Literature Review

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Mobile devices have become a staple in the lives of millions. The affordability, variety of options, mobility, and ease of Internet access have created the opportunity for both children and adults to carry mobile devices daily. Mobile devices include cellular phones or iPod Touch units. For the purpose of educational use, the type of cellular phone used would need to be a smart phone with Wi-fi access. This availability of mobile devices creates an opening for educational systems to adopt such devices as learning tools in a variety of ways. For the past few years, schools around the world have been developing ways to use mobile devices as educational tools. My research will focus on academic achievement experienced by schools that use mobile devices as educational tools in the classroom. This means they allow students to use mobile devices as a tool to help them meet an educational goal. Specifically, I intend to focus on the ways in which schools use mobile devices to enhance their lessons and how these mobile devices impact academic success as determined by standardized test scores.

Perspectives

While many schools are beginning to allow student use of mobile devices, perspectives on the issue of using mobile devices in the classroom are still quite varied, even within schools that allow them. There are educators who stand firm to the belief that mobile devices don't belong in the classroom. At Roanoke College, Professor Nazami made a show of proving this to students by smashing one student's cell phone when it rang. Although he later admitted it was planned with the student, he stands firm to his assertion that it is not the role of educators to entertain students and that these devices are merely distractions that take from a student's ability to think critically (Freedman, 2007). Teachers who did incorporate mobile devices in their classroom also commented on the challenges of these devices. Teachers in Victoria who used iPod Touch devices in their classrooms for a year commented on how much time it took to learn how to best use the devices, how much time it took to plan lessons utilizing the devices, that the devices caused a great pedagogical change, and their biggest challenge was that technical issues could often ruin an entire lesson (Murray & Sloan, 2008). A teacher in North Carolina had similar problems when her students used the iPod Touch devices. She noted that from time to time she encountered wireless connection issues and students' work would be lost (Taber, 2010). Another disadvantage of mobile devices is that they may open doors for students to cheat and it is possible that they could create a gap between the technologically savvy and those who are not (Corbell & Valdes-Corbell, 2007). Wallace echoed many of these sentiments and added that mobile devices could be used inappropriately by students, so schools would have to prepare for ways to prevent such use (Wallace, 2011).

However, there are many proponents of mobile device use in the classroom who point to the benefits of student engagement, accessibility, and lesson variety to name a few. One article points out that other advantages include the ability to collaborate on many levels, use for distance learning, increase student-teacher interaction, the low cost per unit, and the ability to provide instant feedback to name a few. This study also found that mobile devices provided

increased motivation and engagement of students (Stav, Nielson, Hansen-Nygård, & Thorseth, 2010). It was found that due to the many models of phones, they are inexpensive enough that even many students from low-income homes have one. Many families use cell phones as their only form of access to the Internet because they cost less than computers (Wallace, 2011). From a teacher's perspective, the use of mobile devices in class has changed lessons on a daily basis. Taber has her students use their iPod Touch units at the beginning of each class for a warm up activity that provides her with instant feedback about each student's understanding. She says that the iPod Touch warm ups have replaced her old method of having students write in journals that she would have to collect and read (Taber, 2010). Teachers and students from Victoria reported that the students felt increased motivation, were highly engaged, confident, independent, and excited about school (Murray & Sloan, 2008). Many parents are also on board with using mobile devices for learning. A 2010 study found that 62% of parents said they would buy their children mobile devices if they knew they would be used for educational purposes. The same survey also found that high school students' access to smart phones has more than tripled since 2006 (Eisele-Dyrli, 2011). One article even noted that discipline problems were lessened as soon as the school allowed mobile devices and students were more engaged in learning (Grimes, 2009). In fact, it was found that the academic gap between special education students and those who are not special education was lessened. The practicality, accessibility, and ability to collaborate are the features of mobile devices that were echoed by many researchers as being some of the strongest reasons to use them as educational tools in the classroom. As well as the productivity and motivation that students who have been studied using the devices displayed (Swan, Van't Hooft, Kratcoski, & Unger, 2005). According to Shuler, the many benefits of mobile devices make them something that all schools should be implementing. However, she notes that the U.S. lacks the same sort of organizational structure or general leadership when it comes to mobile learning that Asia and Europe have. She states that such leadership is needed to make mobile learning a success in the U.S. (Shuler, 2009). Although some researchers were able to find drawbacks to using mobile devices as educational tools, even those researchers tended to point out the overwhelming benefits that such devices can have on student learning and engagement. The research largely stated that mobile devices are effective learning tools that allow all students to engage with the curriculum in a unique, collaborative manner. In regards to academic achievement, each of these features lends itself to academic achievement, especially the high engagement and enthusiasm about lessons when using mobile devices.

