The *Fate of the World* is in Your Hands: Exploring The Educational Impact of a Climate Change Game

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Abstract: In this poster we present findings from two studies that evaluate player learning from and perception of *Fate of the World* (Red Redemption, 2011), a comprehensive climate change simulation game in which players assume the role of an autocratic world leader charged with selecting political policies and maintaining global political, ecological, and economic stability during the 21st and 22nd centuries. In our first study we interviewed participants (n=6) about their experiences during game play, and recorded gameplay decisions through saved games. In our second study, participants (n=33, experimental n=18, control n=15) completed an extensive survey with standardized batteries as well as specialized questions we designed to investigate how the game might have impacted learning and opinions about specific political policies related to climate change mitigation. Participants were also interviewed.

Introduction

Simulations have been use in classrooms far longer than digital tools have been available. For John Dewey (1900/1990), detailed social simulations (e.g. colonies, mines, farms) were one of the key tools which he used to implement education through occupations, which was a system intended to help children develop an understanding of the complex sociotechnical systems which comprised their society. However, Dewey's classroom simulations were only a qualified success, as teachers found them to be labor-intensive and difficult to replicate. Yet today, Dewey's vision is much more viable, as computer simulations offer an easier, more efficient way to help citizens develop understandings of key socioscientific challenges.

One of the most urgent areas where this kind of comprehensive socioscientific understanding needs to be developed is climate change, and the recent development of an award-winning climate change simulation, *Fate of the World* (henceforth abbreviated *FOTW*), provides for an exciting educational opportunity. In the pilot study that we describe below, we began to examine the question of whether playing *FOTW* could help participants develop a Deweyan appreciation of the complexity and seriousness of the climate change challenge.

The Game

In *FOTW*, the central conceit is that the player has been appointed as the head of a new worldwide agency with quasi-dictatorial powers to enact sweeping political, environmental, and economic policies. Most of the game's scenarios involve trying to slow climate change against a background of resource scarcity, environmental destruction, and economic instability.

One of the aspects of *FOTW* that makes it particularly worthy of study is how complex and difficult a simulation it is. Resource shortages and adverse climatic events, along with the economic and political consequences linked to them, make the simulation challenging for the player to manage, and simplistic solutions are seldom rewarded. For example, if a player decides to ban coal in a particular region without having transitioned the region's economy away from the use of coal, he/she will trigger a severe economic contraction in that region, unleashing political unrest and causing a sharp dip in the tax revenue necessary to pay for implementing new policies.

In order to succeed in the game, it is necessary to monitor a number of variables within the game's underlying model. Above all, players need to monitor CO^2 emission levels, which are by far the most important outcome in the game, but they must also keep a careful watch on political stability, economic growth, deforestation, population growth, education levels, energy stockpiles, and energy generation mechanisms. *FOTW* is not a forgiving game, and failure to understand the game's model, which is constantly accessible to the player via a "stat telemetry" screen, is invariably punished by an inexorable simulated global disaster.

Methods

In the first study, we recruited six adult participants with some prior turn-based strategy game experience to play two scenarios of the game. After receiving a one-hour training session, participants were given one month to successfully complete two game scenarios. The amount of time participants played the scenarios ranged between 10 and 32 hours. No participant successfully completed either of the game scenarios on the first try, but all of the

participants eventually successfully completed at least one of the scenarios. After participants had completed their gameplay, 1 and 1.5 hour long semi-structured interviews were conducted. We are currently analyzing a second study in which we explore prior knowledge and changes in player attitudes towards environmental problems more closely.

Results & Discussion

The first study revealed a number of themes. Perhaps most saliently, many of the participants indicated (and this was backed up by the saved games data) that they began to develop the kind of systemic understanding of social problems that so interested Dewey. P2 offered the following remark: "And it did affect my perceptions… it's just a simplified version of what's really going on… So I think I would maybe retreat from some of my stances on policy."

Most of the players developed a robust understanding of the game's underlying model and made interesting connections to reality. Yet, this understanding did not always take place in the way in which we anticipated: some of the participants understood the game's model, but were also highly skeptical of it.

Still, this understanding did not always take place in the way in which we anticipated: some of the participants understood the game's model, but were also highly skeptical about the correspondence between the game and reality. P3 commented that the game was "preachy" and noted that he "made no emotional connection with the game. It was a number of systems and that was it." Although P3 noted that he learned about a number of factors that might trigger an increase in global temperatures, he was skeptical about the correspondence between the game and reality. P6, meanwhile, found the game to be unduly depressing and actually hacked it so as to reduce all of the policy costs to zero. She commented:

> Almost no matter what I did, the world blew up or war broke out or mass famine… I don't really see the world that way. I see the world more positively, more optimistically, and I think we need to promote that also because the more positive and optimistic a person feels, the more likely they are to do more positive actions.

Clearly, a major obstacle to realizing the game's educational mission is participants' unwillingness to (a) enter the game's interpretive frame and (b) accept the accuracy of the game's representation of climate change and global economics the social problem it simulates. The second study, currently under way, offers a closer examination of possible links between participants' prior beliefs and their responses to the game and also examines the effect of the game on players' attitudes toward environmental and social policies (e.g., coal bans, one-child policies). Participants are taking a survey examining perceptual and attitude shifts. It is anticipated that playing *Fate of the World* will increase players' level of understanding of climate change, increase their concern about the problem and make them more favorable towards aggressive policies to combat climate change.

References

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