

Teaching with SimCity: Using Sophisticated Gaming Simulations to Teach Concepts in Introductory American Government

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ABSTRACT

One of the key challenges of teaching a college survey course such as introductory American government is the lack of interest on the part of students, many of whom take the course to satisfy a general-education requirement. Recognizing that young people are fascinated by video games, the author devised a governance simulation built on the popular computer game SimCity. Although the video-game industry designed these sophisticated simulations to be played by a single participant rather than a large group, the author created a simple set of rules that allows students to run them collectively. This article examines five factors for which an instructor must account if games such as SimCity are to have educational value. The author argues that, if conducted properly, this type of in-class exercise provides a fun and interesting way to teach students about the inherent challenges of governing in a democracy.

A key challenge of teaching a college survey course is the lack of interest on the part of students, many of whom take the course to satisfy a general-education requirement. Whereas advanced political science courses attract students who are both knowledgeable about and interested in politics, the typical introductory American government course is dominated by non-majors who are often disinterested in public policy, and may never take another course touching on public affairs.

As a young professor concerned that introductory courses often attract disinterested students, I began experimenting with methods to make politics seem less abstract and more relevant in their everyday lives. Recognizing that many young people are fascinated by video games, I devised a governance simulation built on a computer-generated city. Whereas many video games involve combat, puzzles, or fantasy, a subset of the market is actually sophisticated computer simulations masquerading as entertainment software. The best-known example, SimCity, provides an excellent opportunity for students to test their skills as both politicians and city managers. The video-game industry designed these complex simulations to be played by a single participant

rather than a large group of players. Therefore, it can be difficult to capitalize on these sophisticated programs to teach students about the inner workings of government and public policy. By collectivizing the decision-making process in a class simulation exercise, I encourage introductory American government students to hone their political skills and policy ideas in a virtual world. After running these educational games for more than a decade, I have developed a relatively simple set of guidelines that enables instructors to use computer simulations, like SimCity, to illustrate important concepts in American government.

BACKGROUND

The use of simulations in the classroom is not new to higher education. Since the 1960s, college-level instructors have implemented learning games in an effort to move away from traditional lecture-oriented instruction. As psychologist Jerome Bruner argued, classroom games are particularly useful teaching tools because they tend to motivate students to think about social organizations (Reeher and Cammarano 1997, 105). Rather than simply listening to a lecture or reading about abstract concepts, educational-oriented simulations allow students to take an active role in learning by interacting with others to solve complex problems. In political science, the use of simulations has been especially popular in teaching foreign policy. In-class games allow students to learn about the strategic decision-making process of nation-states and the inherent

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difficulties of solving international problems when participants are pursuing conflicting objectives. An important advantage of active simulations is that they generate interest and enthusiasm among the participants, which often motivates students to learn more about the materials (Dorn 1989, 4; Loggins 2009, 401).

Coincidentally, the widespread adoption of in-class simulations in higher education overlaps with the emergence of the video-game industry beginning in the early 1970s. However, early video games had limited educational value. It took time for designers to recognize that computer-based simulations could capture a share of the growing video-game entertainment market. The first commercially successful civic simulation, *Utopia*, debuted

watching the metropolis gradually change on a video screen projected in the classroom.

RUNNING A VIDEO-GAME-ORIENTED GOVERNANCE SIMULATION

In principle, the notion of students collectively running a simulated city seems simple. However, after years of allowing students to play recent iterations of the SimCity franchise, I have learned that there are five steps that instructors must take if the game is to have educational value. If conducted properly, this in-class exercise provides a fun and interesting way to teach why democratic governance is so difficult.

