

Trillium Project Brief

Background:

Some of the most pressing problems that humans face today are issues of sustainability; from climate change to overpopulation, these challenges are especially complex because they exist at the intersection of environmental, economic, and social concerns. Higher education institutions have the unique opportunity to equip a generation of leaders with an understanding of sustainability and how it relates to their work.

With almost 700 other academic institutions in the United States, Duke has committed to sustainability education by signing the American College and University Presidents' Climate Commitment (ACUPCC). As a signatory, Duke is required to take efforts to "make carbon neutrality and resilience a part of the curriculum... for all students." (Climate Leadership Statement, 2017).

The **Trillium Faculty Workshop** is one long-standing initiative at Duke that contributes to this goal. Established ten years ago, the annual workshop educates faculty about approaches to integrate sustainability into their teaching. In 2018, Duke's Office of Sustainability began another program called the **Trillium Student Research Initiative (TSRI)**. Its purpose is to facilitate the collaboration of student interns and Duke faculty to develop new courses or modify the syllabi of existing courses to incorporate sustainability.

To date, neither program has successfully recruited faculty members who teach large classes. As the Sustainability Office works to maximize the impact of TSRI, it seeks to engage professors from the five most popular majors at Duke: Biology, Economics, Computer Science, Public Policy, and Psychology.

Research Question:

How can the Trillium Student Research Initiative encourage and assist Duke professors from the largest five majors to incorporate sustainability in their courses?

Objectives:

OBJECTIVE 1: Assess which Duke courses are currently incorporating sustainability.

OBJECTIVE 2: Identify how professors in Duke's largest five majors conceptualize sustainability, and discover barriers to their participation in the Workshop and TSRI.

OBJECTIVE 3: Recommend ways Trillium can connect with Duke's five largest majors, with a focus on the Trillium Student Research Initiative (TSRI).

OBJECTIVE 4: Recommend ways TSRI can expand sustainability integration into Duke's five largest majors.

OBJECTIVE 5: Recommend ways to make sustainability part of the educational experience of all Duke students.



Figure 1. The Trillium programs are named after the Trillium flower, a plant native to the mountains of North Carolina. Its three petals signify the three dimensions of sustainability: environmental, social, and economic.

Methods:

Components of Sustainability

Regardless of their major, all students should have the opportunity to gain sustainability education and learn about the interconnections and interdependency of **ecological**, **social**, and **economic** systems. Through this project, by way of targeting the large majors at Duke, more students will understand how the health of these three systems determines the sustainability of communities and cultures at all levels. The skills learned through sustainability education are applicable, if not fundamental, for students of all majors. In order to ensure the health of future generations is not compromised, the students of today must understand the multidimensionality of sustainability, as they will be the leaders of tomorrow. Reaching more students is critical as they will be able to apply their knowledge in the service of society by solving critical issues and incorporate sustainable practices into their daily lives.

Interviews with Duke undergraduate professors

Process: Conducted at least one interview with faculty in each of the five departments with the most undergraduate students (See Table 1)

Purpose: Gather information regarding course curriculum, conceptualizations of sustainability, awareness about TSRI and the Trillium Workshop, and possible barriers to professor participation

Interviews with past TSRI participants

Process: Conducted interviews with professors who have utilized TSRI for sustainability integration into their course

Purpose: Gather information regarding the value of the TSRI program and overcoming barriers

Review of Duke-specific resources

Process: Reviewed available information regarding TSRI and the Trillium Workshop

Purpose: Discover possible barriers to participation, shortcomings in information availability, and current reach of the programs

Scholarly articles & case studies

Process: Acquired information regarding approaches to university sustainability integration, barriers to integration, overcoming barriers, and reasons to participate

Purpose: Utilize existing information to strengthen our understanding sustainability integration into university courses, inform our interview processes, and relevant



Table 1. Interview details

Description	Faculty
Biology	John Willis
Computer Science	Owen Astrachan
Economics	Lori Leachman, Chris Timmins
Psychology	Sarah Gaither, Paul Seli
Public Policy	Deondra Rose
Former TSRI Participant	Saskia Cornes, Nicolette Cagle

Analysis: Data were manually annotated and coded for significant themes relevant to our research question. Interviews were manually transcribed before annotation.

Themes

- Barriers:** 1) knowledge about sustainability 2) awareness of programs 3) time and effort 4) monetary 5) campus politics
- Mechanisms to overcome barriers**
- Department specific findings**
- Reasons to participate**

Results:

“Everybody is in teaching overload... so this is not the environment to say ‘Look, here’s another opportunity!’ To us, it’s more like ‘Oh, here’s another way to spend my time and energy!’”

