

Participatory Online Learning Games as a Next Generation Scenario Building Tool

An open research design for future collaboration*

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* A.K.A., an early attempt at a dissertation proposal that didn't make the cut, offered online to the web in the spirit of future collaboration and ideas. Please feel free to reference, use and adapt, but just get in touch and credit me, as per the CC license below.

Executive Summary

Overview

Planning for long term climate change requires tools that reflect the interlinked, uncertain, and interactive nature of modern socio-ecological systems. The scale of response necessary to deal with these challenges also demands higher levels of citizen participation, political negotiation, and stake holder collaboration. Learning about, and working with, complex climate crises will therefore require new social and technological breakthroughs if our efforts are to be effective.

Thankfully, a new generation of tools and techniques have been developed which attempt to address this challenge. These include adaptive management approaches, participatory social simulation, interactive land use planning support systems, scenario planning approaches and alternative futures modeling; among others. Scenario planning (SP) is one such approach, which is a structured method of exploring uncertainties in the social environment where the level of uncertainty is high, data is unavailable, or for which adequate models and comparators are unavailable. SP is widely used in the business world to help stakeholders uncover preconceptions and blind spots driving their strategies and to expose linkages and uncertainties that will affect its outcome. Proponents claim that it creates an effective double-loop learning process, with significant consensus-building implications, and various studies exist to support this notion. Various SP efforts have also been integrated into urban and ecological land use modeling, some of which deal directly with climate change. SP is therefore an attractive technique for integrating social change into regional climate change planning efforts.

SP has several limitations, however. First, it involves a great deal of background interviews, data collection, face to face discussion, and group workshops. This creates a limit on the number of people who can participate in, and benefit from, the process. Second, SP often involves a predominance of senior decision-makers and subject experts, many of whom may exhibit conscious or unconscious vested interests in maintaining

systemic continuity and the status quo. This has the potential to reduce the range of sources, perspectives and possibilities a group is willing to consider, thus potentially biasing its results. Finally, the SP process is highly dependent upon the skill and experience of SP facilitators and scenario writers. The combination of participation limits, participant bias and author subjectivity can cause important viewpoints to be missed, important data or trends to be ignored, or unpopular and unpleasant futures to be dropped; all of which limit the utility of SP as a robust tool for social complexity simulation and foresight. These limitations could be address, however, and the process markedly improved by involving larger, more diverse participation over spatially and temporally distributed areas.

Web enabled learning games offer a potential solution for improving SP and unlocking its benefits for regional climate change planning. Research has found that games can facilitate increased motivation, promote active and participatory learning, encourage socialization and group problem solving, and facilitate complex negotiation and high level collective problem solving. They do so by creating a shared environment which encourages trial and error, provides immediate feedback, and promotes situated understanding of complex challenges. Massively multiplayer online environments such as *World of Warcraft*, *Halo 3*, and *SecondLife* demonstrate how such approaches can be effective at motivating hundreds of thousands of distributed users to socialize, interact, and execute complex challenges in dynamic and uncertain problem spaces. An emerging genre known as “alternate reality games” or “augmented reality games” (ARG) such as *I Love Bees*, *The Beast*, *World Without Oil*, and *Tomorrow Calling* connect these communities in real world, virtual/physical hybrids which suggest even more effective ways of involving large numbers of in complex, multiparty, distributed problem solving tasks through a process dubbed “collective intelligence”.

This white paper seeks to explore the potential of massively multiplayer alternate reality games (MMARG’s) to contribute to real world challenges by testing its utility as a

next generation scenario planning tool for complex socio-ecological problems. Research suggests that MMARG's may have the potential to overcome some of the limitations of traditional SP techniques outlined above and could provide concrete value for engaging with interactive social problems such as climate change. If successful, such an approach would exhibit demonstrable value for adding a social dimension to simulation models like AF, for pioneering next generation SP techniques, and for producing new insights into the kinds of "wicked problems" faced by many areas such as South Florida.

