USING TEXT-MESSAGING IN THE SECONDARY CLASSROOM

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ABSTRACT

To examine the potential uses of and barriers to text-messaging in secondary schools, three classes (66 students) of high school students used their personal mobile phones to receive out of school, course-related text-messages from teachers. Forty-six students (70%) agreed to receive text-messages. Findings indicate that participants found text-messaging to be beneficial for increasing course-related interaction. Students who did not participate identified the following barriers: no mobile phone, limited or no texting service on their mobiles, and a lack of desire to participate. Further research is necessary in a setting where all students have access in order to more fully explore classroom applications of text-messaging.

Mobile phones are as much a part of this generation's culture as rap music and Red Bull. Getting a mobile phone is a teenage rite of passage of the magnitude once reserved for getting a driver's license. A recent study found teens believe that mobile phones are an integral part of their identities and that their popularity and status among peers is tied to their phones (Harris Interactive, 2008). When cell phones first appeared almost a decade ago, most school systems in the United States banned them from school grounds. After the Columbine tragedy, however, schools reluctantly acquiesced to parental pressure to allow phones in schools, with the understanding that

they were not to be visible during school hours. This, inadvertently, opened a Pandora's Box of problems for educators. The crux of these problems is not students' desire to make calls from school. It is something much more insidious—text-messaging. Mobile phone users now send more text-messages than they make phone calls and teens (13-17) send more texts than any other age group (Neilsen, 2008).

Text-messages can be sent from one mobile provider to another using the Short Message Service (SMS) capacity that is built into the Groupe Spéciale Mobile (GSM) wireless standard of most mobile phones (Newton, 2000). A 2009 study found that 84% of teens (ages 15-18) have mobile phones, and 85% use the texting feature on their mobile phones (Lenhart, 2007). Teens use text-messaging for a variety of communication tasks: arranging times to meet, coordinating with friends and family, chatting, and gossiping (Grinter & Eldridge, 2001).When one considers constructivist learning theory's emphasis on communication (Vygotsky, 1978) and technology's ability to promote student to student, student to content and student to teacher interaction (Jonassen, Peck, & Wilson, 1999; Thomas, 2007), text-messaging has great instructional potential.

RELATED LITERATURE

The fact that 85% of students have the ability to send text messages and send an average of 50 texts per day (Lenhart et al., 2009) would indicate that students are engaged by this technology and motivated to use it. Initial research on texting would appear to suggest instructional benefits. Teachers can capitalize on teens affinity for mobile phones to use them in the classroom to support content creation (Hartnell-Young & Vetere, 2005), student-centered learning and collaboration (Corbeil & Corbeil, 2007), as well as authentic learning (Brown & Duguid, 1996) and the differentiation of instruction (Kukulska-Hulme, 2005). This is not to suggest that mobile phone use in the classroom is without problems. Cheating, sexting and cyberbullying are all possible examples.

INSTRUCTIONAL BENEFITS

Interaction. Technologies like mobile phones with their text-messaging capabilities can support interaction (student to student, student to instructor and students to content) from anyplace and at anytime (Corbeil & Corbeil, 2007; Liu, Wang, Liang, Chan, Ko, & Yang, 2003; Markett, Sanchez, Weber & Tangney, 2006; Motiwalla, 2007; Stone, Briggs & Smith, 2002). For example, teachers could send texts to students (individually or in collaborative groups) to provide them with data from any discipline (math, science,

language arts, social studies) for real time analysis and response (Prensky, 2005). Motiwalla (2007) found that students like the versatility that mobile phones/text-messaging gives them to access course material and communicate with peers and teachers during periods of dead time, for example while they were riding on the bus, waiting to be picked up, or at an appointment. Interactivity in the classroom can promote an active learning environment, facilitate the building of a learning community, provide feedback and increase student motivation (Market et al., 2006).

Reflection and Discussion. The asynchronous nature of texting allows students time for reflection. Students can add a comment to a previous classroom discussion after leaving school. Reflection is also supported by the texting archival feature that permits students to follow the interaction over time (Markett, Sanchez, Weber & Tangney, 2006). Some students may not feel comfortable making comments in the classroom, either because a student is shy, or because of students who dominate classroom discussion. Again, texting provides a place for these students to participate in the classroom discussion (Davis, 2003; Markett, Sanchez, Weber & Tangney, 2006).

Assessment. Whattananarong (2006) found that mobile phones can be an effective means of testing student performance; students who took tests by mobile phone performed comparably with students who did so by conventional methods. Texting can be used for different types of assessments: pop quizzes, spelling and math tests, and polling student responses (Prensky, 2005). Companies like The Princeton Review and Kaplan already offer SMS based test-preparation questions for the Scholastic Achievement Test and other standardized tests that can be sent to users (Hartnell-Young and Vetere, 2008).

The site, www.polleverywhere.com allows mobile phones to be used in the same manner as student response systems for polling student responses. Classroom response systems, also known as "clickers," are beneficial for formative assessment and peer feedback. (Roschelle, 2004; Naismith, et al, 2004). Users of polleverywhere.com can create free, multiple choice assessments that can be projected on a screen; students respond by typing in a number using their texting feature. As students enter their responses, results are instantaneously displayed on a graph.