Pedagogy

Recently, mobile devices have become gradually more accepted in schools. However, the approaches to how schools have used these devices varies greatly. Yet, all have the same goal in mind, to enhance educational achievement through the use of mobile devices. At Mary Passage Middle School in Virginia students are allowed to use their cell phones in class. The cell phones are used for a variety of activities including blogging, calculating math problems, and test review. For one class review, students responded to 70 review questions using text messaging on their cell phones in under an hour (Grimes, 2009). At Culbreth Middle School in North Carolina, teacher Megan Taber described how her school has given every student in the middle school an iPod Touch to use both in school and at home. She has said that these units have changed the way she teaches. The most useful program to her at this point is having her students type their responses into a Google form survey that instantly tells her if they understand the question or

not. This allows her to know if she can move on or if she needs to re-teach a concept instantly (Taber, 2010).

Although the last two examples were both middle schools, it has been shown that mobile devices can be used to advance learning at any age level. In one study of college students in a physics class, researchers tested how mobile devices could be used as student response systems to replace clickers. The reason they were looking to replace the clickers was because the Wi-fi capabilities of mobile devices made distance learning possible as well. They found that the mobile devices were a good replacement and students reported increased motivation and engagement in lectures (Stav et al., 2010). In three primary schools in Victoria, mobile devices were used for interaction in blogs, podcasts, and web pages (Murray & Sloan, 2008). The method in which teachers with Project K-nect approached teaching with mobile devices was a bit different from the rest. The goal of Project K-nect was to see if giving at risk students mobile devices to use at home and at school would increase their academic success. Teachers would introduce a mathematical topic briefly and then it would be up to the students to work together, using their mobile devices, to create videos explaining the mathematical concept and post it to a class blog so others could learn from them. They also used instant messaging to collaborate on class assignments. The results proved successful. Students in the program scored 20% higher on standardized tests than students who did not use mobile devices in the classroom. It is clear that the use of mobile devices changed the way these students learn and resulted in great academic achievements in just one year (Project Tomorrow for Digital Millenial Consulting, 2010).

One article that examined mobile learning in the classroom discussed the pedagogical implications of mobile learning. The biggest change that may be caused is the role of teachers as mobile devices become a common classroom occurrence. They assert that teachers will change from being "transmitters of knowledge" to becoming "facilitators of learning." Furthermore, lessons will be more individualized and collaborative (Corbell & Valdes-Corbell, 2007). Roschelle was also concerned with the pedagogical implications of learning using mobile devices. He was interested in studying if these devices were a "pedagogical success" or just a passing educational trend. He studied classroom response systems, participatory simulations, and collaborative data gathering. He found that mobile devices provide an unprecedented opportunity for students to learn collaboratively and to access instant information. However, he felt more research needed to be done over time to determine specific classroom goals for mobile device use (Roschelle, 2003). The pedagogical approaches to teaching with mobile devices are vast and open doors for teachers to create individualized and collaborative lessons for students.

Assessment

Although mobile learning is still a relatively new educational phenomenon, there has been a variety of research done on the topic. The studies done vary by goal of the study and demographics studied, but all provide insight into how mobile learning impacts the education system and the potential for academic achievement.

Taylor studied how effective mobile devices were in the classroom and how they were evaluated. She noted that at the time of her study, no formative evaluations for analyzing the use

of mobile devices in the classroom had been created. The goal of her study was to understand the learning opportunities, the impact on the way people performed learning tasks and their social interactions, and how each of these are changed by technology. Using a socio-cognitive method, she found that mobile learning does strongly allow for collaboration, but on-going research over time is needed to develop a full formative evaluation for how mobile devices are used in the classroom (Taylor, 2004). Similarly, Park thought that mobile learning needed to be analyzed and categorized as a way to properly study the effects of mobile learning in education. He created categories using transactional distance theory and added a component that took into account individualized and social learning aspects. The categories Park came up with were: type 1-high transactional distance and socialized mobile learning activity (HS), type 2- high transactional distance and individualized mobile learning activity (HI), type 3- low transactional distance and socialized mobile learning activity (LS), and type 4- low transactional distance and individualized mobile learning activity (LI) (Park, 2011). These categories allow mobile learning to be more goal-oriented towards a certain type of learner and could help future researchers create the type of formative evaluation that Taylor was calling for.

