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Exploring Whitewater Rafting Guides' Values of Learning and Teaching

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Introduction

Being in the natural environment affects one's place in the built environment. Literature suggests the impactful role that *nature-based tourism* (NBT) can play in increasing tourists' general environmental knowledge as well as their environmentally-conscious behaviors following a trip. Many guests leave their experience with a greater knowledge of the area they visited, as well as the environmental impacts of their behaviors [1], [2], [3]. Prior research is skewed toward the perceptions of the *nature-based tourism* clients, rather than the guides themselves [1].

Whitewater rafting is used here as a research basis to demonstrate instances where rafting guides facilitate excursions that encourage guests to connect with the rivers they visit. This research intends to give voice to the guides and leaders of the whitewater rafting industry, including how guide behaviors influence and are influenced by their involvement in *nature-based tourism*. It does so through seeking and drawing out their perceptions on how *nature-based tourism* impacts their guests' knowledge as well as how *nature-based tourism* has impacted their own knowledge base. Namely, this study asks, **what are the values that drive guides to learn and teach about different concepts on their river trips?** To push further, we ask, how do these values offer opportunity for engineering education?

It is intended that this work be generalizable to other place-based and guided, extended, STEM learning experiences that occur within a specific context. Natured-based tourism is a novel perspective to the notion of community-based engagement. With this research study, we seek to understand better the role of an expert-guide grounded in a place-based community and experiential activity in service to engaging interested publics. The role of the river guide as a knowledgeable introduction to the nature-based tourism is a specialized example of STEM outreach and citizen science [4] that can serve to introduce and teach civic responsibility and strengthen connections between the environment, values, and behaviors of participants. It starts with the river guide.

Literature Review

The body of academic literature on whitewater rafting trips is thin, though the body of literature for outdoor tourism in general is much larger. Ardoin et. al. [1] review the literature from 1995 to 2013 to find that much of the prior work surrounding the impact of *nature-based tourism* on tourists' knowledge retention and motivation shifts have been limited to survey-based quantitative results. These findings show that, in general, knowledge gains and behavioral intentions improve immediately following a trip, but are not necessarily retained several months to a year following the trip's conclusion. The few studies that measure retention of environmental behavior changes use self-reported surveys from participants, without direct measurement of such behaviors [1].

While many forms of *nature-based tourism* are appropriate venues for informal teaching of scientific concepts and sharing of values related to conservation-based behaviors, whitewater rafting is a particularly impactful form when it comes to water. [5] conducted a 2-year study to unpack the intricacies of what they referred to as "River Magic." They found three main themes: communion with nature, "communitas," and personal growth. This "magic" allows for a strong sense of connectedness with people and place, and opens doors for new forms of learning.

Powell, Kellert and Ham [3] published a study evaluating the knowledge gains and change in environmental behavioral intentions, prior to and following a multi-day whitewater rafting trip down the Grand Canyon's Colorado River. Their research suggested that knowledge gained on the trip was mostly retained one year later, and that behavioral intentions changed immediately after a trip, but were rarely implemented one year later.

Others have paid close attention to informal learning environments and their impacts on knowledge retention, self-efficacy, and interest in STEM topics. For example, Hiller and Kitsantas [6] researched the effects of a field trip on middle school students' knowledge and interest in STEM fields. Findings suggest that a marine science lesson on horseshoe crabs increased middle schoolers' STEM interest and knowledge more than a control group who did not go on a field [6]. Potential parallels may be drawn between such studies regarding informal learning and the present study (i.e., hands-on learning engages and promotes personal interest and investment in the information that is disseminated).

Powell and Ham [2] describe a framework developed by Ham for securing the attention of *nature-based tourism* participants as a communication strategy for non-captive audiences that interpretive talks must be Enjoyable, Relevant, Organized, and Thematic (EROT). The two also describe Azjen's [7], [8] Theory of Planned Behavior (TPB), which asserts that behavior, and thus behavioral change relies on attitudes, norms, and social pressures, where feelings toward a particular behavior are driven by a set of beliefs regarding the consequences of performing such behavior. This is germane in the context of conservation because participants will not change their environmental conservation behaviors if they do not *believe* their actions will have consequences. The actual consequences of an action are less important than an actor's personal interpretation of those consequences when it comes to acting [2].

It follows, then, that with proper "River Magic" [5], a river guide could employ Enjoyable-Relevant-Organized-Thematic and Theory of Planned Behavior [2], [7] to encourage positive attitudes toward environmentally conservative behaviors in order to enact change. Such behaviors include: donating money, writing letters to government officials, joining environmental organizations, considering the environmental impacts of consumer goods when it comes to purchasing decisions, recycling at home, reading about the environment, voting for environment-supportive officials, and attending community meetings about the environment [2].

