

Mobile Device use in the Classroom: High School Students' Experiences and Perceptions

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Abstract: As mobile devices (e.g. tablets, iPads, iPods, smart phones, and laptops) become more ubiquitous, many students find themselves carrying a personal mobile device to school every day. This action research study examined mobile device use among high school students. Main findings about current trends in mobile reflected three themes: (a) looking up words, (b) research, and (c) text messaging. Findings related to high school students' perceptions about mobile device use also reflected three themes: (a) easy, (b) fast, and (c) enjoyable. The voices of mobile learners provide support for each theme, reflecting an authentic account that teachers and administrators might consider when implementing mobile use to enhance learning. While this study showed that high school students typically approve of their mobile learning experiences, implications for further research are conveyed.

Introduction

As mobile devices (e.g. tablets, iPads, iPods, smart phones, and laptops) become more ubiquitous, many students find themselves carrying a personal mobile device to school every day. There, digital natives (today's students) come into contact with digital immigrants (their teachers), and tensions concerning the role of technology arise (Prensky, 2001). Students' "powerful multimedia communicators... [do] not fit easily within traditional classroom schooling" (Sharples, Taylor, & Vavoula, 2007, p. 241), so many schools do not allow the use of mobile devices at any time (Humble-Thaden, 2011). The reluctance to allow mobile devices in the classroom is based on the perspective that mobile technologies do not encourage students to communicate face-to-face, nor do they promote interactions with real objects (Kruse, 2012). However, over one quarter of United States school district administrators are interested in allowing students to use their devices for learning in the classroom, and over half of parents are likely to purchase a mobile device for their child to use at school (Project Tomorrow, 2012). Mobile devices have been shown to assist students with language and math within a variety of cultures, languages, and age groups (Billings & Mathison, 2011; Ezati & Kimyayi, 2011; Kim et al., 2011; Suki & Suki, 2011).

Mobile learning has been portrayed in a theoretical context, but few studies have focused on student perspectives of mobile use for learning. In response to Humble-Thaden's (2011) call for studies that investigate high school students' perceptions of cell phones as learning tools, the purpose of this action research study was to examine mobile device use among high school students. Specifically, what influence does smart phone use have on student learning and success?

Literature Review

Researchers have studied how mobile learning has been implemented in a wide variety of settings. While some studies describe mobile learning from a student perspective, current high school students' perspectives have not been adequately explored.

This study is guided by an emerging framework on mobile learning. According to Traxler (2007), mobile learning may focus on the devices and technology or the learner's experiences. Mobile learning is defined as "the process of coming to know through conversations across multiple contexts among people and personal interactive

technologies” (Sharpies et al., 2007, p. 225), or simply “learning with mobile devices” (Traxler, 2010, p. 130). Characteristics of this process include the prevalence and portability of devices, which provide information that is blended, private, interactive, and instantaneous (Ozdamli & Cavus, 2011). Mobile learning encourages education that occurs outside of traditional environments and fits within the existing framework of social constructivist-based best practices (Sharpies, et al., 2007). Mobile learning is closely related to distance learning, electronic learning, ubiquitous learning, and flexible learning. Mobile learning also overlaps with the ‘just enough, just in time, just for me’ model of flexible learning, which explains how individual learning needs can be met whenever the need arises (Peters, 2007).

Effective Uses of Mobile Learning

Mobile learning has been very effective in many different contexts. Text messages helped teach English vocabulary to junior high students in rural Iran (Ezati & Kimyayi, 2011). Young children in rural Mexico who were provided mobile devices willingly engaged in reading and literacy activities (Kim et al., 2011). English learners in San Diego excelled on language tasks when they were given handheld devices pre-loaded with organizers (Billings & Mathison, 2011). Elementary students in the Midwestern USA performed better on mathematics assessments when provided with mobile learning interventions (Kiger, Herro, & Prunty, 2012). Other successful initiatives include student-teacher communication. For example, college students in the United Kingdom found that audio feedback, recorded and emailed from a tutor’s smart phone, was faster and more meaningful than written feedback (Nortcliffe & Middleton, 2011). In a similar study, Australian university students were satisfied with the Trigger system, which sent automated text messages about due dates, progress, and assessment results (Richardson & Lenarcic, 2008). Still, Malaysian college students appreciated posing questions to their instructor via text message during lectures (Suki & Suki, 2011).

