Creating Simulations for Political Science Education

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While the use of simulations[1] to teach negotiation theory and issues in international relations (*International Negotiation* 1998, Susskind and Corburn 1999, Starkey and Blake 2001) has become more common, using them to focus on a wider variety of political science topics is still rare. Further, while there are guides to help educators develop their own simulations (e.g., Hertel and Millis 2002), there is a need for a detailed structure for general social science simulation creation. To address these issues, this paper explores the effective integration of simulations into a course, and suggests a useful pedagogical framework—focusing on the choice between educating students about process or content—for building social science simulations. Finally, the paper presents web-based software to facilitate the creation of simulations (face-to-face or computer-mediated) based on the framework.[2]

Throughout the following paper, we will be drawing examples from the International Communications and Negotiation Simulations (ICONS) Project at the University of Maryland (http://www.icons.umd.edu). ICONS has conducted on-line foreign policy exercises for university and high school students for the past 20 years.[3] Over the last several years, ICONS has expanded the scope of its offerings and developed new simulations which focus on teaching, among other topics, negotiations, crisis management, the legislative process, second track diplomacy, the impact of globalization, ethnic conflict, and the development of international law.[4] In addition, ICONS has begun to work with the U.S. Office of Personal Management to train government officials in negotiations, crisis management and ethics in decision-making. The ICONS foreign policy simulation discussed below includes participants from a number of different institutions in the same exercise; the other simulations discussed are "single-classroom" simulations.[5]

Simulation Based Teaching

Simulations offer social science students an opportunity to learn from first-hand experience in much the same way that laboratory experiments allow students of the physical sciences to observe actual physical processes. As in physical science experiments, manipulating variables in a simulation can change the dynamic of the interactions and the outcome of the simulation. This sort of experiential learning allows students to apply and test what they learn in their textbooks, and often helps to increase students' understanding of the subtleties of theories or concepts and draw in students who can be alienated by traditional teaching approaches. By putting students in role-play situations

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[1] When we talk about simulations in this paper, we are referring to human-to-human interactions. While these may be mediated by a computer, computers are not themselves actors in the simulation. As such, what drives the simulation forward is the interaction among the participants, not, for the most part, external inputs.

[2] This paper is intended to be a "how-to" manual and does not contain a review of the extensive literature on educational simulations. See Starkey, B.A. and E.L. Blake, 2001, Simulations in international relations education, *Simulation & Gaming*, 32(4): 537-551.

[3] The "International System" simulation focuses on policy interactions among states in the international system on a variety of international issues. For more information about the university level program or to login to a demo simulation, see http://www.icons.umd.edu/pls/staff/website.simulation_description?v_sim_type_id=1.

4 At the same time, we have expanded our ICONSnet simulation support software so that it is no longer entirely a communications package. Now, depending on the options selected by the simulation designer, participants can submit and vote upon proposals, take actions, file reports to reflect upon their participation and performance, and conduct brainstorming sessions.

[5] Of course, the foreign policy simulation could be conducted at a single site, while the other exercises could link together participants at different locations.

where they need to make defensible decisions and often have to convince others to work with them, simulations also provide students with the opportunity to develop their communication, negotiation, and critical thinking skills, and in many cases, improve teamwork skills (Wolfe and Crookall 1998, Ruben 1999, Brown and King 2000).

Drawing on work by Petranek (1992, 2000), we suggest that a well-designed simulation is more than just the interaction among the participants. A simulation should be designed to maximize learning during each stage of a simulation: preparation, interaction and debriefing, which are outlined in Table 1.

Stage	Activity
Preparation	Introduction to the topic and any necessary research or familiarization with simulation materials
Interaction	The period of "game play" during which participants communicate and attempt to meet their goals
Debriefing	Guided reflection time after the interaction stage is over. This may be done through group discussion or as a written assignment.

