

Inviting college students to investigate the global eco-social emergency through a transdisciplinary perspective

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Introduction

We live in a time of emergency, in which the model of growth and organization of material life has become incompatible with the planet's natural resources and life support. We are now facing fundamental issues concerning the balance of natural and cultural systems and quality of life as a whole. In a post-pandemic context, concerns about the world-wide impacts of climate change will increasingly be in the forefront for students preparing to join the workforce in the next few years. Factors such as eco-anxiety, difficulty to grasp the complexity of the global eco-social crisis, and the need to envision pathways moving forward are increasingly present among college students.

As in any context of crisis, there are also opportunities for significant change and advancement. The complex and uncertain nature of these issues call for integrative, inter- and transdisciplinary approaches. Education for sustainable development remains a fundamental area for investment as universities strive to fulfill their role in fostering a culture of sustainability. It is increasingly important to provide opportunities for students to develop awareness and competences to deal with complex challenges in the socio-ecological context and influence how social, cultural and environmental resources will be used in the future.

Developing competences on research and action for sustainable futures will be essential for upcoming professionals. This paper presents an initiative in undergraduate education oriented towards these goals, created and implemented in the context of an undergraduate Honors program in a North American university.

Methods

As part of the Virginia Tech Honors College's investment in instruction and experience in transdisciplinary, collaborative problem-solving, we developed the project *Honors Culture of Sustainability*. The project helps develop the culture of sustainability in the college by:

- advancing research and knowledge and modeling sustainable awareness and practice;
- developing competences on sustainability which will be essential for future professionals;
- creating a campus living laboratory for students to engage in interdisciplinary research exploring cultural and social aspects of sustainability;
- establishing a mutually beneficial partnership with the university's Office of Sustainability

The first initiative was developing a new 3-credit undergraduate course named: *Investigating the Global Eco-Social Emergency*. The starting point for the course was the idea that complex contemporary challenges such as the environmental crisis need to be approached through a transdisciplinary and collaborative perspective.

Designed as a seminar with Honors students from various majors and all years, the course engaged students with the complexities of the socio-ecological crisis from a variety of disciplinary and cultural perspectives, including natural sciences, philosophy, engineering, technology, social sciences, and the arts. Topics in the investigation included climate change, production and consumption, global inequalities, commodification of natural resources, ecological movements and social justice, systemic thinking, policy and decision-making, and future scenarios for socio-ecological transformation.

The course design applied and advanced guidelines for strategies to promote the culture of sustainability among youth (as proposed by Mouchrek, 2018): explore dimensions connected to youth realities; contextualize issues through diverse perspectives; extend frames of reference and contexts for action; facilitate convergence around innovative alternatives; promote empowerment and autonomy; invite youth people to reflect in-context about values, motivations, and impact of choices.

Students in the course learned to work productively with uncertainty and complexity, learned to analyze and integrate diverse kinds of knowledge, and developed critical skills in transdisciplinary collaboration. Students also reflected on their own perspectives and worldviews, while expanding their awareness of the eco-social responsibilities associated with professional practices.

On the first iteration of the course in Fall 2021, a cohort of students from eight different majors went through a complex overview and had the opportunity to develop knowledge and ownership through critical thinking and debates about several topics. The transdisciplinary modules in the course discussed:

- Origins and Evolution of the Concept of Sustainable Development, Dimensions of Sustainability
- Environmental History & the Anthropocene
- Current research on climate change from Physical Sciences
- Production & Consumption, Growth
- Engaging in Transformation, Addressing challenges to meaningful climate action
- Food Systems, Regenerative Agriculture
- Leadership for Global Sustainability

- Degrowth, Circular Economy, alternative economic models.
- Culture of sustainability, Consumerism + Alternative Ways to Address Human Needs
- Values & Lifestyles, Changing Paradigms, Positive Examples of Sustainable Transformation
- Principles of Ecology, Deep Ecology, Philosophical aspects, Eco-systemic thinking
- Ecopsychology, Nature Connectedness, Eco-anxiety
- Environmental Policy, The Green New Deal
- Social and relational aspects of Climate Change
- Environmental Justice & Activism
- Transdisciplinary projects for sustainability
 - Landscape, Future scenarios for socio-ecological transformation.
 - Climate Adaptation and Resilience (focus on coastal areas)
 - Renewable Energy, projects in interface with communities
- Ecological consciousness in Literature
- Creative practices as pathways for a transformative future

As part of the comprehensive overview offered by the course, a guest talk series was integrated into the curriculum. The list of guest speakers and collaborators included faculty members from the United States and Brazil, whose expertise span varied, multidisciplinary sustainability-related topics: architecture and urban studies, policy, humanities, natural resources, geography, leadership studies.

