

Interest in the Game Citizen Science - Extended abstract

Introduction

Developing educational video games requires addressing the widespread issues of access to high quality education and increasing the rate at which underrepresented populations pursue science domains (National Research Council 2011). Because video games are widely played, inherently systemic, and show potential as educational tools, they may be especially useful in science, technology, engineering, and mathematics domains (Mayo, 2009). Though many approaches have investigated video games in terms of content within STEM domains, fewer studies have explored the relationship between the game or community and student/player interest. In particular, few guidelines exist detailing how to design a game that improves player interest in predetermined material and little is known about the long term outcomes of video game-based interest development. Despite the need to generate games that not only teach content, but also increase a student's propensity to pursue STEM-related careers or activities in their spare time, our understanding of how video games might be designed and used to trigger interest in socially desirable topics is currently poor.

In this study, we present pilot survey data on the interest-related perceptions of students playing the educational video game Citizen Science, an adventure game in which the player takes the role of a young person in Madison, Wisconsin, who is trying to save a local lake from becoming irreversibly polluted. Researchers developed this game specifically as an educational tool that would serve as an engaging game while simultaneously teaching children about lake science and civic participation. That is, Citizen Science was designed with the goal of generating or improving student interest, leveraging methods within the literature that have previously been successful (e.g. visually and aurally pleasing, character customization).

Because Citizen Science addresses multiple topics that may improve student interest, our goal was to develop a survey tool that would help understand what topics presented in the game were found to be most interesting by the game's players. Our goal in developing a Citizen Science interest survey was to examine differences in interest development across the player base so as to detail the relationship between individual traits, game-play, and learning outcomes. Further, we anticipate that understanding the topic areas in Citizen Science that are particularly interesting will inform its use in formal educational environments and avoid instances where, because diverse student populations may interpret game play differently, the game may have unintended and potentially negative consequences (Gaydos & Squire, 2010; Devane & Squire, 2008).

Theory

Interest, or an individual's propensity to re-engage with content, activities, or objects, may be useful in explaining individual variations in activity development in a video game setting (Hidi & Renninger, 2006, Renninger & Su, 2012). Research conducted by Jansz (2005) points to player control within a video game as an important aspect of their appeal, whereas Przyblski et al. (2012) posits that video games are motivating because they allow players to explore a variety of personas.

Interest theories address only half of the challenge associated with developing educational video games that support interest development, the other half being a theoretical understanding of the video game itself. For example, research on the “catch” and “hold” interest development model (Durik & Harackiewicz, 2007) has highlighted several effective approaches to establishing “catch” in a learning setting, such as enhancing the visual appeal of the learning activity (Durik & Harackiewicz, 2007) or providing opportunities for participant personalization (Parker & Lepper, 1992). Because most video games are designed with both visual appeal and personalization capabilities in mind, they are uniquely situated to serve as an educational tool that encourages players to become at least temporarily interested in inherent topics or themes. This also means, however, that a more detailed understanding of visual appeal and interest may be necessary to improve future development.

Our research examined interest within three domains: interest in lake ecology, civic participation in activities that can improve local lake health, and educational video game play. Based on existing interest models, we believe that these three facets of interest within Citizen Science could predict subsequent engagement in the game’s content material and message.

Methods

Players were first given the opportunity to play Citizen Science for forty-five minutes, followed by a semi-structured interview and Likert-scale interest survey both related to topics addressed through gameplay. The survey was a thirty-three item, self-report questionnaire designed to measure triggered interest in the session (an immediate interest response, or “catch”) and situational interest (defined as temporary and situation-based interest) in civic participation, lake science, and educational video gaming (see Table 1). Thus far, we have conducted sessions with seven university students from the Madison area enrolled in an introductory learning sciences course and will increase the sample size to fifty participants through fall 2012.

Table 1: Breakdown of interest survey content

Topic	# of questions
Lake Ecology	9
Civic Participation	9
Educational Video Games	10
<i>Citizen Science</i>	3
Total	31

Results

Because seven participants have completed the study thus far, analysis of results is preemptive. We anticipate testing for reliability amongst items, performing a power analysis and exploratory factor analysis on participant responses once a sufficient sample size is obtained. Typical tests for assumptions and convergent validity will be run.

Discussion and Implications

This study is designed to measure student interest and engagement with different facets of the game Citizen Science. Many established models of interest development exist, however, studies that explicitly link them to, or test them within, the domain of educational video games are rare (at the time of writing, the authors could find none).

This study marks a movement to begin the development of tools that support large-scale data analysis of population traits that can be used to inform learning outcomes and game-play activity across varying populations. Given the likely movement of video games toward “big-data” and other large-scale digital assessment, tools that provide theoretical explanations of educational game play activity will become increasingly necessary, as large sets of data rely on theoretical rationales for valid processing and interpretation. By focusing on interest, our goal is to begin detailing one measure of the individual that might be useful when making claims about game and player mediated learning outcomes.

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