Open research questions

It is proposed that a combination of various collective intelligence, crowd sourced and Web 2.0 techniques in an experimental, game-like fashion could form the foundation of the next generation of scenario planning. To test this assertion, an experimental action-research game could be created to test the following research questions:

1. Can web-enabled learning games be used to involve non-traditional participants in complex urban planning and climate change debates?
 - a. Does participation in such a game increase users' understanding of issues involved?
 - b. Does participation influence the participant's opinion about such issues?
 - c. Does participation influence the participant's willingness to get involved in other efforts, take action, or support proposed adaptation policies and plans?
2. Beyond these participatory and pedagogical impacts, can said games be structured in such a way as to provide meaningful inputs to real world climate change planning efforts?

- a. Specifically, can they be structured to produce meaningful, internally consistent narrative scenarios similar to those produced in traditional SP processes?
- b. Also, can said narratives be adapted for use as valid inputs for quantitative simulation modeling exercises such as GIS land use growth models or more sophisticated agent-based social simulation models?

Proposed game structure

Alternate reality games (ARG's) are a new and emerging form of social interaction, both over the web and in physical space. It may therefore be useful to provide a thumbnail sketch of the proposed game and its workings in order to familiarize the reader with how it can be used to generate data for the research questions outlined above.

Game designers and scholars often identify the following elements of a successful game. These include:

1. Narrative background
2. Target user identity
3. Game goals
4. Player roles
5. Game tasks or challenges
6. Skills, tools and resources available to meet these challenges
7. Game play mechanics
8. Outcomes and evaluation / feedback

The proposed learning game could have a working title such as, “*Climate Cadre: It's up to You to Save the World*”, or “*World of ClimateCraft*”. The game would take place in a world of ineffective governance and rapid climate change, where it is up to teams of players to work together to map this world, acquire territory and status, and solve collectively challenges.

Proposed elements of the game could be as follows:

1. *Narrative background*

The game takes place in an alternate reality, several years in the future but essentially similar to today's world. Florida's government and industries have failed to adapt to climate change, and it's up to the players to save their city. Players form small "cabals" of highly trained eco-designers, whose job it is to identify changing climate patterns, respond to crises, assess damage, and propose solutions to get their city back on its feet.

The game begins when the polar ice sheets melt, producing an instant overnight sea level rise of 6 feet. Most of Florida's coastal towns are immediately subsumed underwater. This produces a range of surprising consequences, including governmental paralysis and a near total media blackout. It is the player's job to understand what has happened and what to do about it.

2. *Target user identity*

The game will be targeted to attract "smart kids who want to save the planet". This will likely include high school and college age students, but is broad enough to encompass anyone who considers themselves a "smart kid who wants to save the planet". Players will be cast as "super-skilled, semi-secret, future minded, locally embedded, culturally collaborative eco-design climate heroes"; a kind of secretive Jedi-knight collective whose mission is to save the city, stabilize the climate, and rebuild a more resilient community.

3. *Game goals*

Game goals will include real-world exploration and mapping of urban critical infrastructure, competition against other teams to solve puzzles and dilemmas related to climate change impacts (both online and in augmented reality space), and discussions about climate change trends, social response, and various dynamic social interactions.

4. *Player roles*

Although final player roles will only be decided after stakeholder interviews and game prototypes, the following list suggests potential player roles in character with the spirit of the game:

- *Spatial Analyst*: A maps, simulation, and spatial data integration specialist
- *Media Ninja*: A perception artist, attention tutor, public propagandist. Someone expert at influence, PR, media creation, political spin
- *Social Activator*: A coalition builder, red tape assassin, political enabler, social "fixer", motivational mercenary whose job is to recruit, educate and mobilise people
- *Matter Manipulator*: A physical design specialist, mechanic, prototype, architect, engineer, designer, etc.
- *Intelligence Analyst, aka, the "Sense Maker"*: A data analyst and intellectual synthesist, responsible for data fragment collection, trend integration, hypothesis creation, etc. An expert in emergent phenomena reading, social science combinatrics, economic integratonism and future conditions back-casting
- *EcoSysAdmin*: A specialist in complex natural and human systems, with a highly attuned understanding of energy, water, nutrients, waste, ecology, biology, chemistry and living systems theory.

