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Teaching with AudaCity: A Board Game for Urban Studies

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Abstract: In order to improve undergraduate students' mastery of urban theory, we developed an active-learning module that allows participants to compete with one another in a board game of strategic planning and coalition formation called "AudaCity." Utilizing a games-based learning design, the game places players in the roles of adversarial property developers, political actors, and zoning committees all seeking to build and raise rent from developments within a spatially-constrained urban grid. Game mechanics such as proximity bonuses and limitations to available space compel players to simultaneously compete against and collaborate with their peers to advance their development agenda while thwarting rival projects in the hopes of generating more wealth than their competitors. Unlike a prescribed simulation, the final outcome of the game is an urban environment organically generated from the accumulation of the players' individual decisions. In this paper, we provide an overview of the game's mechanics and place the game within the larger context of game-based learning and serious games. Importantly, we note that urban studies classrooms were at one time an early adopter of the games-based learning design, but the inclusion of simulation in teaching urban studies has waned since the 1970's. We hope that this active-learning module can demonstrate the effectiveness of allowing undergraduate students to master urban theory through the negotiated construction of their own urban space and inspire future instructors to return games-based learning to urban studies. We draw on qualitative data from several courses in which AudaCity was implemented to demonstrate its effectiveness in facilitating student learning. With data from several instances in which AudaCity was used in undergraduate courses and writing assignments completed by students after playing the game, we find that playing AudaCity helps students be able to discuss urban studies models and theories clearly and connect these models and theories to both their game experiences and relevant situations in real-world cities.

Keywords: urban studies, board game, games-based learning, growth machine theory, sociospatial perspective, real estate

1. Introduction

AudaCity is an interactive, competitive board game where learners act as "real estate developers" seeking to build and raise rent from developments within a spatially-constrained urban grid. Following a games-based learning paradigm, we find that this game increases student engagement and facilitates learning. The peer-competitive aspect of the game heightens students' understanding of urban studies models and inspires students to connect their learning to real-life urban growth dynamics. In this paper we will delineate the game mechanisms and demonstrate student learning using data collected from several instantiations of the game in a variety of classrooms.

2. Background

The active-learning paradigm encourages instructors to create experiences that require learners to contribute to the instructional environment. Unlike traditional lecture the active-learning approach creates "learning opportunities for our students that allow them the opportunity to *experience course material, rather than just think about it*" (Wills, Brewster, and Fulkerson 2005: 394, emphasis added). A review of today's post-secondary pedagogy demonstrates the effectiveness of active-learning exercises (McCammon 1999, Petranek 1994, Scarboro 2004, Smith 1996). Games-based learning, an example of active-learning, employs techniques where students either play interactive games or role-play a simulation to achieve goals within a prescribed set of conditions of varying complexity. Examples of simple applications are modifications of well-known games or "quiz-show" games that may bolster engagement by encouraging a competitive spirit among students during a single class session (Jessup 2001, Pence 2009, Schella and Rojewskia 1995). At the other end of the spectrum, students may role-play as characters that interact with one another in a long-term simulation sustained across many class sessions (Simpson and Elias 2011).

Whether a token game or a complex simulation, all games-based learning techniques break from the traditional lecture structure by providing students with the agency to exert some control over the learning framework. This higher-order engagement has been repeatedly identified as a means of overcoming students' reluctance to engage with intimidating academic concepts (Coghlan and Huggins 2004, Pedersen 2010). As students evaluate, strategize, and compare their choices, they develop a robust experience with the course's

theories and concepts - turning the abstract into something "real" that they can reflect upon. The most successful games-based learning applications pair critical decision-making with immediate feedback and the opportunity to identify links between their experiences and course concepts (Norris 2013, Steele 2003).

During the 1950's and 1960's, urban theory classrooms were trailblazing in-class simulations designed to explore social problems like overcrowding, environmental hazards, and spatial inequality (Nikkel 1976). The best compilation of urban simulations from this period is an edited volume by Coppard and Goodman (1979) in which they collected and summarized dozens of urban simulations developed by a variety of individuals – from educators to policy makers. Coppard and Goodman's collection raised two important critiques of urban simulation. First, most required a significant sacrifice of time; some ranged in duration from over a week to an entire semester. Next, many of the games also involved significant management by a supervisory instructor, which can impede the flow of gameplay and reduce students' sense of control over outcomes. Over the next few decades, the use of games and simulations to introduce students to urban dynamics waned dramatically (Dorn 1989).