In addition to assessment, polleverywhere.com could be used to generate authentic data for math class, research and persuasive writing. In addition, this tool could be used in faculty and parent assemblies to receive feedback. Finally, in some regards texting could be perceived to be better than clickers because texting enables teachers to assess short-answer problems and open-ended questions (Lindquist, et al, 2007; Pitler, Hubbell, Kuhn, & Malenoski, 2007).

Student perspective. Another reason mobile phones/text-messaging are attractive tools for classroom use is that most students are familiar with their operation and already use them to complement classroom interaction (Motiwalla, 2007). A survey of high-school students in the UK regarding their attitudes towards mobile phones and learning found that most students felt positively about using mobile phones for a number of communicative purposes: group work, discussion, assisting and receiving assistance from classmates, communication with the teacher, and taking quizzes (Kukulska-Hulme, 2005). Moreover, some students are already using mobiles and texting for school related work. A study of students in Japan, for example, revealed that they use their mobile phones for communicating about school work (Lenhart, Ling, Campbell, & Purmobile, 2010; Inagaki et al., 2004). Students like texting because it is fast and easy to use and because the anytime anywhere aspects of the phones allow them to multitask (Lu, 2008; Yerushalmy & Ben-Zaken, 2004). Texting is quiet (Grinter & Eldridge, 2001; Mitchell, Heppel & Kadirire, 2002) which allows students to communicate and collaborate in situations that would normally not allow it, for example in the library.

INSTRUCTIONAL BARRIERS

State legislatures initially restricted mobile phone use by students when the possession of mobile phones and pagers were perceived to be used primarily for illicit activities (e.g., gang and drug) (Pickett & Thomas; 2006, St. Gerard, 2006). These policies were revised following the tragedy at Columbine in 1996 and again following the terrorist attacks in New York on September 11, 2001 (Dounay, 2004; St. Gerard, 2006). Many states began to revoke prior legislative restrictions and defer mobile phone policy to local school districts (Dounay, 2004). Currently, forty-nine states have deferred mobile phone policy to local school districts (Akers, 2010). In response, the majority of districts have banned mobile phone use; sixty-nine percent of American high schools now have bans on mobile phone use or possession on school grounds (CommonSense, 2010).

Cheating. The use of mobile phones for cheating is a concern for many school stakeholders. These concerns appear to be supported by research findings (Common Sense Media, 2009; Lenhart, 2010). In a recent study conducted by Common Sense Media, one-third of high school students admitted using their mobile phones to cheat. Additionally, two-thirds of the students questioned reported their classmates used their mobile phones to cheat on their schoolwork. Twenty-five percent reported that their friends cheated by texting a friend to get the answer to a test question; twenty per-

cent reported cheating by searching the internet; and seventeen percent stated their friends used their mobiles to take a picture of a quiz page to give to their friends who will be taking the test later. These findings would appear to justify many of the fears of school stakeholders regarding students misusing their mobile phones in school.

Cyberbullying. Cyberbullying, like traditional bullying, is an intentionally aggressive act or behavior perpetrated by one individual or group on another person over a period of time using electronic forms of contact (Smith, Mahdavi, Carvalho, Shanette & Tippett, 2008). A 2006 report by Harris Interactive found that 43% of U.S. teens have experienced some form of cyberbullying. A recent study by the Pew Internet and American Life Project found that 26% of teens have been harassed through their mobile phone either by calls or text messages (Lenhart, 2010).

Sexting. Another serious concern regarding mobile phones in schools is their use by students AND teachers for sexting. Sexting is taking a sexually explicit image, often of oneself, and sending it to someone via text messaging. Students have also used mobile phones to secretly take inappropriate photographs of peers and text these images to someone else (Akers, 2010; St. Gerard, 2006). As many as one in five teens have sent a nude or semi-nude photo of themselves to someone in a text message; twenty-two percent report having received such an image from someone else (National, 2009). Sexting has also been connected to cyber-bullying. For example, posting sexually explicit images on Internet sites like Facebook or sharing those images with individuals other than the person who initially received the image via a text.

SUMMARY

There are many benefits to using mobile phones or "mini-terminals for text-based communication" (Grinter & Eldridge, 2001, p. 219) in the K-12 classroom. Due to the omnipresent nature of mobile phones, most of the students are already in possession of them and are extremely well versed in their use. Therefore, expenditure and training would be minimal. Additionally, text-messaging via mobile phones supports a wide array of instructional benefits including anywhere and anytime interaction with peers, instructors and course content as well as providing a medium to receive, reflect upon and communicate with classmates concerning course related material. However, these benefits are tempered by a number of concerns. The use of textese by students has been linked by practitioners to the erosion of students' spelling and writing skills. Additionally, many school stake holders are concerned about mobile phones facilitating cheating, cyberbullying and sexting by students.

OVERVIEW OF THE STUDY

At the beginning of the spring semester of 2008, students in three classes: two sophomore advanced placement English classes taught by the first author (23 students in one class and 22 in the other) and one first year Latin class (21 students were given the option of receiving course related text-messages from their instructors. Students were told that they would receive reminders about tests and homework as well as other texts concerning class assignments after school hours.