To take full advantage of powerful civic simulations like SimCity, political science instructors can recalibrate the game by introducing basic rules that allow a class to run a simulated municipality collectively.

on the Intellivision gaming system in 1981 (Dillon 2011, 67). Although primitive by today's standards, the game allowed players to govern an island by spending public money to plant crops, construct buildings, launch fishing boats, and deploy military vessels. The sophistication of virtual city planning took a quantum leap forward in 1989 with the introduction of SimCity. Whereas early civic-minded games had simple inputs and clearly defined goals, SimCity redefined the genre by creating a complex simulation with no apparent objective. Players could manage a city to enhance social services, increase the population, or simply limit urban sprawl (Sihvonen 2011, 66). Whatever their objectives, through trial and error, players quickly learned important principles of city planning, including the need to balance the budget, the value of providing basic social services, the practical limits of high taxation, and the importance of emergency preparedness. For individual users, simulation games such as SimCity have significant educational value (Gee 2003, 48; López and Caceres 2010, 1344; Rieber, Smith, and Noah 1998).

From the perspective of political science instructors, the value of all civic-management simulations is limited by one overriding factor. Players manage their city not as democratic leaders but rather as absolute dictators, setting their own objectives and unilaterally enacting policies without any meaningful opposition. Although this streamlined approach to governance simplifies gameplay, it reinforces a somewhat one-dimensional view of governance in which officials, once elected, simply make decisions in the best interest of the community. Gone are the messy policy fights wherein people with different ideological views compete to achieve conflicting political objectives.

To take full advantage of powerful civic simulations like SimCity, political science instructors can recalibrate the game by introducing basic rules that allow a class to run a simulated municipality *collectively*. Rather than one student making unilateral decisions on behalf of the city, a class-oriented version requires students to propose legislation, discuss alternative policies, and vote to determine how to use city resources. Because most games like SimCity are not based on taking turns (i.e., time passes in the simulated city regardless of whether a player takes any action), students will struggle to govern the city in real time,

1. Select an Appropriate Computer Simulation

An instructor can run a governance simulation using any number of video-game titles. As long as a program is somewhat realistic, it permits the user to play the role of a community leader, and it involves making reasoned choices to promote the city's well-being, the game provides the basis for a shared-governance exercise. For the past 11 years, I have run my governance simulations using SimCity 4.¹ The game design is straightforward in that students understand how the game works after a relatively brief introduction. Nevertheless, the designers carefully created a simulation in which players can delve into the details of a municipal problem and, if they so choose, find creative solutions. Because SimCity 4 was designed to allow players to address a city's problems in more than one way, it gives students an excellent opportunity to think through policy alternatives and debate the most efficient way to improve the quality of life for the simulated citizenry.

When instructors select a game as the basis for their governance exercise, they will need to play it to learn how it works. I have learned through experience that students often ask basic questions about the mechanics of the game. An instructor need not be a SimCity expert to run the governance simulation in class. Part of the appeal of the exercise is challenging students to visualize policy-oriented solutions to practical problems. This often involves a combination of collective brainstorming and a process of experimentation through trial and error. It is inevitable that students will make mistakes; this impresses on them why governance is so difficult.

It also is helpful to streamline the simulation by giving students a basic "starter city" rather than asking them to begin with a blank slate. Because my starter cities are simple and poorly managed, students can see problems immediately and take quick action to institute policy reforms.

2. Create Simple Rules for Collective Governance

Those who have played games like SimCity know that these programs are extremely sophisticated. In light of the complexity inherent in a good simulation, it is important for the rules of collective governance to be relatively simple. That is, it is

difficult to succeed at SimCity when playing the game alone; doing so while negotiating with dozens of other students is an especially daunting task. Accordingly, the rules of governance must be straightforward so that students can quickly turn their attention to improving the city rather than learning about a Byzantine constitution. My simulated constitution is very simple, as follows:

- One student is designated mayor of the city.
- All other students play members of the city council.
- To perform any action, students must secure a majority vote of the class and the mayor’s signature.
- If the mayor will not consent to a bill, the class can override the veto with a two-thirds vote.²

Except for the unicameral legislature, the rules roughly approximate the political design of the US Constitution.³

A key to running a successful governance simulation is to give students a sense of purpose. Games such as SimCity are so open-ended that students can become confused easily, uncertain as to which of a dozen objectives they want to pursue. To help them focus on a few key issues, students are given a scorecard that lists a relatively small number of objectives that they are responsible for pursuing throughout the simulation. To “win” the game, students score points if they succeed in meeting one or more of their assigned goals. These objectives include, for example, boosting air quality, improving education, reducing crime, and lowering residential taxes.

