Photovoice: A method for college students to snap and chat what's intriguing about field trips

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BURD'S eye view
RESEARCH & EVALUATION

Overview

In this technological era, young adults spend countless hours engaging with social media, exchanging memes, and communicating with images. What for a previous generation of teenagers were countless hours spent gabbing on the rotary dial telephone, millennials are swimming in images that relay conversations and important messages. They were brought up on selfies. They stay in contact daily through Instagram and Snapchat. And they display what's going on with their "friend groups" through Facebook, as well as monitor what's going on with other friend groups. What better way to gather data from college students and learn about their lived experiences and internal worlds than through photovoice!

In this paper, we examine the qualitative method Photovoice and briefly its history. We consider how useful applying the method is to the evaluation of informal education outdoor programs. We explore Photovoice as a way of gathering the perceptions and experiences of college students who participated in field trips of the SHIP-GEO, *Stimulating Hispanic Participation in Geosciences* http://www.utrgv.edu/geopaths/, project of the University of Texas Rio Grande Valley (UTRGV), School of Earth, Environmental and Marine Sciences (EEM). We elucidate its usefulness for evaluation by comparing data gathered through Photovoice to traditional survey responses. Finally, we discuss some logistics to consider for implementing the method smoothly.

What is Photovoice?

Photovoice is a method in which participants take photos of what they believe is important, interesting, or significant to them, in this case, with their phones. Then they describe and explain the significance they attribute to the image through oral or written accounts. This data collection method is a way of capturing what people attend to, care about, or are interested in, and the meaning the image holds for them. By coupling the image with the accounts, the procedure originates with the respondent's perspective. The evaluator comes in second and analyzes the visual data to expand beyond the verbal accounts and to enhance interpretations.

At its inception, researchers developed Photovoice in the domains of public health and community development to empower participants from marginalized groups and give them voice. For example, Wang & Burris (1997) developed the methodology for a needs assessment in which poor, rural Chinese women took pictures that facilitated a discussion of their needs for basic resources in their community, such as clean water. In a study of the transition to fatherhood and smoking, Oliffe and colleagues (Oliffe, Bottorff, Kelly, & Halpin, 2008) used Photovoice to investigate the social context and behavior of new fathers during their partners' pregnancy and after the child was born.

Researchers have also applied the method to educational studies. One study, in particular, was the impetus for testing out Photovoice in the current evaluation. Berendt employed Photovoice in his doctoral research to study the informal learning experiences of high school students who were attending a field trip at a science field station (Berendt & Machtmes, 2016). The researcher get students disposable cameras and directed them to capture what they considered important, meaningful, or interesting. Our reasoning: If

high school students could use cameras to document and communicate what they found personally significant during their field trip, why couldn't college students on a geology field trip do the same.

Student Experiences during Field Trips

Researchers have explored student experiences and informal learning during education outdoors. Student experiences during field trips, in particular, include what happens during the events as well as what they take away with them in the form of memories, new and renewed interests, and changed behavior. Researchers and theoreticians have discerned various factors that students benefit from by participating in field trips (for a review, see Morag & Tal, 2012). Students' motivation and interest can be enhanced during field trips. Students have the opportunity to learn in the context as well as dialogue and interact with their peers about the natural world. Broken down, in Brody's theory of learning in nature (2005), field trips involve students' acting, thinking, and feeling and each occur with respect to the setting and personal and social experiences over time. From Brody's theory, students transform in these different domains during the trip and the changes persist long after.

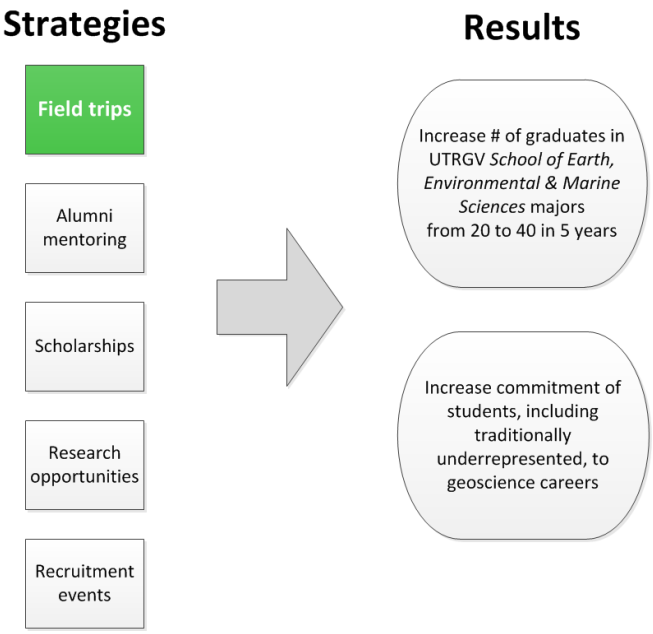
Academic frameworks help to focus how we think about student experiences during and after field trips. Yet, the program design, goals, and theory of the particular project in question SHIP-GEO guide the analysis and interpretation of the data gathered.

