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Offering Space for Change in Crisis: Critical Pedagogy for the Environmental Sciences

Melva Treviño[1] and Amelia Moore[2]
[1] *Department of Fisheries, Animal, & Veterinary Sciences, University of Rhode Island*
[2] *Department of Marine Affairs, University of Rhode Island*

Abstract
In this article, two university professors explore what it means to teach anti-colonial and anti-racist anthropological theory and ethnographic methods to graduate students at an American Land Grant University and predominantly white institution (PWI) within environmental scientific research and policy graduate programs. The goal of this article is to show how critically informed anthropological pedagogies can sustain diverse educational spaces in times of crisis that foster empathy, ethical transgression, and social transformation.

Keywords
Anti-colonialism, Anti-racism, Critical Pedagogy, Environmental Sciences, Ethnographic Methods

Introduction

The last few years have been unsettling for American higher education. The COVID-19 pandemic left students disaffected from academic life. The polarised political climate between the Right and the Left has weaponised education as an ideological battleground. The intractable conflict and moral ambiguity surrounding the state of Israel and Palestine has unfurled across campuses. A surge in Diversity, Equity, and Inclusion (DEI) programs swept the nation –followed swiftly by a growing backlash. Combined with dropping enrolments and increasing costs, these developments have left university instructors responding to unprecedented levels of uncertainty, trauma, and resistance. One mode of response has been to reflect on the role of the academy itself in fomenting institutional inequities and to develop educational spaces that foster transformative students who can navigate these complex challenges. In this article, two university professors from the University of Rhode Island explore what it means to teach anti-colonial and anti-racist theory and ethnographic methods to graduate students at an American Land Grant University and predominantly white institution (PWI), specifically within environmental and coastal scientific research and policy graduate programs. The goal of this article is to show how critically-informed anthropological pedagogies can sustain diverse educational spaces in times of crisis that foster empathy, ethical transgression, and social transformation.

Our Ongoing State of Crisis

The national context of growing political polarisation, anti-trans, anti-queer, and anti-DEI sentiments, xenophobia, social patriarchy, and the disavowal of structural forms of racism are well known. What might be less visible is the social context of the state of Rhode Island. Despite its long-standing allegiance to the Democratic Party, and the fact that the legislature has thus far refused to pass laws restricting critically-aware education, the state remains characterised by what it has yet to substantively address: accountability for Indigenous dispossession and profit from African enslavement, environmental research and legislation that do not equitably include the voices of the most vulnerable, and an entrenched White liberalism that disavows its own complicity in ongoing structural disparity. We recognise that the political conditions in Rhode Island are not yet like those in Texas or Florida, but this disavowal produces a form of social polarisation wherein privileged majority populations tend to be dismissive of the effects of current events on more marginalised populations, whose experience of the current moment is far more fraught.

Despite valiant efforts to increase institutional equity over many decades -especially for undergraduate students- the University of Rhode Island (URI), the only public research university in the state, continues to embody these structural and emotional disparities in many ways. This is experienced through the complex relationship with the Narragansett Nation and other regional Indigenous organisations, the perpetual calls by alumni of colour for acknowledgment of the lack of representation and resources for underrepresented, racialised, and minoritised (URM) members of the campus community, the disconnect between institutional understandings of inclusion and the lived experiences of URM students and faculty, and the enactment of DEI initiatives that too often leave marginalised people feeling like uncomfortable guests rather than co-owners of the institution. In short, some populations at URI experience the university as a supremacist space of (re)marginalisation, exacerbated by political conditions.

Within our College of Environment and Life Sciences (CELS), these disparities materialise through low numbers of faculty, staff, and administrators of colour and the fact that URM students fail to successfully complete programs at higher rates (personal communication with college administrators). Disparities also manifest semiotically through the use of concepts like "anthropogenic climate change", "habitat degradation", the "blue economy", and "environmental justice" -- buzzwords that, while commonplace, are rarely addressed critically within science, technology, engineering, and mathematics (STEM) fields. Reframing these concepts through the lens of equity-oriented, anti-racist, and anti-colonial perspectives –such as racial capitalism, settler colonialism, blue washing, and community-centred, reparative environmental justice– is often met with scepticism or dismissal from colleagues who do not experience these disparities in embodied ways.

These crises and disparities inspire students who want to address these issues in their work. Over the years we have seen several graduate students develop or revise their theses or dissertations to directly address (in)equity issues, build meaningful relationships with marginalised populations, or explore multiple ways of knowing that question the assumed objectivity of positivist science. The need to support ourselves and our students within a climate of disparity challenges engaged faculty to respond in creative ways.

Who Are We in Crisis?