Students' perceptions of learning and engagement are also important when analyzing academic success using mobile devices. Moura and Carvalho found that 69% of students who had the opportunity to engage in mobile learning agreed that using mobile phones in the classroom were good for learning and the other 31% were indecisive on the matter. All of their data results proved that the majority of students found the addition of podcasts on their mobile devices were positive additions to the classroom. To complete their study, they had students complete an array of activities using the mobile devices including: listening to literature, finding videos online, voice recording, writing, reading, and more. They collected data using two questionnaires with open and closed ended questions and a Likert scale. They also found that 73% of students reported that mobile devices gave them motivation for school activities and 73% also reported that a major benefit of the devices was the ability to access information at all times (Moura & Carvalho, 2009).

One study that strongly shows the correlation between academic achievement and mobile learning was done by Project K-nect. As referenced earlier, Project K-nect looked at how mobile learning could impact academic achievement in schools with at risk students. The study focused on 78 students and four teachers who participated in the program between August 2009 and January 2010. The evaluation team collected data through classroom observations, focus groups, interviews, and video collection. It was found that after one year of using mobile devices in the classroom, test scores were 20% higher than students who did not participate in the program at the same school and were 30-40% higher than others in the same district. Furthermore, over of the students who participated in the program, which was highly math based, are now interested in taking additional math courses. 85% of students also reported feeling more successful in math and 94% stated that the mobile devices helped them gain confidence in their abilities in math (Project Tomorrow for Digital Millenial Consulting, 2010). Similarly, when looking at data from Culbreth Middle School, the school mentioned earlier where Megan Taber works, there was a 6.4% increase in test scores between the time before students had iPod Touch units in the classroom and 2009-2010, the first year students had access to the iPod Touch units on a 24/7 basis ("State," 2011).

In closing, it is clear that mobile learning is an educational phenomenon that has become

more accepted in schools every day. The topic of mobile learning is quite broad and can be viewed and applied in many different ways. For my purposes, I used the information provided by the authors to learn about what mobile learning is, the varying viewpoints on the topic, the ways that teachers use mobile devices for effective learning, and finally, studies that have been done already that provide information about how mobile devices can be studied for their effects on academic achievement. From the information given, it is clear that researchers have found benefits of mobile devices beyond just academic achievement that would need to be considered.

One thing that I noticed in all of my research was that not many studies have been done researching the actual academic impact of mobile devices. Most of the research talked about the intrinsic benefits like increased motivation, engagement, and interest, but very few provided evidence of actual academic achievement based on standardized test scores. In approaching my research, I would continue to look at Culbreth Middle School, whose test scores I reported on earlier, and look at more subject specific test results and how teachers specifically utilized the iTouch units by subject. Such information would provide evidence for others considering using mobile devices of the benefits of mobile devices when measured using standardized tests. Although there are undeniable challenges when it comes to incorporating mobile devices in the classroom, the academic and motivational benefits seem to outweigh the drawbacks.

References

Corbell, J.R. & Valdes-Corbell, M.E. (2007). Are You Ready for Mobile Learning? *EduCause Quarterly, 30* (2). Retrieved from http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/AreYouReadyforMobileLearning/157455

This article transitions from defining forms of mobile learning to examining the benefits and challenges of mobile learning, to looking at the pedagogical implications of mobile learning. There is a basic break down of the various types of mobile learning devices including: iPod Touch, smart phones, personal digital assistants, e-readers, and laptop/tablets to name a few. Next, the article discusses potential classroom benefits which include: facilitating collaboration, reducing cultural and communication barriers between teachers and students, enhancing student centered learning, and quick, current, on-the-go access. However, it also points out certain drawbacks like more opportunities for students to cheat, giving tech-savvy students an advantage over those who are not, and the rapid change of technology which could make content and devices outdated. Lastly, the article discusses the pedagogical implications of using mobile devices in the classroom. The biggest implication is that the independent nature of these devices will transform teachers from "transmitters of knowledge" to "facilitators of learning" to create lessons that are more "situated, personal, collaborative, and long-term." It was also found in this article, that when polling 107 university students, they found that 90% had cell phones and 94% stated they were ready for mobile learning in the classroom.