Methods

This study used phenomenological semi-structured interviews to gain insight into the perceptions of whitewater rafting guides with regards to their roles in informal learning, and their desired impacts on guests' values. Purposive sampling sought maximum variability in participant

experience in formal teaching environments, participants' experience in rafting, and gender. Maximum variability draws out the greatest variety from the smallest number of participants in the hopes of providing the richest snapshot of the phenomenon [9].

In addition to verbal interviews, photo elicitation was used, calling on participants to bring a photograph of an experience which represented an "aha" moment for the guides, when a rafting concept was crystallized. Such photo elicitation offers a unique opportunity to "evoke deeper elements of human consciousness" than can be achieved by words [10]. The choice to use critical incident interviewing in general was intended to draw out guide values and assumptions in the analysis portion of this project [11]. We asked guides to describe details of the experience, including what was solidified for them. Interviews were conducted via Skype video conference, and were audio recorded, transcribed, and coded.

The first author of this study is a member of the raft guide community and thus benefited from easy access to a pool of participants for recruitment. Multiple coders to ensure analysis was not biased. The first participant was a 30-year-old male who is a high school social studies teacher in the off-season. He has been guiding for 9 years and has taught numerous guide schools in which he trained others to become guides. The second participant was a female in her early 20's who has been guiding for 5 years. She guided all through her undergraduate education, and is still guiding, one year out of school. The third participant was a female in her mid-20's who has been guiding for 7 years. The small sample size of 3 participants meant that this research served as a pilot study for future work.

Results and Findings

When asked to bring a photo regarding the crystallization of a rafting concept, study participants took different approaches. One individual brought a photo of a time he realized that even when it's just another day on the job for him, it can mean all the difference to teens finding their way in life (Figure 1). Another brought a series of photos representing a time when, as trip leader, she had confidence and trust, and had her cleanest ever run of a difficult rapid (Figure 2). The third participant brought a photo representing a time when she helped teach a guest and experienced the joy of witnessing someone else have a concept click (Figure 3).

Figure 1. *Participant Photo 1.*

Figure 2. *Participant Photo 2.*

Figure 3. *Participant Photo 3.*

In service to the first research question, regarding the values that drive guides to learn and teach about various topics, data were collected that demonstrated two separate categories of values.

The first category stems from corporate policy that each guide be able to deliver an interpretive talk about a topic of choice to a group of guests. These topics were sometimes forced, but almost

always related to the environment guides were in, such as talks about turkey vultures or the Me-Wuk Indians. The values here ranged from guides wanting to keep their jobs to guides feeling they owe it to the clients and to the canyon they're in every summer to know something about the region.

The second category of values was much less superficial and spoke to many of the reasons these participants became guides in the first place. The common thread among the participants was that they all felt a duty to make sure guests could connect to the wild places they visit, so that they may one day behave in favor of preservation. One participant saw her role as,

> teaching people how to slow down, and then also teaching them how these places are threatened, and how these places help them slow down, and how they should maybe look out for ways to protect them.

Another had similar sentiments, noting,

> I think there's a capacity there for change, for action, and convincing people that the environment is worth protecting.

Within both of these categories – learning for the sake of respect for the environment they're in, and learning for the sake of environmental conservation campaigning – was an observation that guides are very easily able to grasp concepts such as fluid mechanics and physics without ever necessarily having been taught with vectors and calculus. They are motivated in experiential learning to understand these concepts together, such that (a) the rapids are run smoothly and (b) they deeply understand the dynamics of the system.

Finally, central to learning in this context is the community aspect of a trip. Guides often shared interpretive talks with each other, learning from and teaching other guides to spread the knowledge to guests. In training, guides learned to "read water" together to safely get boats down the river. And lastly, these trips would not exist without the guests that come along, teaching guides lessons of their own summer after summer.

Conclusions

While all guides for this study worked in the Western United States, this work has implications for river trips elsewhere in the world, as well as many other commercially-run outdoor experiences. The primary focus here is water, but other types of *nature-based tourism* may address a great number of other environmental issues, such as air quality, soil health, and endangered species, with opportunities for community engagement at every turn. This study fills a gap by strongly representing the narratives of the guides and leaders, maximizing their opportunity to posit solutions.

This pilot study may pave the way for research involving effective methods for taking advantage of small river trip communities to engage in learning, as well as to use the natural environment to understand the built environment. Calling on the expertise of *nature-based tourism* community members who are immersed long-term in the *nature-based tourism* experience (i.e. guides) may

offer an opportunity to better understand the connections that their clients make regarding the effects of their actions. Future work will explore this in greater numbers. STEM literacy and awareness about relevant STEM topics (systems-thinking, ecological and environmental engineering) will also be future foci. An aspect mentioned by guides about the effectiveness of learning STEM within experiential learning is also of future interest.

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