think and speak on their feet, a valuable skill that comes naturally to few, but is of benefit to everyone.

Since you can assess their comprehension of the reading assignments on an ongoing basis, you can freely assign written assignments of greater interest to you and the students—because a full series of written tests on the material is less important. In courses beyond the introductory level, for example, neither of us have final exams. Instead, students do more independent research, like an extra short paper or a more in-depth term paper. The ongoing feedback from class participation also lets professors know more quickly and effectively than weekly quizzes if students are comprehending the material. Because you help them through the material, you can assign more sophisticated readings.

Finally, we have found that this method leads to much more satisfying interaction with students. It challenges both the students and us. Class is less predictable, less scripted, more spontaneous; and students have, by virtue of their responses, often caused us to view an issue taught many times before in a new light. They have taught us in turn. The method also requires the instructor to learn all student names; this personalizes classroom interactions and helps to create a greater sense of community and common cause.

In sum, whether it is adopted in part or in whole, we are convinced that a modified Socratic approach can do much more to improve undergraduate teaching—unless you happen to be one of those rare, spellbinding lecturers.

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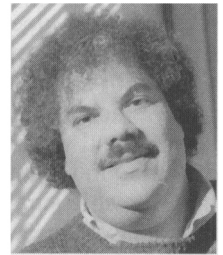
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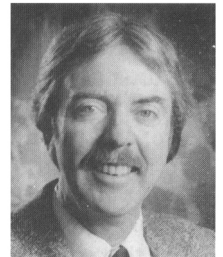
Designing In-Class Simulations[1]

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Editors Note: The following article currently appears as the first teaching article on the APSA World Wide Web site. In addition to the text, the version appearing on the web site will contain two appendixes which include a sample economic policy-making simulation and a supplemental reading list on active learning pedagogy and evaluation of student learning. This site can be accessed at http://www2.dgsys. com/~apsa/ps.html. In the future additional articles from the pages of PS will appear, including articles of special interest from the Features, Teaching and Profession sections.

Simulations have long been part of scientific research methods. Meteorologists use computer simulations to help predict the path of weather fronts; economists use them to make economic forecasts for an economy; military strategists use simulations to conjecture about the course of events during military campaigns; the list goes on. Less traditional, however, is the use of simulation as a teaching tool.

Sometimes viewed by one's colleagues as merely "playing games" in the classroom, simulation has been perceived in some teaching environments as diverting faculty and student attention away from the main goal: absorbing the lessons. But even when teachers are sympathetic to an active learning approach, the use of simulation in the classroom is often hindered by a lack of available and applicable simulations on relevant topics. Simulation use is also impeded by a lack of good guidelines for developing effective simulations.

Simulations and Active Learning

Simulations have the power to recreate complex, dynamic political processes in the classroom, allowing students to examine the motivations, behavioral constraints, resources and interactions among institutional actors. Woodworth and Gump argue that simulations "provide the laboratories for political science" (Woodworth and Gump 1994); indeed they do provide such laboratories, even if imperfect ones. After a simulation, participants have a deeper understanding of institutions, their successes and failures.

Using simulations in the classroom is one way of encouraging student participation. Other types of active learning approaches include case teaching, discussion teaching more generally, or even the use of hands-on exercises. The active learning approaches:

(1) seek to give students a deeper level of insight into the political process
(2) encourage students to be more attentive and more active in the learning process
(3) help students retain information for longer periods of time

(4) develop critical thinking and analytical skills through collaborative efforts

(5) enable students to develop speaking and presentation skills, simultaneously building their confidence.[2]

Simulations seek to mirror real-world situations. Students can therefore experience many of the same constraints and motivations for action (or inaction) experienced by real players. This is not to say that simulation is a perfect model, but it gives students the best understanding of political processes short of actually being involved in them. Our experience with simulation even suggests that it motivates students to become involved in the real processes that our simulations seek to emulate. It is therefore important for faculty to help students differentiate the simulated process from the real-world process during a debriefing period after the simulation, but this does not mean that the simulation diverges far from the real process.

