Informal Community Science Investigators (iCSI)

Missouri Botanical Garden
Massachusetts Institute of Technology
in partnership with
Columbus Zoo and Aquarium
Red Butte Botanical Garden
San Diego Zoo
Evaluation by PEER Associates

Building STEM engagement for 'tweenage' youth through game play, working with researchers, and community involvement.

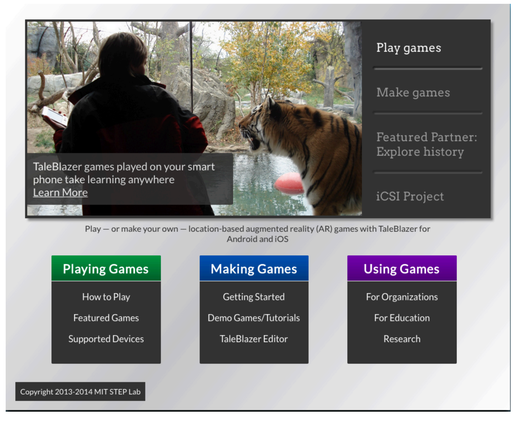
TaleBlazer AR Software

What is TaleBlazer?
TaleBlazer is a digital platform for making and playing mobile, location-based augmented reality (AR) games on smartphones and tablets running iOS or Android.

What is an "augmented reality" game?
Augmented reality (AR) games combine *real-world* locations with *virtual* characters and objects. As players move around the real world, their location triggers interactions with virtual characters, objects and information based on their current location.

Who plays AR games?
TaleBlazer games have been created for zoos, botanical gardens, nature centers, historic locations, and living history museums. Users play interactive games lasting approximately 30-90 minutes using their GPS-enabled smart phones.

How can I create a game?
Game designers (either organization staff or youth program participants) use an online editor to make their own TaleBlazer AR games. The programming environment has lots of room for creativity, localization and unique game-specific interactions.



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iCSI Engagement Path

What iCSI leaders should promote as they design games and supporting activities.

Stage 1: Have Fun
A—Build interest in the natural world
B—Play and design challenging games

Stage 2: Learn
C—Gain science content knowledge
D—Use science skills and tools
E—Think like a scientist

Stage 3: Do
F—Take environmental action at home
G—Improve the community
H—Choose more STEM activities

Stage 1: All iCSI games and supporting activities should be designed to address Stage 1 outcomes.

Stage 2: This is the 'sweet spot' for AR games, and games should involve players in a learning experience integrating some mix of new content knowledge, use of skills and simulated tools, and scientific thinking.

Stage 3: Where possible, AR games model and promote Stage 3 behaviors. Post-game activities are linked to a suite of experiences designed and supported by the host institution and/or other resources.

Long-term outcomes not formally measured by iCSI include building science identity and making STEM course and career choices. Games and activities should set the stage for these, but designers are not accountable for making them happen within iCSI.

Program Evaluation

Game Design Process
- Bi-weekly check-in calls
- iCSI Activity Outcomes Matrix

We found that the regular check-ins between and among the sites helped everyone to learn from each other, get a better sense of what was going on at other sites, and generally increase the cohesiveness of the iCSI team. In addition, the evaluation team greatly increased their understanding of the ongoing iCSI activities, challenges, and successes in designing their games.

The outcomes matrix was designed as a way to encourage game designers to explicitly design games to be geared toward the specific outcomes identified by iCSI staff. For instance, in one game, designers have players learn about potential medicinal uses of plants in order to gain science content knowledge.

User Experience
- Game User Experience Debrief Protocol
- Ongoing check-ins with iCSI sites

Through our regular meetings we discovered several technical and logistical challenges that the program is currently trying to address, including spotty WiFi access and challenges in recruiting participants in the target age range. Several other challenges were reported by iCSI sites and subsequently addressed by MIT staff working on changes to the TaleBlazer software.

User Outcomes
- Evaluation of summer camp programs
- Embedded assessment

From summer camps in 2013, we learned that sites were successful in delivering a challenging and thoughtful experience. Particular areas of success included engaging children in game design experiences and providing stimulating "theme-based" experiences to complement the technological learning. Primary challenges included pre-camp communication, number of adults available, schedule and structure, age appropriateness, and software bugs. Changes have been made to summer camp 2014 to address the challenges perceived.