Both instructors started by using an email group list to send their separate classes text-messages. Emailing the text-messages allowed the instructor to send text-messages without (a) giving students their personal mobile phone numbers and (b) being charged for sending texts from their personal mobile phones. All responses to these email-sent text-messages returned to the email inbox. Shortly after the start of the study, the Latin instructor discovered that some of his students' mobile phones or service providers did not support receiving text- messages from email. At this point, he began sending his students text-messages via his personal mobile phone. This lack of service provider support for text-messaging was also a problem in the English classes, but because the instructor did not have text-messaging service on his phone, he continued to send texts to his class via email.

Messages sent by the English instructor were strictly reminders about assignments. Messages were sent both from work and home. Only one reminder was sent per day. The Latin instructor used texts to communicate a variety of school related topics including but not limited to sending students extra Latin sentences to interpret.

PARTICIPANTS AND SETTING

The ages of the sixty-six students in the three classes ranged from 15-17 years old. There were 27 males and 39 females. Participation was voluntary, and 46 of the sixty-six students (70%) elected to receive text-messages from their instructor. Those students who consented to participate and received permission to do so from parents/guardians were instructed to send their instructor an email with their area code, mobile phone numbers and the names of their mobile phone service providers. The setting for the study was a large, urban school in the southern United States. The school year consisted of two semesters with students taking four 90 minute classes each semester.

DATA

Data were collected from three sources: (a) the actual text-messages that were sent (by both instructors and students), (b) students' surveys and dis-

cussions, (both during and after the study), and conversations between the two participating teachers and between the teachers and students.

Because direct observations were not possible, a survey was used to provide insight into the participants' demographics and perceptions concerning the use of text-messaging (Appendix A). All 66 students in the three classes completed the survey. The survey was used to assist in understanding the benefits and barriers associated with text-messaging as well as students' perceptions on improving the use of text-messaging in their classes. The survey used multiple-choice, first choice responses and short response formats.

If students indicated that they did not text, they were asked to explain why not. If the students used texting, they were asked to give their perceptions concerning use of text-messaging over the semester. Finally, an open-ended question at the end of the survey asked for any additional comments. A log was kept of the texts the teachers sent and those received from students. These messages were stored in email and in a backup word processing document.

DATA ANALYSIS

The data that was collected was analyzed using a qualitative research approach. Analysis consisted of organizing the data into manageable units and then reading and re-reading it while looking for themes to emerge. Emerging themes were used to create a coding system to further organize the data, that is, to sort the data into relevant categories (Appendix A and B). The analysis of text messages revealed five primary categories with 12 subcategories. The survey revealed three primary categories with seven subcategories. Each one of the primary and subcategories will be addressed in the findings section.

FINDINGS

At the end of the semester, all 66 students in the three classes completed the survey, and the results of the multiple-choice questions on the survey are presented in Table 1. Students' responses indicated the degree to which texting is a part of their daily lives. The majority of students, eighty-three percent, indicated that they texted daily—45% of these students text hourly and 38% daily. The majority, 60%, sent over twenty texts per day. In fact, many students noted that the number of texts they sent was much higher (one student commented "More like 200 per day"). Likewise, 63% of students received 20 or more texts per day.

Table 1: Survey information		
	Number of Students (n= 66)	*Percentage of Students*
My age is …15 …16 …17 …18	11 47 8 0	
My sex is …Male …Female	27 39	
Do you have a mobile phone? …Yes …No	63 3	96% 4%
Do you use text-messaging? …Yes …No	60 6	91% 9%
How often do you text-message? …Weekly …Daily …Hourly …Did not respond	7 23 27 3	12% 38% 45% 5%
How many text-messages do you think you send per day on average? …Less than 5 texts per day …Less than 10 texts per day …Less than 20 texts per day …More than 20 texts per day …Did not respond	10 6 5 36 3	17% 10% 8% 60% 5%
How many texts do you think you receive per day? …Receive less than 5 texts per day …Receive less than 10 texts per day …Receive less than 20 texts per day …Receive more than 20 texts per day …Did not respond	11 5 4 37 3	18% 8% 7% 62% 5%

Lack of access was a problem for a small percentage of participants. Fourteen of the sixty students who had the capability to do texting on their mobile phones, elected not to receive texts from their instructors. These students indicated that they did not participate because they did not text, had a limited number of texts, could not figure out how to participate, or did not want to participate.

Because two of the three classes in the study were sophomore level, the

majority of the students in the study were 16-years-old; data revealed that the 17-year-old participants' texted slightly more often than the other ages (see Table 2). Half of the 17-year-old participants sent texts hourly and half of them sent texts daily; compared with 47% of the 16-year-old participants who sent texts hourly and 37% of who sent texts daily. Overall, 38% of the participants sent texts hourly and 47% of them sent texts daily.

Table 2: Tabulated statistics: Q1 Age, Q5 How often do you text message?						
Age	Text Hourly	Text Daily	Text Weekly	Never Text	Missing	All
15	4	3	1	1	2	9
	7.02%	5.26%	1.75%	1.75%	*	15.79
16	19	15	6	0	6	40
	33.33%	26.32%	10.53	0.00%	*	70.18
17	4	4	0	0	0	8
	7.02%	7.02%	0.00%	0.00%	*	14.04
All	22	27	1	7	*	57
	38.60%	47.37%	1.75%	12.28%	*	100.00%

Females sent texts more frequently than males (Table 3). Over half of the females (51%) reported texting hourly, and 38% sent texts daily. Only 42% of their male classmates reported texting hourly; 38% of the males sent texts daily.