The principal disadvantage of using simulation is that the teacher must sacrifice a degree of breadth in substantive coverage in return for a deeper level of student understanding on more narrow topics. In many ways, however, this disadvantage is negligible, especially when considering the increase in retention levels. One study has found that students retain 10% of what they read, 20% of what they hear, 30% of what they see, 50% of what they see *and* hear, 70% of what they say, and 90% of what they do *and* say together (Stice, 1987:293). Even if these figures are only approximate, they definitely indicate that broad knowledge obtained through passive approaches to learning will not be retained over the long term. This implies that, though some course material must be foregone in the short term, there is likely a gain in longer term knowledge and skills through active learning experiences.

Simulations come in many varieties. One type is machine simulation like those used by economists to model and forecast economic phenomena. Another is man-machine, or computer-assisted, simulations

that employ a mix of computer technology and human input. The role of the computer can vary in this type of simulation. In the ICONS simulations based at the University of Maryland under the direction of Jonathan Wilkenfeld, the Internet is employed to create a conferencing system that allows many students to negotiate international problems from geographically distant locations (see for instance Crookall and Wilkenfeld, 1985). Another man-machine simulation designed by one of the authors of this article uses a PC to generate payoff structures for a coalitional bargaining game based on a formal theoretical chapter from Howard Raiffa's *The Art and Science of Negotiation* (1982). The computer in this simulation acts as a calculator generating payoffs for coalition formation while the students negotiate and control the actual outcomes of the exercise.

The last type of simulation is role-playing simulations, in which students are assigned roles within a political process and then asked to act like real political actors. Computers are generally not involved in such simulations, but might play a peripheral role. This type of simulation and its design are the primary focus of our efforts in this article.

Simulation Design

Teaching Goals: The first step in developing a simulation is defining the goals you wish to achieve. Defining goals clearly is essential to determining the structure and methods of your simulation. For instance, if you are teaching a course on American politics and want to illustrate the Congressional committee process, you must design a simulation that allows one party to dominate and also incorporates parliamentary procedure. If you are teaching a course on comparative politics and wish to illustrate how different political systems produce different types of policies, you might develop a simulation that focuses on a set of bilateral negotiations between an authoritarian political system and an open political system.

It is very helpful to write down your goals before beginning. By do-

ing this, you can keep them handy as you create the structures of the exercise. When the simulation is over, you will need to return to these goals as you construct your debriefing questions and summary.

Simulation Construction: The second step in creating a simulation is to identify all the major actors in the particular process to be studied. If the goal is to study policy development, who are the real players in the process? Think about all the possible influences on the process and include them all: special interest groups, congressional subcommittees, agency directors, party leadership, and so on. In the Congressional committee example from above, this would include the committee chair, the various members of both political parties, the structures of the subcommittees, relevant members of the bureaucracy, lobbyists, and even staff members.

A "role sheet" should be constructed for each player or group of players. Role sheets explain the institutional position of the player (e.g., White House Press Secretary), his or her major goals and motivations (e.g., primary concern about the President's public image and re-election fortunes), and the constraints and resources involved with the role. If appropriate and useful, these role sheets may suggest how a player might further his or her goals. For the White House Press Secretary, this might include manipulation of the media or the use of leaks of crucial information to others in the simulation.

Role statements should also reflect the structural or power relationships that exist in the real-world environment and how they should manifest themselves in the simulation. In a simulation focused on bilateral trade negotiations, this might entail giving export and import figures that show the degree of trade dependence or independence possessed by either party. In a Congressional committee simulation, this would mean explaining the gatekeeping function of the committee chair and the varying powers and resources of the majority and minority parties.

The next task is the creation of a

scenario that interests and challenges students presenting a compelling issue or problem that requires thought and action on their part. Scenarios do not need to be complex and many can be as short as one page. The main requirement is that the students recognize that they are required to act and resolve the problem at hand.

Newspapers are a good source of scenario ideas. If the process to be studied is policy development, find an article about a specific policy currently under debate and use it as the basis of the simulation. When the future of the Milstar program was in the headlines some time ago, it made for a scenario simulating policy development in a system of separated institutions sharing power. The Haitian military regime and the North Korean nuclear weapons program provided stimulus for two scenarios focusing on crisis decision-making in the United States National Security Council.

