The Next Climate Treaty? Pedagogical and Policy Lessons of Classroom Negotiations

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Scholars and policy pundits have advanced more than thirteen different designs of a climate change treaty to succeed the Kyoto Protocol. Each of these designs claims to correct the defects of the current agreement. But what kind of a treaty is likely to pass the test of international and domestic politics and negotiations? Can we learn something about the hurdles and opportunities for climate cooperation from negotiations simulations in the classroom? The paper engages these questions by analyzing an experimental course design organized around simulated negotiations of the next climate change treaty. Unlike classroom simulations which rely on hypothetical scenarios, this course sought to approximate actual domestic and international constraints within which countries negotiate. The paper details the structure of the course, the ways in which it familiarizes students with domestic and international climate politics, and the components of the negotiations module. The analysis examines the pedagogical impact and policy learning associated with the simulation and draws conclusions about the broader applicability of this approach.

Keywords: climate cooperation, climate politics, simulation, active learning, teaching, negotiations

The Kyoto Protocol has been widely criticized in the US as an ineffective instrument for climate cooperation (Benedick 2001; Victor 2001; Barrett 2003).[1] Critics and pundits alike have proposed multiple alternative institutional solutions. These range from a regime based on per capita emissions, to technology transfer provisions, to a massive increase in international assistance targeted at green house gases (GHG) mitigation in developing countries (Benedick 2001; Athanasiou and Baer 2002; Schelling 2002; Aldy, Barrett, and Stavins 2003; Bodansky 2003). Each of the proposed institutional designs claims to correct the defects of the Kyoto Protocol. But would these designs pass the test of international and domestic politics and negotiations? Most alternative proposals fail to address this question.

Any cooperative solution to the global climate change problem is likely to be first and foremost a political deal. Effective institutional designs cannot, therefore, be conceived of in the abstract, but rather, in the context of political realities. Climate change cooperation involves overcoming significant collective action problems both internationally and domestically. The nation states of the world face divergent costs, incentives, ideologies, and preferred strategies with respect to the reduction of GHGs. There is a strong temptation to free ride given the diffused nature of cooperation benefits and the concentrated nature of GHG mitigation costs. Within many countries, the reduction of GHG emissions will require massive changes in the energy structure and consumption of the economy, creating both winning and losing interest groups. Pepper this complex two-level political mix with constantly evolving science, technologies and cost-benefits analysis of alternative policies, and there is a recipe for one of the most complex issues on the international policy agenda.

Can classroom negotiations help illuminate the political forces that shape climate cooperation and reveal useful lessons about the political feasibility of alternative parameters of the next climate treaty? This article analyzes the outcomes and implications of a classroom negotiations module implemented in an upper level seminar on Climate Change Politics offered at Colby College in the spring semester of 2006. The simulation module was organized to approximate real political constraints in climate negotiations, focusing on states that are among the largest global contributors of GHGs. It offered an opportunity for students not only to think of alternatives to the Kyoto Protocol, but also to actively assess which of those alternatives might pass the test of political bargaining. The article examines the potential of classroom negotiations for engaging students in actual policy problems and providing tools for learning and policy insight. It also highlights strategies for achieving a closer integration between the simulation and other class components to enhance the rigor and impact of the exercise. As such, the study explores a broader range of objectives and new methods of implementing active learning in international relations classes.

The article proceeds as follows. The next section situates the simulation exercise within the literature on active learning. The class and negotiation structure are then summarized, emphasizing the methods used to approximate political constraints and integrate multiple components of active learning. Finally, the article analyzes the dynamics and outcomes of the simulation from policy-learning and pedagogical perspectives. The broader lessons and applicability of this simulation model are explored in the conclusion.

One Method, Multiple Objectives

There is a growing consensus on the benefits of using active learning techniques in international relations classes. The simulation of negotiations specifically allows students to experience the dynamics of international bargaining and the procedures of international organizations (Smith and Boyer 1996; McIntosh 2001; Chasek 2005). Simulations provide a framework to engage students in the use of abstract political concepts beyond the constraints of lecture-only education (Smith and Boyer 1996; Kille 2002; Krain and Lantis 2006; Krain and Shadle 2006). These functions are particularly relevant for international studies since the international relations literature is replete with theories and conceptual debates, which could appear detached and overwhelming to students. Active learning methods also help students retain theoretical knowledge and grasp the broad usefulness of analytical perspectives (Bernstein and Meizlish 2003; Shaw 2004; Krain and Shadle 2006; Young 2006). Such methods can

strengthen student engagement in class, as well as the communications and presentation skills of participants (Kille 2002). These pedagogical aspects make active learning methods an attractive option for a course on climate change politics.

One of the challenges of teaching climate change policy is to simultaneously convey to students the key elements of climate science as well as the complex politics of reaching a cooperative solution. Since much of the public debate, at least in the US, has focused on climate science and on the deficiencies of the Kyoto Protocol, there seems to be a particular need for a deeper and more earnest look at the global politics of climate cooperation. Students seek opportunities not only to learn about and criticize existing policies or lack thereof, but also to actively engage in thinking about policy and institutional alternatives to a complex problem. The course described here, Climate Change Politics, uses multiple teaching methods to provide students with tools for analyzing climate politics across countries, cities, and interest groups. The traditional components of the course (reading materials, lectures and research assignments) are aimed at familiarizing students with various theoretical concepts and agendas. The simulation of the next climate treaty negotiations, on the other hand, is the capstone experience, designed to promote creativity, ''bring theory to life,'' and create a sense of engagement in the complex world of international climate negotiations.