Table 3: Frequency of texting analyzed by gender						
Sex	Text Hourly	Text Daily	Text Weekly	Never Text	Missing	All
Female	16	12	3	0	7	31
	28.07%	21.05%	5.26%	0.00%	*	54.39%
Male	11	10	4	1	1	26
	19.30%	17.54%	7.02%	1.75%	*	45.61%
All	27	22	7	1	*	57
	47.37%	38.60%	12.28%	1.75%	*	100.00%

The largest discrepancy between the males and females was found in the number of texts sent and received per day. Females reported sending (Table 4) and receiving (Table 5) more texts on a daily basis than their male classmates. In fact, 70% of the female participants reported sending more than 20 texts per day; only 50% of the males sent more than 20 texts per day.

Likewise, 70% of the females acknowledged receiving more than 20 texts daily; 54% of the male participants reported receiving 20 plus texts per day.

Table 4: Frequency of sending text messages analyzed by gender

Sex	Send Less Than 5 Texts Per Day	Send Less Than 10 Texts Per Day	Send Less Than 20 Texts Per Day	Send More Than 20 Texts Per Day	Missing	All
Female	3	4	2	22	7	31
	5.45%	7.27%	3.63%	40.00%	*	56.36%
Male	7	2	3	12	3	24
	12.72%	3.63%	5.45%	21.81%	*	43.63%
All	10	6	5	34	10	55
	18.18%	10.90%	9.08%	61.81%	*	100.00%

Table 5: Frequency of receiving text messages analyzed by gender

Sex	Receive Less Than 5 Texts Per Day	Receive Less Than 10 Texts Per Day	Receive Less Than 20 Texts Per Day	Receive More Than 20 Texts Per Day	Missing	All
Female	4	3	2	22	7	31
	7.27%	5.45%	3.63%	40.00%	*	56.36%
Male	7	2	2	13	3	24
	12.72%	3.63%	3.63%	23.63%	*	43.63%
All	11	5	4	35	10	55
	20.00%	9.09%	7.27%	63.63%	*	100.00%

BENEFICIAL EFFECTS OF TEXTING

Student to Student Interaction. Survey data show that regardless of whether they received text-messages from their instructors in this study, students were using text-messaging for school related purposes. When asked if they sent texts to their friends about school work, 39 (61%) acknowledged that they did. One student said that she received them, but did not send them. Only nine (14%) of the students who participated in receiving texts from their instructors stated that they had never texted a friend about school work. They sent text messages to classmates and friends for a variety of course related reasons:

• To ask or answer questions about assignments
• To ask for help or offer help to others concerning class work
• To find what they have missed when they had been absent from class.

Student-to-Teacher and Student-to-Content Interaction. The same benefits were reported by students about receiving course related texts from their teachers. Of the 63 students who received school related text-messages, 58 (92%) found them valuable. In addition to receiving instructional texts from their teacher, students in the Latin section were able to ask their teacher questions about homework and make-up work as well as specific questions about quizzes and grades.

Seven students (11%) used texting to ask their instructor questions and for help on homework. They explained that this allowed them to not get stuck and/or frustrated when working on course work. They also liked knowing they could get their questions answered quickly by the teacher, and remarked on the benefits of receiving extra problems to complete. Students obtained additional practice by receiving texts in Latin which they had to translate to answer. Furthermore, students answered texts from the instructor in Latin.

Convenience. Forty-three of the students' (68%) perceived that the primary function of the text-messaging was to remind them of assignments, dates and/or test material. Although this is a limited application of this tool, this application should not be discounted. Student's responses showed that the convenience of the reminders they received were extremely helpful in ensuring that they came to class prepared. Several of the students replied that due to their busy schedules they often forgot to complete assignments or study for tests and pointed out that the instructors' texts were valuable reminders that contributed to their overall success in the course.

Several students also noted the benefits of reminders on days when they had been absent from class. These students pointed out that the instructors' texts allowed them to avoid falling behind and come to class prepared. When asked if they would like other teachers to use texting in their classroom, students again brought up the benefits of even the simple reminders. One student stated that he would never forget to do his homework again and that these reminders were especially helpful over the weekend. Another student's comment concerning the use of texting by instructors summarized it all. When asked if other teachers should use texting she responded, "Of course! There is no reason not to."

Miscellaneous. Additional data, including the time and dates of texts, revealed that students had sent texts during school time on several occasions.

Students also used the texting for joking and venting about school. Finally, texting was used in the English class to make the teacher and other students aware that an assignment that had been texted to the students would not be completed by the majority of one class because one of the students in the class had been in a serious automobile accident, and they were all at the hospital.

The two instructors in the study also found texting to students to be extremely beneficial. Instructors thought texting students helped students remember assignments and thus ensured that they were better prepared for class. Both instructors agreed that texting helped improve the classroom community and, especially in the case of the Latin class, helped to build student rapport. Finally, they found the time commitment to be minimal compared to the benefits of texting their students.

BARRIERS

Teacher-generated texts for class work did run into some barriers related to a lack of access and technological problems, as well as a lack of desire on the part of some students.

Lack of access. Three (5%) participants did not have a mobile phone. Although this seems like a relatively small percentage of students, the lack of access by even one student in public education, limits the instructional use of texting to supplemental. The restrictive impact of this barrier was acknowledged by several students who commented that one way to improve the use of texting in the classroom was to expand the use of instructional texting in order to incorporate more students.

