Project Name SUNY Games II	

Principal Investigator Peter Shea

Campus Albany, University at

Year of Project 2013

Tier Tier Three

Project Team

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- Tobi Saulnier, First Playable Games
- Aaron Westendorf, Agora Games
- Glenn Van Knowe, MESO
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Overview Summary

Expansion of a joint, online, academic program that promotes understanding of games for learning and results in a network of interdisciplinary participants by partnering with industry (First Playable, Agora Games, and the atmospheric simulation and forecasting company MESO).

Outcomes Summary

Website describes plans for game development across SUNY:
http://blog.suny.edu/2013/08/consoles-and-classrooms-suny-games-ii-to-create-stem-video-games/

Project Abstract

"Videogames are a powerful medium that curriculum designers can use to create narratively rich worlds for achieving educational goals. In these worlds, youth can become scientists, doctors, writers, and mathematicians who critically engage complex disciplinary content to transform a virtual world."

Barab, S. A., Gresalfi, M., & Ingram-Goble, A. (2010). Transformational Play: Using Games to Position Person, Content, and Context. Educational Researcher 39(1), pp. 525-536.

"Barab et al.'s work with Quest Atlantis provides the strongest evidence that science based gaming can be useful for achieving deep learning, but until there are studies that expand beyond tepid exploration of isolated science topics, the full benefits of situated science video games are unlikely to be manifest."

Young, M. et. al. (2012). Our princess is in another castle: A review of trends in serious gaming. Review of Educational Research, 82, 61-89.

SUNY Co-laboratory on Immersive Virtual Environments for STEM Learning

The academic disciplines reflected in Science, Technology, Engineering and Math (STEM) are critical for success in a 21st century workforce. However, research continues to indicate that U.S. students are becoming less engaged and falling significantly behind the rest of the world in STEM disciplines specifically, and college degree attainment generally. In 2009, just 34 percent of U.S. 8th graders were rated proficient or higher in a national math assessment, and more than one in four scored below the basic level. In recent international exams given to 15 year olds in U.S. high school students ranked significantly behind 12 industrialized nations in science and 17 in math. Students in only 4 industrialized nations scored lower in math. Only 30 percent of U.S. high school graduates in 2011 were ready for college work in science.

Through the ongoing development of a joint, Open SUNY program, we will continue to explore how faculty and students from diverse fields across SUNY - art, music, computer science, natural science, management, education and beyond, can collaborate on projects to conceive, design, and create guided, inquiry-based, immersive games that promote deep understanding of STEM content in k-12 settings. Following our initial strategy we argue that a focus on STEM will address significant state and national challenges and will help position the project for additional external funding. We propose that the guiding principles devised in the current project will allow us to continue to successfully develop the program. These include fostering authentic and interdisciplinary STEM learning; engaging students in learning as both game consumers and producers; building an open collaborative infrastructure (Open SUNY network) to enable: cross-sector, cross-campus, and cross-program collaboration.

Why games?

As the Federation of American Scientists concluded from its recent Summit on Educational Games: "The success of complex video games demonstrates that games can teach higher-order thinking skills such as strategic thinking, interpretative analysis, problem solving, plan formulation and execution, and adaptation to rapid change. These are the skills U.S. employers increasingly seek in workers and new workforce entrants. These are the skills more Americans must have to compete with lower cost knowledge workers in other

nations." A growing research and development agenda has begun to emerge in this area (e.g. Barab, Gresalfi & Arici, 2009; Young et. al. 2012) and significant opportunity exists to improve the nature of teaching and learning across educational sectors through a coordinated effort.

Why a SUNY-wide interdisciplinary academic program?

The main weakness with many similar efforts to develop video games for learning has been an individual approach and lack of attention to learning science. Even games that have won the national STEM Video Game challenge are very weak in visual appeal, pedagogy, game play, design, graphics etc. because they are the products of individuals or very small team efforts without a research base. Successful commercial video games are produced by larger teams benefiting from varied talents. Our growing partnerships with industry professionals holds promise in providing insights into effective processes for running virtual design studios, a concept that has grown out of our current IITG project. Serious games for education need diverse talents and resources similar to commercial studios to develop into a more scalable and useful learning resource and/or viable product. More importantly, for such products to be effective their designs must be informed by proven research. One of the powers of SUNY is its breadth of existing academic programs and pools of faculty and students. Through this grant we will continue to identify and bring together the necessary resources and talent to achieve the goals of producing high quality, research-based educational games for STEM learning through a joint online program offered through Open SUNY.