Today's incarnation of "urban-themed games" have limited use within an urban studies classroom. While the most popular board game of all time "Monopoly" (Magie and Darrow 1903) is superficially a "real estate game," its utility in teaching urban theory undercut by its static geography and the reliance on the luck of the dice roll, irrespective of any meaningful diplomacy. In contrast, settlement games like the highly-praised "Settlers of Catan" series (Teuber 1995) encourage players to construct their empires by negotiating over limited space and resources. Unfortunately, most strategic settlement games are designed around historic (often ancient or pre-industrial) themes and require an investment of several hours of time to complete - a luxury rarely viable in an undergraduate setting (Veracini 2013).

In digital simulation, the most visible example of urban dynamics is the popular "SimCity" series (Maxis 1989). "SimCity" is an electronic game which allows individual players to manage the growth of a city, allocating budgets on infrastructure, planning transportation, and implementing zoning. While effectively introducing some key features of urban planning, Gaber (2007) identifies how SimCity contains several limitations as a pedagogical tool. Foremost among these is that real cities are not constructed based on the whims of a single omniscient dictator. To be a useful tool for modeling urban growth mechanisms, a game must engage multiple actors seeking both shared and competing interests.

3. Audacity: Teaching urban dynamics through active-learning

AudaCity is an active-learning game in which students role-play as developers and political actors in a simulated urban space. The game requires face-to-face negotiation and hands-on play which facilitates multiple methods of learning. As players pursue their individual interests, a unique city-space is developed that closely mirrors many of the features seen in contemporary cities. AudaCity is designed for four to six players. Gameplay takes place in four phases over six, eight, or ten rounds. The phases will be described in brief detail below (a full set of instructions is available from the authors upon request) and a game of six rounds may be completed in about 90 minutes.

3.1 AudaCity as the board game

In "AudaCity," each player's goal is to accumulate more wealth than the other players by collecting rent from "developments" that they place on the game board. These developments are represented by tiles that vary by shape, size, rent value, and initial financial investment. Importantly, players may not simply set their developments on the board as they wish. Before any development piece can generate rent, all players must complete the following steps in turn: (A) strategically select an unclaimed space on the game board that can contain their development tile, (B) pay the cost to tentatively place the development at that site as a "proposal", (C) negotiate with peers to secure political support for their proposal, and (D) players with "surviving" proposals pay the final "construction cost" of the development tile to convert their "proposal" to a permanent rent-generating development. For brevity, we will limit our explanation of the gameplay to the two complex steps: proposal placement and negotiated political support. The AudaCity board is a grid of uniform " blocks" separated by long columns and rows that operate as placeholders for streets. At the start of the game, a few long tiles representing streets are placed between blocks to indicate which city blocks are connected to a transportation system and thus "active" for play. As game play advances more streets are added, opening up new blocks for development.

Much like real urban space, not all locations are equal in value or desirability. On the AudaCity game board, developments' rental income is modified by the spatial conditions of their placement: block density (sharing a block with other developments), nearby government infrastructure (such as parks or prisons), and street frontage (adjacent to street tiles). Figure 1 illustrates an example where three strategic placement options are available to the "green player" (indicated by the letter "G") during the course of a game, seeking the best possible placement for a 2" x 2" development tile within three active blocks.
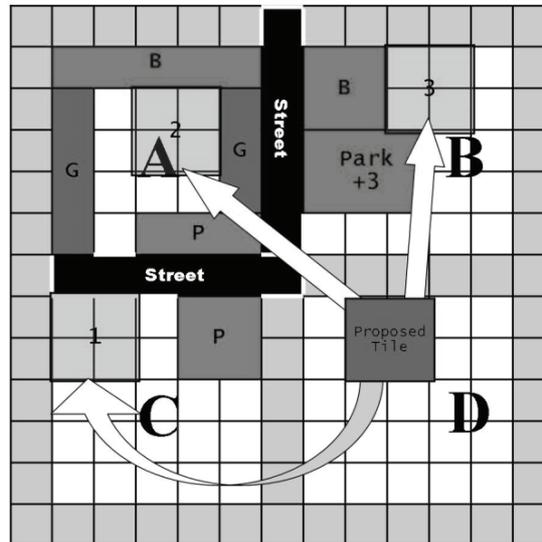

