

## Game Development for Education

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### KEY IMPLICATIONS

- This study shows that non-digital games, when coupled with a knowledgeable researcher/designer, can be successfully developed and sustainably used in real classroom settings.
- This process produces both useful research tools that can help shed light on game-based learning, as well as professional development activities for teachers looking to expand their practices by including games into their work.
- This study supports considering the way that students adopt different frames during game play as a means for game-based learning.

### BACKGROUND

Though digital games provide a new and exciting medium for education, their high development cost and logistical overhead combined with change-resistant institutional cultures have stymied widespread, effective, and sustained adoption. This study explores non-digital games as a viable alternative.

### FOCUS OF STUDY

Two games, *Sovereign City*, and *Valence*, were designed and used in two different school sites to investigate how students learn

in the context of a game-based curriculum. The games' designs were intended to test a development model previously explained in SUG 36/13 whereby the researcher adopts the role of the designer and developer and teachers adopt the role of clients—a common relationship in commercial development.

This research used two inquiry questions to guide data collection and theory generation:

1. How do students and teachers make sense of the academic concepts that an educational game addresses particularly in light of their understanding of academic concepts previously addressed in their classroom or elsewhere?
2. How do students and teachers make sense of the academic concepts that are addressed in their class outside of game play, given their prior game-based experience, especially regarding the academic content introduced through the game?

### KEY FINDINGS

From Site 1, the study highlights how individuals' identities as students and as players serve as important and intersecting mediators of game-based learning. Specifically, two social frames stand out. Students' group discussions during

game play revealed that actions taken and classroom dialogues revolved around (1) players attempting to successfully complete the game, make strategic moves, and ultimately win and (2) students enacting prior histories with one another in their school setting, where personal and social relationships intersect.

From Site 2, the lack of structural similarity between the concept maps and the content is reflected in the lack of students' discursive linkages between scientific concepts and the game. Additionally, the teacher made only two explicit references to the game in his lecture. It is unsurprising then, that students did not show significant effects from the game structure in their responses or from the order in which the game was played within the lesson.

## SIGNIFICANCE OF FINDINGS

### Implications for Practice

The teachers at the first site have gone on to national acclaim for their work, with the lead teacher on the project receiving the President's Teaching Award for her work on our project, and the team receiving a gold Innergy award. The teachers at the second site have continued to use the game we co-developed and recently embarked on their own game design for a new content area—biology. This study shows that non-digital games, when coupled with a

knowledgeable researcher/designer, can be developed and sustainably used in real classroom settings.

### Implications for Policy and Research

In 2017, the teachers are collaborating with the Curriculum Planning & Development (CPDD) to train other teachers who are interested in using the game, *Sovereign City*, in their classrooms.

### Proposed Follow-up Activities

- Support the development of low-cost, non-digital games by coupling experienced practitioners with a knowledgeable educational researcher/designer
- Test the theory of game-based learning by way of encouraging students to move between frames

## PARTICIPANTS

Two schools, 7 teachers and 138 students were involved in the study.

## RESEARCH DESIGN

This study focused on various aspects of game play in two sites. Multiple data sources were collected and analysed to understand the phenomena of game play and its role in classroom learning. Both qualitative and quantitative analyses were employed to examine the relevant data sources.

## About the authors

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