Table 1. Stages of a Simulation

In order for students to get the most out of simulation-based teaching, simulation developers need to take care that the exercises they develop engage the students and provide robust learning opportunities at each phase. The preparation stage provides students with the opportunity to study the subject matter of the simulation and the role that they are portraying. Applying this knowledge helps them develop goals and strategies for the negotiations. If the participants are structured as teams, students also learn communication, negotiation, and decision-making skills from their interactions with their teammates. During the interaction stage, students have a chance to put their learning from the preparation phase into action. Exchanges with their counterparts can challenge their thinking and push them to delve deeper into the content. The interactions also allow students to apply and test different strategies for achieving their goals. Finally, the debriefing stage gives students the chance to internalize the lessons of the simulation. Without guidance and time for reflection, students may not be able to make the connection between what they learned in the simulation and the concepts that or processes that the instructor was trying to illustrate.[6]

To get the simulation going, you will need to develop several components to provide to your participants. The first is a clear statement of purpose. It is not always necessary to share this at the beginning of the simulation, but it should definitely be discussed at the debriefing to help participants put their participation in the proper context. (In fact, you might not want to share the purpose if that might alter the way that students will behave in the simulation, and therefore undermine the learning objectives.) The second is an introduction or scenario to describe the negotiation environment, introduce the issues, and generally, set the stage for the simulation. The third is the "game mechanics" that lay out the rules for the simulation.

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[6] For sample debriefing questions, look at the ICONS Simulation Builder (http://www.icons.umd.edu/simbuilder/) under "Simulation Stages."

Besides these basic elements, you can choose to add components depending on your teaching goals. For example, you may wish to provide students with a set of resources to consult in the preparation phase, or role sheets to provide them with information on their role's background and interests.[7] Similarly, giving participants a utility point structure can help them to make decisions about what outcomes would be most beneficial to them and their negotiation counterparts. You might also want to prepare "reports" to have students file at various points in the simulation to help them to reflect upon what they are doing and what they are learning.

In developing your simulation, you need to keep the considerations outlined in Table 2 in mind. While much of the following discussion is rather obvious, thinking explicitly through each of these points is a useful exercise. The next several sections of the paper will discuss each of these considerations in some detail.

Goals	1. Educational purpose
	2. Content vs. process
	3. Role of research (i.e., degree of learning in the preparatory phase)
Structure	1. Real or fictional case
	2. Level of complexity
	3. Participants
	4. Decision-making process
	5. Actions and the negotiation environment
	6. Nature of outcomes
	7. Constraints on participants
Limitations	1. Time
	2. Technology

Table 2. Considerations in Designing a Simulation

Goals
The primary consideration for organizing your simulation is to clearly determine your rationale for attempting to promote learning by means of a simulation. How you frame your educational focus can help determine the structure of your simulation. Remember that a simulation is not necessarily a game, with specific rules for moves and clear winners and losers (Ellington et al. 1998). A simulation does not necessarily have to have a satisfying conclusion, nor does each participant need to feel that the simulation is "fair." Indeed sometimes, the purpose of the simulation is best served if the simulation is patently unfair. For example, in the simulation of the International Whaling Commission (see http://www.icons.umd.edu/pls/staff/website.simulation_description?v_sim_type_id=5) that ICONS uses to teach multilateral negotiations, the resources of the teams are wildly unequal. This makes clear to the participants the impact of power on negotiations and allows the instructor to make points about creating procedural power when material power is lacking.

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[7] For examples, view the "Resources" in the ICONS Globalization or International Whaling Commission simulation at http://www.icons.umd.edu/pls/staff/website.simulation_description?v_sim_type_id=17 or http://www.icons.umd.edu/pls/staff/website.simulation_description?v_sim_type_id=5.

A primary distinction is whether you are attempting to train students in the use of a procedure or technique, or whether you are attempting to teach them particular concepts of content or process. If the primary purpose is training, then you will need to put more emphasis on replicating reality. ICONS' second track diplomacy simulation is intended to train conflict resolution specialists to run ARIA (adversarial-reflexive-integrative-action) workshops for partners to a conflict. As such, the simulation closely follows the established structure that facilitators would use in the actual process.