Perspectives and Pitfalls

Whereas college students in general approve of using their mobile devices for learning (Humble-Thaden (2011), there is some evidence that indicates students prefer to use their devices for communication and entertainment (Dahlstrom, 2012; Suki & Suki, 2011). Similarly, Wang, Chen, and Fang (2011) reported that high school students in China perceived their mobile learning experiences as enjoyable and enhanced their learning. While there is a great deal of optimism about mobile devices’ ability to positively impact learning, Kruse (2012) argues that learning will not occur unless teachers make informed decisions about how students can learn most effectively, and those decisions will not necessarily involve mobile learning. Similarly, Beckmann (2010) warns that learning will occur only when pedagogy is considered before technology.

The limited research on mobile learning experiences in classrooms today (Traxler, 2010) coupled with the lack of research that examines American high school students’ perceptions of mobile learning reflects a need to examine high school students’ perceptions of the use of mobile devices. Revealing current students’ attitudes about mobile learning might influence teachers towards integrating mobile devices into instruction (Prensky, 2001). The significance of the secondary student viewpoint is increasingly relevant as more schools adopt policies that encourage mobile learning (Project Tomorrow, 2012).

Methods and Procedures

This Action Research study (Mills, 2011) used a mixed methods approach to examine high school students’ use of smart phones and the influence of those devices on student learning and success. The following questions guided this study: (a) What are current trends in mobile device use? and (b) What are high school students’ perceptions of mobile use?

Mixed methods were chosen because they allowed the researcher to address these questions from multiple perspectives. Students were not only asked to report on their own mobile device behavior; their behavior was also observed in the classroom. Qualitative descriptions of students’ mobile device use in class provided one perspective, while quantitative descriptions showed additional trends that may have otherwise gone unnoticed.

Context

As an employee of a tutoring company that served low-performing schools, the first author was responsible for distributing mobile devices (iPod Touches, iPads, and “netbooks”) to students who received 20 tutoring hours. Often times he felt conflicted about giving out these devices because of the uncertainty that students would use them for educational purposes. That same job also provided an opportunity to work with teachers in their classrooms. The degree to which mobile device culture had infiltrated the school was surprising. Some students would be engaged with their devices for what seemed like entire class periods. Teachers took a variety of approaches for dealing with students’ behavior. While some teachers yelled at students, others quietly asked students to put their device away or ignored the behavior. Many schools do not allow the use of personal mobile devices. This policy limits students’ learning because it can restrict easily-accessible, valuable sources of information from the student. The school, where the first author is currently employed, encourages teachers to choose their own policy for mobile device use in the classroom, which made it possible for this inquiry to occur.

Participants and School Setting

The study was conducted at a Title 1 high school, in the southwestern part of the U.S. that serves approximately 1800 students. Of these students, 61% are economically disadvantaged, 75% are considered at risk, and 13% are identified as Limited English Proficient. Table 1 shows the schools ethnic demographics.

Table 1
Demographics of the high school where the study was performed

Characteristics	Percentage of school population
African American	9.1%
White	21.4%
Hispanic	68.1%
Native American	0.3%
Asian/Pacific Islander	1.0%

Participants included 67 students (29 males and 38 females predominantly of color) in 11th and 12th grade, ages 16-19, from three different sections, enrolled in an elective science course. Mobile device use was highly regulated in all 3 sections by reacting appropriately to a visual prompt that indicated when mobile devices should be accessed for explicit instructional purposes, and when mobile devices should be put away.

Qualitative Data Collection and Procedures

The first data source included responses to an open-ended questionnaire at the beginning of the grading period. Participants reported on their own mobile device use via an open-ended questionnaire with two general questions: Think of a time when you learned something new using a cell phone, iPod, iPad, or similar device and Think of a time when a teacher instructed you to use a cell phone, iPod, iPad, or similar device. Both general questions included four sub questions that asked the student to identify the device, programs, apps, or features used, the learning task involved, and feelings toward the experience with the mobile device. Paper copies of the survey were distributed to all participants and only 63 completed and returned the survey at the beginning of a class period.

