Neighborhood Investigations and Game Design Using Mobile Media

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Abstract: This poster presents a design-based research study aimed at exploring the use of commercial mobile devices to support guided, yet open-ended and emergent explorations of place. As part of our study we explore the potential of a design studio model to support students' ability to investigate, analyze and report on contested issues and places in and around their school and guide their design of place-based Augmented Reality simulations and games.

Introduction

Mobile devices allow for new forms of learning that challenge the traditional culture of schools. While some schools have chosen to focus on the potentially negative consequences of these devices, others have begun to more seriously consider the growing disconnect between school policies and practices and the way that learning takes place outside of school (Squire, 2009; Norris & Soloway, 2009). The study presented here seeks to address this disconnect by exploring the potential of commercial mobile devices (particularly iPhones and similar smart phones) and "off-the-shelf" software to support guided, yet open-ended investigations of place. As such, it builds on previous research highlighting the potential of mobile media to support inquiry-based and constructivist learning environments (Rogers & Price, 2009; Sharples, Taylor, & Vavoula, 2005), as well as research related to critical, place-based learning (Gruenewald, 2003; Hull & James, 2007).

Study Design and Methods

Neighborhood Investigations and Game Design is a studio-based design curriculum piloted with two groups (N=10 and N=12) of 11th and 12th-grade students over a period of twenty days. Both of the implementations took place in a suburban high school and included *a place-based inquiry workshop*, where students used mobile devices to identify and investigate contested issues in their city and *a mobile game design workshop*, where students collaboratively designed place-based Augmented Reality games using mobile devices. We utilized a design studio model during both of these workshops as a way to simultaneously scaffold the students' designs and teach them about the design process (Cox, Harrison & Hoadley, 2009). A normal class period (90-minute block) included the following: (1) *Large-group check-in* at the start of class. This usually occurred at the school, but on occasion took place at a location outside of the school (e.g., we used a local coffee shop and the city hall as meeting locations). This time was used for full-group presentations, critiques and discussions related to the concepts we were studying (e.g., game design, contested places) and as an avenue for checking in on individual and group progress; (2) *Community-based independent and small group research and investigation*. During this time students left the school building to conduct field work that was relevant to their design(s) (e.g., conducting interviews, taking photos, making observations, testing prototypes). During these field excursions, students either selected from pre-scripted design quests or developed their own design tasks to guide their investigation. In addition, they used mobile devices (both their own and ones supplied by the researchers) to receive additional quests, collaborate, gather data and share their progress; and (3) *Large-group debrief sessions* where students reported on their field and design experiences, shared works in progress and participated in formal critiques. During the AR game design workshop the students also used studio time to play several pre-designed Augmented Reality games, design and prototype "micro-AR games", and collaboratively design their own Augmented Reality simulation aimed at teaching other students and staff at the school about a controversial issue in their local community.

Because we were interested in exploring the curriculum and the overall learning environment as an integrated system we employed a design-based research methodology. As such, a major goal was to iteratively redesign the curriculum and intervention strategies *in situ* in order to ground our questions, findings and re-designs in both the existing theory surrounding mobile and place-based learning and the issues, challenges and questions that emerged from our unique context (Cobb, diSessa, Lehrer & Schauble, 2003). The data we analyzed to make (re)design decisions included: observations, students' design journals, small group and individual interviews and student generated artifacts. Because of space constraints we chose to limit our discussion of the data/data analysis in this short paper, however, as part of our presentation we will share photographic evidence, excerpts from interviews and design journals, and student generated artifacts (e.g., design documents, media assets and final games) that both, exemplify the key components of the intervention, and support our findings.

Findings

Our preliminary findings suggest that framing the students' investigation around the concept of contested issues and places served as a conduit for developing their understanding of the multiple perspectives surrounding contentious issues in their community. Not surprisingly, students' positionality shaped the way they initially perceived and discussed the issues, people and places they chose to study. However, each student's understanding of the issues became more complex as their investigations advanced and they developed a greater capacity for empathetic thinking. Studying issues within their local community increased students' engagement and challenged them to think more complexly about these issues, while also providing opportunities for them to perform and explore a range of identities (e.g., game designer, researcher, community activist). Similarly, the AR design experience also provided a space for students to share their own perspectives on the places where they live their daily lives. For many students a highlight of the design experience was seeing their voices and perspectives represented in the final AR design/simulation.

The studio model, in conjunction with the use of mobile devices, helped cultivate a hybrid-learning environment where students fluidly moved between the classroom and the broader community in order to complete investigatory and design tasks. The mobile devices allowed us to maintain contact with students as they explored the broader community, while providing them space to semi-autonomously and flexibly manage their own research, social interactions, and progress. We maintained contact with the students as they worked in the community via mobile-to-mobile (text messaging, emails, phone calls) and face-to-face conversations. It was common practice for us to setup in a central location, where we were in close proximity to the students as they worked in the field. If a question came up or we wanted to check-in with a student or a group, we would communicate with them via cell phones and/or arrange a meeting place. These "in the field" meetings provided opportunities to connect with individuals or small groups to offer feedback or just in time instruction. Despite our emphasis on the use of mobile devices, a central design space (e.g., a shared work space and physical design board where students posted and collectively organized their work) and consistent design rituals or practices (e.g., journaling, group discussion, critiques) also proved critical to the studio/learning experience. The physical design space provided opportunities for students to share their work informally and often became the site of emergent design conversations. Similarly, the design journals provided an opportunity to gauge students' conceptual understanding and general reactions to particular activities and/or the overall design process.

Finally, consistent with previous research around the use of a studio model for designing and learning about design, our study found that: (1) Developing AR games recruited students' digital media skills, tools, and Web-based communities that were not ordinarily used in school to complete tasks; (2) Creating games for an authentic audience deepened the design experience and increased engagement; (3) The complex, distributed nature of the design task led to the development of particular areas of expertise (related to both content, design and technology use) within the groups and allowed students to select design tasks that met their interests and skill levels. Overall these factors provided an avenue for differentiating the learning experience, which in turn, led to increased engagement, more autonomous learning behaviors, and increased feelings of self-efficacy.

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