Simulations require that specific tasks be assigned to specific players. Each task should be modelled after a real-world task. Examples could include designing a budget, reaching a consensus on the resolution of a problem, resolving a foreign policy crisis in a way acceptable at both domestic and international levels, or creating public policy. In the Milstar scenario, the task was to agree on a national policy regarding the future of the Milstar program. Another simulation created by one of the authors of this article involved a local community's problems in dealing with extraordinary snowfall. This problem produced an overextended snow removal budget; the simulation therefore involved a legislative committee conducting a public hearing, a debate, and finally a vote on the transfer of funds across budgetary categories to cover the public works shortfall.

Some scenarios play out better if a series of tasks are proposed. For instance, in a simulation designed to emulate the formation of foreign policy priorities, students met to prioritize foreign policy problems, first, in homogenous *intra*-agency groups and, later, in heterogeneous *inter*-agency groups with representatives of all relevant foreign policy agencies. If bureaucratic politics analyses are truly simulated, the inter-agency portion of the simulation should prove much more difficult because each agency group defends its own programs and advocates policies designed to enhance their standing. A simulation of negotiations with terrorist organizations might include a series of decision points involving terrorist demands.

The major difficulty of multi-task simulations is for the teacher who must be prepared to let students make their own decisions. The teacher must also be prepared to adapt the parameters of the simulation to fit with student decisions. In a terrorist negotiation simulation, this might mean evaluating the effectiveness of the use of force or reporting on the number of hostages killed in response to a decision made by students.

Finally, it is essential to provide any data or resources necessary for completing the assigned task. Newspaper articles, budgets, and assigned readings can provide necessary background. Inventories of military capabilities, budgetary allotments, the "nuts and bolts" of initial bargaining proposals: these are often crucial for realistic decision-making. Such data can be provided through lectures, presented in hard copy at the start of the simulation, or the teacher might even require students to conduct research in advance. The greatest advantage of this last alternative is that it requires students to think about the simulation before it actually begins.

Running the Simulation: Organization is the key to running successful simulations. The scenario and role assignments should be handed out well before the start of the exercise. It is then helpful to solicit questions from the students. This will allow the pace of the simulation to move quickly. The more complex the simulation the more important it is to distribute roles well in advance, so that players have an opportunity to research their roles and think about strategy. Depending on the amount of time you have set aside for the exercise, you may also encourage students to work in groups before the simulation so they can formulate collective strategies.

Roles should be assigned according to your teaching goals. If you are unconcerned with the conflict between personal values and bureaucratic position, then you may allow students to choose their own roles. If you wish to emphasize the "where you stand depends on where you sit" dictum, you should be more careful. For example, in a bureaucratic politics simulation conducted by one of the authors, students completed an attitudinal survey that focused on their reactions to the Soviet Union and the use of force in foreign policy. "Hawks" were then assigned to the human rights bureau of the State Department, and the "doves" were placed in the Pentagon. The role assignment procedure depends on what you hope to accomplish in the simulation.

It is useful to post task assignments in advance along with a timeline for the completion of each task. Name tags facilitate interaction among the students during the simu-

lation. Information about all the assigned roles should be distributed without giving away the secret motivations indicated in individual role assignments.

Finally, it is important to announce basic ground rules at the outset. In general, whatever would be allowed in the context of the real situation should be allowed in the simulation: alliances, spying, leaks of information, use of parliamentary procedure to block proposed actions by adversaries, party caucuses, etc. Announcing ground rules may also inspire creative strategy ideas by outlining what is permissible in the game. For instance, in a Congressional politics simulation, students might find they are having difficulty in resolving an issue because of the dynamics between representatives of opposing political parties assembled in the room. The majority party might then decide to caucus and remove the minority party from the room for a period of time in order to solidify internal support. The minority, then, can use the media players to publicize and to criticize the secrecy and lack of open policy-making exhibited by the majority party.

When given a role and a task to perform, students generally respond quite well. Don't be worried if the simulation starts a bit slowly, for this may be the first experience for many students in this type of learning environment and it may take them a few minutes to feel at home in the simulated world. Because of the complexity involved, players may at times lose track of the task, the scenario, or the time. Careful monitoring, judicious coaching, and even intervention keeps the simulation moving. Be available to respond to student questions on all aspects of the simulation. Rotate among the groups to be sure participants are playing out their roles appropriately. Remember that some coaching of key players may be necessary, for few students have been placed in such a decision-making environment prior to this experience. Give plenty of warning about time deadlines. But also remember that the problem of missing deadlines can be a learning experience. You know something has been accomplished when a student remarks that "It's amazing how much

like the U.S. Congress this class has become—a day late and a few billion dollars short."

