BRIDGING CLIMATE SCIENCE AND SECURITY: TEACHING CLIMATE CHANGE AND NATIONAL SECURITY AT THE U.S. NAVAL WAR COLLEGE

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ABSTRACT

Like almost all climate education, the Department of Defense's educational institutions approach the subject of climate change in the science and engineering fields. In contrast, the social sciences remain primarily overlooked. At the U.S. Naval War College, the *Climate Change and National Security* master's course introduces students to the basics of climate science and expands the topic into the myriad security implications. Drawing from political science, students examine climate change and human security from an international relations and foreign policy analysis perspective. This course combines a social constructivist strategy and an adult learning–oriented pedagogical approach by cross-utilizing course framing, educational materials, and assessment deliverables. The approach has minimized potential climate skepticism and denialism. The course incorporates climate communication and climate psychology elements to address climate anxiety and to empower students with solutions.

Keywords: climate science, climate security; multidisciplinary approach to climate security

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Like almost all climate education, the Department of Defense's (DOD) educational institutions approach the subject of climate change in the science and engineering fields. In contrast, the social sciences remain primarily overlooked (Siegner and Stapert, 2020). The research from government agencies such as National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), and the DOD's Strategic Environmental Research and Development Program, as well as the risk assessments from the intelligence communities, have not widely informed the educational curricula. Political science security studies, including strategic studies, international relations, and foreign policy analysis programs, favor conventional military-related security topics.

As a more unconventional security risk, these programs lag in considering how climate science affects international security. As a result, the joint professional military education requirements that all military officers receive only minimally and anecdotally incorporate how climate change

affects the strategic environment. This deficiency in climate literacy had led to a workforce that fails to include climate security issues into the DOD's strategy, policies, and planning.

To start filling the gap, the U.S. Naval War College (NWC) created a Climate and Human Security Group in 2017, began teaching climate change and national security electives in 2020, and hosted the first open and free conference on the subject at a DOD academic institution in 2021. This article describes my theoretical, structural, and pedagogical approach to teaching the *Climate Change and National Security* course.

The NWC offers a master's degree and Joint Professional Military Education (JPME) Level I to mid-level officers and Level II to senior officers. The students include officers from all branches of the military service as well as government civilians. To enhance the learning environment and build relationships worldwide, around one-quarter of the approximate 500-resident student body includes international officers from partner countries.

The NWC also offers JPME Level I with the possibility of earning a master's degree through the College of Distance Education. This non-resident program reaches an additional 4,300 students annually. The NWC is regionally accredited through the New England Commission of Higher Education.

The *Climate Change and National Security* elective course was designed and developed for two separate delivery modes. Since 2020, it has been delivered four times, twice to resident students and twice to non-resident students—each time it has been over-subscribed or had a waiting list. While this subject is not broadly part of the core curriculum, students have many options to fulfill their elective requirements. The demand for this and new climate courses reflects a growing interest in the subject. The resident version awards two credits and is delivered synchronously over 10 weeks. This was done via Zoom in 2020-2021 due to COVID-19 requirements and face-to-face with masks in fall 2021. Both JPME Level I and II students participate in the resident course. The non-resident version is a 12-week, three-credit asynchronous course fully designed, developed, and delivered through Blackboard. The organization and course materials are nearly identical, with the material pared down for the resident version of the course; the andragogical approach and social constructivist strategy are utilized in the same way.

Theoretically, the course bridges climate and political science—combining climate science, international relations, and policy analysis. Not a physical scientist myself, I assign NASA and NOAA materials as they are specifically designed to translate climate science to a broad audience. Building on that knowledge, international relations scholarship frames the "global commons" problem with the potential responses of mitigation, adaptation, carbon capture, and geoengineering (Keohane, 2015). The rest of the course employs a policy analysis approach—familiarizing the students with a topic, identifying what international and national actors are working on that respective topic, and reading the key primary sources: relevant U.S. strategy documents, Intergovernmental Panel on Climate Change reports, the National Climate Assessment, and annual reports. The course has a practical, policy centric, and solution-oriented current event focus. When students complete the course, they should fully understand a news

story, for example, why a U.S. envoy is working with a United Nations agency to manage a problem about a human security topic.