As a capstone project, groups of students from different majors co-designed a transdisciplinary project based on the Sustainable Development Goals aiming to address eco-social challenges at the regional level, integrating principles and practices from their respective fields of study. The capstone project explored the potential of design-based approaches to develop concrete and action-oriented projects, offering opportunities for students to go through a structured process to collaboratively reflect and work to envision possible futures in a multiparty team.

The final individual project was called *My Eco-Social Emergency/e Story* and included a reflexive essay and a presentation about each students' perspectives, interests, purpose and motivations to engage in work around the culture of sustainability in the academic, professional and personal lives. Students' capstone projects are published on the Virginia Tech Online Repository (VTechWorks).

Discussion

In the first course iteration, students created a close-knit community, which turned out to be one of the strongest factors to foster resilience and ability to navigate through uncertainty with a proactive approach. This was an excellent teaching experience, in which students were interested, engaged with the content and with their peers. Creating a community in the class was an intentional strategy that required regular work, dedication, and energy – but the efforts were worthwhile.

An important aspect of this course is that we approach topics that are important not only for students' academic and professional trajectory, but topics that influence their lives as a whole -- as citizens, as individuals, and so on. Knowledge, awareness, and competences on climate action and sustainability will be essential for students to prepare for the future regardless of their professional field. Also, these are topics for which transdisciplinary action, research and action are particularly important -- these complex problems will not be understood or addressed without collaborative, integrated action of professionals from diverse disciplines.

It greatly matters to offer opportunities for students to develop skills and awareness regarding the social and cultural aspects of sustainability. In a university with a strong profile in technology development, it seemed especially important to foster abilities to think deeply about the impacts of technology regarding the need to sustain life on the planet (including natural, social, cultural, ethical aspects).

In the words of Blanche Verlie (2022), "climate is living-with". Because of the personal impact of climate change, it is always important to be careful to keep a healthy, positive learning environment during classes. To make it clear to students that, while it is important to learn about scientific facts and social realities about climate change and face how serious is the current eco-social emergency, on the other hand it is also important to actively avoid entering a state of anxiety, depression, or disillusionment. How can we keep nurturing a space to learn and navigate these issues (not denying the process, not delaying action) while also maintaining a healthy level of hope, constructive engagement, creativity that is needed for our personal, academic, and professional growth? That's the question constantly in my mind when designing and teaching these classes.

Another central aspect of teaching is the possibility of creating participatory spaces and structures in the classroom. It matters to build courses in partnership with students, being open to their suggestions, insights, and inputs coming from them. However, co-creation needs structure -- therefore it is important to organize and structure the learning space with significant markers, which then will allow us to focus on opening possibilities from participation, exchange of ideas and deepening reflection.

In that sense, students were asked to fill a midterm evaluation survey (in week 7 of the course). This was an opportunity for positive formative assessment. Their feedback made it possible to redirect the focus in some of the course activities, while confirming the course's overall direction and approach. Finally, their feedback on the final evaluation at the end of the term has greatly confirmed that the class had a positive impact for them in several directions. .

The success of the course and increasing interest from students inspired the creation of a second module, this time a course-based undergraduate research (*Honors Culture of Sustainability Lab*). Designed to be the applied counterpart of the seminar course, the Lab is a space for students to engage in a scientific, interdisciplinary undergraduate research project that investigates values and psychological barriers related to sustainability among Virginia Tech

students and proposes collaborative strategies for transformation. In its first iteration in Spring 2022, the Lab engaged students in quantitative and qualitative research, including data collection and analysis, interviews, focus groups, ideation, and dissemination. The course fostered competences in sustainability such as integration, reflection on values and cultural models, complex problem-solving, social responsibility, and participatory skills. Developed in partnership with the Office of Sustainability, the research generated recommendations to help inform institutional efforts to promote a culture of sustainability at Virginia Tech.

References

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