Depending upon the nature of the skills that you wish to have students develop, "training simulations" might require more control over the environment than you are willing to give to the students whose interactions would otherwise drive the simulation forward. In such cases, you might want to use a human-computer simulation that can provide a more immersive and controlled environment. Schank and Neman (2001) discuss "learning-by-doing" (or "goal based scenarios") as an effective training technique for skill development.[8]

If, instead, you are more interested in helping students to learn content or process, then your purposes may be better served having by structuring the simulation as a more abstract representation of reality. This can help to provide more clear focus on the concepts in question. The International Whaling Commission (IWC) simulation is used to teach negotiations, not the actual workings of the IWC. As such, the simulation does not have to follow the specific procedures used by the IWC in its deliberations but can instead focus on the process of negotiations.

If your emphasis is on teaching concepts, the second decision you must make is whether learning about process (e.g., decision-making, negotiation, economic or power relations, the impact of constraints, interpersonal relations involved) or the content (the facts, history, or science that provides the context for the simulation) is more important. Most simulations provide opportunities for learning on both fronts, but you must decide which is primary. This will help you to determine the proper balance between the preparation and interaction stages. Because process-oriented simulations attempt to teach by doing, they should focus more on the interaction among the participants. Content-oriented simulations, on the other hand, should have the students delve deeply into the subject matter in preparation for the simulation.

Consequently, you must decide upon the role of research in preparing for the simulation. Are the participants to receive prepared material about their goals and positions or are they to be required to prepare material about their goals and positions? Having the students prepare material about their goals and positions is one of the key ways to help them learn content and can indeed justify the use of a simulation as a motivating tool almost by itself if the preparation work is taken seriously. On the other hand prepared material can save a great deal of time and allows maximum time to be devoted by the participants to developing strategies. This facilitates learning about process.

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[8] "Return of the Wolf," designed to teach high school students about wildlife ecology, puts students in the role of a scientist investigating a declining wolf population in a national park. Users interact with a computer-based model, rather than with other students, as they attempt to solve the problem. The Institute for Learning Sciences at Northwest University has developed proprietary authoring tools to allow people to build prototype simulation systems.

The goal of ICONS' IWC simulation is to help students understand the process of negotiation better by allowing them to practice, compare, and observe various negotiation techniques. The choice of the IWC as a forum for conducting their negotiations was largely arbitrary; whaling politics provides a mix of players trying to find a mutually acceptable outcome in the face of clear differences in the country's interests. Because we were not concerned with student knowledge about whaling, we chose to supply enough each participant with background information and a clear statement of their interests and objectives so that there would be little research for them to do.

An ICONS foreign policy simulation, though, is a platform for the students to do research and gain specific knowledge about the international system and a number of pressing international issues. What are the goals and problems of various countries? What are the preferred policy outcomes for various countries? How do countries' interests coincide or differ on key issues? Given this focus on content, the educational impact of the preparation phase of the simulation is significant, with students writing position papers outlining their interests and negotiation strategies. The interaction phase of the simulation provides motivation for the student preparation and allows students to learn more about the issues that they have researched through their interactions with the other participants. At the end of the simulation the students should not be experts in how diplomats actually talk or the workings of international institutions, but they should know much more about the goals, challenges and policies of the country they represent, the issues at stake, and the interactions of contending countries on these issues.

Structure

1. Real or fictional case

Is the simulation going to be based on real-world actors and situations (World Trade Organization deliberations, the Cuban Missile Crisis, the workings of the U.S. Congress) or a fictional case? A fictional case can help you avoid pre-existing bias or perceptions, as well as heated emotions, but this option requires more preparation in creating a back story. Further, it is much harder to focus on certain kinds of content, especially when you are focusing on real world content. That said, issues of pure theory can often be examined more easily using a fictional case. The prisoner's dilemma game would be a classic example.

Of course, it is possible to use real-world actors in fictionalized situations. ICONS' globalization simulation is centered on the parties involved in the political economy of the Niger River delta region of Nigeria – among others, the Nigerian government, Greenpeace, Shell Oil and the representatives of the Ogoni people – and their negotiations about the future shape of the petroleum industry in the region. Although a real-world meeting of this group is unlikely, the issues raised by the negotiations shed a great deal of light on the problems posed by globalization. Conversely, you can choose to use fictionalized actors in real-world situations. ICONS' U.S. Senate simulation uses fictional Senators, but the issues that are negotiated are ones that the real Senate considers.