We are two women of colour professors with degrees in sociocultural anthropology and human geography and training in cultural multiplicity, history, power, structural supremacy, and critical articulations of justice. Our research, methods, and pedagogy centre the voices of the marginalised and address structural inequities to collaborate around equitable solutions. We have interdisciplinary experience working in small island nations, coastal communities, urban and rural environments, and within the university and the academy. Amelia, an associate professor, descended from enslaved Africans and African American university professors who taught during and after the Jim Crow era, teaches the graduate course *Race, Gender, Colonialism, and Science (RGCS)* in the Marine Affairs Department. Melva, an assistant professor, first-generation graduate student and immigrant from a working-class Mexican American family, teaches the course *Doing Ethnography* (*DE*) in the Biological and Environmental Sciences graduate program. We have taught at our institution for ten and seven years, respectively, and have each come to embody the ontology of "The One" in our academic units (Garcia Peña, 2022). Amelia is the first full-time faculty member of colour to be hired on the tenure track in her department, while Melva is the first woman of colour, and currently the only faculty member of colour, in her department.

Within CELS, we are a minority within the minority. In addition to being women of colour, we are part of a small handful of critical social scientists, and our qualitative and community-based methods are often misunderstood, less accepted, and devalued by colleagues. Our "otherness" and "radical" ethos can be perceived as disruptive, intimidating, and condescending. Concurrently, this "otherness" is what allows students who need us -- those whom university invisibilises (Garcia Peña, 2022) -- to find community with us. Alongside another colleague, friend, and Black woman professor, we are known by some graduate students as the "Holy Trinity" because we centre race, class, gender, ability, sexuality, and colonialism in our STEM work, and carefully mentor students in navigating academia from marginalised positionalities.

Who Are Our Students in Crisis?

Graduate students from all over the university can enrol in either of our courses. These are scholarly courses designed to introduce theories, concepts, and methods based on peer-reviewed research and publications, critical theory, and vetted practices. While our courses were not developed together or intended to be paired, they share

numerous pedagogical similarities, and students often elect to take both during their time at URI. The students who take our courses have backgrounds in environmental, social, and natural science. Some pursue academic careers; many go on to work in government agencies, non-profits, or the private sector, including industries such as offshore wind energy. Despite teaching in a PWI, our classrooms include disproportionately high numbers of students of colour, as well as queer students, students with disabilities, international students, and first-generation students. While most of our students come from the Northeast, we also teach students from the wider U.S., Southeast Asia, the Middle East, Sub-Saharan Africa, and Latin America. Our courses are electives, and students enrol to incorporate critical, anti-colonial, and anti-racist perspectives into their research. Students have also shared with us that they want to learn about these topics from atypical professors in fields characterised as the realm of White men. Importantly, our students are not exposed to similar course content elsewhere in the college curriculum.

Responding with Critical Pedagogy

Our pedagogical approach is grounded in our experiences of the crises of our time and in our belief that education –including STEM education –can be liberatory (Freire, 2000). We create safe spaces for experimentation with anti-racist, anti-colonial, and feminist concepts that challenge the inequitable status quo. We also intentionally organise our course activities to build trust and community –especially in an academic setting that often feel alienating and hostile to students from marginalised identities.

Despite administrative pressures to increase enrolments, our courses are intended to be small discussion seminars with anywhere from eight to twenty students. This allows us to sit around a large table or in a circle, where everyone can see one another. This arrangement follows the Harkness Method, a student-centred instruction model in which all participants are seen as key contributors, knowledge producers, and collaborators (Soutter and Clark, 2023). In this egalitarian setting, learning flows in multiple directions: from instructor to student, student to student, and student to instructor.

Course Design, Content, and Strategies

Race, Gender, Colonialism, and Science

RGCS was initially conceived as an introduction to science and technology studies (STS), and it was originally titled, *Social Studies of Science*. However, after the election of Donald Trump in 2016, I found a graduate student in tears, curled in a ball in a campus hallway. When I asked what was wrong, the student said that no one else had asked them that question. They explained that, as a queer-identifying immigrant from Central America, they feared they would lose their status and right to be in the U.S. They were feeling exposed, struggling to find anyone in their program who could empathise with their situation. This encounter, combined with the realisation that national, regional, and local politics were threatening to re-marginalise vulnerable populations, catalysed my sense of accountability. I decided to change my entire graduate syllabus.

I subsequently redesigned *RGCS* to centre content by scholars of colour, as well as feminist, queer, and Indigenous thinkers, and those from the Global South. The course now explores how our institutions- academia, legal systems, policy, governance, social science, natural and environmental sciences, and medicine- have historically upheld conditions of structural supremacy while claiming to improve the conditions of humanity. Students are asked to reflect on their own experiences, disciplines, research, and career goals and to reimagine these aspects of their professional lives. The goal is to inspire the creation of transformative scientists who will lead the next generation of intersectionality-inclusive environmental science.

