moderate experience
 - e. Very experienced
6. How confident are you in your ability to help your child navigate a site like Schoology? Likert scale.
 7. Do you believe your child will benefit from having access to an online learning management system? Likert scale.
 8. What, if anything, most excites you about your child utilizing an online learning management system like Schoology in the future? Written answer.
 9. What, if anything, most worries/displeases you about your child using an online learning management system like Schoology in the future? Written answer.
 10. Rank how successful you believe your child will be at completing assignments and viewing course materials online. (options from very successful to not successful)
 11. Are you concerned with your child's access to the internet after school hours? Yes or no.
 12. If needed, would you be willing to have a brief follow up conversation with me at a later date? Yes or no.
 13. If so, what form of communication would you prefer? (please check those that apply)
 - Phone
 - Email
 - Other

Appendix F

Teacher Questionnaire:

1. Which of the following do you currently use to communicate information to students/parents? Checkboxes
 - a. Email
 - b. Synergy initiated email
 - c. Phone call
 - d. Website
 - e. Texts
 - f. Written letter
 - g. Other:
2. How often, on average do you update your online communication with students/families currently? Multiple choice
 - a. Daily
 - b. 2-3 times per week
 - c. Weekly
 - d. Monthly
 - e. Other:
3. Describe your experience and/or use of Schoology. Written answer.
4. What are the top 3-4 opportunities offered by Schoology that most excite you? Written answer.
5. What are your 3-4 least favorite qualities of Schoology? Written answer.
6. What are the top 3-4 concerns you have regarding your use of Schoology for next fall? Written answer.
7. What do you plan to use Schoology for next fall? Check boxes.
 - a. Share class information
 - b. Sharing assignments
 - c. Sharing notes/videos
 - d. Collecting work
 - e. Formative Quizzes
 - f. Tests
 - g. Discussions
 - h. Communicating with students/providing feedback
 - i. Other:
8. To what extent would you be interested in having more learning opportunities for yourself around best practices with using an LMS like Schoology? Likert scale.
9. If needed, would you be willing to have a brief follow up conversation with me at a later date? Yes or no
10. If so, what form of communication would you prefer? Short response.

Appendix G

Student Questionnaire:

1. Do you think Burnsville's adoption of Schoology is a good thing? Likert scale.
2. Which of your classes currently use Schoology?
 - a. Social Studies
 - b. Math
 - c. English
 - d. Science
 - e. None
 - f. Other:
3. Rate your level of experience with Schoology. Likert scale.
4. On average, how many times per week are you using Schoology?
 - a. Daily
 - b. 2-3 times per week
 - c. Once a week
 - d. Once every 2 weeks
 - e. Once a month
 - f. Less than once a month
 - g. Never
5. What do you use Schoology for? Check all that apply.
 - a. Finding notes or articles to read posted by a teacher
 - b. Posting on a discussion board
 - c. Downloading/completing an assignment
 - d. Turning in an assignment
 - e. Communicating with a teacher
 - f. Taking a quiz
 - g. Taking a test
 - h. Watching a video linked to Schoology
 - i. I have never used Schoology
 - j. Other:

If you have used Schoology answer the following 6 questions.

6. How comfortable are you using Schoology to access notes, videos and other course material? Likert scale
7. How comfortable are you using Schoology to access and turn in homework assignments? Likert scale
8. How comfortable are you using Schoology to take quizzes and tests during the school day? Likert scale

9. How comfortable are you using Schoology to take short homework quizzes outside of school? Likert scale
10. How easy is it to find class material (videos, notes, assignments, etc.) on the Schoology site? Likert scale
11. How easy is it to complete tasks and submit work on Schoology? Likert scale
12. Do you think using Schoology makes learning easier or harder? Likert scale
13. Select any words that describe your feelings toward Schoology.
 - a. Unnecessary
 - b. Inconvenient
 - c. Practical
 - d. Necessary
 - e. Frustrating
 - f. Efficient
 - g. Difficult
 - h. Useful
 - i. Important
 - j. Organized
 - k. Annoying
 - l. Confusing
14. What are your top three favorite characteristics of Schoology? Written answer.
15. What are your three least favorite characteristics of Schoology? Written answer.
16. In 2-3 sentences, describe how you think teachers should use Schoology in their teaching. Written answer.

Appendix H

Technology Expert Questionnaire:

1. Why does your setting use or not use an LMS like Schoology?
2. If your setting uses an LMS please answer the following (if your setting does not, however you feel you have input that contribute feel free to do so):
3. What are the top three reasons a school or district should adopt an LMS? Written answer.
4. How can Schoology improve the instructional practice of teachers? Written answer.
5. What other positive attributes/uses of Schoology should teachers take advantage of? Written answer.
6. What struggles (for teachers or students or administrators) have you witnessed during the integration process of an LMS like Schoology? Written answer.
7. What are some other potential drawbacks associated with Schoology? Written answer.
8. What are three recommendations you would give to teachers who are implementing Schoology in their classrooms for the first time? Written answer.
9. What, if anything, have you found effective in family engagement/education pertaining to the online tools being developed in your district? Written answer.

Appendix I

Student Focus Group Questionnaire:

1. Tell me about your current practices using online tools outside of class to help you with your learning.
2. Ideally, what types of materials would your teachers make available to you online?
3. If you were in charge, would you require that all teachers use Schoology, or not? Why?
4. What are were your initial impressions of Schoology?
5. What did you like about Schoology? Why?
6. What did you dislike about Schoology? Why?
7. How would you like teachers to use Schoology? Why?