3. Simulate Partisanship by Assigning Students Conflicting Objectives

One of the more popular and potentially educational aspects of the live SimCity simulation is that students have an opportunity to play the game as a Republican or a Democrat. By selecting a scorecard that closely aligns with their partisan affiliation, students decide if they want to score points primarily by lobbying to improve social services or by lowering taxes (tables 1a and 1b are examples). Students who select a scorecard designated as a “Strong Democrat” can score most of their points by meeting the city’s demand for clean air, reduced crime, improved education, or longer life expectancy. Students who select a scorecard designated as a “Strong Republican” can earn most of their points by lowering residential, commercial, or industrial taxes.

Those with scorecards designated as “Centrist Republican” and “Centrist Democrat” earn an equal number of points by attending to both taxes and social services. The scorecards, which I generate in Microsoft Excel, are randomized in that no two students will earn points in exactly the same way (scorecards are available at <http://sites.psu.edu/simcity>). Because all students who opt to play as a Democrat earn most of their points by enhancing social services, the mix of social issues that each Democrat favors will vary randomly among players. Although all students who opt to play as a “Radical Democrat” are indifferent to higher tax rates, each will earn points by addressing a different mix of social services (e.g., clean air, improved life expectancy, lower crime, and improved education). The randomized objectives, even among students with the same partisan affiliation, create political infighting, particularly for students in the majority party.

Allowing students to play as a Republican or a Democrat is useful for various reasons. First, students genuinely enjoy playing a role in a simulation that corresponds to their personal political beliefs because the debates, which correspond to their personal views, seem less abstract. Second, players quickly divide into teams and vote as a block to pursue their shared goals. This dynamic adds an important element of realism to the legislative process. Third, because most students earn points primarily through enhancing social services or lowering taxes, the partisan factions are prompted to negotiate complex compromises, thereby reconciling potentially conflicting objectives. For example, partisans on both sides often realize that by enlarging the city and leveraging economies of scale, legislators can enhance social services without raising taxes. If the game is played correctly, both Republicans and Democrats can earn points and improve the well-being of the city.

Some municipal simulations such as SimCity 4 allow players to “pass” legislation simply by clicking a menu option. Enacting legislation typically provides a modest improvement in one of the city’s social demands. For example, the “free clinic program” improves overall life expectancy. However, almost all legislation places additional burdens on the city budget. In addition to keeping taxes low and providing the city with basic social services, scorecards allow students to earn points by “passing laws” favored by their constituents. Conversely, students lose points if legislation that is opposed by their constituents is enacted.

Table 1a: Examples of Scoring by Party

Scoring for Strong Democrat		
Social Demands	Position	Improve by 10%
Reduce Air Pollution	---	----
✓ Improve Life Expectancy	Strong Support	+ 121 points
✓ Improve Education	Weak Support	+ 40 points
Reduce Crime	---	----
Fiscal Demands	Goal	Per 1% Reduction
✓ Lower Residential Tax	Lower	20
Lower Commercial Tax	Lower	0
Lower Industrial Tax	Lower	0
✓ No New Taxes!	No Hikes	+6 points

Table 1b: Examples of Scoring by Party

Scoring for Strong Republican		
Social Demands	Position	Improve by 10%
Reduce Air Pollution	---	----
Improve Life Expectancy	---	----
✓ Improve Education	Strong Support	+ 22 points
✓ Reduce Crime	Weak Support	+ 15 points
Fiscal Demands	Goal	Per 1% Reduction
✓ Residential Tax	Lower	80
✓ Commercial Tax	Lower	50
✓ Industrial Tax	Lower	20
✓ No New Taxes!	No Hikes	+37 points

To generate realistic legislative coalitions, I learned to create scorecards in which Republicans favored some laws and Democrats favored others (see tables 2a and 2b). Because the GOP typically favors the same set of laws, Republican students have an incentive to work with their teammates to craft a legislative agenda.