- *Resource Amplifier*: The money guy, able to identify opportunity and bring social, economic and media resource to bear in order to exploit emerging potential for social action.

5. *Game tasks or challenges*

Players would be tasked with exploring and creating various scenarios for how different social systems and groups will respond to sea level rise (SLR), then backing these forecasts up with real world evidence and argument. Challenges will be of sufficient difficulty to require collaborative solution, either through small teams or collectively as a group. They will also be structured in such a way as to produce necessary data for SP policy exercises. To ensure player interest and fun, however, challenges will be cast in dramatic narrative contexts, potentially with time limits, and in competition with other player teams.

Task challenges may include:

- *Field reconnaissance*: Use GoogleEarth, Flickr, and other online tools, combined with physical in person visits, to document, map and analyze the extent of SLR damage and its impacts.
- *Social structure mapping*: Creating maps and networks of key social actors and interests, to be used to identify “social fault lines” which broke after SLR. Narrative creation of how different stakeholder groups responded of SLR and what their current position and attitudes were.
- *Vulnerability assessment*: Integration of field data into social, economic and infrastructure vulnerability stories, identifying key drivers, key weaknesses, and key vulnerabilities which broke as a result of SLR (and threaten to cascade towards further system failure).

- *Driving forces historiography*: Producing plausible explanations for how the world got to where it is, including past trends and drivers, actors, etc. Best analysis or suggestions wins.
- *Specific-based catastrophe prevention challenges*: Utilization of player team's databases and problem solving skills to solve specific SLR / critical infrastructure failure challenges. These could include the potential failure of nuclear reactors, the arrival of hordes of climate refugees, toxic industrial waste seepage, power outages, etc. Players will be required to combine real world geo-caching exercises in a scavenger hunt format to collect key items and propose solutions to stop various crises.
- *Policy recommendation*: After immediate crises have been solved (and potential social reactions mapped), players will be required to produce policy and design proposals to stabilize their city's life support systems and respond better for future climate catastrophes.

6. *Skills available to meet these challenges*

A variety of skills will be available to different player characters to help meet these challenges. Skills also double as scoring mechanisms depending on player and team accomplishments. Potential skills include the following:

- *Coalition building*: Rewards for creating networks with team mates and other teams, rewards for recruiting new game players
- *Extreme-scale collaboration quotient*: Rewards for the amount of time, messages, actions, and useful comments offered to others in the game
- *Data mining*: Rewards for adding new and relevant data to the community database, known as "data fractions".
- *Sensemaking*: Rewards for creating compelling combinations of data fractions that make sense of what is happening and help in problem identification. Particular awards for "spotlighting", revealing a large and

previously unknown critical issues and for “trend sensing”, putting together data fractions into plausible trends and mini-forecasts

- *Protovation*: Rewards for submitting prototype solutions or designs for identified problems, called "proto-probes"
- *Commentationality*: Rewards for providing useful and numerous comments or feedback on data fractions, sense trends, and proto-probes
- *Stratagility*: Rewards for responding quickly to novel and emerging circumstances, i.e., for rapid response times.
- *Influency*: Rewards for getting covered in mainstream media outlets and elevating attention to the challenges and solutions
- *Spatiality*: Rewards for covering large geographic areas and involving non-local teams or participants, for extensive geo-tagging using user created stickers and tags on real world objects

Note that the terms “Extreme scale collaboration”, “Protovation” and “Influency” are taken from the Institute for the Future’s prototype collaborative forecasting game, *Superstruct*. Skills will be used to help solve online problems as well as to measure accomplishments, i.e., skill points are awarded based on different achievements but also may factor in to their ability to solve problems (depending on the level of technical sophistication involved in online portions of the game).