Technology problems. As was noted in the Methodology section, two of the three classes received text-messages via email. Some of the students' service providers did not support receiving text-messages from email. Emailing the text-messages was initially used because it allowed the instructors to send text-messages without (a) giving students their personal mobile phone numbers, or (b) being charged for sending texts from their personal mobile phones; however, not all service providers support the reception of text-messages from email. With this exception, technical problems were all but absent from this study. Overall, 54 (86%) of the 63 students who received texts reported no down time. Only two of those reporting problems indicated the nature of their text interruption: they were being punished by their parents ("grounded") and had lost their cell phone privileges.

Lack of desire. Other barriers and problems were reported. One student had a limited number of texts and did not want to use the quota for texts from the teacher. Students also did not like receiving texts early in the morn-

ing. In fact 12 students commented that they would like to receive texts at what they perceived to be a more appropriate hour. At least one student noted that the instructor's messages were truncated due to the 120-160 character restriction.

Both instructors were frustrated by the lack of access. Much of this frustration came from their limited use of texting. They believed course related text-messaging had a tremendous amount of classroom potential; however, they were limited in the ways in which they could use it in their classrooms because not all of the students had access to cell phones and could benefit from receiving their course related text-messages. This lack of access limited instructors to using texts for primarily supplemental purposes (e.g., sending reminders). The Latin instructor also reported a degree of initial frustration because he was new to texting and found it hard to type expeditiously. Students also complained about how slow he was at texting.

DISCUSSION

Much of what the students' texts and surveys revealed is supported by research in using mobile phones and texting in the classroom. The vast majority of students who participated in this study: (a) had mobile phones, (b) used text-messaging and (c) found texting beneficial for school work. In fact, 12% more of the teenagers in the study had mobile phones and 6% more had the texting feature than national statistics (Lenart, 2009). Additionally, although not required, 70% of the students agreed to use their personal phones to receive course related texts from their teachers. This finding is supported by research that showed that most high-school students felt positively about the ability of mobile phones to support interaction (Motiwalla, 2007) and about using mobile phones for class communication activities (Lubega et al, 2004).

Roblyer and Doering (2009) asserted that technology has the ability to engage and motivate students while providing teachers with unique instructional opportunities. The numbers of texts students reported sending and receiving, as well as the fact that they are already using texting for school related conversations or collaboration, would suggest that students are highly engaged by and motivated to use their mobile phones.

The Pew Internet & American Life Project found that 70% of teens use texting for school work and 23% use text messaging at least once per day for school (Lenhart, Ling, Campbell, & Purmobile, 2010. Students in this study also reported that they already used their mobile phones for schoolwork and that they sent texts about school work. Why? Because their mobile phones and texting allowed students to communicate and collaborate with each

other and their teacher while also enabling them to access course content at anytime and from anywhere (Corbeil & Corbeil, 2007; Liu, Wang, Liang, Chan, Ko, & Yang, 2003; Markett, Sanchez, Weber & Tangney, 2006; Motiwalla, 2007; Stone, Briggs & Smith, 2002). If the scope of the study had not been limited due to lack of access, it is likely that benefits would have been increased greatly. Regardless, students still reported that they found even a small degree of usage, sending simple course reminders to be beneficial and to have helped their grades.

Lack of access for some students created the possibility of instructional inequity. Research indicates that, like other digital divides, this is one of socioeconomics. Seventy-five percent of teens from households earning more than $75,000 a year have a mobile phone; only 59% of teens in households with a yearly income below $30,000 a year have a mobile phone. Furthermore, close to half (45%) of poorer teens say they never text about school work compared to 30% of all teens who say they never text about school assignments (Lenhart, Ling, Campbell, & Purmobile, 2010).

The potential for instructional inequity meant that, at least in the English sections, the instructional uses were limited. If all students had access to a mobile phone and texting, the texting feature on students' mobile phones could have been used for pop quizzes, short answer or additional practice (Prensky, 2005). For example in the English class, students could have been sent passages from poems or stories to analyze or link to relevant articles they could read online, or phones could have been used for conducting research. The free, online student's response tool, pollanywhere.com could have been used to gather authentic data from classmates and could be used inside or out of the classroom to conduct assessments.

Access could have been circumvented to a degree through sending students without mobile phone emails with the same information, but the same digital divide exists there, albeit to a lesser degree. Ninety-seven percent of households with incomes over $75,000 have computers compared to 70% of households with incomes below $30,000 (Lenhart, Ling, Campbell, & Purmobile, 2010). Moreover, email does not provide the benefit of anywhere/anytime access.

CONCLUSION

Technology can benefit instruction because it engages and motivates students while providing unique instructional opportunities. Students are obviously motivated to use their mobile phones, and early research, including this study, indicates that students find their use for school work to be beneficial. Many school stakeholders, however, remain reluctant to allow mobile

phones into the classroom because they believe mobile phones facilitate cheating, sexting, and cyberbullying. These are valid concerns; however, mobile phones are not the cause of these problems. They are moral and ethical in nature, not technical.

In 1980, before mobile phones, 75% of students reported cheating in school (Baird, 1980). Twenty-five years later, 74% of students reported cheating in school (Pickett & Thomas, 2006). Research indicates that students cheat due to "an erosion of ethics, self-centeredness, teachers and parents not holding them responsible, and pressure from high-stakes testing and from parents to perform regardless of the means. None of those reasons has to do with technology or mobile phones (Strom & Strom, 2007).