The simulation module in the Climate Change Politics class follows some of the well-established objectives of active learning methods. The module is introduced to help *illuminate key theoretical concepts* such as ''veto actors,'' ''actor preferences,'' ''coalition building,'' ''issue linkage,'' ''focal points,'' ''relative gains,'' and ''North-South divide.'' All of these concepts and the theories behind them are essential aspects of the study of international cooperation and climate politics. The simulation is also intended to increase understanding of policy outcomes, and of the *interplay of actors* that typically determine them. Such understanding is important in the context of the multi-level climate politics. The attainment of deeper knowledge of climate politics depends, however, on a careful structuring of the assignments that lead to the negotiations, a point that will be elaborated in the description of the course design. The broader objective of *positive student engagement and skill development* is also embedded in the climate simulation, as well as in other class components such as an online discussion forum, presentations, and class participation.

In addition to established objectives of active learning methods, the simulation analyzed in this article pursues two additional goals, which have been less widely discussed in the literature. The climate treaty simulation was explicitly intended to approximate the actual political context of cooperation. Negotiations modules have been applied to multiple issues including terrorism, peacekeeping, poverty and hunger, global summits, human rights, the European Union, environmental cooperation, and others (Kille 2002; Shaw 2004; Krain and Lantis 2006; Krain and Shadle 2006). Most of these simulations use hypothetical scenarios intended mainly to illustrate the dynamics of a particular issue or organization. The advantage of using a hypothetical scenario is that it does not require as extensive background knowledge, although some background reading and preparation is involved in virtually any well-organized simulation (Asal 2005; Chasek 2005). Hypothetical scenarios also allow for greater control by the instructor in designing the parameters of the simulation, and can be more easily implemented as a stand alone component of a class.

In the context of the Climate Change Politics course analyzed here, however, one of the most important objectives is to relate students to the role of *political dynamics and constraints*, both domestic and international, in shaping the

parameters of cooperation and institutional design. It is not difficult to be critical of the Kyoto Protocol, which currently provides the international framework for climate cooperation. Nor is it too difficult to offer better hypothetical institutional designs. Indeed, more than thirteen designs of a post-Kyoto treaty have already been offered in the policy literature (Aldy et al. 2003). Rather than continue to spin the wheel of Kyoto criticism and alternative designs, the course seeks to empower students to assess the political feasibility of alternative agreements, a question not adequately addressed so far in the policy and theoretical literature. A negotiations simulation is a creative mechanism to achieve such an objective. In the course of the negotiations, delegates have to overcome multiple collective action problems and political constraints, which students might not fully appreciate in the absence of an active learning approach embedded in a context that approximates reality.

A related objective of the post-Kyoto treaty simulation employed in the class is to empower students to draw *policy implications* about institutional design and the conditions for successful climate cooperation. This, again, is not a widely recognized or discussed role of classroom simulations, which are typically perceived as too detached from reality and suffering from too many limitations to offer any practical policy insight. As we would see in the analysis of outcomes and student learning, however, a carefully designed simulation exercise could dramatically increase student appreciation of the political factors that inhibit or facilitate cooperation and provide them with a tool for assessing the feasibility of the alternative institutional mechanisms. Moreover, such knowledge motivates students to remain engaged in the issues and to follow policy developments beyond the classroom. By assessing the pedagogical impact of a simulation module, this paper seeks to illuminate new opportunities for active-learning in international relations.

Course Design and Simulation Structure

The Climate Change Politics course offered at Colby College is designed for upper level students with majors in Environmental Studies, Government, or International Studies. It assumes preliminary knowledge of the basics of climate science and political science theories. The instructor uses the first three meetings to introduce advanced topics and debates in climate science. The rest of the class is dedicated to analyzing the interests and strategies of multiple actors (countries, the European Union (EU), industries, NGOs, legislators, and public officials) at multiple levels of politics (local, national, and international). Students also examine in depth the negotiations of the United Nations Convention on Climate Change (UNFCCC), including the Kyoto Protocol and the subsequent Conferences of Parties (COPs). Students are tested on major concepts, analysis of international institutions, and national policies in two midterms, each accounting for 25% of the grade. The other 50% is based on class participation (10%), a research paper and presentation on the climate policies of a particular country (25%), a group paper resulting from the classroom simulation (10%), and an individual policy memo justifying the position taken by the country in the simulation (5%). As it becomes evident from the breakdown of the grade, approximately 50% of the class grade is based on assignments that have at least some component of active learning. Many of these assignments (the research paper and presentation, the final negotiated document, and the policy memo) are closely related to the simulation exercise.

