

## Research Questions

### Focus Question:

What is the impact of a science research trip experience on student learning, motivation, and future pathways?

### Sub Questions:

- What is the effect of a science research trip experience on learning, applying, and retaining main evolution and ecology concepts?
- What is the effect of the science research trip experience on instilling confidence to do field science and motivate students toward learning science?
- What is the impact of the science research trip experience on a student's personal connection with science and the natural world as well as influencing educational or career pathway choices?
- What value does this research project have on my own classroom teaching as well as the direction and focus for future research trips?

## Background

Students at O'Dowd have the opportunity to participate on science research trips with Ecology Project International (EPI) where they work with scientists in the field to learn field research skills, conduct their own research projects, and interact directly with the particular ecosystem where they are working. I have noticed that these trips provide a transformative and lasting educational experience for these students. They frequently draw from their trip experiences when applying new concepts in the classroom. Many continue to pursue more experiences in nature beyond the classroom and some have chosen to continue pursuing their interests through a variety of other pathways.

The purpose of my project is to investigate the impact that our science research trips have on student learning, motivation, and in creating long-lasting connections to science and nature.

## Sample and Treatment

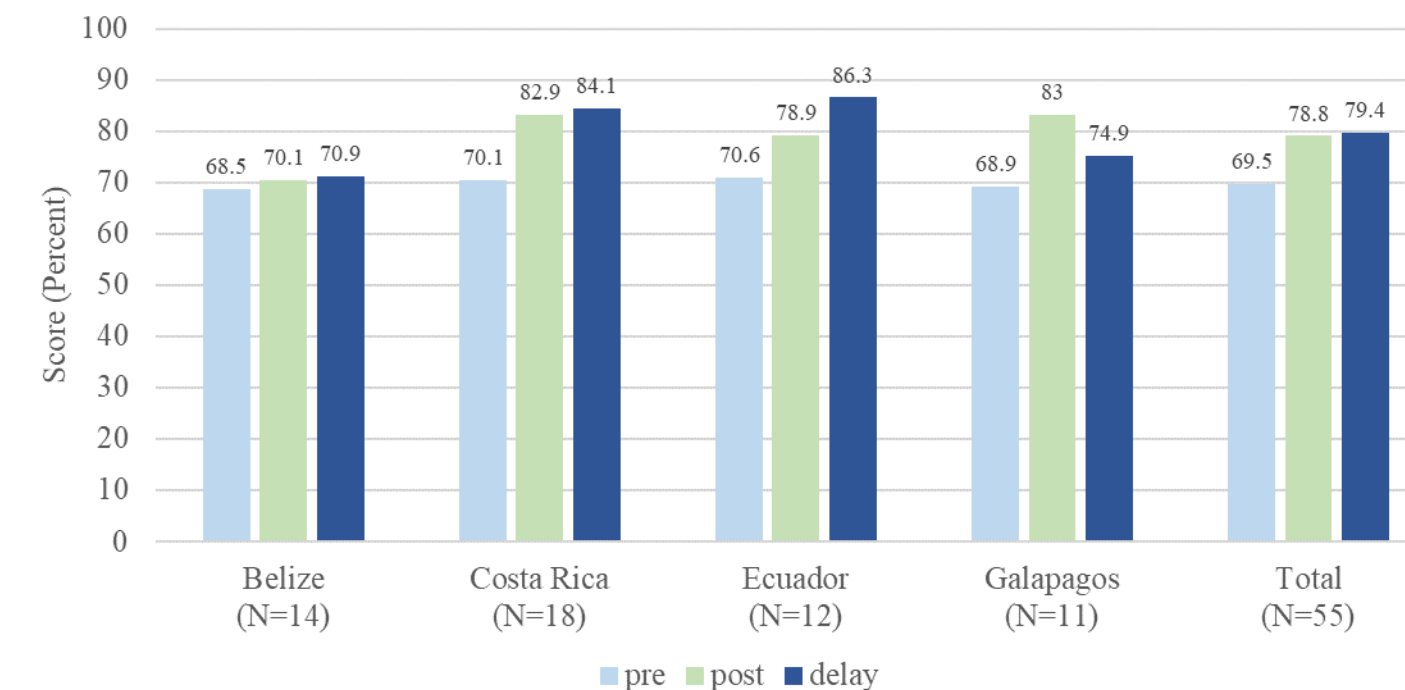
Prior to each research trip, students attended three pre-trip meetings to learn specifics about the research site and practice data collection techniques. Throughout the trip, students are guided to complete the essential field work and in generating their individual research projects to ultimately present. Beyond the data collection and analysis, students learn by making field observations, playing focused games, completing journal writing prompts, and interacting with field researchers.

