

Mobile Phones for Mobile Learning: The Geo-Historian Project

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Abstract

This paper proposes that mobile learning is alive and well, but that many educators and stakeholders view mobile learning from a spatial and temporal perspective that is much too narrow. In addition, we contend that mobile learning in the classroom is an oxymoron; if mobile learning is what the name implies (i.e. mobile), then it should be implemented as such. We use a mobile learning initiative, the Geo-Historian Project, to illustrate this point, and to show that the application of mobile devices for learning forces us to examine learning “within and across the complex ecologies of people’s lives,” as this year’s conference theme implies. This paper is more of a conceptual nature than a description of research conducted, as the Geo-Historian Project is not scheduled to commence until September 2010.

Introduction

Wireless mobile technologies are increasingly embedded in our lives and have drastically changed the ways in which we communicate and access digital content. Moreover, ever smaller and more powerful digital tools are allowing us to effortlessly capture, edit, upload, and share media in a variety of formats. Despite the proliferation of mobile phones and other mobile devices, they have not been as widely accepted and used in education, because many adults are still reluctant to allow widespread student access to and use of wirelessly connected devices in formal educational settings, usually for reasons related to safety or distraction (van 't Hooft, 2007). In fact, Nash (2009) has argued that the mLearning revolution has failed to provide the kind of change that education so desperately needs, and that it has merely provided “mobile learning in the classroom.”

This paper refutes Nash’s statements and argues that mobile learning is alive and well, but that many educators and stakeholders (including Nash) are looking at mobile learning from a spatial and temporal perspective that is much too narrow. In addition, we contend that mobile learning in the classroom is an oxymoron; if mobile learning is what the name implies (i.e. mobile), then it should be implemented as such. This does not mean that classroom environments should be excluded from the realm of mobile learning; instead, we argue that mobile learning is successful when it occurs across boundaries of space and time. In this paper, we use a mobile learning/digital history initiative, the Geo-Historian Project, to illustrate this point and to show that the application of mobile devices for learning forces us to examine learning “within and across the complex ecologies of people’s lives.”

Perspectives/Theoretical Framework

Mobile Learning

Mobile learning is not just about technology or delivering content to mobile devices, but also about processes of meaning-making and “being able to operate successfully in and across new and ever changing contexts and learning spaces” (Pachler, 2009), transcending boundaries of time and space (Sharples, Taylor, & Vavoula, 2007; van ‘t Hooft & Swan, 2007). In short, the world has become the curriculum in which users create their own contexts for learning (Pachler, 2009). In addition, learning that is mobile underlines the importance of both the real and the digital, as each realm augments the other (e.g. Cook, 2009; Klopfer, 2008). Learning that takes place within such a context incorporates the kinds of knowledge, skills, and expertise that are needed in the 21st century, including creativity and innovation, critical thinking and problem solving, communication and collaboration, information, media, and ICT literacy, as well as a variety of life and career skills (Partnership for 21st Century Skills, 2009; see also Ally, 2009).

Mobile technologies such as smartphones are well-suited to support these types of learning (see e.g. Shuler, 2009). A review done by Naismith, Lonsdale, Vavoula, and Sharples (2004) identifies a number of categories in which learning that is supported by mobile tools can be classified. The categories include:

- constructivist activities that enable learners to actively construct their own new ideas or concepts based on their existing knowledge. Constructivism (Piaget, 1977) posits that people learn by creating their own understanding of the world in an iterative process that builds on past experiences and knowledge. It is characterized by exploration, flexibility, trial and error, and constant feedback.
- situated learning activities that take place in an authentic context. Situated learning (Lave & Wenger, 1991) complements constructivism in that it places an individual’s learning within a real-world context and communities of practice, i.e. it sees learning as a very social activity. Mobile devices are well suited because of their size and ability to interface with their physical context as well as other mobile devices.
- collaborative activities that promote learning through interaction. Mobile devices can supplement human interactions by providing digital work spaces that can be shared.
- informal and lifelong learning activities that support learning across boundaries of space, time, and curriculum (see e.g. Klopfer, 2007; Lin, 2007; Rogers & Price, 2007).