Eisele-Dyrli, K. (2011, February). Mobile Goes Mainstream. Retrieved from http://www.districtadministration.com/viewarticle.aspx?articleid=2704

This article discusses the use of many different mobile devices in the classroom. The article first mentions how perspectives on mobile technology have changed among administrators and educators. While once feared and banned by schools, teachers are quickly discovering that mobile devices are not going away and are accessible tools that can advance lessons. A survey in 2010 found that high school students access to smart phones has more than tripled since 2006 and that 62% of parents said they would buy their child a mobile device if they knew it would be used for educational purposes in schools. The accessibility of these devices make them practical tools for learning. It notes that we need not focus on the type of device, as devices are constantly changing and evolving, what educators should focus on is using the tools in an academic setting in the best possible way.

Freedman, S.G. (2007, November 7). New Class(room) War: Teacher vs. Technology. *The New York Times.* Retrieved from http://www.nytimes.com/2007/11/07/education/07education.html?adxnnl=1&adxnnlx=1311708718-hSsCSU+gfRDnE/NbX7a8PA

Offering an opposing perspective on using cell phones in the classroom, this article begins by telling the story of a university professor who smashed his student's cell phone with a hammer when it rang on the first day of class. Although it turned out this was planned, the message was clear to his students, mobile devices do not belong in the classroom. The professors interviewed in this article maintain the point that it is not the job of instructors to entertain

students or make school less boring. One professor insists that education requires contemplative, critical thinking, something that can't be done when mobile devices are present in the classroom. Rather than encouraging students to use these devices to take an online class survey, he was angered by the fact that more than a quarter of the students took the survey while sitting in class. This article questions how instructors can be expected to teach an engaging, thoughtful lesson and manage students on mobile devices at the same time.

Grimes, C. (2009, April 6). Cell phones get top marks in class. *Daily Press.* Retrieved from http://articles.dailypress.com/2009-04-06/news/0904050082_1_cell-phones-student-s-cell-math-classes

At Mary Passage Middle School students are given the freedom to use cellular phones in the classroom. After seeing that of the students already owned these devices, it became clear that it was an easily accessible tool that could put learning at the students' fingertips. In one example, students responded to a 70 question review using text messaging and completed the activity in under an hour. Since implementing the cell phones as classroom tools, administration has noted that participation is up and discipline problems are down. Students have used the cell phones to do everything from write on a class blog to solving math problems. Administrators note that it is a losing battle to have students leave the devices at home, so they may as well utilize them in the best possible way.

Moura, A., & Carvalho, A.A. (2009). Mobile Learning: Two Experiments on Teaching and Learning with Mobile Phones. In *Advanced Learning* (6). Retrieved from http://www.intechopen.com/articles/show/title/mobile-learning-two-experiments-on-teaching-and-learning-with-mobile-phones

This article focuses on two studies the authors completed. The first study examines the use of podcasts via mobile devices to study literature. The article also focuses on students' perceptions about the use of mobile devices as learning tools. The researchers noted that mobile devices in schools can be used for three primary functions: as a source of information, as a productivity tool (audio, video, and photo), and as a writing tool. Overall, the students' perceptions of using the podcasts to study literature rated the learning experience as a positive one. With regards to students' perceptions of using the mobile devices, 69% agreed that using mobile phones in the classroom were good for learning, while the other 31% were indecisive on that matter. All data results showed that the majority of students found mobile devices and podcasts to be positive additions to the classroom.

Murray, C. and Sloan, J. (2008, November). iPod Touch Research Report. Retrieved from www.eduweb.vic.gov.au/edulibrary/public/ict/ipodtouchresearch2009.doc

This source, published by the Department of Education and Early Childhood Development in Victoria, provides a wealth of information about how the iPod Touch can be used within the classroom. The researchers completed studies on students using the iPod Touch to learn about any issues encountered when using the devices, the pedagogy behind using these devices, and the professional learning needs of teachers. As stated by the researchers, the main

question they were studying was "how can the use of handheld technology (iPod Touch) contribute to changes in pedagogy used in teaching, learning and assessment?" It is mentioned that using the iPod Touch in the three schools studied encouraged student interaction in blogs, podcast, Web pages, and was particularly motivating to ESL and reluctant learners. The results of the iPod Touch implementation were both positive and negative. Students were highly engaged, confident, motivated, independent, and excited by the use of the iPod Touches for their course work. Many teachers had different reactions however. The teachers involved in this found that using the mobile devices required a great amount of time, lesson planning, pedagogical change, and technical expertise as issues arose. Although time consuming and requiring dedication from the teachers, it was still clear that the iPod Touches were considered successful and valuable to learning in the schools tested.

