Chapter 43
mLearning to Enhance Disaster Preparedness Education in K–12 Schools

Thomas Chandler
Columbia University, USA

Jaishree Beedasy
Columbia University, USA

ABSTRACT

Several of the most disconcerting and compelling news events of the 21st century pertain to natural and human-caused disasters. However, these themes are generally absent in the social studies, civics, science, or mathematics curricula of most U.S. K-12 schools. Similarly, discussions about ways to incorporate new digital tools, such as mobile tablet computers and apps into such discussions are also overlooked. This chapter provides a roadmap for considering disaster-oriented themes in the K-12 curriculum and then provides several examples of apps that can be included in classroom lessons along with guidelines for incorporating these digital tools into pedagogical practices. The authors have framed their analysis within the context of mLearning as a way to address cross-disciplinary themes via mobile technologies.

INTRODUCTION

Disasters have been increasing since the start of the 21st century. From September 11th, 2001, to Hurricane Katrina in 2005, to Hurricane Sandy in 2012, U.S. citizens have been faced with situations that have threatened their well-being, while also generating new realizations that there are several dangers for which they are truly vulnerable. As noted by McKibben (2010), this trend is likely to continue globally, given that the world's population is anticipated to grow from 6.8 billion to 9 billion by 2050. Likewise, the unprecedented growth of densely populated cities in the developed and developing world places more people in direct harm's way from natural and human caused disasters, ranging from extreme coastal storms, to earthquakes, to pandemic influenza, to terrorism, among other concerns (STC 2012).

When considering ways to better prepare and respond to such catastrophes, a common thread involves enhancing our communication capabilities, particularly for instantaneous electronic messages that can be exchanged in real-time between citizens and response agencies during and after emergencies. Due to the rise of hand-held technologies, first with the iPad in 2007, and then with a wide range of competing tablet devices, it is now possible for millions of people to collaborate virtually to solve complex problems in ways that were once unimaginable. For instance, when Hurricane Sandy struck the New York region in 2012, several community groups used smartphones, handheld tablets and associated apps to coordinate the delivery of food, water, blankets, and flashlights to residents stranded in low income housing complexes. The logistical civic support provided via these mobile electronic tools was often conducted several days before New York City's first responders arrived at the scene. Similar stories abound. In recent times, more often than not, it is community participants who are now at the forefront of disaster mitigation, particularly because they now have increased mobility for sharing text, photos, videos, and geospatial information online, in real-time, with their own hand-held devices (Cohen 2013).

Yet, although there are a plethora of examples in which community groups have used handheld technologies to prepare for, respond to, and recover from disasters, there has been little discussion as of yet about ways in which K-12 educators can become involved in the process of incorporating these technologies and themes into their teaching. While some of the most compelling current events of our time pertain to natural and human caused disasters, these topics are generally absent in the social studies, civics, science, or mathematics curricula of most K-12 schools. Similarly, discussions about ways to incorporate new digital tools, such as tablets and apps into such discussions are often ignored. This article provides a framework for considering disaster preparedness oriented programs in the K-12 curriculum using wireless hand held devices, and resources that are currently available. The authors have framed this discussion within the context of mLearning across multiple contexts, through social and content interactions, using personal electronic devices (Crompton 2011). In other words, with the use of mobile devices, learners can learn anywhere and at any time.

BACKGROUND

In August 2005, when Hurricane Katrina struck the U.S. Gulf Coast, handheld mobile devices had very limited capabilities. Apps were not yet invented, Google Earth was in its infancy, and Facebook was still used mostly by young adults for communication with a selected circle of friends. By the time of Hurricane Sandy in October 2012, the digital communication landscape had changed considerably. Apps and social media had been incorporated into mainstream media broadcasts and were being used by Federal, state and local government agencies for bi-directional communication with the public. On the first day of the storm, Instagram was reported to have ten storm-related pictures per second posted - 244,000 under the hashtag "#sandy" and another 23,000 under "#frankenstorm" (Baer 2012). The storm was the second most talked about issue on Facebook during 2012, after the presidential election (Prakash 2012). Usage of apps such as the FEMA App, iMPrepared, and Shelters by the Red Cross also skyrocketed.

Hurricane Sandy marked the first time that the response to a major U.S. disaster was prominently documented and organized by citizens at the grassroots level. When evacuees fled their homes, they packed their hand held devices, and sought to recharge them remotely, whether at shelters, in automobiles, or via a neighbor's generator. When people witnessed a dangerous situation, they frequently documented it with a digital photograph, seeking to share it with others. Apps which incorporated social

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