

Introduction

In an attempt to mitigate human impacts on the environment, environmental education initiatives are growing in popularity and application. Environmental education is gaining recognition both domestically and internationally as key to environmental protection and sustainable development. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) created the Education for Sustainable Development (ESD 2030) framework to increase the knowledge of learners surrounding issues such as climate change, resource use, and biodiversity loss. This framework supports the expansion of educational activities and facilities while monitoring the extent to which education is helping to reach environmental goals. Species conservation has become a greater focus of such environmental education programs as the rate of extinction and habitat degradation continues to accelerate (McGovern et al., 2020). Further, research shows that a focus on species-specific education can contribute to overall ecosystem health and widespread environmental outcomes (Thompson & Rog, 2019). As such, understanding what makes education programs most successful is essential to contributing to species and overall environmental outcomes. The purpose of this research is to explore the perceptions of environmental educators on the effectiveness and impact of their educational programs to promote behavior change toward species-specific conservation.



Research Objectives

To 1) explore the education strategies used to promote species-specific conservation 2) to report on the barriers to implementing successful education programs and 3) understand how educators define the success of their education programs in contributing to conservation goals.

Methods

We chose to focus on a taxonomic species of concern: sea turtles. Sea turtles are considered charismatic megafauna and can be used as an effective strategy for increasing public awareness and education. Our research participants were educators at marine conservation centers in the United States. We used a concurrent mixed-methods research design to effectively gain information about their perspectives (figure 1). Participants completed 2 surveys and 1 phone interview. The first survey asked educators to rank different factors within each strength, weakness, threat, and opportunity category as it relates to species conservation education. After the first survey, we interviewed participants following a semi-structured interview guide we designed. We then created the final survey using the top-rated factor from the first survey. We asked participants to rate which overall factor they believed was most essential to successful programs. We then performed a quantitative SWOT-AHP analysis and a qualitative thematic analysis of interviews to understand educators' perceptions of their programs.