In *RGCS*, students encounter the colonial legacies of higher education and the development of the sciences in the crucible of White supremacy, patriarchy, genocide, and extractive economies (Wilder, 2013, Subramaniam, 2014, Cipolla, 2017, Lee and Ahtone, 2020). This critical history is extended by scholars like Kim Tallbear, Ruha Benjamin, J.T. Roane, Max Liboiron, Ayasha Guerin, Paige West, and Juno Salazar Parreñas who interrogate the way these legacies structured the epistemological possibilities of genetics research, technological development, ecological conservation, land and sea management, and the life sciences to circumscribe the ontological realities of the world's subjugated people, organisms, and ecosystems. The Course content evolves each year to reflect the interests and educational or professional backgrounds of enrolled students. Each week, students present critical responses to the materials in relation to their own academic or scientific work. Many revise their ongoing research projects in response to course provocations.

The physical setting of the classroom encourages students to stay present with content and conversation, enabling the rapid development of interpersonal connection. Emotions are fully appropriate in this setting. From the beginning of the semester, we use first names and invest time in building mutual empathy. When students care about each other, they are more likely to listen carefully to one another, ask sincere questions, and consider sensitive subjects without judgment or censure (hooks, 1994).

Because the course is centred on considerations of (in)equity, past, present, and future, I do not position myself as the expert. The class operates non-hierarchically: the professor is a guide and a moderator of tensions, but not an absolute authority or arbiter of truth. Content is discussed through peer-to-peer dialogue and presentations. Students develop final papers or projects that connect course content to their personal research, and they provide constructive feedback on each other's work throughout the semester. Everyone progresses together.

Doing Ethnography

DE introduces students to theories and practices of ethnographic research. The course is for graduate students planning to conduct ethnographic fieldwork as part of their master's thesis or Ph.D. dissertation. However, natural science students, whose research requires significant interaction with communities, also take the class. I constantly strive to balance between providing students with a "traditional" foundation in ethnographic methods and exposing them to alternative frameworks and "fugitive" praxes that pursue liberation and transformation through epistemological decolonisation (Berry et al., 2017).

Throughout the semester, we discuss the strengths and weaknesses of the various techniques ethnographers use to collect and generate data, including the ethical aspects of ethnographic research, and the field's deeply colonial and exploitative roots. We explore how ethnography has evolved to address these issues and identify best practices in contemporary ethnographic methods. Students learn practical skills and the theoretical underpinnings of traditional ethnography, including interviewing, participant observation, field jottings, and photography. We also cover approaches not typically conceived of as "ethnographic methods" such as *testimonios* (Cahuas, 2020) and *pláticas* (Fierro and Delgado Bernal, 2016).

Like Amelia, I view my role not only as a guide and facilitator but also as a partner in the learning process. Class sessions are conversational, encouraging students to think critically about the content in the assigned readings and to discuss their interpretations with intentionality. Students openly express their opinions and understanding of the course materials without fear of judgment. In this co-produced learning environment rooted in mutual respect, everyone feels validated while being challenged to learn and grow. We support collective edification by valuing diverse perspectives, respecting others' opinions, sharing moments of laughter, and showing up for each other when emotions are running high.

Students apply the methods they learn to conduct a "mini" ethnography. To emphasise the importance of reflexivity and introspection, one of the first assignments is a "Subjectivity and Positionality Statement." Students are prompted to critically examine how their subjectivity, positionality, and intersectional identities might influence their research, introduce bias, and affect access to the population(s) they intend to work with(in). The aim is to encourage them to recognise that as scientists, they "are part of the world they study, not some objective, detached research tool" (O'Reilly, 2012, p. 222). This lesson can be especially challenging for natural science students, who are often taught that objectivity means ignoring one's identity. That mindset risks producing "helicopter research" (Adame, 2021) or "parachute science" (Stefanoudis et al., 2021). In response, I teach alternative modes of relating to and collaborating with research participants in ethical, love-based ways that challenge colonial models of "neutrality". This includes bidirectional ethnographic research in which researchers and participants learn from one another and engage in mutually beneficial projects (Alonso Bejarano et al., 2019). It also means respecting when communities refuse participation, and pursuing research praxes that intentionally promote their self-determination (Simpson, 2007).

Conclusion

Outcomes

In the years teaching these courses, we have experienced intensely positive and deeply challenging student outcomes. After taking our classes, some students have altered their research projects. In some instances, their advisors have supported these changes. In others, particularly where students have asked to change their research focus or methods, some advisors have expressed their discomfort with approaches they deem inappropriate, unscientific, or beyond their purview. As a result, some students have left their faculty advisors, jeopardising their mentorship relationships, scholarly networks, and funding sources.

