

Transformational Play Spaces For Microeconomics with EconU

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Abstract: As students advance in our educational system, disengagement increases and may contribute to high drop out rates in higher education. Video game play can be a tool to re-engage learners in powerful ways. Transformational Play theory includes conceptual understandings to make sense of and transform a problem-based fictional context. Informed by this theory, the focus of our work is to examine the potential of a game-based learning environment to provide an opportunity for improved learning for an undergraduate economics course.

Introduction

A recent Gallup polls show worldwide engagement in school and work steadily decrease throughout grade school and directly into the workplaces (Crabtree, 2013). The Institute of Play reports that college drop out rates are at 46% in the US and this education crisis can be viewed as an engagement crisis ("Institute of Play", 2014). Video games can provide learners with engagement opportunities that improve academic achievement (Barab et al 2009). EconU was developed by the Educational Gaming Commons in collaboration with Dirk Mateer and Dave Brown from Pennsylvania State University's Department of Economics (See Figure 1. EconU). The main goal of the EconU project was to reinforce economics content by engaging students in more authentic and immersive experiences. Utilizing economic algorithms, EconU was designed so that students would rely on conceptual content knowledge to succeed in the game. In EconU, students took on the role of protagonist as a University President and were expected to build and maintain their own fictional University, by demonstrating knowledge of the following key microeconomics concepts:

- Elasticity
- Trade Offs
- Demand/Supply
- Total Revenue
- Costs
- Diminishing Returns
- Among others

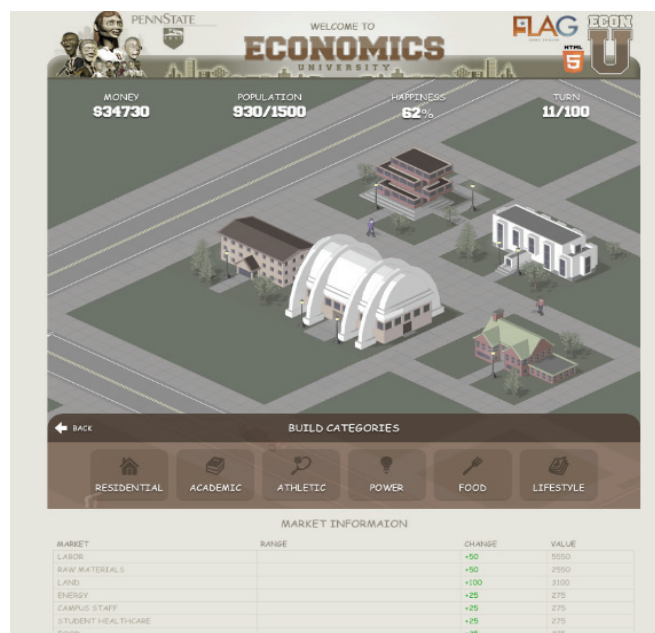


Figure 1. EconU User Interface

Building from previous data, this study represents a design-based iteration that explores game play through Transformational Play (Barab, Pettyjohn, Gresalfi, Volk, & Solomou, 2012).

Theoretical Frame

This research draws from Conceptual Play Spaces with its original theory based on a focus of the design of the instrument. As the team refines its process, we take a more internal stance and begin to draw from the work of Dewey with transactivity (Barab, Gresalfi & Ingram-Goble, 2010), which helped birth Transformational Play. Dewey referred to transactivity as the notion that experiences modify their participants. Barab and colleagues further this idea and determine that these are dictated through transactive states of participation (Barab, Gresalfi, Dodge, & Ingram-Goble, 2010). This study will focus on applying conceptual understandings to make sense of and, ultimately, transform the context (Barab et. al., 2012) through the transactive state of substantive participation (Barab et al., 2010). Substantive participation speaks to Target Concepts of core understandings and practices that students are expected to learn; Legitimate Tasks of increasingly complex real-world and fantastical challenges with nested goals and Embedded Scaffolds that show the availability of appropriate tools, resources, and lessons for understanding. We will use a mixed methods approach to refine the design and implementation of games to support, reinforce, and improve learning in Economics courses. The research questions that guide our DBR study are:

- R1: Are there differences in the impact of EconU compared to traditional methods of review for Econ 102?
- R2: What are the qualitative differences in participation between EconU students and traditional review students?

Current Findings

Preliminary findings suggest that designated C students preferred this method of review and showed more positive reflections of the experience than A students. This may suggest the engagement of EconU resonated with a particular population that would otherwise go unnoticed and deemed marginal students of microeconomics. Towards a critical agenda and contrary to a well-known social stigma, this design work seeks to show that gaming environments can provide meaningful and powerful learning tools and engage a marginalized learning population. This critical design is addressed not only by context (gaming) but also in content (economics), as the study of economics represents the social science that studies the activities surrounding the processes that govern production, distribution and consumption of human resources. Our work aligns with Barab et al. as we view our design in context and content, services a bottom-up change, where our intervention could be leveraged as an instrument for broader social change and potentially stretches beyond economics content (Barab et al, 2007).

Next Steps

In the service of our broader agenda, we take on an ethnographic approach. As an ethnographic study the investigators intend on being participant-observers. They will attend the classes regularly, play the game and participate in the student forums. Toward understanding several layers of meaning that reflect the identities of the members of the learning community, the researchers will work to build a stable profile of the economics learner. We intend on iteratively refining the practical application of the game including the game mechanics themselves to meet Transformational Play needs for meaningful participation (Barab, Gresalfi, & Ingram-Goble, 2010).

References

- Barab, S. A., Dodge, T., Ingram-Goble, A., Pettyjohn, P., Pepler, K., Volk, C., & Solomou, M. (2010). Pedagogical dramas and transformational play: Narratively rich games for learning. *Mind, Culture, and Activity*, 17(3), 235-264.
- Barab, S. A., Gresalfi, M., & Ingram-Goble, A. (2010). Transformational play using games to position person, content, and context. *Educational Researcher*, 39(7), 525-536.
- Barab, S., Pettyjohn, P., Gresalfi, M., Volk, C., & Solomou, M. (2012). Game-based curriculum and transformational play: Designing to meaningfully positioning person, content, and context. *Computers & Education*, 58(1), 518-533.
- Crabtree, S. (2013). Worldwide, 13% of Employees Are Engaged at Work. *Gallup*. Retrieved from <http://www.gallup.com/poll/165269/worldwide-employees-engaged-work.aspx>