Former students who participated in the same research trips through EPI were also involved in this project to gain more insight on the lasting impact of these trips.

Research trip specifics and sample size

| Research Site   | Main Focus          | Student Number |
|-----------------|---------------------|----------------|
| Andes           | Spectacled Bears    | 12             |
| Belize          | Bottlenose Dolphins | 14             |
| Costa Rica      | Leatherback Turtles | 18             |
| Galapagos       | Galapagos Tortoises | 11             |
| Former Students | All                 | 141            |

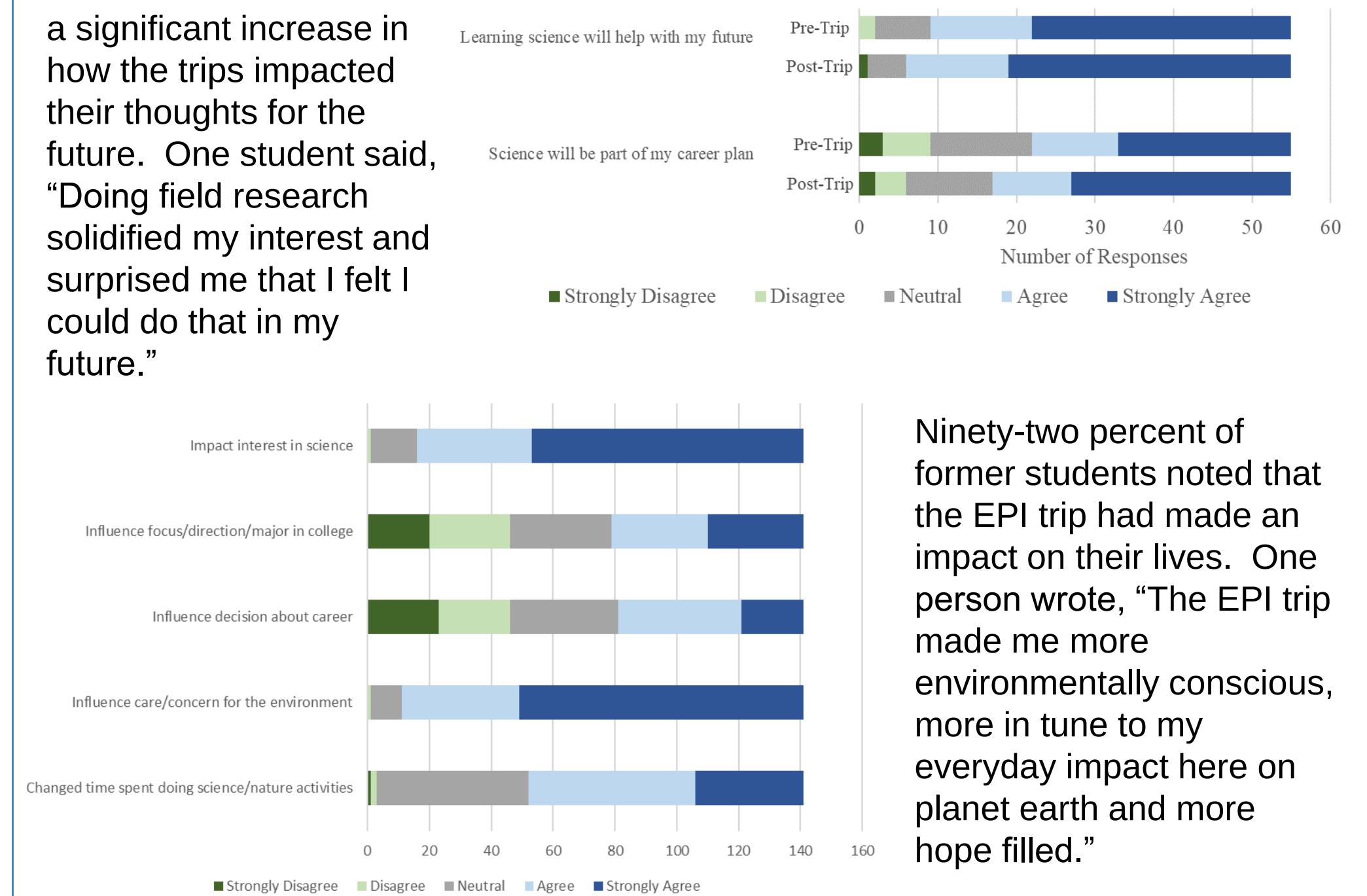
## Evolution and Ecology Concepts



Score distributions for the Pre-, Post-, and Delayed Assessments for each trip as well as a summary of scores for all trips indicating a significant increase in knowledge and application of evolution and ecology concepts as well as retention, (N=55).

## Connection with Nature and Future Pathways

Current students showed a significant increase in how the trips impacted their thoughts for the future. One student said, "Doing field research solidified my interest and surprised me that I felt I could do that in my future."



Ninety-two percent of former students noted that the EPI trip had made an impact on their lives. One person wrote, "The EPI trip made me more environmentally conscious, more in tune to my everyday impact here on planet earth and more hope filled."