The simulation is thus integrated with other class components, which prepare students for the exercise. As it has been recognized in the literature on active learning, the objective of the particular negotiation exercise is typically

the best guide for determining the appropriate structure (Kille 2002; Asal 2005). This integrated structure is important for preparing the students and achieving the objective of approximating the political constraints in climate negotiations. The 10-page research paper assignment, for instance, is critical for embedding classroom negotiations in the understanding of political realities. Students research and write the paper on the country that they later represent in the simulation. The paper analyzes the country's energy structure, GHG emissions, climate politics, policies, and international position. Students present their papers in class meetings, for which additional readings on each country are assigned. The role of these assignments is twofold. First and foremost, they give students the opportunity to gain a detailed understanding of the climate policies of different countries through reading and independent research. Country-specific presentations also develop shared knowledge of country characteristics and positions from which students can build on later during the negotiations module.

The negotiations module takes place in the last week of the class, after students have gained considerable knowledge on climate politics and cooperation. The simulation structure is kept simple. Each student represents one country. The small size of an upper level seminar (12–15 students) makes the one-student-one-country representation manageable and motivates students to focus on individual research and preparation. Typically, the countries represented are those with the largest contribution to global GHG emissions, as well as some developing countries likely to be particularly vulnerable to climate change. Table 1 lists the countries represented in the simulation. Nonstate actors, such as nongovernmental organization or corporate interests, are not represented in the formal simulation, although each student ought to consider the domestic influence of such actors when formulating their country's position.

The simulation consists of two supervised in-class plenary sessions (one at the beginning of the week and one at the end) and several plenary sessions moderated by the students autonomously. During the first in-class plenary, each student has to present the negotiations position of his or her country for a post-2012 climate agreement. The syllabus for that week includes multiple references of prominent proposals for post-Kyoto institutional designs published in the academic literature.[2] Negotiations between the first and the second in-class plenary are not supervised by the instructor in order to allow students more freedom to discuss, network, and link issues. Such *laissez-faire* format of classroom simulation is not very common because it entails a potential risk of unequal participation, shirking, and failure of the exercise. With adequate preparation, limited timeframe, and final graded assignments related to the simulation, however, this partial *laissez-faire* component may entail substantial benefits, as the analysis of negotiations dynamics and outcomes will demonstrate. During the second and final supervised, in-class plenary, students have the option to present (i) a common proposal for a post-Kyoto treaty and its main institutional design elements (possibly with some details left to be worked out); (ii) no common agreement, but a detailed presentation explaining why negotiations had collapsed; or (iii) a partial agreement involving only some countries, in which case both the group of countries endorsing the partial agreement and the group of countries rejecting it have to present their positions. This plenary

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[2]Students had the opportunity to consult among others Schelling 2002; Aldy et al. 2003; Barrett 2003; Pew Center on Global Climate Change, 2003; Sugiyama et al. 2005; Tangen et al. 2005; United National Framework Convention on Climate Change 2007.

Table 1. Countries Represented in the Simulation, May 2006

Country	% of global GHG emissions year 2000
United States of America	20.38
China	14.72
Russian Federation	5.68
India	5.60
Japan	4.01
Germany	3.01
Brazil	2.52
Canada	2.03
United Kingdom	1.95
Indonesia	1.50
Australia	1.46
South Africa	1.24
Bangladesh	0.36
Peru	0.21
Total GHG emissions without the EU-15	64.67
Total GHG emissions with the EU-15	76.61

Source of GHG emissions data: World Resources Institute, CAIT 2007.

enables the instructor to provide feedback on any agreement or institutional design that might emerge as a result of the simulation.

The output of the negotiations module is a joint class paper, which presents either the details of the new agreement signed by the participating parties, or a position paper explaining why an agreement could not be reached, or why only a partial agreement was reached. The group paper provides an important mechanism of assessment and typically motivates earnest participation and input on the part of most students. The same grade is assigned to all students based on evaluating the clarity, cohesiveness, and logical structure of the new agreement or position paper. Each student also submits an individual, two-page long, position statement addressed to the legislature of the country she or he represents. The statement has to justify the position taken with respect to the new treaty negotiated or lack thereof. This is one of the most important assignments related to the negotiations module. It seeks to approximate the domestic political constraints under which negotiators typically work and impose a two-level framework of negotiations. For example, in the fall 2006 seminar, the U.S. representative had to work within the priorities of the President George W. Bush administration in ways that are also accountable to a Republican Congress. The Russian negotiator had to defend the position of a government dominated by President Vladimir Putin. The position statements had to demonstrate a good understanding of the political priorities of the actual governments in place as of May 2006. Otherwise they risked being poorly argued, resulting in a lower grade. The position statement allows the instructor to assess the degree of student understanding of the negotiations, outcomes, and their relation to national priorities. Another form of student feedback on the simulation exercise is a short survey (see Appendix A) administered after the completion of the course. The survey is a voluntary form of debriefing, seeking more direct feedback from students on the learning impact of the exercise.

