

Project and Learning Plan

I. Intellectual Merit:

Over the past several decades, many efforts have been made to encourage and develop education for environmental sustainability through large national and international agencies. For example, through the National Environmental Education Act of 1990, the US Environmental Protection Agency has provided leadership and support in spending \$100 million to increase the public's awareness of environmental issues (Potter, 2009). Likewise, the United Nations Educational, Scientific and Cultural Organization (UNESCO) put forth recommendations for education for a sustainable environment in 1996 (Fien & Tilbury, 1996). The North American Association for Environmental Education ([NAAEE], Hollweg et al, 2011) also offers recommendations for incorporating environmental education across the K-12 spectrum.

New Jersey has had a particularly strong focus on addressing environmental sustainability education across the K-12 spectrum in recent years. For decades, Sustainable Jersey has worked with municipalities in the development and certification of sustainable practice, and more than 80% of the state's municipalities have participated in these programs (see www.sustainablejersey.com for more information). In October 2014, Sustainable Jersey for Schools was launched. This program is voluntary and allows schools to achieve Sustainable Jersey Certification. To become certified, schools will be required to complete and submit a balanced package of sustainability actions including those inside and outside the classroom. This local focus, along with the national and international efforts drove efforts within the TCNJ School of Education to design and launch a program geared toward preparing future teachers to become leaders in environmental sustainability education—a five course minor in Environmental Sustainability Education, coordinated by PI Lauren Madden.

As part of these efforts to build a body of competent environmental sustainability educators, we believe that it is critical to understand the current ideas and conceptions that young children hold about environmental sustainability. The body of research literature on this topic suggests that children who are exposed to environmental and sustainability education inside and outside the classroom report more enjoyment, content knowledge, and a greater sense of agency (Dillon et al., 2006; Rafferty & Laird, 2013). Research also shows that more exposure to environmental education results in stronger outcomes in terms of attitudes, beliefs, and standardized text scores (Dillon et al., 2006). Many studies of children's views of the environment focus on a hierarchical models ranging from seeing the environment as something external, to something with which humans interact, to something humans are responsible for protecting. One seminal piece of research, a large scale meta-analysis (Loughland et al., 2003) found that younger children were more likely to view the environment from a relational perspective, while older children were more likely to view the environment as an external object. These findings beg the question we seek to explore: *What are preschool students initial understandings of environmental sustainability and how do they change after exposure to short term instruction about the environment?*

We hope to investigate this question using a qualitative approach. We will identify one or more local pre-kindergarten classes at nearby elementary schools to use as a study site. We will plan to collect data using two sources: transcripts from small group discussions with students and

student drawings. In the discussions, we will use a semi-structured open-ended format to learn more about the students' perspectives. We will encourage students to speak and draw their responses, and will record and transcribe our conversations verbatim. At the conclusion of the discussion, we will conduct a short activity (TBA) related to environmental sustainability. We will return to the school one week later to have a follow-up conversation using the same format to allow us to document any changes in students' perspectives. We will provide teachers with teaching resources and lesson ideas around environmental sustainability in advance of the study and encourage the teachers to use them during the week between conversations.

All data will be uploaded to Atlas.ti for a thematic analysis of data using the framework described by Loughland et al (2002), which is considered the benchmark framework in the discipline, and one that is used widely across the discipline. Jennifer Liang will present outcomes at the 2016 Celebration of Student Achievement (COSA) and will co-author at least one scholarly conference presentation and journal article disseminating the results.

II. Role of the Students and Mentors:

Lauren Madden, the project PI, is the coordinator of the Environmental Sustainability Education Initiative in the School of Education. She has focused the last year and a half developing courses, writing grant proposals, and researching trends in environmental and sustainability education. She is completing her fourth year at TCNJ, and has had a number of experiences mentoring undergraduates in her work here at TCNJ including serving as a MUSE mentor in 2012, mentoring a COSA poster presenter, co-presenting with 5 students across three different NJ Science Convention conferences, co-authoring one book chapter and two journal articles with students (another book chapter is currently in preparation).

Lauren's role in this project will be to establish relationships with teachers and administrators at research sites, assisting in data collection and analysis, mentoring Jennifer in all phases of the research process (literature review, data collection, analysis, and dissemination), and leading the efforts to disseminate findings through publication and presentation at conferences.

Jennifer Liang is a junior majoring in Early Childhood Education and Psychology. She has completed extensive coursework in early childhood development, teaching methodologies, psychology, and research methodology. She is well prepared to learn more about and use specific qualitative research strategies to collect and analyze data. She will conduct an extensive literature review on early childhood environmental education, collect, transcribe, and analyze data, and present her findings through a COSA poster or presentation. Her expertise and background knowledge in child development provide her with a solid contextual understanding of her work on this project.

III. Broader Impacts:

Undergraduate research is relatively new to the SOE. Students' research experience is often limited to their non-Education second major around non-educational issues. With the increased focus on environmental sustainability education in NJ, and especially within the SOE, this project will allow one of our students to build on her prior knowledge and preparation to experience an authentic research endeavor in an up-and-coming area of focus in our school, state, and field. Jennifer hopes to learn more about educational research and eventually explore graduate study in education; this project will prepare her well for her future goals.