Exploring Teen Co-design in Alternate Reality Games for Learning

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Abstract
In this paper, we describe a new research project that will employ co-design techniques with teens to support the design of Alternate Reality Games (ARGs) for informal science learning. Our work builds upon our existing in-depth experience using co-design methods with children who are 7-11 years old, along with recent projects in which we have explored variations to these techniques with teens, adults, and other age groups.

Author Keywords
Participatory design; co-design; teens; learning; games; alternate reality games.

ACM Classification Keywords
K.3 [Computers and Education]: General.

Introduction
Alternate Reality Games (ARGs) are an emerging genre of interactive, transmedia storytelling that require players to collaboratively hunt for clues, make sense of disparate information, contribute content, and solve puzzles to advance an adaptive narrative that is woven into the fabric of the real world [19]. Combining elements of stories and games, ARGs provide unique informal learning opportunities that can draw thousands of players and millions of observers [4,13]. Many aspects of their design also make ARGs ideal

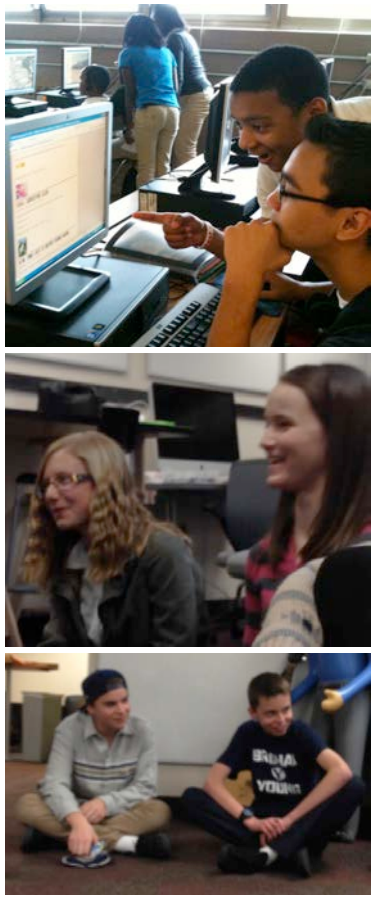

Figure 1. *At top*: Teens (13-15 years old) participate in our 2-week pilot ARG. *At Middle/Bottom*: Teens (13-14 years old) share ideas about the narrative design of our ongoing ARG project. (Note: We have permission to show children's faces in our research project.)

platforms for engaging with informal learning institutions including museums and libraries [14,18].

An ARG is also a participatory storytelling experience. ARG designers must devise a flexible script that they collaboratively adapt with players during game-play [8], a dynamic that is similar to the approach educators take when designing lessons that they then dynamically adjust in response to student feedback during class [22,23]. Moreover, the ARG's core player-responsive design principle makes it an authentic environment to support participatory design.

Despite the recognized potential of ARGs as novel tools for informal learning and participatory design, no large-scale ARGs have been developed or evaluated that focus on learning in science, technology, engineering, and mathematics (STEM). We are engaged in a three-year, National Science Foundation (NSF) sponsored, design and research project to explore design strategies for developing and implementing ARGs for informal STEM learning. Our target audience is teenagers, 13-15 years old, who are currently underrepresented in STEM including females, blacks, and Hispanics [20,21]. Our research is an outgrowth of a pilot project that also targeted this age group and has been reported in various HCI and Learning Sciences venues [4-7,17].

The participatory role that ARG players assume during game play is closely aligned with a participatory design method known as Cooperative Inquiry [11,12,16]. In Cooperative Inquiry, child designers work as equal partners alongside adult designers and researchers. It is a type of co-design that enables teams of children and adults to share ideas in ways that maximize idea elaboration yet minimize differences in age, ability, and communication styles [11]. As a participatory philosophy [11,16], it has been successfully used with children, 4-11 years old [1,2,9-11,15,24-26]. We have also explored ways to tailor existing techniques for teenagers (13-18 years old) [27], and will build upon this foundation in our current ARG project.

One of the key research questions for our NSF project concerns the ways in which co-design with teenagers might enhance the overall game design and game play. How might including members of the target audience positively impact player engagement and player experience? What techniques are most effective for co-designing informal learning ARGs with teens? How might we embed authentic learning assessments into design sessions throughout the design and implementation process, so that we can gather and analyze data about adolescent perspectives and knowledge about STEM concepts? Furthermore, how might co-design be used not only to inform design, but also to gather baseline data relevant to the later summative evaluation of the game?

To address these questions, we have partnered with teens in our target demographics to support us through our design process. Although the benefits of participatory design and co-design techniques [3] are well understood, how to apply these techniques to the development of informal learning ARGs is not. Moreover, how to adapt co-design approaches that have proven effective with 5-12 year olds into techniques that accommodate teens requires additional research. Our preliminary work has found that certain methods, like bags of stuff [25], a low-fidelity prototyping technique, tend to appeal to younger age

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Elizabeth Bonsignore is a PhD candidate in the iSchool at the University of Maryland. Her research interests include the design and use of social, participatory experiences and technologies that support lifelong learning, whether in formal education (schools) or informal contexts (museum, library, home). Specific work includes analysis of mobile storytelling application design and use [9]; technologies to support personal expression and scientific inquiry practices [10,26]; and the design of Alternate Reality Games as platforms for participatory learning [4-8]. These efforts include close collaboration with Kidsteam, an intergenerational co-design research team at the Human-Computer Interaction Lab (HCIL).

[See Bio 2, next page.]

groups. We have witnessed adults simply fidgeting with pipe cleaners while they talk about their design ideas, rather than diving in to create them. Will we see similar effects with teens? Are there methods that teens are "too cool" for? How can we leverage existing tools and cultural elements that teens are excited about in support of co-design (e.g. Snap Chat, Dubstep music, etc.)? We will evaluate existing co-design techniques with teens and develop and test novel approaches tailored to their age group.

Our co-design teams for this project are geographically distributed (one in Maryland, one in Utah), so we also plan to investigate design approaches that accommodate collaboration across distances, building upon early exploratory work [24]. This has unique implications for co-design with ARGs, particularly due to the distributed nature of ARG participation and the importance of appealing to broad audiences across the country.

Giving adolescents a voice in the design of their own user/player experiences is a key element to support learning and engagement. Our efforts represent a positive step toward that end. We look forward to sharing the background and status of our efforts co-designing with teens with other workshop participants, and contributing to a lively discussion on methods and designs that support rich user experiences for teens.

Acknowledgements

We thank the teens, librarians, and adult co-designers who will be working with us on this project. We also thank Professor Derek Hansen (Brigham Young University) for his feedback, and the US NSF for funding this research (NSF AISL-1323787).

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Jes Koepfler is a PhD candidate in the iSchool at the University of Maryland as well as Director of Design Research & Strategy at Intuitive Company, a user-centered digital design firm in Philadelphia, PA (http://intuitivecompany.com/about). She has applied co-design and participatory design methods *in the wild* for use in the development of new digital experiences in industry. Her company is currently working with teens on a new safe driving application as well as supporting the ARG project described in this paper.

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