7. *Tools and resources*

Players would have a variety of tools and resources available to solve these challenges, including GoogleMaps and GoogleEarth, wikis, forum, blogs, digital photos, Facebook, Twitter, iPhones, YouTube, RSS feeds, phone numbers and responsive cell phone systems such as SCVNGR. All game play will take place in a web-based collaborative space, based on MIT servers, which

will serve as the “eco-design” team headquarters. This will allow player teams to coordinate their actions, as well as for research team members to help orchestrate and administer the game through secret instructions from HQ.

8. *Game play mechanics*

Players would play the game both online and in physical reality. There will be no actual game application or 3D world such as *World of Warcraft* or *SecondLife*. Instead players will draw from a range of online resources including specially designed blogs, websites, and forums to piece together clues, offer suggestions, and play the game. Various missions and challenges will require physical face to face meeting and exploration as well, such as various field intelligence collection exercises, scavenger hunts, and the like. All interaction and response will be player generated, forming the bulk of the game’s content creation.

9. *Outcomes and evaluation / feedback*

Successful games exhibit a mix of both real time feedback and long term reward. Immediate feedback will be provided through the use of physical scavenger hunts and geocaching exercises, as well as through timed events such as phone calls, RSS feeds, Twitter statements, etc. Many ARG’s use dramatically timed events in a “count-down” format to maintain suspense and involvement, as well as provide time for players to solve complex problems such as code breaking and clue research. The exact nature of the challenges and rewards will of course be dependent upon detailed game design and user feedback, but will likely follow along these lines.

Testing of the results

It is hoped that the creation of an experimental, action-research ARG for scenario planning would produce meaningful data that would be relevant for future research. Player-created content derived from the completion of various tasks will likely produce all of the material necessary to test issues of SP relevance. This will include the creation of key historical drivers, post-SLR social forecasts, and other similar narratives, etc.

In-game player statistics such as the number of players, number of teams, amount of play, number of messages posted, etc. would also provide data for more formal evaluation of games impact on attracting new stakeholders. A series of pre-test and post-test questionnaires could be used to elicit players' level of knowledge on key climate change issues, their opinion about how such issues should be dealt with, and their self-reported willingness to pay (or willingness to support) a variety of climate change policy packages. This would provide the raw data to evaluate of participation in the game produced substantive learning benefits, on top of any data collected on the content benefits of such an approach for SP.

Contribution and benefits

The hypothesis driving this open proposal is that new methods for engaging communities and society are necessary if we are to prepare for the changes caused by climate change. The poet and social critic Audre Lorde once famously remarked that, “the master's tools will never dismantle the master's house.” By this I believe she meant something similar to Einstein's quote, “we cannot solve problems by using the same kind of thinking we used when we created them.”

The 20th Century delivered us a set of social and technical tools based upon the problems of that time. The 21st Century demands that we must invent new ones if we are to thrive in the changing environment of tomorrow.

Complexity science, learning theory, and computer simulation have provided us with tools for understanding socioecological challenges like climate change. Yet our ability to use them has not developed fast enough to take advantage of what they have to offer. The question that these ideas strive to address is, “can we leverage our innate ability to learn through play in a way that will help us understand, prepare for and address the fundamental challenges of our time?” I believe that conducting action-research leaning experiments such as this one will help us answer this question and, in doing so, better prepare us for a rapidly changing world.

Afterward

Although this research idea was an initial draft of my PhD thesis proposal that was later significantly modified and focused, I still feel that this is a very sexy, interesting, and valuable idea that should be taken up and pursued. I am therefore very eager to give the ideas away and collaborate with someone else (academic, student, gamer, whatever) who might be interested in giving these ideas or this game life.

Appendix: Some examples of popular alternate reality games

World Without Oil: <http://www.worldwithouthoil.org/>

I Love Bees: http://en.wikipedia.org/wiki/I_Love_Bees

Black Cloud (by the McArthur Foundation): <http://www.blackcloud.org/index.html>

The Lost Ring (sponsored by the IOC for Beijing, 2008): <http://www.theloststring.com/>