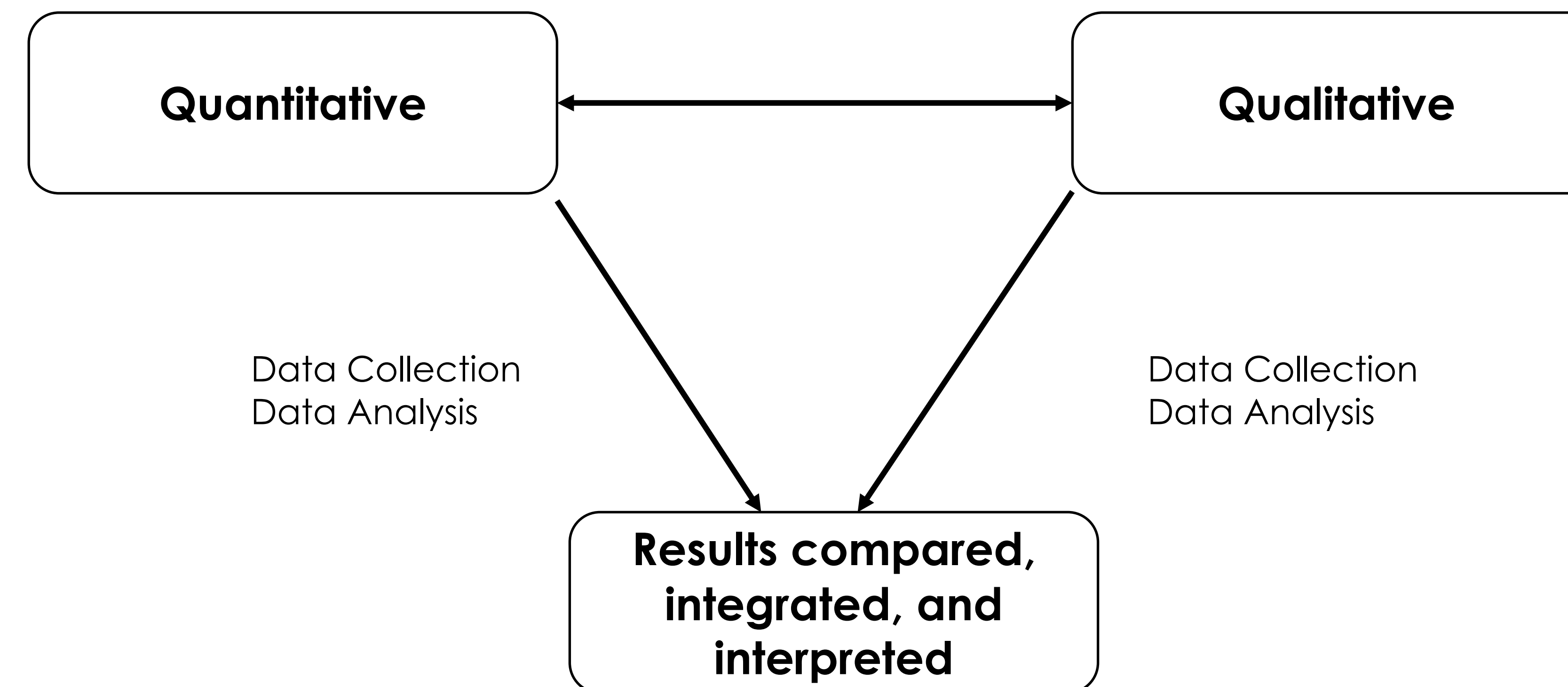


Figure 1: Triangulation of the quantitative and qualitative data increased our understanding of the perceptions of educators. Diagram modified from Atif et al., 2013.

Results

Table 1: The consistency ratios for each SWOT category in our survey. Values of <10% indicate a high level of agreement

Survey Round	SWOT Factors	Consistency Ratio
I	Strengths	4.2
	Weaknesses	1.0
	Opportunities	0.8
	Threats	2.6
II		4.0

Table 2: The top-rated factor within each SWOT category.

Strength	Weakness	Opportunity	Threat
Activities that engage the community in hands-on conservation and create public awareness	Lack of resources dedicated to education (e.g., time, money, space)	Providing the local community with programs and activities to promote conservation behavior	Climate change and other large-scale environmental threats to species
Top factor: Activities that engage the community in hands-on conservation			

Our SWOT-AHP analysis of our survey data showed consistency ratios all within the accepted values of <10% (table 1). These consistency ratios show high levels of agreement among educators about the most important factor in each category and the overall most important factor (table 2).

Our thematic analysis of the 12 interviews resulted in many lines of codes, the most common relating to empowerment, community building, and ownership, funding barriers, and STEM identity (figure 2).