Figure 1: Examples of development placement strategy to three "blocks"

In option 1, the green player's potential development would be place in Block C and receive a rental income bonus from two squares of street frontage and a single neighbor. In option 2, the green player would forgo the street frontage to secure the rent bonus generated by sharing a block with four neighboring structures, two of which are their own. In option 3, a future-minded green player could benefit from the rent bonus generated by sharing a block with a city park and might see their development's value increase later if a street or other structures are added to that block.

The impact of these spatial modifiers is twofold. First, the game-space better reflects actual urban space where a development's value is determined by its proximity to amenities, accessibility, and density. Second, the "city" built through play is organically created through the accumulation of individual players' decisions instead of a static board or pre-planned script - thus a dynamic play space in which no two games are the same.

3.2 AudaCity as a role-playing simulation

While players are acting as developers seeking to maximize their rent, players also role-play as local political forces that possess the influence to determine which proposals will survive a vetting process each turn. To select the roles for the game, we drew inspiration from Logan and Molotch's (1987) seminal work on urban growth modeling and selected six local "growth machine" actors: the mayor's office, the city newspaper, the local chamber of commerce, the labor union, the city university, and the utility company. These roles determine how much political power each player controls and determine the order in which players place proposals and vote.

Players select their roles every other round through a blind, simultaneous bidding process where they commit some amount of their money to "run for office." The player who bids the most money wins the right to choose their role (and thus turn order and political power) first, followed by the second-highest bidder, and so on. Regardless of the outcome, all money bid is lost, so players must decide for themselves what value they place on selecting roles. Once the players have chosen their roles and placed their proposals in the assigned order, the negotiation phase takes place. Players consider the relative advantage and disadvantages of the proposals that have been placed on the board and choose to distribute their "support tokens" (a representation of political influence) onto the proposals they most favor.

Two key rules shape gameplay and strategy in this phase. First, the proposal with the fewest "support tokens" at the end of the negotiation phase is removed from the board, unbuilt and the money spent to propose the development is thus wasted. Second, players may not vote for their own proposal. As a result, players must lobby their competitors to support their proposals or they will lose their proposal investment and the opportunity to build a rent-generating development. The potential exclusion often leads to players framing debates in terms of how their proposed developments would actually benefit their peers. Often sub-groups of players will coalesce around shared interests and form coalitions to ensure the success of their development goals (or the failure of perceived threats) through bartering for money, support tokens, and political favors.

The AudaCity game continues through these phases of role-selection, development placement, and negotiation through the predetermined number of rounds. Players allocate their "cash-on-hand" according to their own strategy: bidding on "growth machine" roles, placing developments, and buying influence through bribery each round. At the end of each round, players collect modified rents from all of their developments. At the end of the final round, players collect rent, and sum the construction costs of their built developments, and add that to their remaining cash on hand. The player (or team) with the greatest wealth is the winner of the game.

An additional layer of collaboration may be added to the game by having teams of three or four students play as the individual actors on the board. This way of playing was attempted in one playtest, and has the advantages of reinforcing student knowledge as they discuss with their teammates the strategies and choices available to them and allowing several more students to play on one board. This style of playing, though, does dramatically slow the pace of the game, and has the potential to leave some players feeling left out when their team does not agree their individual strategy preferences.

4. Evaluation

Evaluating the effectiveness of serious games is important, and as Baptista and Carvalho (2013) demonstrate, the first question to ask is "does the student learn with this product what he/she is supposed to?" (4). Here we will demonstrate student learning with evidence from post-play writing assignments completed by students after instantiations of the game in several settings. The post-play writing assignments were adapted from Fisher (2008) and Wills, Brewster, and Fulkerson (2005). These assignments facilitated student reflection on several facets of the experience - from the events and emotions of the game, to the ability to generate explanations and generalize from their experiences.