The simulation of climate change negotiations analyzed here thus presents several new structural aspects. It adopts an integrated approach, whereby the simulation is not a stand-alone exercise, but part of multiple assignments intended to illuminate the domestic and international politics of climate cooperation. The simulation leaves space for independent, *laissez-faire* negotiations to allow for

greater creativity and closer approximation to the actual negotiating conditions. There are also several mechanisms of formal assessment and feedback on student participation and learning in the context of the simulation. Such an integrated approach is critical, as one of the objectives of the simulation is to relate students to the multi-level political constraints faced by negotiators and to spur active thinking and evaluation of alternative policy options. Closer integration of traditional and active learning methods also facilitates better preparation and evaluation of students. This helps avoid some potential drawbacks of simulations identified in the literature such as highly uneven engagement of students, or perception of simulations as a less rigorous element of learning (Asal 2005). Since the implementation of such integrated methods of simulations and active learning has not been widely reflected in the literature so far, we hope that this analysis of simulation dynamics and impacts will prove useful for the further application or modification of the approach.

The analysis of the simulation module presented in the following section takes into account the perspectives of both students and the instructor. It is based on several sources of information. The section on negotiations dynamics builds on a participant-observant analysis with input from a student, who participated in the negotiations and is one of the co-authors of the paper. The analysis highlights key dynamics and concepts illuminated during the course of the simulation. Assessment of policy-related student learning is provided on the basis of the instructor's evaluation of the final agreement and individual position papers, as well on the basis of the post-simulation survey results. The draft article was also circulated to all students participating in the class to elicit commentary relevant to the analysis and the conclusions.

Analysis of Negotiations Dynamics and Outcomes

The course on Climate Change Politics has been offered twice at Colby College, during the spring semesters of 2005 and 2006. The analysis provided here focuses on the process of supervised and unsupervised negotiations that took place in the spring of 2006. While the two in-class plenary sessions provided the framework for the simulation, initial statements, and faculty feedback, much of the actual bargaining and design of a new treaty happened over the course of three plenary session organized autonomously by students. One advantage of the *laissez-faire* approach of this simulation is that it offers more freedom and opportunities for students to explore alternative policies and institutional outcomes. In the process, several structural elements became particularly important for facilitating negotiations and agreement on a new climate treaty. These factors included the leadership of the chair coalition formation, overcoming the North-South divide, and working under a specific and tight time-constraint. It is interesting to note that all these dynamics, which have been identified as important by the students themselves, have parallels in actual environmental negotiations (Sebenius 1984, 1991; Mintzer and Amber Leonard 1994; Le Prestre, Reid, and Thomas Morehouse 1998; Buchner 2005).

The delegate from the United Kingdom emerged as the *de facto* chair of the negotiations in the early stages of the unsupervised plenary session. Exercising leadership, the U.K. representative solicited conflicting parties to present their individual positions on the issue to the plenary. The chair advanced negotiations by expediting an agreement on the basic rules for discussion. It was decided that every delegate possessed an inherent right to participate in the discussions, but participation was to take place in an organized manner and be restricted to the specific issue in question. More generally, however, the chair resorted to reminding the plenary of the seriousness of the matter and the time-constraint for reaching a consensus on a position paper. She contributed

to the efficiency of the negotiations process by acting as a broker, thereby creating channels of conflict resolution. On occasions, she drafted middle-ground proposals and established issue-linkages between the positions of different parties. These proposals became new focal points of further negotiations.

The process of coalition formation was another element of the simulation, which emerged in the course of preparation and informal discussions. The requirement for formal country position statements to guide the first in-class plenary triggered an interest in the development of negotiating coalitions. The first of these comprised four developing nations: Indonesia, India, Peru, and Bangladesh. It became known as the ''pro-active developing nations'' coalition, which produced a single proposal, emphasizing equity concerns (initially changing the baseline for emission reductions from total emissions to per- capita emissions) and the necessity of technology and financial transfers. Of the industrialized nations represented in the simulated negotiations, the U.K., Germany, Canada, and Japan presented a joint proposal that demanded mandatory targets for developing and developed nations alike, but showed little consistency in coordinating other objectives. The United States presented an individual proposal, stressing ''meaningful participation'' by developing countries as imperative. Given the almost ubiquitous desire among the negotiating parties to secure U.S. participation in the protocol, the US held a quasi-veto in the initial stages of the negotiations. Thus, the US was able to take clear-cut positions on certain issues, such as requiring mandatory emissions reductions commitments for developing nations as a condition for signing the protocol, without fear of being alienated.

The ''pro-active developing nations'' coalition provided a check to the US veto power. Despite their relatively small economic weight, developing nations played a crucial role in re-establishing the balance of power in the negotiations. The U.S. conditionality for signing the protocol, ''if the developing nations do not commit to emissions reductions, the U.S. will not sign the protocol'', became the main bargaining chip of the developing nations' coalition. As the delegate from India put it, ''We all know the domino effect: No developing countries, No U.S., No protocol'' (Schwartz 2006). The process of supervised as well as free-style negotiation thus enabled students not only to understand, but also to experience and manage the sources of country's interests, coalition-building, and bargaining power in climate politics. When asked in the post-simulation survey which concepts were best illuminated in the course of the negotiations (see question 3, Appendix A), ten out of eleven respondents checked the concepts ''*actors' preferences*'', ''*bargaining power*'' and ''*coalition building*''. Overall, ''understanding better theoretical concepts'' was identified as one of the most beneficial aspects of the simulation by survey respondents.