If you choose a real-world case, you must also decide upon the timeframe. A historical case can be problematic in that participants might feel bound to recreate history. This can be handled by focusing on an area that is little known or on a key turning point of a well known event that is not usually examined. For example, most students are aware of the Nuremberg trials and many may be familiar with their outcomes. ICONS' War Crime simulation focuses on the little known London Conference where the key four Allied countries determined the nature of the Nuremberg trials and arrived at an approach that was to have a lasting impact on international law and human rights in the post-war world. Focusing on the London Conference helps to make clear to the participants of the simulation that the nature of the war crime trials was not a foregone conclusion and to appreciate the nature of the human rights debate from a variety of different perspectives.

The timeframe is also an issue in ICONS' foreign policy simulations. Teams are expected to base their strategies on a rigorous review of both the long-term and short-term needs, wants, and interests of a country. Students' actions in the simulation should be driven by this review of the general situation of the country rather than by a cursory review of just the most current issues involving a country. This "big picture" focus of the simulation is encouraged by positioning the negotiations in the near future, rather than in real time.

Because of the focus on content knowledge, most ICONS simulations involve real cases. This is also true for our more process-oriented simulations. We chose a real case (the conflict over the territory of Aceh in Indonesia) for our second track diplomacy simulation because much of ARIA is structured on the need to clear psychological hurdles. We felt that however difficult it might be for participants to work up passion about a real life case of violent conflict that is not theirs, it would be that much harder to do so for a fictional conflict.

2. Level of complexity
The next question is how much complexity you wish to introduce into the simulation. Simulations by definition involve simplification, but you can choose how closely you wish to approximate real-world situations and institutions. The key is to make the simulation only as complicated as necessary to effectively communicate the desired lesson. Introducing students to basic concepts will probably require less complexity than helping them to understand more complicated theoretical points. The prisoner's dilemma can be illustrated with a very simple simulation, but demonstrating alliance politics would require a more complex structure.

Again, the emphasis you place upon content or process will have some bearing on this. A content-oriented simulation may not require a great deal of complexity. One of the primary goals of an ICONS foreign policy simulation is to introduce students to policy interactions among nations in the international system. The focus is on how states attempt to achieve mutually beneficial outcomes while protecting their own national interests in a largely "rule-free" world. Therefore, we do not try to replicate the workings of any particular international institution. Educating about process may require a more complex model of reality, especially if the interaction of various components of the process is important to your educational goals. Model United Nations simulations, which are intended to teach students about the workings of the UN, take a different approach by replicating several UN decision-making bodies and requiring students to work within a strict set of rules.

3. Participants
The number of participants will be a major factor in determining how much freedom you have both the level of complexity and the decision-making process you will use in the simulation. More participants make it easier to model complex interactions, but can make the logistics of running the simulation more difficult. Of course, the number of participants in a simulation is usually dictated by the size of the group that you are working with. You must balance your educational goals with logistical necessity. If you have a larger group than you think can be accommodated in one simulation, you can choose to run several smaller simulations simultaneously. This can have the added benefit of making for interesting debriefing sessions by comparing the course and results of the different simulations.

The level of complexity in the simulation will be affected by how you choose to construct your actors. For example, in an international simulation, will the participants play as unitary state actors (e.g., India, Pakistan)? Or will participants play on teams representing cabinets or organizations (e.g., Indian Prime Minister, Pakistani Defense Minister)? Your choice may depend on the level of realism that you want to introduce to the interactions, or it may depend specifically on your learning objectives. Participants as unitary actors would be appropriate for an examination of the rational actor model or neo-realist theory, but would defeat the purpose of a simulation meant to illustrate bureaucratic politics.

Finally, while it may be logistically necessary (or even preferable, depending on your objectives) to have each actor in a simulation represented by one person, organizing participants as teams allows you to model the interaction as a two level game. Most ICONS simulations are run with groups of students playing each simulation actor, and we have found that the negotiations within the team, as they attempt to identify interests or decide upon strategies, are often as educationally significant as the negotiations among the teams.