While the argument can be made that the categories listed can be applied to learning activities in the classroom, it should be obvious that they work much better for learning that is not limited by physical or temporal boundaries. Despite Nash’s (2009) concerns, there are many mobile learning initiatives and activities that fit the latter. For example, Vavoula, Sharples, Lonsdale, Rudman, and Meek (2007) developed “a service for children to spread their learning between schools and museums using mobile phones linked to a personal Web space” (p. 33) to link formal to informal learning that is constructivist and collaborative. As Klopfer (2008) has described for mobile games, mobile tools and 21st century learning are connected by constructivism and situated learning. Hence, learning activities that are designed to be constructivist and situated can be characterized as “social, authentic and meaningful, connected to the real world, open-ended so they contain multiple pathways, intrinsically motivating, and filled with feedback” (p. xi). Frequency 1550 (e.g. Admiraal, Raessens, & van Zeijts, 2007) and

Environmental Detectives (Klopfer & Squire, 2008) are excellent examples of Klopfer's characterization of mobile learning. Arrigo and Cipri (2010) describe a mobile learning environment, the Accessible Mobile Learning (AMobiLe) system, which enables student learning that is constructive, situated, collaborative, and lifelong, as they strive to create a learning environment in which barriers for disabled students are removed. The CloudBank is a good example of collaborative and informal/lifelong learning, as it "aims to build a mobile- and web-based crowd-sourced information system to help international students further their knowledge and understanding of local UK language and culture" (Pemberton, Winter, & Fallahkhair, 2010, p. 144). Moreover, future learning "systems" may incorporate "complex learning databases with a learner's personal data, [to] provide all students with a personal, customizable, and flexible education (Polson & Morgan, 2010, p. 185).

As stated, these are just a handful of examples on a long list of mobile learning initiatives that take learning beyond the confines of the formal classroom. The area of interest for this paper is the use of mobile tools in social studies, more specifically history.

Digital History

Rapid advances in computer and Internet technologies in the 1990s and 2000s opened up a plethora of opportunities for education, one of them being digital history. According to Lee (2002), digital history can be defined as "the study of the past using a variety of electronically produced primary source texts, images, and artifacts as well as the constructed historical narratives, accounts, or presentations that result from digital historical inquiry" (p. 504). Digital history is done in many places and the results come in many shapes and sizes. It includes large-scale digitization projects such as the Library of Congress' American Memory Project (<http://memory.loc.gov>); state-based efforts like the Kentuckiana Digital Library (<http://kdl.kyvl.org/>) and the Missouri Digital Heritage Initiative (<http://www.sos.mo.gov/mdh/>); and relatively smaller collections such as the Cleveland Digital Library (<http://www.clevelandmemory.org/SpecColl/cdl/>) or the Schenectady, NY Digital History Archive (<http://www.schenectadyhistory.org/>). Most of these digital collections are meant to be viewed on a desktop or laptop computer; hence it is difficult to view them on wireless mobile devices within their physical context. Some digital resources have been made available for use within their local context. An example of this is the Remarkable Ohio website and iPhone application, developed by the Ohio Historical Society and eTech Ohio. The application allows users to view historical markers, read about the site's historical significance and capture the markers on their mobile devices. Photos can be sent to the Ohio Historical Society or uploaded onto the Remarkable Ohio Web site at www.remarkableohio.org, and are made public pending review.

In addition, several universities actively pursue the craft of digital history; two frontrunners in this area are the Virginia Center for Digital History (<http://www.vcdh.virginia.edu/>) and the Center for History and New Media at George Mason University (<http://chnm.gmu.edu/>). These institutes of higher education tend to take a more scholarly approach and are primarily involved in research, tool development, and providing historical resources.

Some universities also provide teaching resources for K-12 educators, including lesson plans, classroom activities, and best practices. The Library of Congress (<http://memory.loc.gov/learn/lessons/index.html>), the National History Education Clearinghouse (<http://teachinghistory.org/>); a joint effort of George Mason's Center for History and New Media

and the Stanford University History Education Group), the University of Houston's Digital History Project (<http://www.digitalhistory.uh.edu/>), and the University of Victoria's Great Unsolved Mysteries in Canadian History (<http://www.canadianmysteries.ca/en/index.php>) are a few sites where teachers can access such resources. However, most of the resources that are available are designed for learning or doing history *in the classroom*, i.e. removed from the community in which it happened.