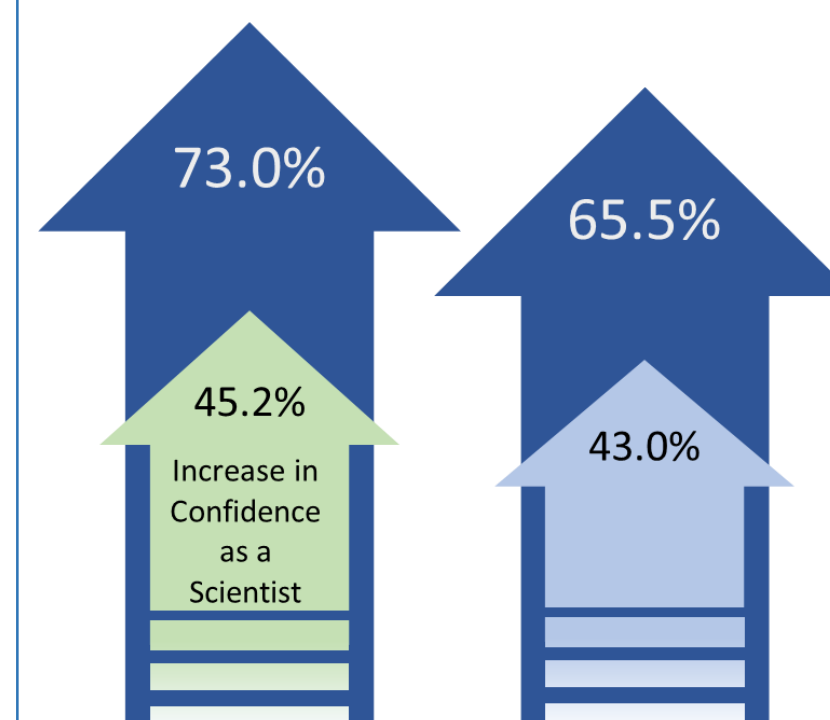


Figure 3. Telemetry for bears in the Andes



Figure 4. Hike in the Andes

## Confidence as a Scientist and Motivation



### Student Quotes:

"I really like knowing how aspects of the natural world are interconnected and when that intersects with science, I'm super interested and motivated to learn."

"Being on this trip has really opened my eyes on what nature has to offer. I plan to be more connected with the outside and educate others on what I have learned."

## Conclusion and Values

Based on the results from this research, science research trips have a clear value as an educational and transformational resource. Learning, interest, excitement, creativity, and passion are often enhanced by these experiences.

Here are ways that I plan to promote and potentially expand this resource in the future:

- Expand current science course curriculum to include more field components.
- Include field research opportunities for students within the outdoor Living Lab area on campus.
- Maintain science research trips and look to develop more substantial financial resources so that more students can participate.



Figure 1. Marine invertebrate data



Figure 2. Student research presentation.