4. Decision-making process
Another aspect of simulation structure is a framework for participants to make decisions. Decisions are reached in the IWC simulation through a series of votes on proposals submitted by the negotiation parties. The goal is to reach a unanimous agreement, but the level of "success" achieved depends upon how many countries agree to the final proposal. ICONS foreign policy simulations also culminate in voting on proposals, but since the simulation structure does not reflect the actual procedural workings of any international conference or organization, there are no set rules for a proposal to have been considered passed. This lack of closure is occasionally frustrating to students, but it encourages reflection in the debriefing and evaluation phases.

If you are modeling a two level game, you may choose to specify procedures for intra-team decision-making, allowing the team to function as a hierarchy or requiring that the team reach decision through consensus or majority rule. Your choice will have an effect on the play of the simulation and the experience of the participants. For example, while hierarchy may be more realistic in many cases, it is often frustrating to the participants if they have to follow a leader. Fairness, though, is not key if the goal is to present a realistic model of, for example, the process of developing American foreign policy. The United States of America is a democracy, but the executive branch is not.

There are no set conventions for intra-team decision-making in ICONS foreign policy simulations. Educators participating in the simulation can decide on their own classes' method of decision-making. Some instructors who are focusing almost exclusively on content tend to use democratic decision-making rules in the classroom regardless of which country their class may be portraying. Others who place a greater emphasis on process will create hierarchies for each team that reflect the structure of the foreign policy apparatus in the country being portrayed. In either case, the country teams do act as unitary actors in the interaction stage.

5. Actions and the negotiation environment
When you design a simulation, you create an "environment" within which the simulation is conducted. For example, an ICONS foreign policy simulation takes place slightly in the future in the actual international system (Starkey et al. 1999). This means that the interests and constraints faced by the simulation participants are the same as those faced by their real world counterparts. Outside of the final agreements that may be negotiated, countries cannot take actions that change the negotiation environment, and consequently cannot alter the interests of the other countries.

It is possible, however, to build a simulation where actions taken by a participant change the environment and affect the interests and constraints of the other parties to the negotiation. One of the features of the IWC simulation is the ability of some countries to grant foreign aid to others. Donor countries have a limited amount of aid, and once the funds are expended, there is no more money to give. For their part, recipients of foreign aid may be more likely to accept an agreement favored by the donor. In the India-Pakistan crisis simulation, India, Pakistan, and China are given the right to, among other things, move troops into and around Kashmir and launch military actions, while the Kashmiri Liberation Front can undertake various terrorist activities. Each move alters the environment and affects the kind of settlement that can be reached to resolve the crisis.

Whether you choose to allow actions with consequences for the environment depends upon what you are trying to teach. Decision-making in crisis situations requires that participants be able to make specific moves either to try to resolve the crisis or in response to actions taken by other participants. Negotiating to solve a transboundary problem such as global warming, on the other hand, requires participants to try to reconcile competing interests in a more stable, long-term environment. Allowing participants to "change the environment" may actually undermine the learning objectives. Your choice also depends upon the level of realism you wish to model. A more complicated model of reality will allow more "linkages" to outside issues than a simple model will. Allowing participants to take actions will give them more ability to be creative in trying to negotiate a final agreement.

6. Nature of outcomes
Another issue of game mechanics is the sorts of outcomes that a simulation may have. A simulation can end based upon actions that are taken or agreements that are reached, or may simply end when the clock runs out. What actions can participants take and/or what sorts of agreements can participants make with each other? As a simulation designer, you must decide whether these outcomes should be structured, i.e., defined in advance for the participants, or non-structured. Non-structured outcome possibilities allows for creativity on the part of the participants, but provides fewer constraints and may allow them to come up with solutions that are too easy or unrealistic to the detriment of what you are trying to teach. An ICONS foreign policy simulation is launched with a detailed scenario to set the context for the exercise and frame the issues to be negotiated, but the participants have very few restrictions on the types of proposals they can advance and negotiate. Because one goal is to encourage participants to be creative in finding ways to advance their interests, telling them what their policies must be would be counterproductive. Consequently, in this type of simulation, we use a "proposal center" that allows participants to use their own language to build proposals for consideration and voting. Actions may also be non-structured. In the India-Pakistan crisis simulation, participants can ask SIMCON (Simulation Control) for the ability to take actions that are not on the pre-determined list of available actions.