For this evaluation, the AudaCity module was implemented along with post-play writing assignments as a required activity in four mid-level urban sociology courses at three different institutions. Two of these courses were at a large public state university (35 students, and 47 students), one was at a small private liberal arts college (19 students), and one was at a regional state university (40 students). In each application, students split into small groups of four to six players and each group received a copy of the board game and materials for simultaneous play. The instructor then reviewed the rules of the module and allowed the students to play the game without direct oversight. Occasionally students asked questions concerning minor rule clarifications. Towards the end of most games, and in informal debrief sessions in class, students volunteered their reflections on the impacts of their choices.

4.1 Learning objectives

Combining the post-play writing assignment with AudaCity, we expect that after these activities the student will be able to:

- Apply urban studies theories and models to describe how development processes in the game.
- Compare and contrast game situations to real-world urban dynamics.

The post-play writing assignments provide substantial qualitative evidence demonstrating how students met these learning objectives by making explicit connections between the gameplay activity, models and theories, and issues in the real-world. Here we quote clear, but representative, examples of student writing that demonstrate their attainment of the specified learning objectives.

The first learning objective expects that students will be able to demonstrate how urban studies models and theories explain development processes in the game. In the courses examined here, the two major models of

development processes which students consider in these writing assignments were Logan and Molotch's (1987) growth machine model, and Gottdiener and Hutchison's (2011) sociospatial perspective (SSP). In these assignments, students choose to write about one of these models.

One student applied the growth machine model to explain their game because coalition formation was a major part of their gameplay experience. As they wrote, "I found the best strategy was to keep people from joining forces against me by coming to an agreement with *one* of the involved parties, often to the loss of the other. This weakened their ties with each other, making at least one of them more likely to side with me." This student explained their perspective was that building a coalition, and being able to express that coalition's growth proposals as good for all players was an essential piece of strategy. As the student wrote "The key to all of this … involves proposing things that are greatly beneficial to you in a subtle manner, as if you're not aware of how much it helps you. Then make cases for how each decision you make actually benefits one or more of the other players."

Other students, though, were equally able to apply the SSP to what they experienced in their games. In the following example, the student highlights how the focus on spatial particularities in the SSP helps explain their gameplay "It was virtually nonexistent for someone to vote for a proposed building that did not inhabit the same city block as one of their own buildings. In other words, it was space that defined the nature of our relationships with each other, not just the ultimate goal of growth."

This same student elaborated on how other facets of the SSP were applicable to experiences in their game. In particular, the student explained how space on the board was socially constructed in much the same way space is perceived to be socially constructed in a city by the SSP. They discussed "… Every developed space was 'socially constructed' by the various temporary coalitions that formed. Each city block was a reflection of our own interest … Some city blocks would … fail early on because one or more of the members would begin to place their proposals in a different block that seemed more personally profitable to them. When this would happen, the coalition that formed around the development of the original block would fail and a different coalition would form around the new block."

These examples are representative of how students demonstrated their ability to make use of both the growth machine model and the SSP to explain development processes in the game. Students with this ability see how models are useful in identifying relevant aspects of development processes and are also able to clearly summarize how those specific pieces of the process played a role in what happened in the game. Rather than seeing the winners and losers of the game as "lucky," students realized that that players who were best able to make use of their relative position within the framework of the game were most likely to do well. Reflecting on the game and writing about what happened in the game in the context of one of these models reiterates the lessons learned in the game while also affirming the usefulness of these urban studies models.

These post-play essays also demonstrate evidence of student ability to apply a variety of urban studies concepts to gameplay. For example, one student reflected on how various actors have dramatically different perspectives on development and the value of urban space. This student referred to urban sociologist Henri Lefebvre in explaining the variety of social understandings of space, writing that: "Lefebvre's work applies to the gameplay within AudaCity because capital investors and businesspeople do think about space abstractly, much different than the social ways in which residents or individuals think about space." As the student elaborated, "While individuals are thinking of a place to live, the environment they want to have for their children, etc., businessmen and political figures are more interested in what will bring the most money and opportunities to the area in which they live, work, or represent."

After studying urban theories and playing AudaCity, students should also be able to draw connections between models and theories from urban studies, their gameplay experience, and what they see in real world urban development, thereby meeting the second learning objective. One student's response drew parallels between frustrations with the political debate in the game and those at actual town council meetings, which the student had attended. This student explained in both AudaCity and real-world meetings "the issues at hand were arguably more about the benefit of one or two rather than that of the city as a whole."