The second data source consisted of a survey administered at the beginning of a class period a few weeks into the grading period. While most students accessed the survey on school-provided laptop computers some used their mobile device instead. The instrument was designed to capture students’ experiences with mobile devices and how they felt about those experiences. The survey was adapted from Kreutzer’s (2009) research instrument and formatted as a Google Forms document to assist with data aggregation. Besides one open-ended question (“Do you have anything else to tell me about your mobile devices?”), all of the questions were multiple-choice items.

Qualitative Data Analysis

The data sources were analyzed using qualitative data reduction strategies in order to manage, categorize, and interpret data to identify themes (Marshall & Rossman, 1995). Key words and phrases that related to mobile learning experiences or perceptions were highlighted in the open-ended responses. These highlighted phrases and words were coded according to repeated words, phrases, and ideas (Charmaz, 2006). Some responses contained multiple thoughts, which were coded separately from one another. When the coding was complete, the data were

grouped into categories; then through constant comparative analysis (Strauss & Corbin, 1998), further analysis reduced the categories with descriptive statements taken from questionnaires. Using constant comparative analysis and axial coding (Charmaz, 2006), the separate categories were sorted, and placed into subcategories. A deeper analysis of the data was done by comparing initial codes and notes to generate the final themes. Some categories were strengthened by survey responses, while others were weakened or replaced with more suitable descriptions. A final comparison of survey and questionnaire responses resulted in three themes related to current trends in mobile learning and three themes related to student perceptions of mobile learning.

Results and Discussion

The purpose of this study was to examine mobile device use among high school students. Primary findings related to trends in mobile use generated three themes: (a) looking up words, (b) research, and (c) text messaging. Findings related to student perceptions of mobile use generated three themes: (a) easier, (b) faster, and (c) more enjoyable. The themes are discussed in relation to the respective research question with appropriate student comments.

Research Question 1: What are current trends in mobile learning?

Looking up words, was a mobile learning activity that students engaged in for two major reasons. The most common reason was to find the meaning of a word. "I looked up definitions to words in my English hand out," one student wrote. Another reported that "when [she] couldn't understand a word, [she] used [her] phone to search it." The other reason students looked up words was to ensure correct spelling. While the majority students used their device's internet browsing capabilities to look up words, a few used dictionary apps or other features. This finding suggests that looking up words is a widespread mobile learning activity that can contribute to school success. Because of the connection between literacy skills and school success (Martinez, 2011), additional support for this theme came from the questionnaire question, "How much has your cell phone helped you do well in school?" While few students reported that it helped "a lot," more students reported that it helped "some."

Research for assignments or projects was a common theme. "Sometimes when a teacher assigns a project," wrote one student, "The teacher will instruct us students to use our electronic device for whatever we need to accomplish our projects." A broad range of research topics were described, including "parts of the body," "someone who [the student] thought was a hero," "history facts," "information about a country," and "forensic science." The questionnaire revealed that a majority of students have used their mobile device to "research information for school" at some point in the past, and few students engaged in research on their mobile device. This suggests that high school students research what they need when they need it, in concert with other research (Peters, 2007). For example, students acknowledged: "You can use it for literally anything," "Whatever question I asked [G]oogle," and, "Google has the answer to all my questions."

Text messaging was the third theme used to describe trends in mobile device use. Students described two situations where teachers incorporated text messaging. One was where a teacher set up a live response poll to which students could respond via text message and the results of the poll were projected for the class. One student appreciated how she "could see where the class as a whole was at" and she "was not on the spot if [she] got it wrong." Another liked the experience, but felt the process made her learning "more difficult than it should have been." The one student who didn't "like" the poll still thought "it was okay." This near universal approval for online polls echoes Miller's (2012) research findings. The second situation where a teacher used text messaging was to send reminders to students about due dates and assignments. This allows the teacher to communicate via texting without distributing a personal phone number. Although students' inability to contact the teacher could pose a problem for some, one-way text message reminders have been shown to positively influence student success at the university level (Richardson & Lenarcic, 2008).