It is important to maintain political balance in the simulation lest the minority party becomes isolated while the majority caucus writes and passes legislation at will. So that all students remain actively involved in the simulation, I always select a student from the *minority* caucus to play the mayor, thereby creating a divided government. When they realize that the leader of the minority party can veto bills passed by the majority, students enter into serious negotiations between the opposing factions. Creating a divided government not only makes the simulation more interesting, it also provides useful insight into the difficulty of governing when the two political branches fundamentally disagree about government priorities.

the simulation far more realistic. Providing the opportunity to earn extra credit does not guarantee that any of the students will succeed in meeting the objectives listed on their scorecard. After running the simulation more than a dozen times, I have observed that slightly more than half of my classes are unable to amicably solve the municipality's problems without driving the city into financial ruin. Because I deduct points from all of the participants if the simulated city is plagued by debt, there are many occasions in which none of the participants earn extra credit. Nonetheless, the prospect of earning a small amount of extra credit seems to enhance the experience whether or not the students are, in the end, successful in meeting their goal.

5. Help Students Make Connections between the Simulation and the Real World

To transform a giant game of SimCity into a genuine learning experience, it is important to encourage students to reflect on how the game mirrors governance in real life. I have found that

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4. Create Modest Incentives for “Winning” the Game

I have learned through experience that offering students a small amount of extra credit motivates participants to take the simulation seriously. The extra credit, which typically is 1% to 2% of their final course grade, is calculated based on the number of objectives each student meets by the end of the game. Giving students a small, almost symbolic stake in the outcome of the simulation compels most students to become actively involved in the discussion about municipal policy. This token extra credit creates an urgency to the deliberations that makes

although many undergraduates immediately understand the purpose of the exercise, some get lost in the game. They become so focused on driving up their score that they lose sight of the big picture. To reinforce the lessons of the governance simulation, I sometimes require students to write brief papers about the simulation, reflecting on how the exercise was both similar to and different from politics in the real world.⁴ Moreover, if I run the simulation early in the semester, I can refer back to the game when discussing real-world examples of politics later in the course. For example, students quickly learn to “play hardball”

Table 2a
Giving Partisans Similar Legislative Interests

Scoring for Strong Democrat				
	City Ordinance	Position	If Passed...	Points
Independent	× Legalized Gambling (\$\$\$)	Oppose	- 21 points	
	Power Conservation Program		----	N/A
	✓ Water Conservation Program	Support	+ 26 points	
Republican Issue	Smoke Detector Program		----	N/A
	CPR Program		----	N/A
	Carpool Incentive Program		----	N/A
	× Pro-Reading Campaign	Oppose	- 10 points	
	× Commuter Shuttle Service	Oppose	- 28 points	
Democrat Issue	✓ Tourism Promotion Program	Support	+ 20 points	
	× Youth Curfew Act	Oppose	- 27 points	
	Tire Recycling Program		----	N/A
	✓ Paper Waste Reduction	Support	+ 22 points	
	× Nuclear Free Zone	Oppose	- 16 points	
	✓ Auto Emission Reduction Act	Support	+ 6 points	
	✓ Free Clinic Program	Support	+ 23 points	
	Clean Air Act		----	N/A

Table 2b
Giving Partisans Similar Legislative Interests

Scoring for Strong Republican				
	City Ordinance	Position	If Passed...	Points
Independent	Legalized Gambling (\$\$\$)		----	N/A
	Power Conservation Program		----	N/A
	✓ Water Conservation Program	Support	+ 44 points	
Republican Issue	× Smoke Detector Program	Oppose	- 2 points	
	✓ CPR Program	Support	+ 4 points	
	✓ Carpool Incentive Program	Support	+ 8 points	
	× Pro-Reading Campaign	Oppose	- 18 points	
	✓ Commuter Shuttle Service	Support	+ 41 points	
Democrat Issue	Tourism Promotion Program		----	N/A
	Youth Curfew Act		----	N/A
	✓ Tire Recycling Program	Support	+ 4 points	
	× Paper Waste Reduction	Oppose	- 4 points	
	Nuclear Free Zone		----	N/A
	× Auto Emission Reduction Act	Oppose	- 67 points	
	× Free Clinic Program	Oppose	- 9 points	
	Clean Air Act		----	N/A

