Cover Page

Title of submission: Girls as Space Game Designers: Extreme Baseline Research

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Name and full contact address (surface, fax, email) of the individual responsible for submitting and receiving inquiries about the submission:

Carrie Heeter
Professor of Telecommunication
Comm Tech Lab Director
Michigan State University in San Francisco
2467 Funston Avenue
San Francisco, CA 94116
415-681-6473 (v)
415-681-6490 (f)
heeter@msu.edu
http://commtechlab.msu.edu/carrie/

Girls as Space Game Designers: Extreme Baseline Research

Carrie Heeter
Director
Michigan State University Comm Tech Lab
2467 Funston Avenue
San Francisco, CA 94116 USA
heeter@msu.edu

Brian Winn
Assistant Professor of Telecommunication and
MSU Comm Tech Lab
253 Comm Arts & Sciences
East Lansing, MI 48824 USA
winnb@msu.edu

Rhonda Egidio
Professor
MSU College of Education
240 Erickson Hall
East Lansing, MI 48824
egidio@msu.edu

Punya Mishra
Associate Professor
MSU College of Education
240 Erickson Hall
East Lansing, MI 48824
punya@msu.edu

Norm Lownds
Michigan 4H Children's Garden Curator
MSU Horticulture Department
Plant and Soil Science
East Lansing, MI 48824
lownds@msu.edu

Abstract

This NSF-funded two year research project explores gender and age differences in attitudes toward technology, space exploration, game design, and learning from games. In addition to rigorously testing the proposition that all-girl design teams will envision substantively different education game experiences than all-boy design teams, this project will provide extremely elaborate baseline research to inform future design of highly entertaining learning games.

By June we will have spent five months preparing our two week Space Pioneer Adventures summer camp (offered to 10 fifth grade girls, 10 fifth grade boys, 10 eight grade girls, and 10 eight grade boys). Working in same sex, same age teams of five, in Week 1 they will experience a wide range of technologically delivered space learning activities. In Week 2 they will envision their ideal space learning game.

Conference participants will see and provide feedback about our baseline participatory learning game design research plan.

Keywords

Cognitive Psychology, Ethnography / Ethnographic Studies, Experience Design, Experience Interaction Design, Participatory Design, User Experience, User Interface Design, User Research, User-Centered Design / Human-Centered Design, Gender Differences, Age Differences, Game Design, Learning

Industry / category

(education, entertainment, games)

Project statement

The argument is computer culture (and by extension, computer software) "could be positively transformed through the integration of girls' and women's insights" [1]

Virtual environments are increasingly being called upon to advance science learning. With possibilities for interactive multimedia displays and learner customization, these environments hold great promise. But are these environments friendly to girls? Computer games, designed by young men for boys and young men, epitomize technology's exclusion of girls, their interests, and values. Less obvious but more devastating, this technological estrangement exacerbates girls' lack of interest and self confidence not just in computers but in science. Technology itself and even the design of technology-enhanced science experiences may disadvantage girls, turning them away from science, math, engineering, and technology instead of engaging them.

Experts urge more women and girls to become involved in software and hardware design, to begin to transform computer culture. The "Girls As Designers" (GAD) project will look at what can happen when girls design their own technology-enhanced science learning experiences. Do girls and boys approach the design process differently? If so, what are the characteristics of a girl-friendly design process? Do all-girl design teams create products that are more appealing to other girls than products designed by all boy teams? Are gender differences more strongly polarized by the end of middle school, or are they equally evident even in fifth grade?

Funded by the National Science Foundation, GAD brings together an unusually close partnership of scientists, designers, and end users. One project goal is to contribute to scientific understanding of the impact of gender on game design. In addition, we will use participatory design techniques to inform creation of highly engaging learning games that appeal to girls and boys. Ultimately we also plan to create out-of-this-world space exploration learning games, although that is a separate project. Our findings should be of interest and useful to game designers and educators.

Project participants

The GAD team includes professors of education, professors of digital media arts, professional designers, space content experts, and K-12 teachers and students. The Michigan State University Communication Technology Laboratory and College of Education are the primary collaborators. Comm Tech Lab multimedia designs have won more than 50 awards since 1990. Many of our products are available online or on CD-ROM. The MSU College of Education is one of the top five education colleges in the U.S.

Project dates and duration

The project began in January, 2003. Space Pioneer Learning Adventures camp will be held at the end of July. In Spring 2004 we will show the child team envisioned professional artist-created promos for the

game concepts to classes of fifth and eight graders and assess their preferences, with final results ready in Fall 2004. Funding for this research is a total of $570,000 over the two year period.

Process

GAD will invite small teams of girls to experience and critically assess a series of high quality science-learning experiences diverse in their technology and extent and form of interactivity, ranging from planetarium show to role play simulated mission to Mars, from CD-ROM games to exploring space science on the web, television to immersive virtual reality. These young, newly expert technologists will then design their ideal science learning experience, with the goal of teaching science and inspiring kids to be interested in science, math, engineering, and technology.

GAD will profile girl reactions to the diverse forms of science learning. The design process and design outcomes of the all-girl design teams will be analyzed and compared to all-boy teams. GAD will compare fifth grade girls (whose enthusiasm for science parallels boys) with eighth grade girls (whose enthusiasm and self confidence in science has declined), looking for similarities and differences in technology attitudes, design process, and design outcomes.

Professional software developers will create visualizations of each team's prototype. With no indication of the gender of the designers, each set of visualizations will be shown to same-age students to discover whether boys and girls prefer prototypes developed by their own gender.

We are still refining the Space Pioneer Adventures camp protocol. Here is a draft plan for the first week, intended to educate participants about space and expose them to diverse technology-delivered space learning experiences so that they become informed designers in Week 2.

day	activities
Monday	Pretest TV Show (Windows on Mars) Garden Combined Hands on & Virtual
Tuesday	Simulation Game Ask the Space Scientist (live) "Liftoff" Mission Simulation CD-ROM
Wednesday	Challenger Center Museum Mission to Mars Role Play Planetarium Show Challenger Center Space Museum
Thursday	3D VR Experience: Mars Flyover Space Learning Game TBA TV Show (95 Worlds)
Friday	Multiplayer Game TBA Mars Red Rover Lego Robotics Web Safari or Brain Pop or Windows to the Universe web exploration

Immediately following each activity children will complete a short questionnaire measuring liking (fun rating, do it again, sense of presence, gratifications, interest in learning this way) and learning (what five interesting things about space do you remember). They will then, in their team of five, participate in a focus group debriefing. We will compare age and gender reactions to different technologies and content.

Here is a very rough overview of the kinds of design decisions the teams will be asked to make in Week 2.

day	activities
Monday	Brainstorm Company Name & Logo Learning Technology Debrief Space Learning Content Debrief National Science Standards Content
Tuesday	Freeform Brainstorm: What Would Be Cool? Choose a Graphical Style Write the Back story
Wednesday	Explore Space Art Gallery, Choose Imagery Define Game Goals Character Creation
Thursday	Rules and Game Play Plan Navigation Sound Track, Sound Effects Selection Envision the Archives (for background knowledge search) Design Game Cover
Friday	View Example Game Promos Storyboard Promo Record Descriptions and Testimonials Prepare PowerPoint Presentation Final Presentation to Game Company

We will be refining the survey and focus group research instruments and the day by day experiences and conducting small pilots to refine our observation and data collection methods.

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References

[1] AAUW Educational Commission on Teaching, Gender, and Teacher Education. Tech-savvy: educating girls in the new computer age. Washington, DC: American Association of University Women, 2000.