Structurally, the course is divided into two parts: climate change and human security. Below are the student learning objectives.

> This course will enable students to develop a broad understanding of transnational and non-traditional security threats of climate change and human security. Students will be able to
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> 1. Articulate the relationships between climate-related issues, human security, and national security.
> 2. Evaluate climate change as a national security issue by examining international engagement, policy options, and U.S. government roles and responsibilities.
> 3. Analyze the three pillars of human security (economic development, human rights, and security) as applied to the topics covered in this course: food and water insecurity, health insecurity, environmental insecurity, sea-level rise, migration, and humanitarian response.
> 4. Describe the current status of the human security issues in this course to include contemporary issues, prominent international actors, and governance.
> 5. Assess national-level strategic and operational approaches to climate and human security topics.

Complementing the climate science introduction, the first third of the course also examines climate change through international, national, and national security perspectives to build a foundation for the issues presented in the rest of the course. Next, the human security framework provides a three-part structure highlighting the interlinkages of human rights, economic development, and security. After providing a foundation in climate and human security, students explore specific human security topics, including development and economic insecurity/poverty, food insecurity, population, environmental insecurity, water scarcity, health insecurity, migration, humanitarian response, and sea-level rise. Learning objectives are met by familiarizing the student with the international and domestic organizations working on that issue, their strategies and governance, and current issues. In each session, this foundation is then augmented with a caselet (brief case study) highlighting the current state of affairs within that respective area. When students complete a session, they should have a basic literacy on that issue—what it is and what is essential to that community.

APPLYING LEARNING THEORY TO ADDRESS SKEPTICISM

The course combines a social constructivist strategy and an adult learning–oriented pedagogical approach by purposefully cross utilizing the course framing, educational materials, and assessment deliverables. First, as a master's course delivering potentially debatable material, I establish course learning and contribution standards before the course even starts. This guidance outlines expectations in critical thinking, making connections, respectful interaction, and academic tone and allows students to ask questions and share concerns upfront. Second, instead of readings only, I introduce a variety of materials, including educational videos, podcasts, and website reviews, to augment lessons. This appeals to many different learning preferences and

permits students to openly share and discuss course content with family, friends, and co-workers. As such, it reinforces both interest and learning. Third, the primary deliverable (65% of the final grade) is a paper on a topic of their choice that students work on throughout the course. The project studies a problem of key interest to them personally and explores potential policy options for the problem. This fulfills Knowles's (1980) andragogical approach to adult learning: adults learn best when the subject is of immediate value and relevance. It also capitalizes on the natural inclination to problem-solve in the learning process.

This approach addresses a significant concern about teaching climate change: addressing climate deniers or skeptics. Initially, I anticipated this problem to be much bigger than it was. Due to self-selection, students pre-dispositioned not to focus on climate do not sign up for the elective course. As a side note, without much depth in understanding, most mid-to senior-level officers in the core curriculum now routinely recognize climate change as a security issue—a significant shift in thinking about the topic within the last ten years. Those who choose the elective course specifically range from climate advocates to climate novices—the latter is self-admittedly unfamiliar, leading to both curiosity and skepticism. In my experience, while there are varying opinions on the importance of the topic, at best, most in the security community have a fundamental understanding of climate science. Starting the entire class with fundamentals harmonizes the knowledge base from the start. In addition, the latitude given for students to pursue a project of their choosing allows them to internalize course information appropriately and reflect on their skepticism within a topic of personal interest.