Like cheating, bullying predates mobile phones. Cyberbullying is the technological incarnation of this harmful behavior. Cyberbullying, like traditional bullying, is about power and, often, gaining social status (Holladay, 2010). Sexting, albeit foolish at best and criminal at worst, has been called "the new form of flirting-an explicit love letter" (McLoughlin & Burgess 2009). Sexting is often about romance; sixty-nine percent of sexts are sent to someone the person is dating (National, 2009).

All of these behaviors, cheating, cyberbullying and sexting, have this in common: they are new forms of old behavior. Technology has made it easier for students to engage in these behaviors while increasing the potential harm caused by them. Mobile phones are not the cause of these problems, and banning them will not be the solution. Experts recommend instead that schools, students, teachers, administrators, parents and the community be educated about ethical and moral behavior (Manzo, 2009; Strom & Strom, 2007), Internet safety, and the dangers of sexting (Manzo, 2009; Sexting, 2009; Taylor, 2009) and cyberbullying (Chibbaro, 2007; Holladay, 2010; Manzo, 2009; Poland, 2010).

Schools need to develop clear policies and procedures for use of mobile phones and how to address any incidents of inappropriate use(s) and inform parents and students of these (Poland, 2010; Smith, Mahdavi, Carvalho, Sonja, Russel, & Tippett, 2007; Soronen, Vitale & Haase, 2010). A mobile phone can be a tool for negative behavior. However, to quote a Latin phrase, "ex abusu non arguitur ad usum," the abuse of a thing is no argument against its use. Research has demonstrated the ability of mobile phones to be a positive tool for educational purposes both inside and out of the classroom.

REFERENCES

Akers, J. (2010). *Student mobile phones should be prohibited in K-12 schools.* Retrieved from http://www.kysafeschools.org/pdfs-docs/hotpdfs/Mobile%20phones.pdf

Baird, J. S. (1980). Current trends in college cheating. *Psychology in the Schools, 17*, 515–522.

Brown, J., & Duguid, P. (1996). Stolen knowledge. In H McLellan (Ed.), *Situated learning perspectives* (pp 47-56). Englewood Cliffs, NJ: Educational Technology Publications.

Chibbaro, J. S. (2007). School counselors and cyberbully: Interventions and implications. *Professional School Counseling*, 11(1), 65-67.

Common Sense Media. (2009). Hi-Tech Cheating: Mobile Phones and Cheating in Schools: A National Poll. Retrieved from http://www.commonsensemedia.org/hi-tech-cheating

Corbeil, J. R., & Valdes-Corbeil, M. E. (2007). Are you ready for mobile learning? *EDUCAUSE Quarterly, 30*(2). Retrieved from http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/AreYouReadyforMobileLearning/157455

Davis, S. (2003). Observations in classrooms using a network of handheld devices. *Journal of Computer Assisted Learning*, 19(3), 298-307.

Dounay, J. (2004). Pagers and cellular phones on school property. StateNotes: *Safety, Crime and Violence.* Education Commission of the States. Retrieved from http://www.ecs.org/clearinghouse/54/44/5444.pdf

Grinter, R.E., & Eldridge, M. (2001). y do tngrs luv 2 txtmsg? Proceedings from *ECSCW '01: Seventh European Conference on Computer-Supported Cooperative Work.* Dordrecht, Netherlands: Kluwer Academic Publishers.

Hartnell-Young, E., & Vetere, F. (2008). A means of personalizing learning: Incorporating old and new literacies in the curriculum with mobile phones. *The Curriculum Journal, 19*(4), 283-292.

Harris Interactive. (2008) A generation unplugged—Research report. Harris Interactive. Retrieved from http://files.ctia.org/pdf/HI_TeenMobileStudy_ResearchReport.pdf

Holladay, J. (2010). Cyberbullying: The stakes have never been higher for students—or schools. *Teaching Tolerance, 38*, 43-46.

Inagaki, T., Kobayashi, Y., & Nakagawa, H. (2004). Attitude survey for pupils about using mobileular phones in classrooms. In L. Cantoni & C. McLoughlin (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2004* (pp. 1059-1065). Chesapeake, VA: AACE.

Jonassen, D., Peck, K., & Wilson, B. (1999). *Learning with technology: A constructivist perspective.* Upper Saddle River, NJ: Prentice Hall.

Kukulska-Hulme, A. (2005). Current uses of wireless and mobile learning. *JISC-funded Landscape Study Report.* Retrieved from http://www.jisc.ac.uk/whatwedo/programmes/elearning_innovation/eli_outcomes.aspx

Lenhart, A. (2007) Cyberbullying. *Pew Internet & American Life Project.* Retrieved from http://www.pewinternet.org/Reports/2007/Cyberbullying.aspx

Lenhart, A., Ling, R., Campbell, S., & Purmobile, K. (2009). Teens and mobile phones over the past five years: Pew Internet looks back. *Pew Internet & American Life Project.* Retrieved from http://www.pewinternet.org/Reports/2009/14--Teens-and-Mobile-Phones-Data-Memo.aspx

Lenhart, A., Ling, R., Campbell, S., & Purmobile, K. (2010) Teens and Mobile Phones. *Pew Research Center's Internet & American Life Project.* Washington, DC. Retrieved from http://www.pewinternet.org/Reports/2010/Teens-and-Mobile-Phones.aspx

Lindquist, D., Denning, T., Kelly, M., Malani, R., Griswold, W. G., & Simon, B. (2007). Exploring the potential of mobile phones for active learning in the classroom. *Proceedings of the 38th SIGCSE Technical Symposium on Computer Science Education, 39*(1), 384-388.