Park, Yeonjeong. (2011). A Pedagogical Framework for Mobile Learning: Categorizing Educational Applications of Mobile Technologies into Four Types. *The International Review of Research in Open and Distance Learning, 12* (2). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/791/1699

In this article, Park looked at mobile learning from an analytical standpoint and categorized mobile learning into four categories. This was a unique way to look at mobile learning compared to the other articles. The categories Park came up with are: Type 1-high transactional distance and socialized mobile learning activity (HS), Type 2- high transactional distance and individualized mobile learning activity (HI), Type 3- low transactional distance and socialized mobile learning activity (LS), and Type 4- low transactional distance and individualized mobile learning activity (LI). He proposed that these categories make it easier to review mobile learning projects in general, especially in relation to distance learning. He created these categories using transactional distance theory and added a component that took into account individualized and social learning aspects.

Project Tomorrow® for Digital Millennial Consulting. (2010). Students leverage the power of mobile devices through the Project K-Nect Mobile Learning Initiative in Onslow County. *Project Tomorrow.* Retrieved from www.tomorrow.org/docs/Project_K-Nect_EvaluationReport_Final_Jul7.pdf

This project was developed to see if bringing mobile devices to at-risk students could raise their academic achievement levels. This program started with at-risk students at a school in Onslow, North Carolina where at least 50% of students received free or reduced lunch. It has since expanded to schools in Ohio and Virginia as well. Students were each given a mobile device with 24/7 Internet access. Teachers provide brief instruction on a topic, then teams of students create videos applying the mathematical concept they learned and blog about it. Students said that instant messaging was the best feature because of the ability to collaborate. Findings of the report include that teachers now view teaching as facilitating, rather than direct instruction, the majority of students who participated in this program scored 20% higher on standardized tests than peers from the same school who did not participate, and 30 to 40% higher than students across the district and state after just one year. Also, over of the participants are now taking additional math courses and 50% of participants are now interested in a career in

math.

Roschelle, J. (2003). Unlocking the learning value of wireless mobile devices. *Journal of Computer Assisted Learning, 19*(3)*,* 260-272.

The aim of this article was to present research findings to determine whether mobile technology is just a trend for the moment or a "resounding pedagogical success." To determine this, three uses of mobile devices were studied: classroom response system, participatory simulations, and collaborative data gathering. Each of these categories are explained and examples are given of how mobile devices are used in these categories. Roschelle also discussed problems with using mobile devices in the classroom including the potential for students to cheat, the possibility of distraction, and the potential to access inappropriate material. He defined mobile devices as tools, they do not control learning and students do not program them, but are used as a tool to aid in learning. The outcome found was that mobile devices provide a great educational opportunity to combine information and collaborative learning, but more research needs to be done to make it clear how these devices can enhance classroom pedagogy and specific classroom goals for use.

Shuler, C. (2009). *Pockets of Potential: Using Mobile Technologies to Promote Children's Learning*. New York: The Joan Ganz Cooney Center at Sesame Workshop.

This extensive report makes the case for using mobile devices in the classroom by thoroughly examining the benefits and challenges of using mobile devices, how schools around the world are using mobile devices, as well as future goals for using mobile devices in the U.S., including things like professional development sessions for teachers and using mobile devices as a mode of educational reform. Shuler found that the U.S., in comparison to Asia and Europe, lacks "well financed, coherent, or highly visible efforts" in using mobile devices as learning tools. She found that within the U.S., those who are using mobile devices are few and spread out, and there needs to be a more generalized leadership to spread this type of learning. This report lays out a specific plan of action that the U.S. needs to take in order to make learning with mobile devices in the classroom used nationwide.

State/LEA and School Test Score Performance. (2011). Retrieved from http://www.ncpublicschools.org/accountability/reporting/leaperformancearchive

This site leads to standardized testing information from Grey Culbreth Middle School in Chapel Hill, North Carolina. Results from the middle school in the year 2006-2007 are greatly different from results in 2009-2010. 2006-2007 is the school year before the school first adopted iPod Touch units for every student, whereas 2009-2010 is the first year that every single student in the school was given an iPod Touch to use daily in class. The results from the 2006-2007 school year show that 84.9% of students passed the state end of year standardized reading and math tests. Results from the 2009-2010 school year, the year iPod Touch units had been

dispersed to all students, showed that 91.3% of students passed the state end of year standardized reading and math tests. This is a 6.4% increase in test scores.

Stav J., Nielsen K., Hansen-Nygård G., & Thorseth T. (2010) Experiences Obtained with I Integration of Student Response Systems for iPod Touch and iPhone into e-Learning Environments. *Electronic Journal of e-Learning,* 8(2), 179-190.