The process of coalition building also brought to life, ''at times too vividly'' according to the words of one student, the North-South divide that characterizes international climate politics and many other areas of environmental cooperation. During the simulation, while each developed country had specific objectives at stake (i.e., Canada wanted emissions credits for providing clean fuel to the United States, Russia sought guarantees of ''hot air'', and the United States aimed at securing moderate emissions reductions), developing countries held negotiation positions that resembled one another on most issues acting as a tacit blocking coalition. The polarized setting that characterized these occasions created adequate conditions for the North-South agenda to infiltrate the negotiations. The interactions between four particular features of the simulation were crucial when dealing with the North-South divide: the brokerage of the negotiations' chair, the emergence of a pro-active developing country coalition, the role of informal caucuses, and the willingness to use side-payments and concessions to elicit agreements.

The informal caucuses, some of which were conducted via e-mail communication and some in informal meetings among negotiating groups, were a particularly interesting and helpful development initiated by students and indicative of their interest and commitment beyond what is formally required of the simulation process. The informal caucuses became the new focal points of negotiations, providing an opportunity to search for solutions without the structural complications of the plenary sessions. The extensive use of informal cross-country communications via e-mail expedited the resolution of the larger North-South divide by breaking it into smaller single-issues such as the creation of a mitigation fund or the specific commitment periods for developing nations. Dealing with these single-issue impasses proved to be more manageable because the informal communications became a parallel forum where conflicting coalitions engaged in *ad hoc* negotiations on specific issues. Given that e-mail communications were visible to all negotiating parties, the exposure to other coalitions' position and objectives encouraged the development of ''negotiation strategies'' in separate caucuses. The existence of these negotiation strategies and the willingness to make concessions were crucial when dealing with the sudden stalemates in negotiations. The ability to break the North-South impasse was evaluated in student discussion as one of the most important achievements of the simulation processes. This was facilitated by the pro-active developing countries coalition. When asked in the survey whether their positions changed during the simulation exercise, five students responded *YES*, five *NO*, and one abstained. The majority of those who responded *YES* (four out five) represented developing countries. As noted by students themselves, with the exception of Brazil, developing countries had less strict positions on climate change policy than those of the developed countries and the economies in transition. Conversely, the five students who responded *NO* represented developed countries with historically unambiguous positions and as a result, significant compromises could not have been made without substantial political cost.

Finally, the exercise approximated actual negotiations rounds insofar as the parties worked under a strict time-frame (10 days) to complete negotiations and produce a new treaty or a position paper. However, actual negotiations are typically not a one-shot game, but involve multiple iterations over long periods of time. The time constraint of the single-round simulation influenced considerably its dynamics. Although justifying a failure to reach an agreement was a viable outcome for the class, the students did not consider it an attractive option. This may be due to a range of factors such as the extensive preparation of students that led to the simulation, or the fact that the students registering for an upper level class on climate change are most likely to have some prior knowledge of the issue and a strong interest in searching for policy solutions. The fact that students showed a genuine desire to avoid coming out of the simulation empty-handed effectively prevented the collapse of the negotiations at various times. It is interesting to note that during both semesters when the course was offered, students succeeded in proposing a post-Kyoto agreement to which most participating countries signed on. Both classes chose not to opt for the path of least resistance, which would have been to produce a well-argued position paper on the collapse of negotiations and the difficulties to reach an agreement. The sixth question in the post-simulation survey aimed at procuring the students' perspective on the factors facilitating cooperation and agreement (see annex 1, question 6). Students ranked their *sense of responsibility and duty* as the most important factor. According to the participant-observant report, there were constant remainders of this factor throughout the exercise as students felt a degree of ownership over the negotiations and the protocol. *Time constraint* came second, followed by *coalition building* and the *role of the chair* last.

Acting under a time constraint and motivated to prevent a failure of negotiations, the delegates to the simulation exercise at Colby College in the spring of 2006 ultimately adopted the Kennebec Protocol to the United Nations Framework Convention on Climate Change signed by all delegates except for the representative of Russia. Instead of working under the existing framework of the Kyoto Protocol, the class produced an alternative treaty as a way to reinvigorate climate cooperation. However, while the Kennebec Protocol presents various innovations, certain elements from the Kyoto Protocol are retained. The main components of the Kennebec Protocol are as follows:

- *Re-categorization of parties into three groups*: Group A, B, and C. Kyoto Protocol Annex-I countries, excluding Russia, became Group A countries to include all industrialized nations with emissions reductions targets under the Kyoto Protocol. Acknowledging the significant differences among developing nations, the former non-Annex I countries were divided into two groups, according to their economic development. Group B comprised "the emerging markets"—the advanced developing nations and Russia. Group C included the remaining developing nations — the "least-developed nations"—represented in the class.
- *Emission reductions requirements for developed countries*: Group A ("industrialized nations") have to reduce overall emissions by 5% of the 2010 level for the next commitment period (2012–2025). The allocation of individual party reductions targets was left to be decided at the following COPs.
- *Emission limitations for developing countries*: Group B and C countries ("emerging markets" and "least-developed nations" respectively) are required to meet emissions standards for each of three envisioned commitment periods. These standards are contingent upon business-as-usual projections made by the regulatory body of the UNFCCC, based on the beginning year for each commitment period (2012, 2022, and 2032). For the first commitment period (2012–2022), Group B and C nations have to meet their business-as-usual projection. For the second commitment period (2022–2032), Group B nations are required to limit their emissions level in 2032 to the level forecasted for 2030 according to their business-as-usual projections, while Group C nations still have to meet their business-as-usual projection (Figure 1). For the third period (2032–2042), nonetheless, both groups are required to limit their emissions level in 2042 to their projected levels of 2038 and 2040 respectively (Figure 2). Figures 1 and 2 provide a graphical representation of developing country commitments.
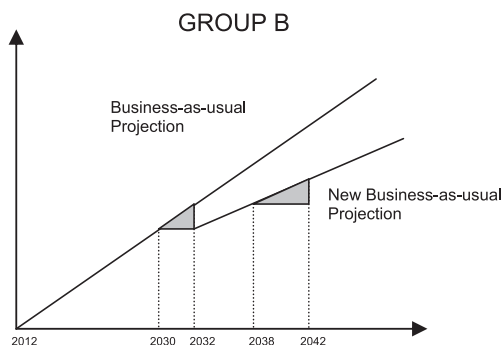

GROUP B

Business-as-usual
Projection

New Business-as-usual
Projection

2012   2030 2032   2038   2042

FIG. 1. Emission Caps for Group B Countries (Emerging Markets) under the Kennebec Protocol

GROUP C

Business-as-usual
Projection

New Business-as-usual
Projection

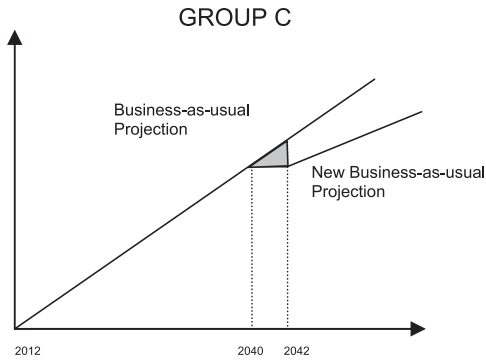2012   2040   2042

Fig. 2. Emission Caps for Group C Countries (Least Developed Countries) under the Kennebec
Protocol

- The Kennebec Protocol retained emphasis on the flexible mechanisms from the Kyoto Protocol (Joint Implementation, Clean Development Mechanism, and Emissions Trading) and introduced two new mechanisms: the Private Sector Involvement and the Adaptation and Mitigation Mechanism. The Private Sector Involvement mechanism allows companies, corporations, and nongovernmental organizations to execute emission reduction projects on a party's territory to earn credits, which could be counted towards company or organizational targets, sold in the International Emissions Market or retained by the organizations. The Adaptation and Mitigation Mechanism is designed to assist developing nations in affording the cost of emissions mitigation and adaptation. Funding for the Adaptation and Mitigation Mechanism is to come from voluntary contribution and a tax on emissions credits from all project-based mechanisms. Access to the Adaptation and Mitigation Mechanism is restricted to signatory Group B and C parties.

Policy Lessons Learned

By approximating the actual objectives and political constraints of climate negotiations, the simulation had a twofold pedagogical impact. First, through the *process of negotiations*, students grasped and experienced important aspects of climate politics and negotiations dynamics. Second, students produced a negotiated document, which they could compare to alternative institutional designs, thereby *drawing policy implications*. The previous section highlighted the learning impacts associated with coalition building, student-led organization and management of plenaries and caucuses, overcoming political deadlocks, and working within a set time-frame to reach an agreement. Here we shall examine the evidence of policy lessons and implications that students gain from the simulation and its outcome. It is furthermore possible to compare the class-negotiated outcome, the Kennebec Protocol, against criteria derived from the academic literature on post-Kyoto alternatives (Aldy et al. 2003). On the basis of this comparison, broader educational and policy lessons of the exercise could be derived.

Through the simulations students developed an appreciation that alternative treaties are often easier to propose than to negotiate. Indeed some options for a post-Kyoto agreement, such as per-capita emission standards (Athanasiou and Baer 2002) or massive Marshall-Plan-type transfers for climate mitigation (Schelling 2002), were on the table early on, but were quickly rejected when it became

clear that such options would not pass the approval of the United States and other developed countries. Yet students also learned that even in a difficult and seemingly deadlocked political context, innovation and compromise are possible. In the post-simulation survey, students noted that they became much more aware of the complexities of climate change negotiations, with several highlighting the challenge of reconciling ''many political agendas'' in specific. A significant number of participants also emphasized that states needed to acknowledge the inevitability of compromising to reach agreement.

The Kennebec Protocol crafted by the students also demonstrated awareness and effort to overcome some of the most pervasive critiques of the Kyoto Protocol, namely that it fails to engage all significant emitters and that its emission reductions commitments are excessively ambitious in the short-term but insufficient to assure a long-term solution to climate change (Aldy et al. 2003; Barrett 2003). The Kennebec Protocol is equally ambitious in its short-term emission reduction targets for developed countries. Very importantly, however, it engages the long-term participation of developing nations by establishing weak to moderate short-term goals and a mechanism to strengthen them gradually over time (see Figures 1 and 2). The incremental approach to commitments was crucial for securing the participation of developing countries' delegates and was thus viewed by participants as one of the biggest successes of the Kennebec Protocol. The weak short-term commitments for developing countries could be seen as compromising the environmental integrity of the Kennebec Protocol. Yet what student negotiators stressed was the importance of securing a global long-term commitment to caps in GHG emissions even on a very gradual basis.