when negotiating with the opposition over legislation. Often, the student playing the mayor will threaten to veto objectively sound proposals to force additional concessions from political opponents. These all-too-common standoffs provide instructors with an excellent opportunity to discuss both congressional budget negotiations and the perils inherent in divided government. Although every simulation is different, students inevitably will grapple with problems that are strikingly similar to those confronted by elected officials in the real world. By referring back to the game later in the semester, instructors can make abstract concepts such as pork, log rolling, budget deficits, cost-benefit analysis, and even the Laffer Curve seem real to students.

THE SIMULATION IN ACTION

After an instructor has purchased, installed, and spent time becoming familiar with SimCity, it is not difficult to set up the simulation for the class. Instructors need to install the simulation software on a computer, preferably in a room with a digital projector, so that the class can watch the game in real time. Instructors can either load a prefabricated city from my “Governing with SimCity” website or construct a simple city from scratch.

Before the simulation can begin officially, instructors must pause the simulation and record the city’s starting statistics as noted on the scorecard. This permits them to determine whether the city improves in terms of air pollution, life expectancy, crime, and education by the end of the exercise. After a brief introduction using a few PowerPoint slides (see the website), students choose scorecards and divide along party lines.

The final and sometimes most important step is designating the leadership. After selecting one student from the minority caucus to be the mayor and one student from the majority party to serve as speaker of the assembly, I promptly unpauses the game and let them run the city. From a practical perspective, it often is easiest for instructors to stand at the computer and make changes to the city after a bill has been enacted into law. For the most part, the instructor is a bystander, offering advice when needed but letting the students struggle on their own accord to improve the city.

licenses. The fees range from \$5 to \$40 per student, depending on whether the instructor adopts the publisher’s textbook.

By contrast, the SimCity governance simulation can be implemented at low cost because instructors need only a single software license and a computer with an overhead video display. The game is reasonably priced. Simulation titles such as SimCity usually cost less than \$50, depending on how recently the game was released to the public. All of the materials needed to run the simulation (i.e., basic instructions, the Excel scorecard generator, a simplified constitution, and online video demonstrations) are available on my Penn State website (<http://sites.psu.edu/simcity>). Because the simulation requires only one or two class periods, faculty can experiment with the use of in-class computer simulations without making a major commitment of time, energy, or scarce financial resources.

From a logistical perspective, governance simulations of this type are highly scalable. My simulation is designed in such a way that every student has a part to play in the exercise, whether as the mayor or as a member of the city council. Since 2003, I have run the game in classes with as few as 12 students and as many as 40. Because the Excel-based spreadsheet can generate a seemingly infinite variety of subtly varying scorecards, the game is sufficiently flexible for the simulation to be easily adapted for classrooms with hundreds of students.

CONCLUDING THOUGHTS

Some faculty might be reluctant to adopt an in-class simulation based on games such as SimCity, concerned that parents might disapprove of the use of video games to teach politics and policy. Because our core mission is to educate students rather than to make learning fun and exciting, it is important to weigh the potential benefits of governance simulations against the time it takes away from traditional instruction.

Part of the reason I created the SimCity governance simulation was to make American government seem exciting, thereby encouraging students to become politically engaged. Whereas survey courses in sociology, literature, and chemistry do not have far-reaching social implications, lackluster high school civics classes or college-level American government courses may contrib-

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CONSIDERING COST AND SCALABILITY

Although I have experimented with the use of computer simulations to teach government for several years, textbook publishers have only recently become aware of the potential to help faculty teach courses such as American government. For example, McGraw-Hill, one of the nation’s leading textbook publishers, recently offered its own government-simulation software, in which students can roleplay as members of Congress and try to pass legislation, raise money, and get supporters to the polls. Unfortunately, colleges are under extreme pressure to control costs, so faculty who want to use its game software must secure a contract with McGraw-Hill to purchase individual software

ute to the political apathy of citizens. Using one or two lectures to allow students to participate in virtual governance might pay dividends if they finish the course feeling that politics is both interesting and comprehensible. The traditional introductory American government course may be my only opportunity to inspire non-political science majors to take an interest in politics and policy. Therefore, I am more inclined to cater to their narrow interests, even if it means using video games to bring the material to life.

