The Influence of Players’ Interactivity and Identity on Social Games Design for Learning

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ABSTRACT
This paper describes the relationship between social influence and science identity within a massively multiplayer online (MMO) role-playing game. For four months, the beta-test community of a new MMO (Blue Mars) was invited into a science mystery game called Martian Boneyards. This game was designed to support and measure collaborative inquiry during players’ free-choice activity. The tools designed for Martian Boneyards, and the participatory manner in which they were implemented, focused on rewarding players’ contributions as recognized by the player community. The research on Martian Boneyards suggests that exploiting the social influence in game environments may help nurture science identity within non-science oriented gamers.

Author Keywords
Social digital games; online identity; science identity.

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms
Human Factors; Design.

INTRODUCTION
While U.S. learners are becoming increasingly disengaged with formal and informal learning environments, nearly all youth and most adults are engaging more and more in Internet-based free-choice experiences, including games [1,2]. Through collaborative and competitive gameplay, players develop social networks and foster a gamers’ form of identity that comes with their status in the game community and having their contributions recognized by other players. Lee and Roth argue that relationships at the community level are important mediators of scientific activity and identity and we believe that identity fostered within the game may impact players’ understanding of themselves outside the gaming world [3].

The Educational Gaming Environments group (EdGE), a team of developers and researchers at TERC in Cambridge, MA, is designing a variety of digital games with the intent of fostering science learning and inquiry in the gaming public. EdGE believes that if players see themselves as important members of a community of scientific inquiry in a game, they may then gain confidence and motivation for science learning in other venues. EdGE games help foster players science identity that is developed not only by seeing one’s self as a science person, but also in having one’s performance and contributions recognized by a community [4].

This paper reports on the apparent emergence of science identity within a massively multiplayer online role-playing game (MMO) that EdGE designed as a prototype study in summer 2010. For four months, the beta-test community of new MMO (Blue Mars) was invited into a science mystery game called Martian Boneyards. Approximately 250 players participated in the game, with a core of 66 interacting with game tools >100 times. More details on the Martian Boneyards game and the research methods involved in these studies can be found in other papers [5,6].

This paper focuses on the design of games that allows for emergent identity and social influence among players.

GAMES AS PARTICIPATIVE ECOSYSTEMS
In games, players often work together as part of a community to solve (often domain-specific) problems with access to informational resources and tools necessary for each problem [7]. The activities, traits, and behaviors that take place in some role-playing and social digital games are in common with many facets of communities of practice where people work together on domain-specific activities using common habits, language, and cultural rules of engagement and developing an accompanying body of knowledge.

EdGE frames the game experience as an ecosystem where the interactions among the elements of the gaming environment are key (Figure 1). In this type of participative game environment, designers kick off an initial game design with resources and a storyline, but that design is far from static. It is the interactions of the players with those design elements and with each other that influence the
game narrative and further activity. The ultimate game storyline and activity is a product of the player community, with the structures carefully designed by the design team.

For a participatory community to succeed, designers need to provide opportunities for social structures to form into a community of practice—building a language, habits, and practices that help members advance towards a common goal. Etiquette, rituals, and events help to cohere the community (Kim, 2000).

In Martian Boneyards, collaboration tools enabled players to gather data, sync data with communal workstations, tag artifacts (with a rating system so that popular tags are listed first), and post evidence-based claims about the mystery. EdGE designers played characters in the game to facilitate gameplay. They were in the game at designated times and also sporadically to interact with players, but they did not “teach” or deliver content—they only encouraged players to help them find the information needed to solve the mystery.

Players who contributed in some noteworthy ways each week were awarded with “swag” such as virtual apparel and accessories (Figure 2) that helped instill a sense of belonging [5,6]. The designers also held a community award ceremony at the end of the game to award top players for their achievements (Figure 3).

Figure 1: A model for a participative gaming system

Figure 2: Top gamer and designer characters in their Arcadia t-shirts

EMERGENT SCIENCE IDENTITY IN TOP PLAYERS

Two of the top players (both female) reported to be non-science oriented in their daily life, but were regarded by their peers as the top investigators in the game. When interviewed, these players attributed their success in the game to the mystery and their attachment to the community of players. One noted: “I wanted to solve the mystery. If I had to learn science, I’d learn science. I’m a gamer, I never give up.”

Participant observers noted that these top players were emerging as leaders early in the game, but their leadership was not a product of a strong confidence in their own science abilities. They observed that the players’ scientific leadership grew as others started to rely on them, one being called “Doc” by other players. This adoption of roles and players’ sense of identity within the community may be an important leverage point for designers to foster communities of practice in games.

The beta test environment of Blue Mars allowed a unique, immersive, and novel environment for Martian Boneyards. EdGE designers are now looking at ways to foster and measure science learning in a variety of game genres, including wireless apps and augmented reality. EdGE is
further researching how the tacit learning that may be a key part of a gamers’ experience that can be exploited for informal and formal STEM learning.

REFERENCES