One advantage of mandatory, albeit weak, targets is that they create an explicit linkage between participation in the flexible mechanisms and meeting country GHG emissions ceilings, which increases the environmental integrity of the flexible mechanisms themselves. The possibility of selling emissions standards in the international GHG emissions reductions market, furthermore, could create incentives for developing nations to reduce emissions below their required targets. Ultimately, such decisions would signify reorienting countries' economies toward a less carbon-intensive future. The inflated targets students adopted in the Kennebec Protocol are not much different from the substantial ''hot-air'' given to the economies in transition by the Kyoto Protocol. This was perceived as a further ''side-payment'' to developing nations, addressing equity concerns and the ''right to development'' principle. These are some important policy insights reached by students in the process of deliberation, bargaining, and institutional design. The principles of gradual engagement of developing nations (while assuring their right to development) and provision of incentives for carbon-lean economies are likely to resonate with actual policy developments as states embark on crafting a truly global climate treaty in the post-Kyoto round of negotiations.

In the process of crafting a new treaty, students also identified the flexible mechanisms of the Kyoto Protocol as likely to remain one of the most attractive and viable instruments for cooperation. This is not far from actual policy developments. Indeed, the flexible instruments have turned from one of the most contentious aspects of the Kyoto treaty to the golden thread on which its implementation is now based (Bothe and Rehbinder 2005). The Kennebec Protocol negotiated by Colby students demonstrated excellent understanding of the current system of flexible mechanisms, as well as some of its shortfalls. Students sought creative ways to tie participation in the mechanisms to long-term emission caps on the part of developing countries. They did it by increasing the direct input of the private and advocacy sectors in these instruments, and substantially increasing their contribution to adaptation policies, which is one of the key concerns of developing countries. The significance of the flexible

mechanisms, their fine-tuning and reform is a useful policy lesson for students, which can find parallels in the actual crafting of post-Kyoto climate institutions (Benedick 2001; Barrett 2003).

Overall, the simulation of the next climate treaty involved experiential learning and empowered students to actively search for cooperative solutions mindful of their political feasibility. One advantage of this approach is that it provides incentives to both learn and create. The extensive preparation prior to the simulation combined with opportunities for discussion and coalition building in a series of *laissez-faire* plenary sessions allowed students to encounter and overcome the typical roadblocks associated with divergent interests, political divides, and veto power.

From the perspective of the instructor, the exercise provided yet another opportunity to assess student learning, creativity, and logical thinking. The fact that two graded assignments were directly associated with the simulation outcomes was extremely helpful first in motivating students to prepare and take the simulation process seriously, and second in providing a tool for evaluation and feedback. The Kennebec Protocol, which was formulated and submitted as a graded paper, enabled the instructor to appreciate the extent of student understanding of the current cooperative mechanisms, and their capacity to branch out of that framework and propose new institutional solutions. The other formal indicator of student learning and evaluation were the individual position papers on the newly negotiated agreement. Although these short papers varied in analytical rigor and therefore in the grades assigned, virtually every single one demonstrated consistent knowledge of the fundamental climate change politics of the particular country, evidence of student engagement and understanding of the negotiated outcome, and ability to interpret this outcome for the context of the country he or she represented.

Broader Pedagogical Impacts and Implications

One advantage of conducting a post-simulation survey is the opportunity to assess more formally the degree of student involvement in the exercise, and to provide a venue for students to evaluate in their own words which aspects of the exercise were of value and why. The voluntary survey, administered after the completion of the Climate Change Politics class, resulted in a very high response rate of 92%, with 11 out of 12 former class participants completing the questionnaire. The overwhelming majority of respondents (nine out of 11), furthermore, *strongly agreed* that they were actively engaged in the simulation exercise with the remaining two stating that they *agreed*. These results illustrate the overall positive perception that students had about their engagement in the exercise and their role in producing an agreement. The fact that students did not miss any of the in-class or unsupervised plenary sessions and that the large majority of these meetings went beyond their allotted time further supports the claim of high degree of student engagement. In addition, even though it was not required, students invested time to create coalitions and schedule informal meetings. A final indicator of student engagement concerns the e-mail exchanges among students during the week of the exercise. In total, 43 e-mails were exchanged in a period of 10 days, of which 39 were addressed to the class as a whole, with each of the students sending at least one. Subjects varied from simple organizational matters to individual positions on particular points of debate. This level of student involvement supports some of the fundamental claims of the active learning literature related to the ability of such methods to provoke and retain student interest beyond what is feasible with more traditional teaching methods.