Liu, T-C., Wang, H-Y., Liang, J-K., Chan, T-W., Ko, H-W., & Yang, J-C. (2003). Wireless and mobile technologies to enhance teaching and learning. *Journal of Computer Assisted Learning, 19*(3), 371-382.

Lu, M. (2008). Effectiveness of vocabulary learning via mobile phone. *Journal of Computer Assisted Learning, 24*, 515-525.

Lubega, J., McCrindle, R., Williams, S., Armitage U., & Clements, I. (2004). Uses of mobile phones in higher education. In Cantoni & McLaughlin (eds.) *Proceedings of EDMEDIA 2004.* Lugano, Switzerland.

Manzo, K. K. (2009). Administrators confront student 'sexting''. Schools urged to develop policies and programs to curb the practice. *Education Week, 28*(35), 8.

Markett, C., Sanchez, I. A., Weber, S., & Tangney, B. (2006). Using short message service to encourage interactivity in the classroom. *Computers and Education, 46*(3), 280-293.

McLoughlin, C., & Burgess, J. (2009). Texting, sexting and social networking among Australian youth and the need for cyber safety education. *Australia Association for Research in Education.* Retrieved from http://www.aare.edu.au/09pap/mcl091427.pdf

Mitchell, A., Heppel, S., & Kadirire, J. (2002). *Technology watch research report.* Anglia: UltraLab.

Motiwalla, L. F. (2007). Mobile learning: A framework and evaluation. *Computers and Education, 49*(3), 581-596.

Naismith, L., Lonsdale, P., Vavoula, G., & Sharples, M. (2004). Literature review in mobile technologies and learning, *FutureLab Report II.* Retrieved from http://www.futurelab.org.uk/resources/documents/lit_reviews/Mobile_Review.pdf

National Campaign to Prevent Teen and Unplanned Pregnancy, Sex and Tech: Results from a Survey of teens and young Adults. (2009). Retrieved from http://www.thenationalcampaign.org/sextech/pdf/sextech_summary.pdf

Nielsen Mobile. (September 22, 2008). Texting now more popular than calling. Nielsen Mobile Press Release. Retrieved March 6, 2009, at http://nielsenmobile.com/html/press%20releases/TextsVersusCalls.html

Newton, H. (2000). *Newton's telecom dictionary* (16th ed.). New York: Telecom Books.

Pickett, A. D., & Thomas, C. (2006). Turn Off That Phone. *American School Board Journal*, 193(4), 40-44.

Pitler, H., Hubbell, E. R., Kuhn, M., & Malenoski, K. (2007). *Using technology with classroom instruction that works.* Alexandria, VA: Association for Supervision and Curriculum Development.

Poland, S. (2010). Cyberbullying continues to challenge educators: Administrators need to take concrete steps to address this behavior. *District Administration.* Retrieved from http://www.districtadministration.com/viewarticle.aspx?articleid=2401

Prensky, M. (2005). What can you learn from a mobile phone? Almost anything! *Innovate, 1*(5). [Online]. Retrieved from http://www.innovateonline.info/index.php?view=article&id=83

Prensky, M. (2001). Digital natives, digital immigrants, Part II: Do they really think differ-ently?" *On the Horizon, 9*(6), Retrieved from http://www.marcprensky.com/writing/default.asp

Roblyer, M. D., & Doering, A. H. (2009). *Integrating educational technology into teach-ing* (5th ed.). Boston,MS: Allyn and Bacon.

Roschelle, J. (2004). Unlocking the learning value of wireless mobile devices. *Journal of Computer Assisted Learning, 19*(3), 260272.

Sexting. (2009). *American Association of School Administrators*. Retrieved from http://www.aasa.org/content.aspx?id=3390

Smith, P. K., Mahdavi, J., Carvalho, M., Fisher, S., Russell, S., & Tippett, N. (2008). Cyberbullying: Its nature and impact in secondary school pupils. *Journal of Child Psychology & Psychiatry, 49*, 376–385.

Soronen, L.E., Vitale N., & Haase K.A. (2010). Sexting at school: Lessons learned the hard way. *Inquiry & Analysis*. Alexandria, VA: National School Boards Association's Council of School Attorneys. Retrieved from http://www.oakland.k12.mi.us/Link-Click.aspx?link=SafeSchools%2FSexting+at+School+Lessons+Learned+the+Hard+Way.pdf&tabid=656&mid=3640

St. Gerard, V. (2006). Updating policy on latest risks for students with mobile phones in the school. *The Education Digest, 72*(4), 43-45.

Stone, A., Briggs, J., & Smith, C. (2002). SMS and interactivity—some results from the field and its implications on effective uses of mobile technologies in educating. Proceedings from WMTE '02: *IEEE International Workshop on Wireless and Mobile Technologies in Education*, 104-108.

Strom, P. S., & Strom, R. D. (2007). Cheating in middle school and high school. *The Educational Forum, 71*(2), 104-116.