In sum, most resources that are available for doing digital history with K-12 students are pre-determined and/or designed for classroom use. They do provide opportunities for student inquiry (Lee, 2002), but this inquiry often lacks an authentic context. Examples of K-12 students actively participating in local historical research, documenting artifacts, interviewing people, and sharing their findings in digital format are few and far between. Most of the projects that are currently available online are no longer active (see e.g. "What Did You Do in the War, Grandma?" http://www.stg.brown.edu/projects/WWII_Women/tocCS.html). However, one of the best-known ones, the Bland County History Archives (<http://63.160.254.53/gap.html>), has now been online for almost 15 years, and constitutes a great example of the power of studying local history and sharing it with the world (see Clarke & Lee, 2004; Coles & Welsh, 2002). It is exactly this type of student-driven learning that we drew our inspiration from when designing the GeoHistorian Project, as we understand the importance of teaching future generations the value of conserving the past and sharing it with others. Therefore, while one goal of our project is to train teachers how to *do* local history with their students and have them implement what they've learned inside and outside of the classroom, our focus is primarily on the digital artifacts that students produce and how they are shared with the community at large. As these student-created digital artifacts are accessed within their physical context by mobile device users, we hope to create opportunities for learning that are constructive, contextual, and informal.

The Geo-Historian Project

The Geo-Historian Project is based on work in the areas of ubiquitous computing, mobile learning, and digital history that focuses on the use of mobile technologies to break down the barriers between schools and community resources such as zoos, museums, and historical sites; and above all, to give students the opportunity to create digital resources for their community. The project utilizes wireless mobile technologies to link classrooms with local historical landmarks and link formal with informal learning. Technologies include digital video and still cameras, digital audio recorders, mobile phones with video and audio capturing and playback capabilities, built-in GPS, and wireless Internet access, and Internet-based media sharing sites such as PocketCaster. In addition, we incorporated the use of QR (Quick Response) or two-dimensional bar codes as a way in which to deliver digital content *within* its physical context to a wider audience, digitally augmenting physical learning environments (Price, 2007). Using these technologies allows students to become local digital historians, learning about, creating, and sharing a living history of real people and real places.

The project is still in its early stages and consists of two parts:

1. Initial project activities will include the creation of curriculum for teaching how to do digital, local history, training teachers, and implementing the curriculum inside and outside of their classrooms. Student-created, digital, and local historical content will be available online and freely accessible by way of wireless mobile devices and QR codes.

2. In collaboration with the local historical society, these QR codes will be placed in the community so that anybody with a mobile phone and a barcode scanner can access the digital content that's behind them.

Initial tests have been successful in using mobile phones for content creation and sharing on the Internet. The next step will involve the development of situated learning activities for students, providing them with a meaningful and authentic context for becoming local historians. Thus, the curricular scope of this project transcends others such as context-aware museum tours, where students learn using pre-determined content and sharing with others is limited (see e.g. Chou, Hsieh, Gandon, & Sadeh, 2005; Lin, 2007), and is more in line with projects like MyArtSpace that use mobile technologies to “form bridges between formal and informal learning” (Vavoula, et al., 2007, p. 33).

Our initial tests indicate that this can be successfully done. For example, at the NECC 2009 Conference in Washington DC, we held a special session for approximately 25 educators at the World War II Memorial, and issued them the following challenge:

The U.S. National World War II Memorial is dedicated to Americans who served in the armed forces and as civilians during World War II. While many people agree that this is an important monument, critics have argued that

- *its location breaks up the view between the Washington Monument and Lincoln Memorial;*
- *the monument takes up space historically used for demonstrations;*
- *its architecture resembles the architecture of Nazi Germany and Mussolini's Italy.*

Your task is to come up with a compelling argument that demonstrates the importance of the World War II Memorial today. Use your mobile phones to access supplementary digital content, using the QR codes provided. In addition, you may use your mobile phone to collect evidence in and around the memorial. We will leave it up to you as to how you want to do that.

Following the learning activity, participants indicated that they got a much better understanding of the memorial itself, because they were involved in an authentic task and spent more time looking at the various parts while accessing supplementary digital video and audio on their mobile phones. In fact, one of the participants mentioned that “While we were doing this there were a group of students being lectured to by a tour guide and they were more interested in what we were doing with the phones” (Crompton, 2009). In addition, one participant mentioned that she should have looked for a veteran who was visiting the memorial, in order to ask him some questions and record the answers on her phone.

Sample Project Materials

The Geo-Historian Project has not commenced yet; it is slated to start in September 2010. However, we will use a combination of printed and electronic media, showing the audience a variety of pictures and video clips from the project, as well as samples of digital content. In addition, we will provide some actual QR codes that conference participants can capture with their mobile devices to access digital content, and experience for themselves how mobile

technologies can be used to augment physical learning contexts with digital content (Figures 1 and 2).