By structuring the outcomes, you can provide the simulation with more focus on the process or content that is the educational objective of the exercise. Agreements may be structured by allowing participants to select from a limited list of outcomes associated with each of the issues for negotiation. The International Whaling Commission simulation uses a "structured proposal center" to constrain the agreement choices and force participants to focus on negotiation tactics. Actions may be structured by limiting the participants to a specified list. For example, participants in the IWC simulation may choose to end their membership in the IWC, but may not use military force. Structured outcome possibilities can help tie participants to more realistic outcomes and force them to deal with tough trade-offs.

7. Constraints on participants
Together with the level of complexity and the degree of structure that you impose on the outcomes, constraints on what the participants are able to do will determine to a large degree how challenging the simulation will be for the participants. The degree and type of constraints you place on the participants in achieving their goals is a key tool you have for shaping how the simulation will play out and the lessons the students will learn.

In the Sudan famine relief simulation, participants have set resources that they can work with, and the agreements that they can reach are strictly limited by the resources available. For example, the U.S. Agency for International Development has the following resources:

- Some $700,000 in funds earmarked for Sudan. It potentially has access to another $1.4 million from a contingency fund, but this would require the approval of the Secretary of State, as well as concurrence from four Congressional committees for reprogramming.
- About 3300 MT of grain in storage in Sudan under its Food for Peace program.
- Two 5-8 ton trucks in Sudan and one Boeing 727-320 aircraft with a 40 MT cargo capacity.
- A working relationship with some of the rebel groups under which it has access to a company of mercenary troops for security purposes. USAID could conceivably hire up to a battalion of additional mercenaries, but this could cost as much as $1 million per month and strain relations with the warring parties.

Each of the other participants receives a similar statement of resources, and the participants' challenge is to solve the crisis, working within the bounds of their interests and resources available. Of course, the simulation was designed so that this would not be an easy task.

When using structured outcomes, another way to constrain participants is to define priority rankings to show which outcomes each of the simulation participants prefer. Similarly, you can assign utility points to each outcome. This is a useful exercise because it allows you to see how likely it is that participants will be able to come to a mutually acceptable resolution. By tweaking the priority rankings, you can make the simulation more or less difficult. By providing this information to the participants, along with instructions to seek the highest-ranking outcomes or to maximize utility points, you are essentially defining their interests. This can be a very useful adjunct to role sheets.

Following is a sample priority rankings table from a simulation set in pre-revolutionary Boston. The issue (one of five issues open for negotiation) is the level of allegiance that is due to the king. The numbers are the rankings that each actor assigns to the outcome in question, with the higher numbers being more preferred. The rankings show at a glance possible alliances and differences on this particular issue.

Outcomes Players	Sons of Liberty	Patriots	Tories	The Governor and his Council	Moderates
The King is a tyrant.	1	4	4	4	4
We are loyal subjects, but no taxation without representation.	2	1	3	3	3
We are loyal subjects who ask the King to listen to us.	3	2	1	2	2
Long live the King.	4	3	2	1	1

Table 3. Sample Priority Ranking

Another kind of structure is imposed by the use of utility points, which are a measure of preference for the various outcomes. In the Ecuador-Peru border crisis simulation, participants are told how many utility points are attached to each simulation outcome (e.g., negotiated settlement, military action, status quo) for both countries. They also know how changes in the simulation environment, accomplished through actions that the participants take (e.g., mobilizing troops on the border), affect the total number of utility points a participant may "earn" at the simulation's conclusion. This helps them to determine what outcome is best for themselves, and because it is a "perfect information" situation, what is best for their negotiation counterpart. [9]

Limitations
What you are able to accomplish with your simulation will be limited by the time and technology available. These constraints may dictate certain choices that might otherwise have been decided by your educational goals. With regards to time, you need to choose how to balance the time available between the preparation and interaction stages. You might make some less obvious choices to help you accomplish your goals. For example, limited preparation time means providing them with a large portion of prepared research on their goals and positions even if the goal of simulation is content learning. The interaction stage can help students to deepen their knowledge of the material through challenges from the other teams.