Taylor, K. R. (2009). "Sexting": Fun or felony? *Principal Leadership, 9*(8), 60-62.

Thomas, K. (2007). *Weblogs used as online discussion boards in secondary classrooms* (unpublished doctoral dissertation). University of Tennessee, Knoxville, TN.

Vygotsky, L. (1978). *Mind and society: The development of higher psychological pro-cesses*. Cambridge, MA: Harvard University Press.

Yerushalmy, M., & Oshrat Ben-Zaken. (2004). *Mobile phones in education: A case of mathematics*. A report by The Institute for Alternatives in Education, University of Haifa.

Whattananarong, K. (2006). *Experiment in the use of mobile phones*. Bangkok, Thailand: King Mongkut's Institute of Technology. Retrieved from http://etd.lib.metu.edu.tr/upload/12606048/index.pdf

APPENDIX A: CENTRAL HIGH SCHOOL TEXT-MESSAGING QUESTIONNAIRE

Please take time to fill out the information below. Even if you did not use receive text messages from your CHS teacher, we are interested in your answers. Pleases be honest in your answers and elaborate on any comments. Thank you.

Circle the correct response.

1. My age is	15	16	17	18
2. My gender is	Male	Female		
3. Do you have a mobile phone?	Yes	No		
4. Do you use text-messaging?	Yes	No		

If you answered "No" to question 4, go to question 9. If you answered "Yes" to question 4, go to 5.

5. How often do you text-message?	Weekly	Daily	Hourly	
6. How many text-messages do you think you receive per day?	5 or less	10 or less	20 or less	More than 20
7. How many text-messages do you think you receive per day?	5 or less	10 or less	20 or less	More than 20
8. As part of you class this semester, did you receive text messages from your teacher?	Yes	No		

If you answered "No" to question 8, go to question 9. If you answered "Yes" to question 8, go to question 10.

Short Answer.

9. Please explain why you did not use the teacher provided text-messaging this semester?

10. Please explain how your teacher used text-messaging in your class.

11. Did you find your teacher's text-messages helpful? Please address why or why not?

12. If you answered "yes" to question 13, would you like your other teachers at CHS to use text-messaging in their classes. Please explain your answer?

13. Did you experience any down time from text-messaging? (e.g., grounded, lost phone, battery dead, technical problems)? If so, please explain any effects this might have had on you or your class work.

14. Did you ever text-message your friends/classmates about school work prior to this class?

15. If you answered "Yes" to question 14, please explain how you have used text-messaging with your friends. If you answered "No" to question 14, please explain why you do not use text-messaging o communicate with your friends/classmates about class work.

16. What did you like best about receiving text messages from your teacher?

17. What did you like least about receiving text-messages from your teacher?

18. How would you change the use of text-messaging from your CHS teachers to make it better?

Additional comments:

APPENDIX B: CODING SYSTEM FOR EMERGING THEMES FROM TEXT

1		*Examples*	
1. Interacting …with teacher (IT) …with peers (IP) …with content (IC)	9:56 AM	Student:	They spelled my name so wrong Schultz it's not even funny I am so mad.
	9:57	Teacher:	So sorry.
	9:58	Student:	My name is not Kayla Vanessa Meghan Hutchison lol how did they manage that?
	9:59	Teacher:	Ha! Hey it is a good story, thought.
	10:00	Student:	Thanks I told you because I was so mad I needed a good laugh and that helped.
2. Asking Questions …about make-up work (QM) …about home work (QH) …about quizzes (QQ) …grades (QG)	7:49	Student:	Can I take yesterdays quiz today while we watch the movie?
3. Practice …students writing texts in Latin (PS) …students reading instructors Latin texts (PI)	5:47	Student:	Magister, multa te petere cupio
	5:49	Teacher:	Busy for 2 hours. Try then.
4. Instruction …Latin instruction from teacher via text messages (I)	2:32	Student:	The boys of mother Cornelia have been taught by means of diligence.
	2:35	Teacher:	They're both genitive.
	2:37	Student:	By means of diligence of mother Cornelia. Yay! Thank you.
5. Mismobileaneous …texting during school (ST) …joking (J) …venting about school (G)	5:47	Student:	Magister, multa te petere cupio
	5:49	Teacher:	Busy for 2 hours. Try then.

APPENDIX C: CODING SYSTEM FOR EMERGING THEMES FROM SURVEY

Themes	Indicators
Barriers	
1. Lack of access (LA)	Did not have mobile phone Did not have ability to text on mobile phone Were not allowed to text by parents Phone has limited number of texts
2. Technological Issues (TI)	Mobile phone did not receive text-messages from email 160 character limit
3. Lack Desire (LD)	Did not want to participate Did not want to text
Benefits	
4. Convenience (C)	Anytime interaction Anywhere interaction Helped if I was absent Help on weekends Immediate help
5. Teacher to student interaction (TSI)	Texted grades Help with homework questions Reminders (helped students with busy schedules)
6. Student to teacher interaction (STI)	Ask questions Come to class prepared
7. Student to content interaction (SCI)	Extra practice examples
8. Student to student interaction (STI)	Many of the students are already using texting for school related communication. Missed work when absent Questions Answer questions Reminders
Recommendations (R)	Expand texting to all teachers Expand texting so all students can benefit