DETERMINING THE EFFECT OF USING OUTDOOR INSTRUCTION ON INCREASING STUDENTS’ ACADEMIC ACHIEVEMENT AND ATTITUDES TOWARDS THE ENVIRONMENT

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**BACKGROUND:** The study was conducted at Penncrest High School in three 9th grade Environmental Science classes. Students spend less time outdoors than their parents, which has made students less comfortable with being in the outdoors, and therefore less connected to the outdoors and the environment. The purpose of this study is to determine the effectiveness of utilizing outdoor education to increase student achievement in science, and to increase students’ positive attitudes towards the environment. In this study, students were taught in an outdoor classroom several times throughout a unit of instruction. This classroom was built by Penncrest students and faculty with grants provided by the Philadelphia Eagles and Axalta Coating Systems.

**FOCUS QUESTION:** Does utilizing outdoor instruction have an impact on students’ learning?

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**METHODOLOGY**

The intervention for this study will be to utilize an outdoor classroom setting for part of one unit of instruction in ecology with a group of roughly 75 ninth grade Environmental Science students across three sections. The outdoor lessons included:
- Foodweb and foodchains lecture and discussion
- Organism scavenger hunt and niche identification
- Outdoor foodweb project
- Trophic ecology lecture and discussion
- Ecological cycles and succession scavenger hunt

**DATA**

- Students showed statistically significant growth between pre-test and post-test with an average growth of 42.6% ($N = 55$, $SD = 9.1$).
- From these scores, the normalized gains were calculated with an average value of 0.7008, which indicates significant gains.
- A two-tailed paired T-Test was calculated from the pre- and post-test scores, which yielded a value of ($p < 0.0001$) between pre- and post-test scores.
- Student Quote: "Doing things hands-on helps me remember; you remember experiences more than what you learn in a classroom"

**VALUE AND CONCLUSION:**

- Utilizing outdoor experiential learning does work in high school science education. Students showed significant growth in their learning during the treatment unit.
- Students showed positive attitudes towards learning and being outdoors, but the Likert survey data did not show a statistically significant change in attitudes due to treatment.
- Student interviews overwhelmingly supported that students enjoyed learning outdoors, and that it enhanced their learning and overall educational experience.