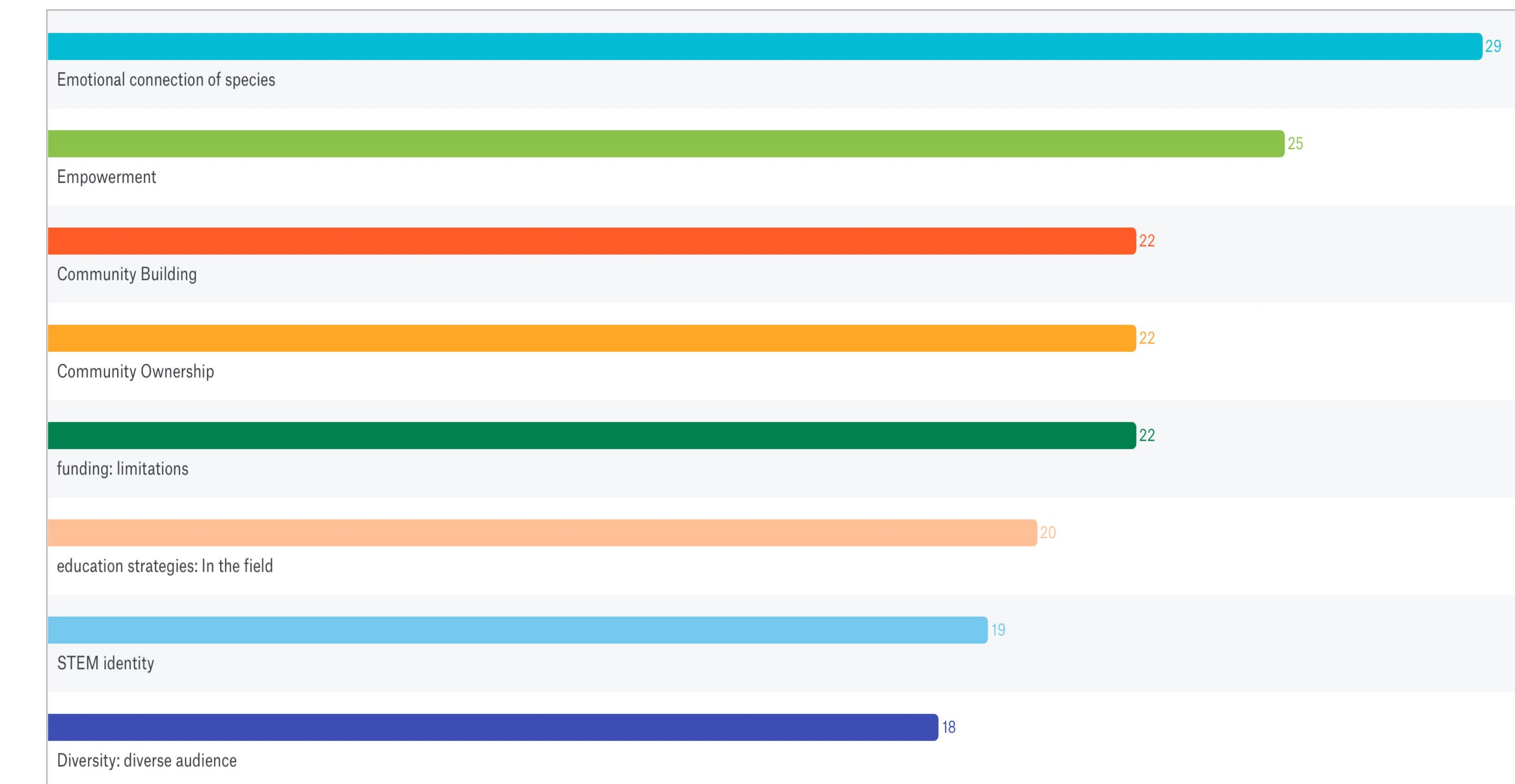
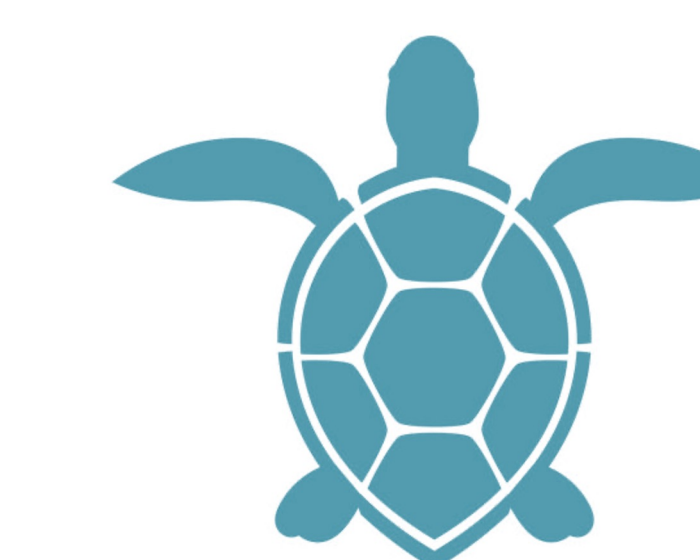


