

Project Summary

Overview

This full-scale development project builds on an award-winning NSF-funded project titled SciEthics Interactive that integrates *instruction in science content* and *ethical decision-making* in virtual world role-playing simulations. In the new proposal, the SciEthics research team will: 1) create a challenging 3D gaming environment from these simulations including new content targeted at underrepresented adolescents and young adults, 2) advance the research on digital gaming's effects on informal STEM learning, and 3) broaden our target audience's understanding of STEM content to stimulate interest in STEM careers.

Intellectual Merit

Most American teens play digital games, potentially as high as 97% percent with fifty percent playing every day (Lenhart et al., 2008). This widespread gameplay transcends ethnicity and socioeconomic status, indicating that nearly all youth regularly learn, create and collaborate in gaming environments. However, little is known about how gaming supports science literacy and identity. Our project will investigate the acquisition of science literacy through serious gaming, with a theoretical foundation in the connection between identity, technology and content.

The immersive nature of gaming offers a high potential for developing a science identity (Bell, 2009) and ethical reasoning. Although the number of serious science games is increasing, no one has created an entertaining multiplayer virtual game centered on ethical issues in informal science learning. Identifying with a field or profession is a key way to develop a lifelong interest, especially important in attracting underrepresented groups to STEM fields (National Academy of Sciences, Global Affairs, & Institute Of Medicine, 2011). This project is unique in that it confronts students with complex science and ethical decisions in a risk-free, informal gaming environment. Diverse expertise among the research team will allow for extensive data collection, user feedback, and reflection from a scientific, ethical, and educational viewpoint.

Broader Impacts

The project team includes public research (Iowa State University) and regional comprehensive (West Chester University of PA) institutions; a non-profit, private institution serving diverse and underrepresented populations (National University); and the oldest Historically Black University in the United States (Cheyney University of Pennsylvania). Partnering with Science Bound and Global Kids, youth leaders from urban communities will play integral roles throughout the project, including sharing the game directly with over ten thousand youth. The SciEthics Interactive game will be made available to learners via desktop computer, mobile device, or a community in the Edmodo Learning platform. SciEthics Interactive is already one of the 200 content providers with direct access to the 15 million teachers and students using the Edmodo platform. The personnel networks we build in order to generate and develop game content will also double as bases from which to partner with schools, school systems, science centers and other organizations to expand access.