Experiential Learning and Pathways to Carbon Neutrality

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ABSTRACT To date, more than 650 university presidents across the United States have become signatories of the American College and University Presidents' Climate Commitment (ACUPCC). A central goal of being a signatory is for a campus to achieve carbon neutrality. This article suggests that bringing the practice of experiential learning to the college classroom is a mechanism to help students understand and become involved in campus carbon-neutrality efforts. More specifically, it discusses the practical realities of using an undergraduate environmental-policy course to create policy proposals for our campus's 2020 carbon-neutrality goal. The findings support a growing body of literature that demonstrates the value of experiential learning by enabling students to move from theory to practice.

Ithough approximately 71% of Americans believe that we should "do whatever it takes to protect the environment" (Pew Research Center 2015), there is a strong partisan divide regarding global climate change between the two dominant political parties. For instance, in 2015, 54% of Democrats and only 15% of Republicans believed climate-change policy should be a top priority for the president (Pew Research Center 2015). Nevertheless, even though protecting the environment is important for most Americans, congressional climate-change policy has not yet been enacted. Despite this lack of congressional action, climate-change policy is being addressed by administrative agencies (Rinfret and Cook 2013), state and local governments (Betsill and Bulkeley 2006; Rabe 2004), and college campuses (Wells, Savanick, and Manning 2009).

More specifically, college campuses across the United States are providing cutting-edge ways to address climate change because it affects everyone, regardless of major (Wells, Savanick, and Manning 2009). To date, more than 650 US college and university presidents have become signatories of the American College and University Presidents' Climate Commitment (ACUPCC). Specifically, "ACUPCC signatories commit to measure and report their greenhouse-gas emissions, take immediate actions to reduce them, and develop and implement a plan to go climate neutral" (EcoAmerica 2016). Often, the first step is to determine a baseline by conducting an inventory of campus greenhouse-gas emissions. The second and more difficult step is to determine how to achieve carbon reductions to reach neutrality. Yet, what is missing in these conversations is how to engage students in learning about the process to attain carbon reductions and to understand more broadly the nuances of environmental policy and politics.

This article explains the results of a semester-long project for an upper-level undergraduate environmental-policy course in political science at a public university in the West. The focus of this project was for students to complete various assignments to suggest pathways for carbon neutrality, which they presented to campus administrators, faculty, and staff. The argument is that this experiential project is a useful learning tool for students to understand how to create their own policy solutions for a public problem: that is, climate change. This article describes the steps of the project, feedback from students, and whether students met course learning objectives. Results from the project demonstrate that students learned how much time it takes to write policy, the importance of teamwork skills, and how to communicate policy preferences to campus-wide decision makers.

MOVING BEYOND THE TEXTBOOK

Experiential learning¹ is important for the college classroom because, too often, academics develop assignments that Trueb (2013, 137) described as "students only learn[ing] to write for the academic setting." In response, many college instructors have adopted a wider array of teaching approaches to engage students with real-world learning activities (Bain 2004; McKeachie and Svinicki 2006).

For example, Kanner (2007) posited that students learn best by experiencing what it is like to "put the skin on of another person" in answering important disciplinary questions. Similarly, Rinfret (2012) clearly noted how a mock city-council simulation allowed students to understand the inner workings of local government. Moreover, Rinfret and Pautz (2015, 442) candidly suggested that experiential learning "Is useful for students to come face-to-face with the often innumerable competing forces in policy making."

Others have noted the value of this type of research, especially in the environmental-policy arena. For example, Wells, Savanick,

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and Manning (2009) used a college seminar to conduct a campuswide greenhouse-gas audit. In their work, they posited that "the practical realities of using a college seminar to conduct a greenhouse-gas inventory presents evidence of the advantage of this approach as an educational and practical tool" (Wells et al. 2009, 229). Moreover, Pennock (2011, 141) reiterated the importance of hands-on policy assignments for political science students because it "gives them the opportunity to practice the type of writing they will perform both inside and outside of academia while still developing critical thinking skills and an understanding of the political world." Yet, Breen (2010, 687) suggested that "As endowments have dwindled and state budget crises loomed during the recent recession, securing and maintaining funds for sustainability projects has become increasingly tenuous."

