

Global Madison: Usability evaluation of an adaptive mobile map supporting situated learning of globalization

Robert E. Roth | reroth@wisc.edu
Stephen J. Young | sjyoung3@wisc.edu
Cheslea Nestel | nestel@wisc.edu
Carl M. Sack | cmsack@wisc.edu
Brian Davidson | bdavidson2@wisc.edu
Julia Janicki | janicki@wisc.edu
Vanessa Knoppke-Wetzel | vknoppkewetz@wisc.edu
Fei Ma | fma4@wisc.edu
Rashauna Mead | rmead@wisc.edu
Caroline Rose | cmrose@wisc.edu
Guiming Zhang | gzhang45@wisc.edu

Track 13: Map Use, Users, and Usability

Keywords: mobile maps, situated learning, usability evaluation

INTRODUCTION: Geographic information increasingly is consumed on mobile devices. Arguably, this has resulted in a fundamental change in the relationship between cartography and geography. Maps today are more than an abstraction of the landscape interpreted from afar; they are interactive information repositories that contextualize and enrich the landscape in which the map user is ‘situated’. In this paper, we approach two research questions facing mobile mapping: (1) what are the key affordances and constraints of the mobile platform when using mobile maps ‘in the wild’, and (2) how should cartographic design recommendations be revised as a result?

CASE STUDY: We explored the design and usability of mobile maps through a case study mobile website called Global Madison (www.geography.wisc.edu/GlobalMadison/). Global Madison supports ‘situated learning’—or lessons that take place in a real-world context—for International Studies 101 at UW–Madison (USA), an introductory course on globalization. The purpose of Global Madison was to make the otherwise ‘familiar’ landscape of Madison ‘strange’ to IS101 students, first using a location-based service to guide students to historic landmarks within the city and then using the mobile platform to deliver narration, maps, and images contextualizing these places in the globalized world. Five landmarks in Madison were selected as a ‘situated classroom’ to stimulate embodied thinking about five global interdependencies: (1) commodity chains, (2) transportation networks, (3) energy consumption, (4) labor markets, and (5) fair trade.

METHODS: We completed a two-part usability evaluation of Global Madison when it was first assigned to UW–Madison students, with the dual goals of improving the mobile website specifically and learning about issues in the design and usability of mobile maps broadly. 244 students in IS101 completed an online survey after completing the guided tour. Survey questions addressed three topics: (1) background/motivation, (2) mobile map design considerations, and

(3) usability considerations. We conducted an in-depth field evaluation with 18 of these students, recording critical incidents impacting completion of the guided tour. We coded critical incidents by four categories regarding mobile map design and usability: (1) hardware issues, (2) software usability issues, (3) weather issues, and (4) orientation issues.

RESULTS: In the online survey, participants rated the landmarks used for the commodity chains, fair trade, and labor markets most highly, indicating these lessons had interesting content, but that the landmarks also were visually salient in the landscape, were off busy streets, and had nearby historical dedications. Regarding map design, participants largely agreed that the level of basemap detail, the density and clarity of map labels, and the visual hierarchy of the route against the basemap were appropriate for the mobile platform; opinion was mixed regarding the use of audio vs. text for situated learning and the ability to use the map for navigating the route. Participants identified data connectivity, switching between mobile applications, and issues with sound as the largest usability barriers. 156 critical incidents occurred during the 18 field evaluations, 78 related to orientation issues, 45 related to hardware issues, 30 related usability/software issues, and only 3 related to weather. The most frequent critical incidents included data connectivity, wrong turns, and difficulty in associating map information with the landmarks.

CONCLUSION: Our case study evaluation of Global Madison revealed several important design and usability considerations for mobile maps, but much work remains to help cartographers fully leverage the ever-evolving mobile platform. Our case study also pointed to the vast potential for mobile maps to support situated learning. We expect to publish the final Global Madison mobile website, revised based on student feedback, in Spring of 2015.