Professor Lori Leachman, Economics

Summarize Results (both boxes)

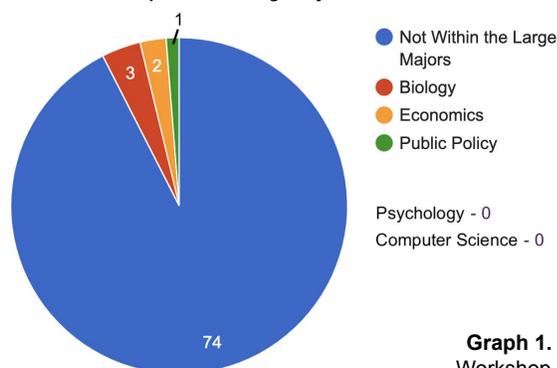
Time and Effort Obstacles Preventing TSRI Participation:

- Current TSRI website **provides an incomplete picture of the program.**
 - does not specify a student intern’s salary rate or any necessary skills
 - does not mention how much time faculty are expected to commit
- **Finding additional information requires time and effort.**

Limited Awareness of Programs:

- 6 out of 7 interviewees from five largest majors stated they were not aware of the program and its purpose.
- Reasons cited were a **lack of an online presence, lack of intra-faculty publication and marketing, as well as lack of student awareness.**
- The graph below reveals limited participation by large major professors in the Trillium Faculty Workshop.

Trillium Workshop Reach to Large Majors



Graph 1. Trillium Workshop Faculty Breakdown

The Unknown Student Variable:

- Applying to participate without knowing who the student intern will be is worrisome for faculty because the professors do not know if the student will be a hard worker and provide meaningful insights, according to a past TSRI participant.
- **This lack of information makes participation feel more risky.**

Unique Challenges for Economics:

- **Professors feel unsupported by the department** leading to lack of motivation to commit to extra work.
- **Many economics professors require higher economic incentive than the \$500 currently offered by the Trillium Faculty Workshop** to commit to the program.

Lack of Sustainability Knowledge:

- Six of the interviews revealed insufficient knowledge about sustainability
- A journal article by Kerry Shephard found that professors who have a personal interest in sustainability are most likely to integrate sustainability into their curricula
- **Inadequate understandings of sustainability lead professors to overlook connections to their coursework and be unmotivated to participate in sustainability programming.**

Limitations: The team was able to interview 1-2 professors from each major. Though barriers were identified that are common to all majors, further research could allow for discovery of barriers that are unique to specific majors. Additionally, further interviews could be conducted with individuals who had heard of the program and chosen not to participate.

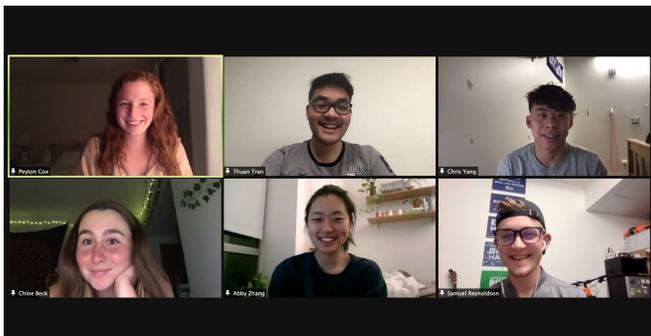
Conclusions and Recommendations:

Make critical information about **program details more accessible online**, include a description of sustainability and resources for how they relate to different fields on the website.

Identify opportunities for increased funding to better compensate professors and students who participate in the Trillium programs. Examples include the U.S EPA Environmental Education Grant and the North Carolina Office of Environmental Education.

Restructure the internship to be student-initiated. Instead of depending on exposure to professors, students should approach a professor, preferably one with whom they have a prior connection, and propose to make changes to a syllabus of their course with their advice. Professors who are interested in the program can still apply to participate and be matched with a student. With this change, students have the responsibility to convince faculty that sustainability is relevant to their field of teaching.

Partner with clubs, institutions, and organizations already well-established on campus to find interns and advertise. Dr. Rose (Sanford) provided the POLIS Center for Politics at the Sanford School and the John Hope Franklin Center as examples.



Team photo: (top row, left to right) Peyton Cox, Thuan Tran, Chris Yang; (bottom row, left to right) Chloe Beck, Abby Zhang, Samuel Reynoldson

List TSRI as an option for the experiential component of the sustainability certificate. On the Duke Office of Sustainability Website, there is a page that outlines the pathways to complete the sustainability certificate. One component of the sustainability certificate is an experiential component and the page highlights potential options such as DukeEngage and Dukelmmers. We recommend listing TSRI as a potential option in this section to increase exposure to potentially interested students.

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