Despite these constraints, political science is an appropriate discipline for embracing experiential learning because it "... involves students coming to understand the democratic processes of a community, the problems it faces, the richness of its diversity, the need for individual commitments of time and energy to enhance community life, and, most of all, the importance of working collaboratively to resolve community concerns" (Ehrlich 1999, 246; quoted in Hepburn, Niemi, and Chapman 2000). This article explains how experiential learning can prepare political science majors and non-majors to not only face but also effectively address the complexities of environmental policy making.

UNPACKING PROJECT DETAILS

Before describing the details of the semester project, an overview of the university carbon-neutrality commitment and class under investigation is necessary. Our campus is a public university located in the West with approximately 10,000 students. In 2007, our university president became an ACUPCC signatory. By 2010, our campus had completed its greenhouse-gas inventory and climate action plan, which clearly laid out goals of reducing campus carbon emissions by 10% of 2007 levels by 2015 and carbon neutrality by 2020. To reach these targets, part of the climate action plan also was to engage the campus in providing solutions and to pursue the use of carbon offsets.² course learning objectives, which included increasing knowledge about climate change, understanding the policy-making process,³ linking theory to practice, learning how to work in a team, and increasing analytical and public-speaking skills. Peer and self-evaluations were part of students' carbon-project grade.⁴ However, grading is a concern from both student and instructor perspectives (Kanner 2007; Oros 2007). The carbon-neutrality project was worth 195 points (i.e., 505 total points for the course) or 39% of the final grade. To provide transparency, students were given clear instructions about how they would be evaluated for each carbon-project assignment. The grading criteria were discussed in class and posted to the online course-resource page.

To evaluate the viability of student proposals at the end of the semester, a team of campus leaders—the president, sustainability committee and coordinator, and campus administrators (i.e., vice president of marketing, dean of social and behavioral sciences, and political science faculty) voted on which group option was most effective. The goal of the carbon-neutrality project was to provide a venue for students to participate in the process through hands-on learning.

Engaging Students in the Carbon Project

Before a discussion of student results and the value of an experiential-learning project, the six course assignments are described in table 1.

What Are Carbon Offsets?

For the first assignment, students were required to read the policyprocess model and the 94-page campus climate action plan and to conduct their own research about carbon offsets and climate change. By the third week of the semester, students were required to submit their own four- to five-page document that defined carbon offsets, campus climate projects, and different approaches to achieving carbon neutrality.⁵ The semester was launched with individual papers because it was important for students to engage in critical thinking about how the topic fit more broadly within the history of US environmental policy and to use this information when teams were formed.⁶

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The purpose of my class's involvement with the campus carbonneutrality goals was to provide an experiential learning opportunity for students to write policy proposals to engage in reaching the targets. I designed the carbon-neutrality project for my Spring 2015 political science environmental-policy class. Thirty undergraduate students (i.e., sophomores, juniors, and seniors) from various majors—political science, business, communications, geography, environmental studies, and art—enrolled in the course. The class met on Monday, Wednesday, and Friday for one hour. The main textbooks for the course were Rinfret and Pautz's (2014) US Environmental Policy in Action and Hernan's (2010) This Borrowed Earth.

Students formed five different teams to complete a series of assignments for the carbon-neutrality project and to meet

Setting up the Details

The second assignment of the project was to create teams. The class was allowed to form its own teams but was required to ensure that students from different majors were included. Each team consisted of six students, resulting in a total of five groups for the class. The groups selected individual team roles including project manager, assistant project manager, media relations expert, science expert, policy expert, and business expert. The rationale for the varied roles is that tackling climate-change policy is multifaceted and cuts across majors. This variation in expertise also was used to introduce students to effective decision making within a team (Carnegie Mellon University 2016).

Each group wrote a team contract that specified how assignments would be completed on time, the division of responsibilities,

and how to maintain motivation and enthusiasm. A caveat in the contract was that each group had the ability to fire underperforming team members. That is, if any member did not adhere to the contractual specifications, they would receive a warning and be required to meet with the professor before being fired.⁷

The Project Slogan and Potential Solutions

By the fifth and sixth weeks of the semester, students were well versed in the background and driving actors (institutional and non-institutional) of US environmental policy. To better understand how additional factors (e.g., the media and public opinion) have an impact on environmental policy, students began the third and fourth assignments. biomass facility—whereas others wanted only to fundraise for carbon offsets to reach the goals. To engender buy-in during this stage of the process, several teams met with community and campus leaders to discuss the viability of their potential solutions and slogans. In particular, to create buy-in, one team attempted to set up meetings with individuals who would attend its final presentation. This team had been compelled by assigned readings on how to effectively engage official and unofficial policy actors (Rinfret and Pautz 2014); if this is not done, they understood that the chances for policy adoption would decrease. This assignment helped students to continue to focus on teamwork, public speaking, writing, decision making, and connecting class readings to practice by creating their own slogans.