Although the literature on classroom simulations offers a number of useful tools ranging from debriefing, surveys, and quantitative analysis (Asal 2005;

Chasek 2005), evaluating the effectiveness of these exercises as learning tools can be a difficult task in practice. One of the advantages of the more integrated approach to simulation adopted in the course discussed here is that by linking the simulation to other graded assignments the instructor gains more gateways to help students prepare as well as to evaluate the performance and learning. However, receiving feedback from students on the value of the exercise also remains critically important. The second question in the survey asked students to rate the usefulness of various course components, including the simulation exercise. Students ranked the *country research paper and class presentation* as the most useful components of the class. Several students stated that for this particular component, students gain from the opportunity to research and synthesize their assigned country's position and learn about the positions of the other 11 states represented. The actual *simulation of the negotiations* and the *individual position papers* were ranked a close second, followed by the *reading material and lectures*, and the *midterms*. Overall these results indicate that assignments with active learning components were identified as among the most useful in understanding climate politics. These responses also suggest that integrating negotiations simulation with student research and presentation as mechanisms of learning and preparation is a promising way to enhance the impact of active learning components.

The last questions in the survey asked students to reflect on the value of the simulation for understanding actual developments in climate change cooperation. All participants thought that the simulation was effective as a learning tool. Students noted that they became much more aware of the complexities of climate change negotiations, with several highlighting the challenge of reconciling ''many political agendas.'' Some students commented on how the simulation helped understand the current state of climate cooperation and the Kyoto Protocol. As one student stated: ''It was possible to see and understand the complexity of international negotiations when everyone had to realistically represent a certain view point. It was much easier to see why it took so long to draft the Kyoto Protocol, and why it is such a lenient agreement.'' Others commented on the value of the simulation for understanding concepts and the challenges of cooperation more broadly: ''Like any simulation exercise, it brought context to the concepts we had learned in class. It's hard to understand the reality, challenges, and frustrations in a negotiation setting until you're living it...It really helped us understand the challenges of getting so many countries with so many different interests to cooperate.''

Conclusion

Constructing a new climate treaty is a politically difficult but critically important task for the global community. Conveying the complexity and opportunities of climate cooperation can be similarly challenging from a pedagogical perspective. The course described in this paper tackled this challenge by providing students with tools to analyze climate change politics internationally, across countries and interest groups, using a variety of techniques. The simulated negotiations, which took place in the last week of the semester, immersed the class in a virtual reality of bargaining, coalition building, and institutional design. This active learning approach offered an opportunity to fulfill three essential pedagogical objectives.

First, students internalized through experience abstract concepts related to theories of cooperation and institutions. Second, through the preparation of country assignments and positions, the simulation exercise allowed students to understand the complex interplay of domestic and international political actors which influences cooperative outcomes. Third, by encouraging students to overcome collective action problems, while requesting a position paper justifying

their individual support or rejection of the negotiated outcome, this simulation technique familiarized students with the role of political constraints in shaping the parameters of cooperation and institutions. The successful negotiation of the Kennebec Protocol shows that students not only grasped complex theoretical knowledge, but were able to use that knowledge creatively and constructively. Beyond the classroom, the simulation module provided students with broader policy lessons. It showed that it is possible to negotiate a protocol with moderate, but worthwhile short-term goals that satisfy, at least partially, the preferences of a large pool of actors.

The simulation module analyzed here was thus designed and implemented with a very specific purpose in mind: to help students appreciate the complexity of climate politics and empower them to actively think about and propose cooperative solutions. Some of the new methods used in the exercise, including extensive preparation through student research, presentation and testing, embedding the simulation in political reality through written assignments, and leaving space for autonomous negotiation and creative thinking, could be applicable to a broader range of classes. Such methods are likely to fit particularly well with upper level seminars, or policy-oriented master's courses focusing on particular issues in international politics. The smaller class size of such courses, as well as the opportunity to gain a deeper knowledge on policy topics, are likely to be conducive to integrating multiple elements of active learning, along with more traditional pedagogical tools. The task of designing new mechanisms of cooperation to tackle multiple global challenges demands much leadership, skill, and craftsmanship on the part of policy makers and societies alike. Our hope is that classroom simulations could inspire students to be the next generation of critical thinkers and leaders in complex policy matters such as climate change.

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Appendix A. Post-Simulation Survey Questionnaire

Were you actively engaged in the simulation exercise? Check one answer.
Strongly Agree: Agree: Neutral: Disagree: Strongly Disagree:

Please rate the usefulness of the following course work components for your understanding of the Kyoto Protocol and climate change cooperation. (1 = the lowest; 5 = highest)
Reading material and lectures:
Mid-terms:
Country research paper and presentation:
Simulation of climate change negotiations:
Individual position papers:

Which of the following theoretical concepts were used or illuminated during the simulation exercise? Check as many as applicable:
Veto Actor:
Actor's preferences:
Bargaining power:
Coalition building:
Issue-linkages:
Relative gains:
Focal Points:

Did your country's position change during the simulation exercise?
Yes: No: Why?

What states/coalitions played a dominant role in the negotiations?

Rate the significance of the following factors in facilitating cooperation and agreement on the Kennebec Protocol. (1 = the lowest; 5 = highest)
Role/moderation by Chair:
Coalition building:
Time constraint:
Student sense of responsibility and duty:
Other:

Was the simulation exercise of value for understating actual developments in climate change cooperation during and/or after the class?
Yes: No: Why?

Do you have additional thoughts or comments about the simulation you would like to share?