Debriefing: Much of the value of simulations is contained in the subsequent debriefing and summary. If the simulation has gone well, students are emotionally involved, very invested in the task at hand, and probably still arguing. At the end of one international development simulation conducted by one of the authors, one student exclaimed, "But I was just about ready to develop!" In order to capitalize on this enthusiasm, ask participants to remain in their groups during debriefing so you can put the simulation back into the substantive context of the course through your questions and comments. The following is a list of suggested approaches to debriefing questions:

1. *Open-ended questions that identify processes, goals, motivations, constraints and resources.*

What happened?
Why was no consensus achieved?
If we did not create the best policy, why not?
Is there a right answer?
Who were the winners and losers?
What angered you about this simulation? Why?
What were the substantive issues? Were they the same for all players?

Such questions allow students to explain in their own words the political and institutional forces behind their behavior.

2. *Interview of the major players about their goals, motivations and frustrations.* This allows students to explain in their own words the political and institutional forces behind their behavior.
"Mr. President, what exactly were you trying to accomplish and what prevented you from doing it?"
"Mr. Speaker, the President claims that the majority party was obstructionist. Are you guilty of causing gridlock?"
"Madam Chairman, you are a presidential appointee yet you quietly made a decision of which the president would not approve. What makes you so independent? How far

would you go if you were really pushed?"

3. *Questions on communication.* They can uncover rules that may have developed implicitly during the game.

To whom did you talk? Why?
To whom did you NOT talk? Why?
What impact did incomplete information have on your strategy?
Whom did you trust? Why?
Why did you not talk to the President?

4. *Questions about the reality of the game.* This type of question helps students recognize the degree to which the simulation mirrored real-world situations. In what ways did the simulation diverge from reality and in what ways was it similar to the real world?

Once debriefing questions are completed, spend a few minutes summarizing the major points and how they relate to the subject under study. You may relate the simulation to relevant conceptual and theoretical frameworks, and you may find it useful to refer back to the simulation during subsequent lectures and discussions. Summarizing the material covered during the simulation is helpful for students who take careful notes and feel they must walk away from the experience with something tangible on paper.

Evaluating the Teaching Results

The greatest unknown in using simulations is the impact of the method on student learning. Both of the authors of this article have accumulated large amounts of anecdotal evidence supporting the idea that simulation promotes greater depth of understanding and higher levels of retention while promoting the development of stronger critical thinking and analytical skills and generating enthusiasm for learning. Unfortunately, none of this evidence has been collected, standardized, or quantified. Indeed, many of our colleagues still believe we receive large teaching enrollments and solid teaching evaluations because the students enjoy playing games rather

than sitting through the more traditional, lecture style course. But we conclude otherwise.

There are ways to uncover how students reacted to the simulation. One way is to ask students to answer three simple questions at the end of the simulation.[3]

(1) What are the advantages/disadvantages of using simulation in class?
(2) What did you learn from the simulation?
(3) How does this class differ from other classes you have taken?

By using these three questions and reviewing student responses, you can begin to analyse the impact that simulation techniques have on students. You can also weigh the value of using the technique in the future. For those of you wishing a more rigorous and systematic approach to evaluation, you might begin by reading Fratantuono (1994), and the variety of material available from those who research education technique.

Simulations are tools for understanding complex interactions. They can provide insights into why political actors make choices that seem unreasonable or irrational. Simulations uncover the real motivational forces intrinsic to players as they struggle with their choices. As with any teaching method, simulation de-

mands a great attention to detail.[3] Developing simulations may seem complex but the payoffs are high.

Notes

1. Boyer would like to thank Jonathan Wilkenfeld, director of Project ICONS at the University of Maryland and his Pew Fellowship colleagues for their help in clarifying many of the ideas contained in this article. Sheilah Mann and two anonymous reviewers also provided very helpful and instructive comments on an earlier draft.

2. For further development of these teaching assumptions see John Boehrer and Martin Linsky's (1990) discussion of eight categories of teaching objectives and Nathaniel Cantor's (1953:59–71; 286–310) discussion of the differences between "orthodox teaching" and "modern learning."

3. This is adapted from a method developed by a number of colleagues in the Pew Faculty Fellowship in International Affairs to evaluate the impact of case method teaching.

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