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For the third assignment, the teams used their specific roles to create a team slogan and then began to identify effective strategies to reach the university's 2020 carbon goals, media tactics (e.g., creating a Facebook page and an infographic), and three to four potential approaches with their political and economic pros and cons. One student in each team compiled these ideas, documented outside research support, and submitted the report for grading.

As expected, the teams created various novel slogans, such as "Know to Grow" and "Carbon Neutrality Is the Stuff." Some teams wanted to focus on a specific area to reach the university's carbon-neutrality goals—for instance, recycling or a campus

Polling⁸

For the fourth assignment, teams drafted a 10- to 15-question survey that helped them understand how public-opinion data helps or hinders policy creation and development. They could grasp from this assignment how data can be used to increase or decrease support for a policy. The survey questions included demographic information, political-party preferences, and a list of options related to the group's project. For instance, one team was interested in a campus biomass facility and its survey asked questions about support or opposition to this project. I provided feedback regarding the wording of questions and the readability

Assignment	Assignment Details	Course Learning Objectives
Assignment 1: What Are Carbon Offsets?	 Read university climate action plan Meet with sustainability director Write background paper 	 Knowledge about climate change Analytical skills Stages of the policy-making process
Assignment 2: Group Roles	Selection of teams and duties Group contract	• Work with a team
Assignment 3: Project Slogan	 Potential media or lobbying strategies Three to four plausible ideas for the campus to reach 2020 carbon goals 	 Knowledge about climate change Analytical skills Policy-making process Work with a team Theory to practice
Assignment 4: Polling	 Survey to measure ideas from Assignment 3 Team meeting with professor 	 Knowledge about climate change Analytical skills Policy-making process Work with a team Theory to practice Public speaking
Assignment 5: Carbon Videos	 Creation of YouTube videos Market approach 	 Knowledge about climate change Analytical skills Work with a team Theory to practice Public speaking
Assignment 6: Presentations and Solutions	 Written report Presentation Selection of team plan Final team evaluations and student feedback 	 Knowledge about climate change Analytical skills Policy-making process Work with a team Theory to practice Public speaking

Table 1 Carbon Project Assignments

of the draft surveys, indicating whether they were ready for implementation.

Each team surveyed from 50 to 100 respondents, including students, faculty, staff, and/or administrators. Several teams administered surveys during other classes; others polled potential participants outside of the student union. Across the five teams, a total sample of 500 unique university community members had been amassed. To limit duplicate respondents, teams were not allowed to poll the same classes. The polling data were instrumental for teams to determine which proposals would be accepted by their peers. For instance, one team that focused on surveying students campus-wide quickly learned that using the terms "carbon fee" and "carbon tax" was not a beneficial framing for their final project.

Videos

For the fifth assignment, students continued their understanding of the importance of teamwork as well as the power of framing and messaging to garner support for their approach for carbon neutrality. We spent class time watching environmental and political videos, including the Crying Indian, to discuss how images can have an impact on perceptions about a topic. Therefore, one or two short clips or YouTube videos were required for the teams to market their approach. During one class session, students unveiled their videos to their classmates, who were required to critique or ask questions regarding each team's videos and policy ideas to help refine their approach. Doing so also was instrumental for documenting which teams expended more effort in their work. For example, one team's video used illustrative music as a team member ran up a mountainside showing statistics on each step. The strong message demonstrated why revamping the campus transportation system and charging a fee for airline travel to purchase carbon offsets were necessary. For comparison, another team filmed students recycling glass and plastic bottles, proclaiming that this was the best approach to reach our carbon-neutrality goals. The video ended by showing money washing down a drain if we did not take action immediately. These examples reiterated to the class how powerful messaging and framing can set a policymaking agenda.