In an effort to advance on student response systems used in the classroom, the authors of this article studied the effects of using mobile devices to replace traditional clickers. One main advantage of the mobile devices was the Wi-Fi capabilities, which made them viable options for distance learning as well as classroom and laboratory learning. The study was based on the use of mobile devices as student response systems in a physics class as well as for distance learning courses in Europe. Some of the benefits of mobile devices they found are that they are cheaper, more widely available, students know how to use them, there are a variety of answer types available, the devices have access to HTML, they can be used for distance learning, they increase student-teacher interaction, they allow students an active part in lecture, and of course, it gives the instructor instant feedback. Students involved in this study reported increased motivation and engagement in lectures.

Swan, K., Van't Hooft, M., Kratcoski, A., & Unger, D. (2005). Use and Effects of Mobile Computing Devices in K-8 Classrooms. *International Society for Technology in Education, 38 (1),* 99-112.

The authors of this article completed a study to examine how students use mobile devices and how these devices affect things such as motivation, engagement, and support for the learning process. The authors noted many benefits of using mobile devices in schools, such as the relatively low cost, mobility, wide availability, and ability to foster personalized and collaborative learning within the school and on a global scale. It was also noted that most students come with knowledge about these devices and don't need to be taught how to use them. The researchers studied six different classes in different settings and class levels throughout Ohio. They tracked student usage including how often students used it, times of day, and types of activities students used the devices for. They found that mobile devices made it easier for learning to take place both in and outside of school and that students mostly used the mobile devices for writing activities. They also found that the majority of teachers interviewed agreed that student motivation and productivity was increased with the use of the mobile devices. In regards to the effects on learning, it was found that the academic gap between special education students and the rest of class was lessened, noting that students felt "empowered to write."

Taber, M. (2010, November 20). Teachers' Views on Technology in the Classroom. [Video file]. Retrieved from http://www.nytimes.com/interactive/2010/11/21/technology/20101121-brain-teachers.html

This video was submitted by a 6th grade teacher who has been using the iPod Touch

in her school for three years. She submitted the video to show how she uses the iTouch in her classroom and the transformations it has made to her way of teaching. She said that she uses the iPod Touch for everything from research to educational games, but she uses them most for daily warm ups with Google Forms. These warm ups provide instant feedback for how well the students understand the questions. Taber noted that the iPod Touch units also have challenges. When using Google Forms, students can lose their work by accidentally closing the browser before their response has been submitted or there are technical issues that cause the units to have trouble connecting.

Taylor, J. (2004). A task-centred approach to evaluating a mobile learning environment for pedagogical soundness. *In Learning with mobile devices research and development.* Retrieved from www.mobilearn.org/download/results/Mlearn_paper.pdf

The purpose of this article is to study the "pedagogic effectiveness" of using mobile devices in the classroom and the learning environment that exists because of these devices. It was stated that due to the relative novelty of mobile devices, no formative evaluations for analyzing their use in the classroom had been created. The overall goals of the study were to develop an understanding of the learning opportunities, the impact on the way people performed learning tasks, the potential impact on social interactions, and how these are changed by the technology. The researcher asserted that the socio-cognitive method of his evaluation allowed him to analyze learners. The socio-cognitive method is a two step process. First there is an activity analysis, which analyzes how people work with technology, and second, a design of new technology is integrated into the lessons. Through the use of mobile devices, learners are able to collaborate and share ideas with peers, a part of the socio-cognitive view. The full evaluation framework is an ongoing work in progress.

Wallace, P. (2011). M-Learning: Promises, Perils, and Challenges for K-12 Education. *New Horizons.* Retrieved from http://education.jhu.edu/newhorizons/Journals/Winter2011/Wallace

This article examines the statistics and uses of children with cellular phones as well as the benefits and drawbacks of using cell phones in an educational setting. A 2011 study found that 90% of children ages 14 to 17 own a cell phone and that they are developing an identity attached to their cell phones. Some of the benefits of using cell phones in schools include the widespread adoption of them, ubiquitous access and spaced learning, and the support they provide for individualized, multi-modal learning. It's also been found that even students from low income homes are likely to have cell phones.The drawbacks to using cell phones in the classroom are the technical challenges associated with them, usability and accessibility issues, and multitasking, distractions, and the possibility for inappropriate use by the students. Overall, the author reports that m-learning, or mobile learning, is something that is so easily accessible, that it is up to educators to use them as tools to enhance learning.