The availability of computers and access provides some opportunities for enhancing the simulation experience, but the use of technology requires careful consideration. Not all simulations are best conducted using computers. Face-to-face contact may be important for some simulation goals, such as when interpersonal communication skills are a goal or when the procedural rules are sufficiently complicated to make translating them to an on-line equivalent very difficult. Further, the length or scope of other simulations may not make it worthwhile to invest the necessary time and effort to set up and run a simulation on-line.

That said, access to computers and the Internet can be a great boon. (Martin (2003) discusses in detail the value that Internet mediation can bring to simulations and games.) During the preparation phase, the World Wide Web gives students access to a wide variety of information that may not be readily available to them in their local libraries. The availability of non-U.S. news and government sources is particularly significant to students participating in an ICONS foreign policy simulation. In the interaction phase, technology can greatly facilitate communication among participants and management of the process. Having teams communicate through the Internet can create important two level dynamics and is often better for simulating the uncertainty and disconnect associated with international crises than face-to-face communications. ICONSnet, ICONS' web-based simulation software, allows various members of a single team to log on from multiple computers and jointly represent a particular team, provides for user anonymity, and offers support for foreign language translation.

A significant advantage of using ICONSnet is that it preserves archives of all messages for later analysis during and after the simulation. A written record supports accountability, as well as allowing for more complicated and detailed communications among the participants. Once the simulation ends, an instructor can "open" the archives of a community so that all messages sent can be read by all participants. This allows participants to see aspects of the interaction that they might

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[9] For an example of how this simulation was used for research purposes see Wilkenfeld et al. (2003).

not have had access to at the time, giving them a more complete view of what happened. We have found that having students review the archives and write a paper about their experiences greatly enhances the learning process.

Finally, conducting a simulation on-line gives you some flexibility about whether you want to conduct your simulation synchronously or asynchronously. Simulations involving a crisis are probably best conducted in real-time so that all participants are reacting to events at the same time. The benefits of asynchronous communication are that it gives each team time to react thoughtfully to the other teams and that it frees the instructor and students from being bound to set schedules. Accordingly, an instructor may choose to have his or her students participate in a simulation outside of class time. While the majority of the interactions in ICONS foreign policy simulations are conducted asynchronously, there are opportunities for synchronous communication, i.e., real-time conferences where participants meet to discuss a particular simulation issue.

Sometimes it is best to use computers as an adjunct that can serve to process information or decisions for the participants and allow their contact to be face-to-face. The ICONS U.S. Senate simulation may be conducted entirely on-line, but another way to run it is to use ICONSnet solely to manage the voting process, while conducting all discussion and negotiations in person. This choice makes sense for instructors who have only limited computer access, or for instructors who would like to more closely replicate actual Senate committee meetings.

The considerations discussed above are central to developing an educationally-effective simulation. To summarize, you need to make sure that you have fully answered the following questions:

1. What are your educational goals?
2. Will you use a real or fictional case?
3. What is your level of complexity?
4. How many participants will you have and how will they be organized?
5. What will the decision-making process be (intra-team and between teams)?
6. How will you use actions? Will they change the negotiation environment?
7. What kinds of outcomes will you have, structured or open-ended?
8. Will there be any constraints on participants? If so, what kind?
9. What kind of time and technological limitations will you face?

The next step is creating the simulation components that you will give to your participants to set the context and procedures for the simulation and to help them begin their preparations. To facilitate this process we have created an on-line Simulation Builder which you can use to help manage the simulation design process.

ICONS Simulation Builder
The ICONS Simulation Builder is a tool to assist instructors in developing simulations which may be conducted off-line, or on-line using the ICONSnet simulation environment. It includes a design worksheet focusing on the considerations from the previous section, and provides an organizational structure that helps assure that designers fully specify the various components necessary to run the

simulation successfully.   If you intend to run your simulation off-line, the Simulation Builder can help you organize and store the elements of your simulation.