Presentation and Report

During the final weeks of the semester, each team worked on a written compilation of all of the semester assignments. The purpose of the report was to demonstrate why their approach was (representing parking, facilities, faculty, and students) and coordinator, climate-change studies director, and political science faculty. The audience participants were encouraged to ask critical questions about each team's project. Afterwards, the instructor gave each participant a ballot to vote on which approach should be accepted and why. The ballots were given to the university president and sustainability coordinator to tally and discuss.⁹

The university president provided the instructor with the final results, which were announced during the final class session. The winning team leveraged all of the assignments to produce an incremental approach, which included a travel toll to create a fund for purchasing carbon offsets from local sources, collaboration with our campus foundation and student government to ensure that the 2020 goals are reached, and videos that underscored the economic and environmental gains of its solution.

DISCUSSION AND IMPLICATIONS

The carbon-neutrality project was a challenging yet advantageous mechanism to actively engage students with real-life implications of major issues in environmental policy. Student feedback was obtained through final reflection, which addressed the following questions: (1) What did you learn from this project?; (2) What were the challenges and benefits of this project?; (3) Did this project meet the course learning objectives?; and (4) Any suggestions for future use?

Student Engagement, Awareness, and Meeting Course Learning Objectives

The learning objectives for the course included increased knowledge about climate change, understanding the policy-making process, ability to work with a team, linkages between theory (i.e. textbook) and practice (i.e., carbon project), and increased analytical and public-speaking skills. Students across majors acknowledged that their level of awareness about policy-making processes and climate change increased because of the participatory learning approach provided in this course.

According to one student, "I was suspicious of the assignment at first because I wasn't sure if climate change is real, but I now realize, because of this assignment, that carbon neutrality or climate policy is important for our community's future." Moreover, approximately 90% of the class suggested in their final feedback reflection that this class was extremely difficult but rewarding because they had to learn how to work with one another to devise a solution. As one student noted, "Knowledge

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the best, supported by their primary and secondary research. The second phase of the final assignment was a presentation explaining why their approach should be selected for campus consideration. To prepare for both assignments, students wrote drafts with instructor feedback; one class session was designated to practice giving presentations. In the final week, each team was allotted 15 minutes to present its approach to the university president, campus administrators, campus sustainability committee about how to write policy and engage in the process by doing it was a life lesson."

In addition, students reported a comfortable campus environment in which to discuss a controversial issue. Some noted that climate change and environmental policy would not be discussed with their family in the rural part of the state; however, they learned through the course that climate change is much broader and would impact our state's natural beauty.

The learning objectives that focused on teamwork and the ability to link theory to practice also were met. The majority of students listed several advantages of the carbon project: (1) learning to work within a team; (2) real-world application; (3) something to put on their résumé; and (4) ability to communicate with others. Several students, regardless of class standing or major, noted that this was one of the first classroom experiences in which they worked with a team to deliver a policy solution. As one student commented, "Working within a team definitely has its challenges, but this class taught me to grow up and how to work with others." Moreover, the fact that students in this course were from a variety of majors did not affect their experience of being able to move beyond the textbook. A business major noted, "It was nice to apply what we were learning from the text via the carbon project." Another student stated, "I am a political science major and this is the first time I am really writing about something tangible or that I can impact." Several students also appreciated that the carbon-project assignments corresponded to reading assignments, thereby providing a way to understand the stages of the policy-process model. For instance, one student commented, "I was able to read a section, listen in class, and then we put it into action. I really appreciated this."

Several students were excited about listing several new skillsets on their résumé. One student commented, "I am glad that I am able to put this project on my résumé so that I could apply for a policy internship in the future." Moreover, 20 of the 30 students reported an increased ability to think critically about environmental policy and enhanced public-speaking skills. However, 10 students agreed that the experience had an impact but their comfort level in public speaking still needed work. According to one student, "Working with a team helped with public speaking, but it is still not something I like to do."

Overcoming Challenges

The drawbacks conveyed by a small proportion of the 30 students centered on two themes: team issues and the amount of work. Two of the five teams had concerns surrounding teamwork dynamics. One group fired a team member. According to one student, "The project really challenged my ability to work with others. It was real; we fired someone for not carrying their own weight. This was really difficult to do, but I guess this is what happens in the real world." A few students noted that the volume of work was much greater than in other classes. As one stated, "This class was intense; in addition to the carbon project, we still had written exams and case-study presentations. It pushed me a lot, but it was really difficult when you also have a full-time job."

CONCLUSION: LESSONS LEARNED AND EXPERIENTIAL LEARNING

Inevitably, what did the students learn from the carbon neutrality project?. Although drawbacks were evident, students overwhelmingly learned from this experience because of its participatory, experiential nature. For example, one student remarked, "In one semester I have learned more than I have in my college career." Another student noted, "Thank you for allowing us to try to make a difference on campus and hopefully on a larger scale after graduation."

