STREAM ECOLOGY AS PLACE-BASED EDUCATION

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July 2023

Master of Science in Science Education

BACKGROUND

Poynette High School is a rural school in SE Wisconsin. Students in Earth and space science used the local Class 1 trout stream to answer the question: Why is Rowan Creek healthy? Students began by reading and discussing literature about biotic and abiotic factors related to stream integrity. Students then collected water quality, forest, and riparian data to explore the connections between land and water. After analyzing the data student knowledge was assessed using a claim, evidence, and reasoning format (CER).

Figure 1. Students collecting macroinvertebrate samples

RESEARCH QUESTION

How does place-based science education affect student growth?
Growth is defined as...
• Academic success
• Self-efficacy in science skills
• Sense of place

METHODS

This study was conducted during two different units. To analyze the effect of place-based education on student self-efficacy and sense of place, students completed a pre and post unit survey. Student academic success was identified by comparing argumentation scores in a CER format between the pre-treatment and treatment units. A post-treatment questionnaire was given to collect qualitative data.

RESULTS

- **Self-efficacy Survey –** Student self scores moved towards strongly agree and away from neutral (figure 2).
- **Sense of Place Survey -** Student self scores moved away from disagree and neutral and towards strongly agree (Figure 3).
- **Summative CER-** An average increase of 0.74 on a four-point scale with the most growth away from beginning scores and toward advanced scores (Figure 4).
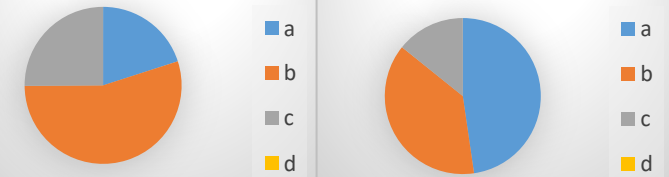
RESULTS

Figure 2. Comparison of Self-efficacy Likert Style Survey Survey results in the treatment (right) vs the pre-treatment (left)units. . a=Strongly agree, b=Agree, c=Neutral, d=Disagree, e=Strongly disagree
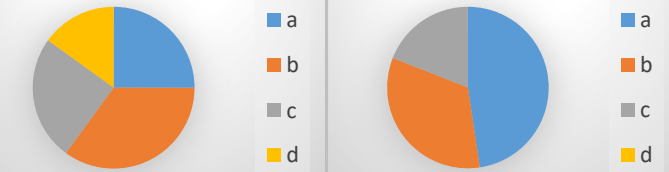

Figure 3. Comparison of Sense of Place Likert-style Survey results in the treatment (right) vs the pre-treatment (left)units. . a=Strongly agree, b=Agree, c=Neutral, d=Disagree, e=Strongly disagree

Figure 4. Comparison of Summative claim evidence reasoning scores in the non-treatment (left) vs the treatment (right)units. AD=advanced, PR=proficient, DE=developing, BE=beginning.