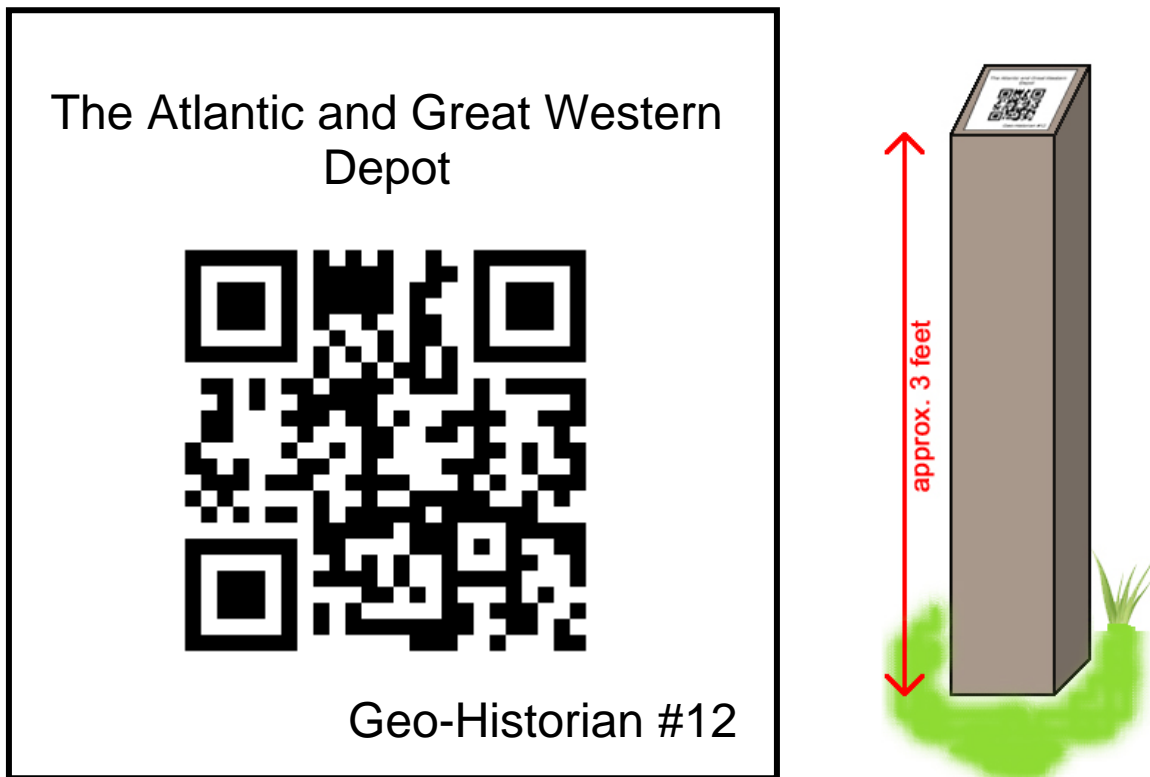


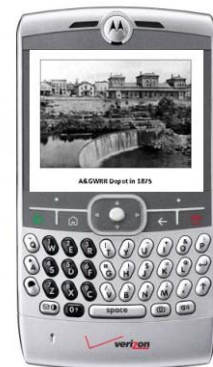
Figure 1. 4"x 4" QR Code Marker, Black on White (left; actual size)
Can be mounted on a 4 x 4 pressure-treated post (right) or a building.



A tourist visits the Atlantic and Great Western Railroad Depot in Kent, Ohio



He scans a QR code from a marker at the depot with his mobile phone



Related student-created, historical content (audio, video, images) is downloaded to the phone

Figure 2. Sample Site and QR Code Marker Use

Conclusions and Significance of the Work

In our view, mobile learning is alive and well, albeit it not on the scale that we would like to see. While some say that mobile learning is dead because it has not brought the changes to our formal educational systems that it is capable of, we believe that those nay-sayers take a much too narrow perspective. Limiting mobile learning to a formal classroom is impossible if the learning is to be truly mobile, as learners are restricted by the physical boundaries of the building, temporal restraints of the school day, and content restraints of the curriculum.

Instead, we propose that mobile learning forces us to look at learning in ways that supplement and possibly even oppose formalized education, i.e. learning that can happen anywhere and anytime, that is personalized, situated, and authentic, and that is connected to the everyday use of mobile devices (Bachmair, 2007; Pachler, 2009; Traxler, 2009). The Geo-Historian Project will aim to do just that.

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