Our students can experience the hypocrisy that Behar describes: You need research subjects to feel like you care about their lives, but you can't actually care if you want to be an objective observer. It is "inappropriate to interiorize too much" (Behar 1997: 8). You are expected to "get the native point of view" *pero por favor*, without actually 'going native"' (Behar 1997: 5), a difficult if not impossible endeavour for scholars engaging in "me-search" – research involving their own identity and communities they identify with (Gardner et al., 2017) – or research "of the familiar" (Simpson, 2007). This dissonance takes an emotional toll on students who may suffer bouts of depression and feelings of alienation in their programs or labs. We have had students aiming to work within equity-based and community-centric frameworks come to us in distress seeking guidance when they were unable to obtain support from their advisors. As a result, some students have graduated with a different degree than they were admitted for (e.g., "Mastering out"). We have also had students ask us to become their advisors, even when we had no role in their recruitment.

While emotionally contentious, these changes can inspire innovative work from our students. For example, two women of colour who took our courses co-founded an advocacy group for women of colour surfers in the Northeast and are co-writing an autoethnography about their experiences. A student from the Pacific Islands decided to change his dissertation plan to centre the experiences, pieces of knowledge, and voices of his fellow islanders and himself as they navigate shifting fisheries governance regimes rather than developing a traditional dissertation that would have turned these experiences into "data" or anecdotal information. Another student getting a degree in genetics developed a new dissertation chapter to critically examine the ethical implications of their field through an environmental justice lens, leading to a published article giving voice to several under-documented concerns.

The fact that students take our course content and pedagogical strategies to heart is reflected in their course evaluations. Students in *DE* have said that, as an outcome of the course, they learned that "research should not be an extractive process; it should be a learning and enriching opportunity for both sides (participants and researcher)." Students in *RGCS* have said that "this class challenged the way [they] have been thinking… and [they are] looking forward to using what [they] have learned to challenge [their] own thesis research and hopefully, the work that [they] will do once [they] graduate."

Challenges

These experiences have also been challenging for us. We feel compelled to create transformative spaces for students to find community and question the disparities within academic and scientific vocations (la paperson, 2017, Garcia Peña, 2022). However, we are cognisant that most of our students won't experience such spaces again in their coursework. To sustain this, students often retain us as mentors, advisors, or committee members, hoping to preserve a culture of support. This is especially true for students of colour and for students with an explicit desire to enact change. We wonder whether this is enough to provide the momentum students will need to become confident, transformative practitioners.

Teaching in scientific institutions that value distance, objectivity, and abstraction over your own methods is also challenging. While we have yet to experience direct obstacles to teaching these courses at URI, we experience subtle resistance when we attempt to bring the lessons we teach into other professional spaces within the institution. This resistance most often takes the form of pressure from colleagues to tone down our language and to dilute the frameworks, concepts, modes of embodiment and temperament, and methods our courses encourage. Unsurprisingly, given our context and the subjects we teach, it is our White colleagues who are less "comfortable" with the notion of "learning as revolution" (hooks, 1994). Nor are they comfortable with

concepts that violate what "we might think of the [W]hite imaginary… as that which is taken for granted or assumed without question…" as "what seems to be the natural way of looking at things rather than an interested interpretation or particular perspective" (Alcoff, 2022: 89).

This common situation leads to the experience of cognitive dissonance, leaving us to feel that a large part of ourselves and our praxis is "too much" for our colleagues. We are hyper-aware that we, as women of colour, "must develop… the [strategies and] rigour it takes to keep our bodies whole… [which] is too often illegible in the colonial, patriarchal space of the academy" (Berry et al., 2017: 548). We are learning to mentor students who see themselves in us, modelling what it looks like to honour our holism and authenticity in both the classroom and the academy, and we know that we must also experiment with navigating such affective dissonance for our students, even when we are pushed to our emotional limits.

Recommendations

We hope that our commentary will inspire more experimentation with critical pedagogy, anti-racism, and anti-colonial praxes within STEM and the environmental sciences. In this time of ongoing crises, we need to collectively move beyond centring the privileged majority that remains stubbornly unable to reflect on the legacies they perpetuate, to centring the lived experiences of marginalisation, equity frameworks, and more inclusive forms of scholarly representation. We need to equip students, particularly URM students, to navigate a tumultuous academic environment in ways that do not corrode their sense of transformative potential.

In our courses we have strategically 1) leveraged class size and the classroom, creating spaces of trust to explore sensitive content; 2) utilised inclusive course content from scholars with lived experience, addressing how their disciplines and methods affect contemporary (in)equities; 3) centred the most vulnerable populations, acknowledging histories of marginalisation that shape their environments; and 4) prioritised self-examination, ethical growth, and emotional maturity, inculcating the transformative capacities of our students to change the environmental sciences from within.

Disclosure statement

The opinions expressed in this essay belong solely to the authors and do not reflect the views of their institutions.

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