According to the questionnaire, text messaging is by far the most common activity that students engage in when using their cell phones. Over half the students reported that texting is the most common way that they use their phone, and few reported texting as the second most common use of their phone. Given these numbers, it is not surprising that text messaging has been integrated successfully for instruction.

Research Question 2: What are high school students' perceptions of mobile learning?

Students perceived mobile device use as easy. “It is much easier to find words on the internet than looking through an old dictionary,” conveys a student’s feelings about learning through mobile devices compared with reference books. Others echoed the same sentiment: “It is easier to find words on the internet than looking through a dictionary,” and, “Our other choice was a dictionary and the iPhone is much more resourceful and easier.” Familiarity with the device affected students’ perception of ease. Technology that is difficult to use cannot effectively influence learning. The easy-to-use nature of today’s mobile devices allows students to self-direct their learning, accessing the content they need when they need it.

Students perceived mobile device use as faster than other methods. One student commented that her device “provided a quick answer.” Other responses that fit this theme included, “I can find the answer faster,” “I can receive information more quickly,” “Faster than looking in the book,” and, “It only makes sense to use the technology available to us if and when we need to look up a quick definition or a quick answer.” Because of the speed at which information can be accessed, mobile use challenges traditional notions of time (Traxler, 2010). As a result, a fundamental assumption of future educational systems may be that most information is available instantaneously, which could profoundly change common conceptions of learning and knowing.

Most students enjoyed using their mobile devices for learning in class. As students explained: “It was a fun way to do my work,” “It was neat,” “It’s lovely,” and “It brought joy to the class.” Other positive comments included: “They are awesome,” “It’s really freaking awesome,” “It’s da bomb,” “I love it so much,” “I love my baby! My iPhone is my bestfriend [*sic*].” While these responses may reflect perceptions towards mobile devices rather than mobile learning, there is no mobile learning without mobile devices. The enjoyment these students felt towards using their device for learning was similar to that of Chinese high school students (Wang et al., 2011).

Limitations

While this research examined high school students’ perceptions of mobile device use, caution should be taken when generalizing the conclusions from this study due to the small sample size and the gathering of data at one high school collected from students enrolled in one type of elective course. Other researchers might interpret the data differently, resulting in different labels for the themes.

Conclusions and Implications

In response to the lack of data concerning high school student perceptions of mobile learning, this study examined high school students’ experiences and attitudes towards mobile device use. Overall, students reported positive perspectives on mobile device use. This study portrays one picture of mobile device use as it currently occurs in an American high school. Trends and perspectives provided by students should be considered by teachers and administrators who wish to create meaningful mobile learning opportunities. However they should also heed the warnings of Kruse (2012) and Beckman (2010), and apply pedagogy before technology.

The speed and ease that students perceived about mobile use suggest that mobile devices are appropriate for learning tasks that can be performed quickly and easily. Text messaging is a promising new avenue of student-teacher communication. Students are used to setting up meetings, receiving important information, and engaging in sophisticated discourse through text messages (Rideout, Foehr, & Roberts, 2010). Live text message polls engage students, but do students learn more? Because text messages are already so widely used by students, more research about the effects of instructional text messaging in high schools is highly recommended. For example, do live text message polls affect learning, and to what degree can text message reminders influence work completion and success?

This findings showed that high school students typically approve of their mobile learning experiences and illustrated the ways in which mobile device use is embedded in students’ culture. However, student approval does not necessarily lead to learning. Do the widespread mobile learning activities students described positively influence success when compared with other approaches? Teachers might use this study to develop new technological guidelines and procedures for their classrooms. Incorporating student perceptions and trends regarding the use of mobile devices may also help educators create lessons that successfully engage today’s mobile learners. Although

uncertainty remains about the possible link between grades and regulated mobile device use, further research might investigate the connection between grades and mobile device use with a different grade level, school setting, or ethnic groups. Increasing the number of students involved and the time over which they are used may lead to a more universal description of the way these variables interact.

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