As another the student explained, AudaCity's "complexity forces you to interact in a similar manner to how real-world movers and shakers make decisions." The student described attending local Urban Land Institute

meetings and explained the connection between the game and the real world by writing, "Just like in the game, each actor describes how something will benefit the community as a whole, when it also greatly benefits them. Coalitions form between different groups, if they see ways to manipulate opposing factors to their mutual benefit."

4.2   Demonstrations of engagement

Beyond the specific learning objectives, it is clear the students appreciate the game and associated assignments. This is important, because as Baptista and Carvalho (2013) explain, to be effective serious games "must be motivating, enjoyable and create pleasure in the learner/player in order to build his/her knowledge" (4). Indeed, as Fisher (2008) demonstrates, if students are emotionally invested, they are more likely to retain lessons learned. With AudaCity, some students expressed trepidation in anticipation of their gameplay experience. For these students, the instructors answered questions and encouraged the students by ensuring that the game mechanisms become easy to understand in practice. With this support, students engaged in their games with all groups completing several rounds of play. Of course, not every student met every learning objective in their post-play writing. A small minority of students came to the gameplay experience obviously unprepared and uninterested or reluctant to play. Despite their reluctance and unpreparedness, their fellow competitors remained able to complete several rounds of the game and were equally able to attain the learning objectives in their post-play writing as students from any other group.

Most students, however, expressed positive reactions to the game in their reflective essays. One student summarized these feelings by writing, "I thought the game did a great job of simulating how city development actually works. The way the players give proposals each year and are almost fighting over the most profitable property areas is very much like the real estate business in actual city development." In each of these courses, the instructors noted improvements in the general tone of the class atmosphere after the AudaCity activity, with students participating more frequently and more thoroughly in class discussion. Several students noted that they felt playing the game and writing the reflective essay was as one of the most effective learning experiences in their course. Another student wrote that "the game can really get people's blood boiling, but it's a lot of fun to play."

During informal debriefing sessions in class after gameplay, students shared reflections on strategies and choices, underscoring their understanding and engagement. Several reflected on the importance of convincing their competitors to support their developments. Others stated that they felt the game allowed them to see how important decisions that impact whole cities are often made in complex, "messy" settings.

While not every student in each of these classes demonstrated overt excitement about the activity, even reluctant students engaged concretely with their competitors in their activity. The professor from the liberal arts college classroom reflected, "It engaged all the students in the class, and got a number of them thinking critically about the role of politics and money." This professor found that AudaCity also "allowed some of the more advanced students to critically reflect on aspects of city life that the game could not model, such as cultural dimensions of space." This professor also noted that, "Perhaps the most pleasant surprise though was that all of [the students] really did throw themselves into the game, regardless of whether or not they were into gaming or were performing well in class."

5.   Discussion

AudaCity is an educational board game in which players must weigh a variety of social and spatial factors which mimic the challenges real-world developers encounter. As players pursue their individual goals, they recognize that the best strategy for their own success is to create coalitions of shared interest and place developments with sensitivity to how their actions impact other players. Despite the open-ended framework of spatial development, patterns of spatial development and coalition formation reliably emerge as players experiment with various strategies. Recognizing how AudaCity transfers lessons about the complexity of urban development, a student wrote, "One must understand how to balance capital, political power, as well as human networking in order to be truly successful in both the AudaCity game and also the game of life." These experiences facilitate learning for students of urban growth and development processes. While the game is comprised of individuals in competition, collaborations emerge each round as students form coalitions and advance collective goals. As another student explained, it is relationships with other players that define the game, writing, "Simply put it is the relationships and influence of those relationships within the political

environment of the city that will largely determine the growth patterns seen there." In developing AudaCity as a serious game, we worked to create a game that illuminates the complex dynamics of urban development in ways that would facilitate students' abilities to apply urban studies theories and models to both the game and real-world situations. After implementing AudaCity in several courses, we see strong evidence demonstrating that students who have played the game are able to attain these objectives. Furthermore, students find value in the activity, as they demonstrate high levels of engagement with, and enjoyment of, the gameplay experience. AudaCity, therefore, re-emphasizes the utility of a games-based learning approach and provides a new learning tool for urban studies courses. As one student concluded, "The AudaCity board game was very educational, informative, and fun."

