

PURE Undergraduate Research Experience

Fall 2019

Katrina Stewart

Architectural Studies



MU Energy Literacy Energy Project

Professor: Dr. Laura Cole

Graduate Student: Sepidah Fallahhosseini

Introduction and Methods

This project focuses on outdoor education and how it can be increasingly influential when teaching children about environmental themes and sustainability. Outdoor education gives students the opportunity to strengthen their relationships to nature and get hands-on experience in engaging with the outdoors. While much environmental education literature focuses on the benefits of outdoor education, few studies have examined the role of the built environment in supporting outdoor learning experiences. This project focuses on “Learnsapes,” which are outdoor learning spaces designed to amplify sustainability education (e.g., Skamp & Bergmann, 2001; Smith, 2000). In order to fully understand the effect that learnsapes can have on students, we developed an energy curriculum for two different elementary schools in the Kansas City region. One of the schools has a built-in learnscape, and the other does not. Using mixed-method data collection, we were able to understand student outcomes.

Research Question: Are there differences in energy literacy outcomes over time and across classrooms for fourth graders who do and don't have access to a Learnscape?

Data Collection

The beginning steps in this research project, after the curriculum was developed, was to collect the data. We used a mixed-methods approach, that included multiple site visits to the schools in Kansas City. Our test subjects were fourth graders from Sunflower Elementary, and Mill Creek Elementary. The Solar Energy Curriculum was 6-weeks long, and started the last week of August 2019. Data collection involved pre/post student energy literacy questionnaires and student systems model drawings before, throughout, and after the curriculum (with interviews of select students before and after). Teachers submitted weekly logs and participated in post-curriculum focus groups.

I was involved in the weekly to bi-weekly site visits to each of the schools in Lenexa, KS. While on the site, we conducted student interviews, classroom observations, and interviewed teachers. In preparation for these trips, I helped prepare materials that were needed for specific classroom activities.



PURE Undergraduate Research Experience

Fall 2019

Katrina Stewart

Architectural Studies



Typical day-in-the-life of Research Trip

When we did site visits to the school, it normally consisted of leaving Columbia around 5:30am to get to the school by the start of their first lesson. We would alternate schools at around lunchtime, and continue making observations until the end of the school day. Our main goal in these site visits was to capture any outside factors that we might miss if we were solely conducting research from Columbia. Our observation protocol checklist was extremely helpful when sitting in lessons to make any observations about certain teaching styles, classroom settings, noise levels, temperature, whether lessons were indoors or outdoors, etc. We also conducted pre-interviews and post-interviews with students about their experience with the curriculum, that could later be used during



Data Analysis

The main source of information for data analysis came from student drawing packets. With our rubric for grading that was collaboratively developed for weeks, Sepidah and I were able to start analyzing the drawings. We took 4 sets of drawings from each classroom, which gave us 24 total. We then were able to compare our results, and came to a conclusion that our grading system was reliable enough to continue. As I pull off the project, Sepidah and Dr. Cole will continue their research findings into the new year.



I also helped to organize any research field notes, interviews, and observation protocols into an online database, so that as research files are in a convenient and safe location .



Learning Experience

I gained a lot from being a part of this experience. I learned what it is like to conduct research on the field. I never knew what went into a research project like this before I was involved so hands-on. I was able to become more knowledgeable about Solar Energy and why it matters, as well as see the impact that it had being taught to young children. My experience working on this with Dr. Cole and Sepidah was fantastic. Being a part of this team gave me a way to participate in a collaborative environment. It was eye-opening to see what life may be like, in case I ever decide to pursue a career in research.