To use the Simulation Builder, go to http://www.icons.umd.edu/simbuilder/ and follow the process to register. Once you have registered, you can begin to enter your simulation components into the structure provided. (See Table 4 for a detailed description.) As you complete each section, your work will be saved, so you do not have to complete the process at one sitting. You can also change any of your previously saved work.

	Component	Purpose
Design Worksheet	Goals	What you are trying to accomplish with the simulation. Specify whether your primary emphasis will be on content or process and what the role of research should be.
	Structure	Who the participants are and the specifics of how they will interact with each other.
	Limitations	Your plan for allocating time available and utilizing available technology.
Required Elements	Title	A descriptive name for the simulation.
	Scenario	The document provided to participants that sets the context for the simulation and frames the issues for negotiation.
	Game Mechanics	An explanation of the procedures and rules to be followed during the simulation, i.e., how the simulation will work.
	Participants	Names of the parties to the negotiation.
	Issues	The topics that the participants will be negotiating over.
Optional Elements	Outcomes	Outcomes associated with each of the issues for negotiation. They may be either explicitly defined, or left open-ended.
	Priority Rankings	With structured outcomes, priority rankings can be defined to show which outcomes each of the simulation participants prefer. If you define rankings, the Simulation Builder will generate priority rankings matrices that allow you to easily compare rankings for participants, and giving you information that you might need to tweak them to make the simulation easier or more difficult.
	Role Sheets	Private information provided to each participant about its background and interests.
	Actions	Possible steps that participants might take to change the negotiation environment or end the simulation. Actions can be tailored for each participant.
	Time Controls	A mechanism for specifying if the simulation is to be conducting in rounds, and if so, the length of the rounds. (Length may be open-ended.)
	Resources	Any additional materials that you might want to make available to your participants to help them in their role-play.
	Reports	A tool to collect substantive, procedural, or other feedback from simulation participants.

Table 4. ICONS Simulation Builder Components

If you want to run your simulation in a computer-mediated environment, the simulation that you design can be easily imported into ICONSnet, where it can be accessed by all simulation participants using only a computer with an Internet connection and a web browser. Running a simulation within ICONSnet is useful if any of the following considerations is important to your simulation design or educational goals:

- Anonymity
- Conducting simulations asynchronously
- Conducting simulations over a distance
- Supporting foreign language translation
- Maintaining full archives of the simulation proceedings
- Managing votes on proposals
- Keeping a detailed record of actions taken

ICONSnet is more than just a communication environment, providing a number of simulation support tools. Once a simulation is built and imported into ICONSnet, you can take advantage of any of the ICONSnet components.

ICONSnet Component	Purpose
Messages	To support asynchronous communication.
Conferences	To support synchronous communication.
Proposals	To allow participants to specify their proposals for resolving the simulation issues. The Proposal Center can be set up to allow open-ended proposals or "structured" proposals limited to the various negotiation outcomes specified. Proposals may be voted upon, if desired.
Actions	To allow participants to take specified actions that help define the context for negotiation, or to take actions to end a simulation.
Consensus-Building	To facilitate "brainstorming" sessions. Once a list is created, participants can rate the items on the list.
Reports	To allow for reflection upon the simulation at any stage in the process.
Resources	To provide an organizational structure for the simulation information that participants need to refer to (e.g., simulation rules, role sheets, and research sources).

Table 5. ICONSnet Components

The Simulation Builder is available free of charge for designing simulations, but there are fees associated with running a simulation in the ICONSnet environment. For more information on using ICONSnet, please contact ICONS at icons@gvpt.umd.edu.

Conclusion
Simulations in the political science classroom can be useful educational tools, but creating ones that will help you to meet your learning objectives can be difficult. The aim of this paper has been to lay out a model for simulation development that focuses on clearly identifying your goals, structure, and

limitations. The paper also introduced the ICONS Simulation Builder (http://www.icons.umd.edu/simbuilder/) to help instructors think through their objectives and organize their components, whether they wish to conduct their simulation off-line or in the ICONSnet simulation environment.

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