Acknowledgements

References

Baptista, R. and Vaz de Carvalho, C. (2013) 'TimeMesh - A Serious Game for European Citizenship'. *EAI Endorsed Transactions on Serious Games* 13 (1), e2

Coghlan, C. and Huggins, D. (2004) '"That's Not Fair!": A Simulation Exercise in Social Stratification and Structural Inequality'. *Teaching Sociology* 32, 177-187

Coppard, L. and Goodman, F. (eds.) (1979) *Urban Gaming/Simulation: A Handbook for Educators and Trainers*. Ann Arbor: University of Michigan Press

Dorn, D. S. (1989) 'Simulation Games: One More Tool on the Pedagogical Shelf'. *Teaching Sociology* 17 (1), 1-18

Fisher, E. M. (2008) 'USA Stratified Monopoly: A Simulation Game About Class Stratification'. *Teaching Sociology* 36, 272

Jessup, M. M. (2001) 'Sociopoly: Life on the Boardwalk'. *Teaching Sociology* 29 (1), 102-9

Gaber, J. (2007) 'Simulating Planning: SimCity as a Pedagogical Tool'. *Journal of Planning Education and Research* 27 (2), 113 - 121

Gottdiener, M. and Hutchison, R. (2011) *The New Urban Sociology* 4th edn. Boulder: Westview Press

Logan, J. and Molotch, H. (1987) *Urban Fortunes: the Political Economy of Place.* Berkeley: University of California Press

Magie, E. and Darrow, C. (1903) *Monopoly* (board game). Parker Brothers

Maxis. (1989) SimCity (video game)

McCammon, L. (1999) 'Introducing Social Stratification and Inequality: An Active-Learning Technique'. *Teaching Sociology* 27, 44-54

Nikkel, S. R. (1976) 'A Review of Urban Instructional Simulations'. *Simulation Gaming* 7, 97-109.

Norris, D. R. (2013) 'Beat the Bourgeoisie: A Social Class Inequality and Mobility Simulation Game'. *Teaching Sociology* 41 (4), 334-345

Pedersen, D. E. (2010) 'Active and Collaborative Learning in an Undergraduate Sociological Theory Course'. *Teaching Sociology* 38 (3), 197-206

Pence, D. (2009) '"I'll Take Ideology for $200, Alex": Using the Game Show Jeopardy to Facilitate Sociological and Critical Thinking'. *Teaching Sociology* 37 (2), 171-176

Petranek, C. F. (1994) "A Maturation in Experiential Learning: Principles of Simulation and Gaming." *Simulation and Gaming* 25 (4), 513-523

Rossiter, K. and Reeve, K. (2008) 'The Last Straw!: A Tool for Participatory Education about the Social Determinants of Health'. *Progress In Community Health Partnerships: Research, Education, and Action* 2 (2), 137-144

Scarboro, A. (2004) 'Bringing Theory Closer to Home through Active Learning and Online Discussion'. *Teaching Sociology* 32 (2), 222-231

Schella, J. W. and Rojewskia, J. W. (1995) 'Community and Technical College Teaching for Thoughtful Results'. *Community College Journal of Research and Practice*, 19 (2), 133-150

Simpson, J. M., and Elias, V. L. (2011) 'Choices and Chances: The Sociology Role-playing Game – The Sociological Imagination in Practice'. *Teaching Sociology*, 39 (42), 42-56

Smith, D. H. (1996) 'Developing a More Interactive Classroom: A Continuing Odyssey'. *Teaching Sociology* 24 (1), 64-75

Steele, T. (2003) 'Sex, Culture, and Linguistic Relativity: Making Abstract Concepts Concrete'. *Teaching Sociology* 31 (2), 212-220

Teuber, K. (1995) *Settlers of Catan* (board game). Mayfair Games

Veracini, L. (2013) 'Settlers of Catan'. *Settler Colonial Studies* 3 (1), 131-133

Wills, J. B., Brewster, Z. W., and Fulkerson, G. M. (2005) 'The Stratification Puzzle: An Active-Learning Exercise in Hard Work and Success'. *Teaching Sociology* 33 (4), 389-395