Finally, there is nothing about a collective-governance simulation that restricts its use to college students. In 2005, I had an opportunity to conduct a governance simulation with underprivileged students from a nearby high school. To my delight,

these 16- and 17-year-old high school students took to the exercise immediately. These young people, who are normally disconnected from politics or policy, became genuinely excited about governance. Their fascination with video games and computer simulations made the mundane challenge of city government seem fun and interesting.

Although the use of SimCity-based simulations will not revolutionize political science and civics education, the selective incorporation of these sophisticated civic simulations has the potential to generate enthusiasm among otherwise disinterested students. As a tool for teaching high school civics or introductory American government, in-class exercises based on SimCity may help the next generation to understand why, in politics, there are no easy answers. ■

NOTES

1. More recently, I have experimented with the 2013 relaunch of the simulation franchise somewhat confusingly titled "SimCity." Whereas the newest SimCity streamlines the functions of running a municipality by liberating players from mundane tasks such as laying water pipes and building power lines, game designers also eliminated important features that allow students to monitor social and economic development of the city over time. Although the new version has improved graphics and a simpler interface, I am still in the process of developing an updated set of rules that would enable faculty to use the game for instructional purposes.
2. Although I generally require a two-thirds vote to override the mayor's veto, the exact ratio varies depending on the partisan divide in the class. On rare occasions, I have had 70% of students elect to play as Republicans. Because I always select the mayor from the minority party to create a balance of power in the simulation, I will raise the number of votes required to override a veto from two thirds to three fourths if necessary. This prevents the

majority party from passing legislation without ever consulting the mayor or the minority party.

3. I have never tried to run a simulated city with a bicameral legislature because the simulation is difficult enough to manage with a unicameral legislative design. Because many American cities have unicameral legislative bodies, the simulation provides a realistic look at municipal governance. After the simulation is finished, I ask students to think about how the simplified constitution made the job of governing the city considerably easier than running the government in Washington.
4. A benefit of writing a paper about the simulation is that it is difficult to plagiarize the material. This reduces the temptation to cheat, thereby providing an incentive to do the work honestly (Woessner 2004).

REFERENCES

- Dillon, Roberto. 2011. *The Golden Age of Video Games*. New York: Taylor and Francis.
- Dorn, Dean S. 1989. "Simulation Games: One More Tool on the Pedagogical Shelf." *Teaching Sociology* 17 (1): 1–18.
- Gee, J. P. 2003. *What Video Games Have to Teach Us About Learning*. New York: Palgrave.
- Loggins, Julie A. 2009. "Simulating the Foreign Policy Decision-Making Process in the Undergraduate Classroom." *PS: Political Science and Politics* 42 (2): 401–7.
- López, José M. Cuenca, and Myriam J. Martín Caceres. 2010. "Visual Games in Social Science Education." *Computers & Education* 55 (3): 1336–45.
- Reeher, Grant, and Joseph Cammarano. 1997. *Education for Citizenship: Ideas and Innovations in Political Learning*. Lanham, MD: Rowman & Littlefield.
- Rieber, L. P., Lola Smith, and David Noah. 1998. "The Value of Serious Play." *Educational Technology* 38 (6): 29–37.
- Sihvonen, Tanja. 2011. *Players Unleashed! Modding the Sims and the Culture of Gaming*. Amsterdam: Amsterdam University Press.
- Woessner, Matthew. 2004. "Beating the House: How Inadequate Penalties for Cheating Make Plagiarism an Excellent Gamble." *PS: Political Science and Politics* 37 (2): 313–20.