Figure 2: The code frequencies of the most common codes applied throughout our interviews

Discussion and Conclusions



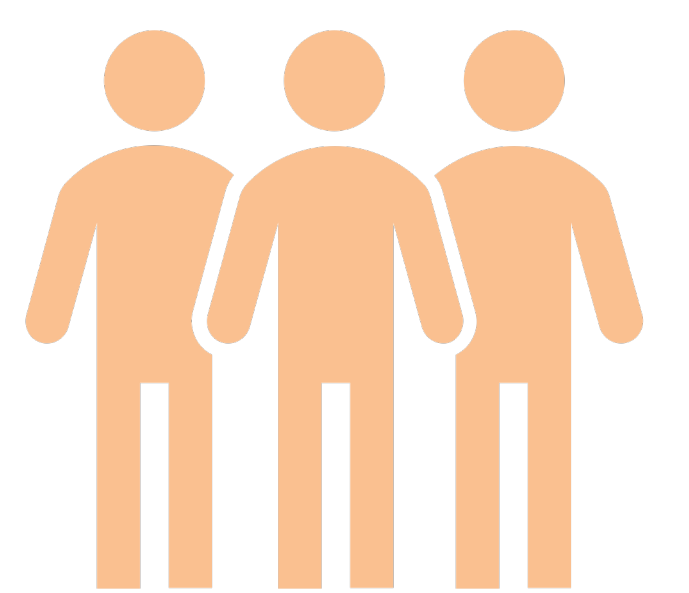
Theme 1:

Recognizing the importance of short-term programming



Theme 2:

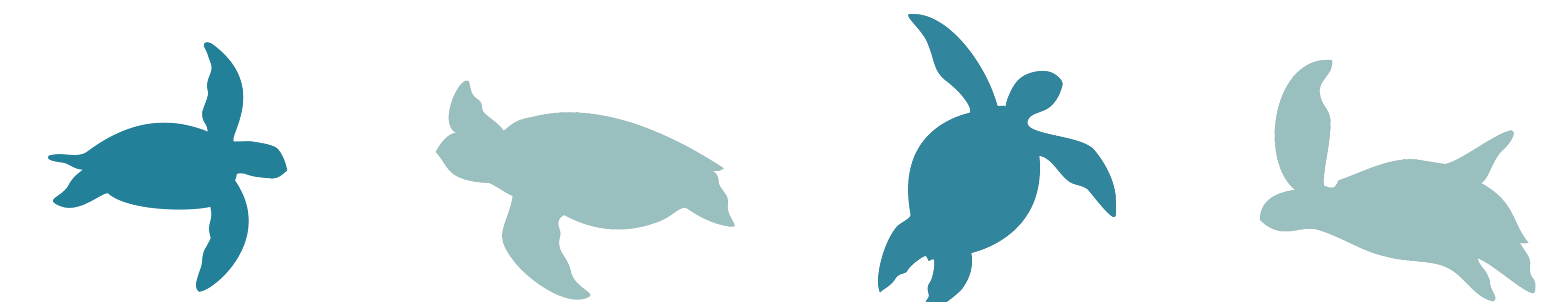
Empowering Individuals and Communities: STEM Identity



Theme 3:

Collaborating with communities to develop ownership over educational programs

Participants believed that short-term programming can be extremely impactful on individuals and communities. This contrasts much of the literature that exists which shares that short-term or single education events may not be sufficient for increasing knowledge or influencing behavior. However, educators in our study shared that they believe short-term programs can be extremely successful if certain aspects are included. These aspects included components related to empowering individuals and communities to make changes and contribute to conservation through developing their STEM identity. Another important factor for success is collaborating with communities when creating programs, as this can increase both community-building and conservation outcomes. To have the greatest impact, environmental education programs should ensure they are working to develop empowerment, STEM identities, and community ownership through their lessons.



References