Understandably, there are advantages and disadvantages to any course assignment, yet I encourage other instructors to adopt this project. Although this assignment takes significant planning, I have a few suggestions for the future. Our campus atmosphere for addressing climate change is collegial. The students were comfortable discussing the topic with classmates, community leaders, faculty, staff, and administrators. Although this comfort about the topic was a norm on our campus, students were frustrated about the lack of action at the state and federal levels. In classroom discussions, some were discouraged about the lack of congressional action but they knew that climate-change issues are being addressed by US Environmental Protection Agency regulatory efforts. However, this might not be the standard on other college campuses. Therefore, I suggest that faculty discuss with the class how to participate in active listening and how to respond to unreceptive feedback.

Despite our campus collegiality, by the end of the semester, the teams became highly competitive about having their solution selected. Students knew that their grade would not be affected by which team won or lost, but winning inevitably became a theme for two groups. After the presentations, I used this opportunity to debrief the class by asking, "Does focusing on winning perpetuate the 'us versus them' mentality that often pervades US environmental policy making or engender an environment in which we cannot create new environmental policy?" One student responded, "Wow, I didn't realize how we're starting to act like members of Congress, focusing on the 'me' instead of the 'us.' Maybe this is why we cannot pass climate legislation." These statements led to a classroom discussion about what occurs when we place our personal preferences above collective policy decisions and, ultimately, the reasons why a major US environmental policy has not been enacted since the 1990s. Therefore, I suggest a debriefing session to discuss why a particular solution came to fruition as well as long-term benefits of class's collective actions.

Moreover, I recommend that the "winning" team approach be implemented by university administrators. For this course, the goal was to use the carbon-neutrality project as a vehicle to actively engage students in policy-making processes. We were fortunate that portions of the selected plan are being considered and that the climate-change conversation continues on our campus. However, as budgets decrease and competition for resources increase, I encourage instructors to work with campus administrators to implement the student plan.

Finally, students remarked about the value in writing proposals to understand more broadly the issues surrounding climate change. This class project is in concert with findings on the importance of experiential learning—that is, allowing students to gain knowledge through participatory learning, which enhances their understanding about a public policy and its potential solutions. Ultimately, the carbon-neutrality project was a way for students to move from textbook theory to practice. Because of projects like this, our students are better equipped to understand the process and make informed policy decisions in the future.

NOTES

- 1. *Experiential learning* is learning through experience and reflections about these experiences.
- A carbon offset is a reduction in emissions of carbon dioxide or greenhouse gases made to compensate for or offset emissions made elsewhere. Examples of carbon offsets are found in renewable energy, forestry, and resource conservation. Offsets can be purchased to reduce carbon emissions.
- Policy-process model or stages heuristic approach include the following stages to understand US policy making: (1) problem definition, (2) agenda setting, (3) policy development, (4) policy implementation, and (5) policy evaluation or change.

- 4. Peer and self-evaluations asked students to assess attendance at group meetings, contribution to research, ability to meet deadlines, respect for group opinions, and ability to communicate. Students provided written feedback in each area as well as rating one another on a scale from 1 (low) to 5 (high).
- 5. The first assignment had 20 points possible. Students were graded on organization, quality of peer-reviewed research, clear definition of carbon offsets, and three to four ways that campuses across the United States have tried to achieve carbon neutrality.
- 6. To aid in research during the second week of class, the university sustainability director and political science library liaison met with students. The sustainability director provided a detailed overview of what the campus had completed to date and an explanation of carbon offsets. The library liaison described useful research tools available for support.
- 7. If performance did not improve, students could no longer participate in the project and would have to write a new 20- to 25-page research assignment on their own.
- 8. Before students started their third assignment, we had a mid-semester meeting. Teams arranged a designated 20-minute meeting with the instructor during the regular class period. Before these meetings, each team conducted peer and self-evaluations. The evaluation rated the performance of team members and individual students on a scale of A through F. The evaluation was accompanied by a narrative explaining why a particular grade had been assigned to a team member. The feedback was useful for our group meetings to discuss remedies for any apparent concerns.
- 9. Student groups were not penalized if they "lost" but winning team members had 2 points added to their final grade. After presentations, the instructor provided teams with feedback from the ballot in the aggregate. The completed ballots were anonymous.

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