Addressing skepticism is achieved through the combined adult learning pedagogical approach and social constructivist strategy. First, students have the opportunity to explore and critically think about the materials made available to them—allowing them the cognitive space to process and evaluate the scientific assessments and government strategies and reports. For example, they are assigned a website review of NASA Global Climate Change, where they examine NASA's presentation of the evidence, causes, effects, solutions, and any tabs of interest (NASA, 2021). This website is widely considered a credible source and preempts skepticism in classroom discussion. Each time they are presented with this assignment, students are surprised by the clarity of scientific information available and then somewhat mystified that the subject has become so convoluted. This assignment is then reinforced through a social constructivist approach—structuring an opportunity for students to actively participate in the social learning environment to situate their learning (Bruner, 1960; Brown et al., 1989; Vygotsky, 1978; Lave and Wenger, 1990; Wenger,1998). I accomplish this synchronously through classroom discussion and asynchronously through threaded posts and responses. Students become their own community with a collective awareness between these approaches that practically eliminates the denial/skeptic impulses. As a result, students begin to understand the scientific background and that this is not even a scientific debate within the government bureaucracy.

After addressing the initial hurdles of climate denial or skepticism, a class can now have a more nuanced discussion about political approaches and the corresponding policy prescriptions. This is how I describe the three general perspectives on explaining climate policy preferences to students:

> First, some argue that climate change is not happening, and advocates of this perspective cite selective data to make that case, and therefore we do not need policies to counter something that is not happening. Second, others argue climate change is happening. Still, it is natural, not influenced by the carbon contributions of the industrial age, and therefore restrictive policies hurt us in confronting a problem we cannot solve anyway. And third, some argue climate change is occurring, it is the result of industrializing our society, and therefore we need to consider what to do about it. Even those who agree that it is occurring may argue that economic growth is more important than addressing climate issues—but again, this is a political debate founded on the American identity and the prioritization of capitalism. You may see a mixture in the climate denial, there is nothing we can do, and economics is more important among the political language. Naturally, people who hold office with these respective views are going to have fierce debates about the policy choices we make in the future—mitigation, adaptation, carbon capture, or solar radiation management/geoengineering.

Typically, with the mixture of basic climate science and critical thinking, students are able to step back and see these narratives and policy preferences with the climate debates.

CONSIDERING CLIMATE COMMUNICATIONS AND PSYCHOLOGY

Admittedly, the first time I taught the course, I realized I was successful by the third week—too successful! Students started to grasp enough science to understand the scope and scale of global warming on the planet. As such, I had also unintentionally succeeded in scaring them. This needed immediate reframing as I adjusted to their legitimate psychological reactions. Typical reactions to understanding climate change involve a wide range of feelings, including fear, denial, indifference, helplessness, uncertainty, and despair. Some refer to this as climate anxiety or climate doom. Based on this, I learned much more about climate psychology and climate communications to be open with students' concerns and reactions and empower them to understand that within themselves and others. I incorporated much more of "what can I do about this" into the discussions. We started tracking the recommendations from our readings, guest speakers, and discussions in real-time, building a growing list of actions. I also included lessons from empowering climate communicators, such as Katharine Hayhoe, regarding how to think and communicate about the subject. In subsequent deliveries of the course, addressing this head-on skipped the paralysis phase of the reaction and channeled students directly into a problem-solving mindset.

REINFORCEMENT THROUGH COURSE DELIVERABLES

Student learning is reinforced through three essential items. The most significant deliverable is a paper and presentation of their topic. Student papers have several feedback loops built into the course structure, including an idea submission, paper proposal, and opportunities for one-on-one meetings that are required at least once. This allows focusing, sharing resources, and reinforcing expectations in voice and content. In addition, the students are assessed on contribution. Every few sessions, students can select between two carefully crafted discussion-board questions, each

designed to draw connections across weeks of material and force students to synthesize the course content. The contribution also includes sharing a weekly fact that stood out to them (oral contribution in the synchronous/post in the asynchronous). Last, students in the three-credit course also take an online quiz after the climate change and human security sessions—reinforcing the foundational knowledge. Combined, these assessment tools keep the students engaged in the content, emphasize key concepts, and drive the synthesis of knowledge while also giving them the opportunity to exert the majority of the effort on a topic they embrace.

CONCLUSION

This overall approach to teaching climate change and national security has been highly successful with significant student engagement. Students are amazed at all the connections between climate and security worldwide and within the United States. As a result, this course will continue to be offered in its current format. Due to the vast demand for the course subject, I am also developing a new geographically organized course: *Climate Security Around the World*. The NWC seeks to continue leading on this critical national security issue of the 21st century.

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