This interdisciplinary approach involves development, application and assessment of innovative use of instructional technology to improve student engagement and learning across disciplines. Ongoing design and development of immersive environments for learning will be the central element of the project. Assessment of effectiveness will also be essential; a core component of the ultimate project will be to conduct iterative, design-based research to better understand the nature of learning in immersive virtual environments. Development of an Open SUNY program also leverages "systemness" in that it utilizes and integrates the varied yet hidden pools of talent across the SUNY system. In bridging higher education and k-12 learning this project also promotes one of the important six "big ideas" of the SUNY strategic plan. Our current NSF grant partnership with Albany High School demonstrates one example of this type of bridging and provides a blueprint for future efforts.

The project will implement the Power of SUNY Innovative Instruction framework, including the SUNY Learning Commons and ongoing collaboration with SUNY Learning Network and SUNY Center for Professional Development. The project will be continue to be shared, participation solicited, and progress documented through the SUNY Learning Commons, the CPD, CIT, and SLN.

Results from Round 1 Funding

As reflected in our mid-term report we have made progress above and beyond the goals of our original IITG proposal. We have created a website that reflects lessons learned (http://sunyresearch.net/IITG) conducted a review of the literature, created a design for the SUNY gaming commons, developed a mini-conference on games for learning, and have two conference session proposals accepted for CIT and one proposal in preparation for the Sloan-C International Conference on Online Learning. We have developed draft program curricula and areas of specialization with partner campuses and investigated governance/policy issues for inter-institutional programs. We have also designed an online Introduction to Games for Education course to be hosted at the University at Albany, which will be offered for credit within the UA CDIT Masters program this summer. We plan to assess effectiveness of this course with surveys, interviews with sample students, grades and direct measures of learning.

The core goal of this ongoing project is to create the infrastructure for a joint academic and research program in games for learning. Critical to achieving this goal is attracting the external resources needed to support the full development of the program. We believe that we have exceeded our initial goals in seeking this kind of external support. While our initial proposal had a goal to "begin to draft" an NSF proposal, our current collaboration has already resulted in a joint submission of a $1,200,000 grant proposal to the National Science

Foundation ITEST Program. We are also currently working on two additional grant proposals and support from the IITG program will allow us to complete this work.

This new phase of the project will be characterized by additional partnering with industry as we seek to develop and acquire the resources and funding to bring our vision to full fruition. New partners on this proposal include the Troy-based game-design companies First Playable and Agora Games, and the atmospheric simulation and forecasting company MESO. We are also investigating relationships with the Boston-based Turbine Games (recently acquired by Warner Bros). The benefits of these partners include in-kind and/or cash contributions above and beyond levels required by the IITG program that will allow us to accelerate success achieved through the initial proposal.

With more than a dozen collaborators representing education, computer science, art, music, game design, instructional design, as well as new industry partners we believe we can continue to create a successful plan, develop additional course work, and build the larger community needed to take this to scale. We also believe that these partners and work to date will make the project a very attractive one for external support. We therefore believe that the cross-departmental, multi-campus, industry collaboration reflected in this proposal warrants funding at the tier-three level.

Conclusion

Fully realized, a comprehensive strategy and accompanying academic program for serious-educational game design in SUNY can leverage Open SUNY to help address widely acknowledged national needs, prepare students for a variety of contemporary and emerging careers, engage external communities, promote entrepreneurship, and position SUNY at the cutting edge in innovative instruction. This proposal continues the crucial work of extending the collaboration necessary for achieving these goals. Fully developed, we envision that this project has the potential to place SUNY at the forefront of the learning sciences in research and development of next-generation immersive environments for learning.

Reports and Resources

- Final project report
- Project website
- Consoles and Classrooms: SUNY Games II to Create STEM Video Games
- Developing Games to Promote Learning
- Mid-project report

Instructional Technologies

- Games (Hardware/Software)