Project

SHIP-GEO is a three-year project funded by the National Science Foundation (NSF) to increase the number of graduates from the School of Earth, Environmental, and Marine Sciences at the University of Texas Rio Grande Valley. SHIP-GEO focuses on increasing student awareness of career opportunities in the geosciences, as well as on recruitment and retention of students in EEM. It expands into the community to attract high school students, community college students, and those currently enrolled at UTRGV to geoscience majors and careers. At the same time, it enlists not only faculty, undergraduates, and graduate students in the school, but also UTRGV alumni and other local geoscience professionals to share their experiences and know-how about career possibilities. SHIP-GEO takes the "world" of geosciences in the Rio Grande Valley as its canvas to introduce students to where and how geoscientists work as well as what is unique about the Earth and how the people live in relation to it. To that end, the project intends to give students room to explore, to pique their curiosity, and to motivate them to pursue geoscience careers.

To frame the evaluation of this project, the leadership team and I met to lay out a program theory and an evaluation rubric. First, the program theory for this project consisted of five strategies and two main results, which Figure 1 presents. Front and center were the field trips. The project strategies also include recruitment, alumni mentoring, scholarships, and research experiences. In the two results, the project team expected to double the number of geoscience graduates in five years and to increase the commitment of students to geoscience careers, especially traditionally underrepresented students.

Figure 1. Program Theory for SHIP-GEO



The second part that frames the evaluation for the project is an evaluation rubric, which is a tool used to "paint a picture of what the evidence should look like at different levels of performance" of the project (Davidson, 2013). Stakeholders determined what project outcomes should look like in five years and their shared vision for how to how to arrive at the results. In doing so, they specified details of the processes and outcomes they expected to see. The evaluation rubric for this project detailed what actions faculty and students should take. Table 1 presents an excerpt from the SHIP-GEO evaluation rubric with the segments of the criteria that pertain only to the field trips.

As Table 1 indicates, the faculty have much to accomplish during the trips. They are expected to show their enthusiasm for and teach about the geosciences, advise students on academic pathways, and provide career education as well as log time with students and build relationships with them. The students, on the other hand, primarily need to attend, but also to engage with the topic at hand by asking questions and build relationships with other students and faculty.

Table 1. Evaluation Criteria for SHIP-GEO Field Trips

Outcomes	
Students	It is evident that students: • develop tightknit STEM cohorts that is engaged socially and academically • more students become aware of geosciences degree campus-wide, complete geoscience majors, and go to grad school or enter jobs in field
Processes	
Students	It is evident that students: • attend events, socialize with others students interested in geosciences, engage with geoscience field, ask questions, and talk to others students about their experiences
Faculty	It is evident that faculty: • show enthusiasm for geoscience and teach students by having engaging conversations about science, making connections in the context, responding to questions, and supporting informal learning

	• build relationships with students (e.g., share personal & professional experiences, people, projects and passion and log time with students) • provide career education, including helping students open eyes to subfields in geoscience and exposing students to work possibilities outside as well as inside the region in geoscience • advise students in academic pathways by directing students and encouraging them to engage in one-on-one conversations with other faculty • connect students to the real-world environment they live in helping them see home through lens of geosciences

Methods

The data includes student responses from surveys gathered at the end of two field trips, one in April to Choke Canyon State Park, Texas and one in September of 2017 to the Volcanic Ash of Rio Grande City, Texas. At the end of each threat, the Principal Investigator (PI) gave students an anonymous link that could be accessed with smartphones or computers. The survey asked for demographics (Table 2), how students learned about the trip, perceptions of its impact on their interest and knowledge in geosciences, networking in the department, and learning about careers. Students were also to share photos and described the meaningfulness using a method called "Photovoice" (Behrendt & Machtmes, 2016). For the first survey, students clicked a link within the survey and uploaded the photos to dropbox, and for the second survey, they emailed the photos directly to the evaluator.

In addition, the evaluator gathered participant-observation data during a field trip held in November 2017 two the Water Resources and Resacas in Brownsville, Texas. Fieldnotes were made later that day and analyzed thematically (Appendix).

Data Limitations

Note that not all of the students who responded to the surveys provided photos with descriptions. Although 21 students who completed the survey in April 2017, just five shared photos. For the September 2017 field trip, just two of the seven students shared their photos and gave descriptions. Two limitations emerged here. The possibility of learning from the full sample is limited, as well as the richness of coupling accounts and photos.

Table 2. Demographics by Field Trip

	Choke Canyon State Park, April 2017	Volcanic Ash, Rio Grande City, September 2017
n	21	7
Female students	15	4
Male students	6	3
Preferred not to answer gender		0
American Indian or Alaska Native	0	0
Native Hawaiian or Other Pacific Islander	0	0
Asian Indian or Asian	0	0
Mexican or Central or South American	14	
Black or African American	0	
White	4	5
Other	5	2
Prefer not to answer race		0
High School	4	
Texas Southmost College		
South Texas College		
UTRGV	10	
I am not a student		
Freshman in college	3	1
Sophomore in college	2	2
Junior in college	10	3
Senior in college	3	1
Freshman in high school	1	
Sophomore in high school	2	
Junior in high school	1	
Senior in high school	0	
Environmental science major	12	4
Aerospace engineering and environmental science major		1
Rehab major	2	
Civil engineering major	1	
Biology major		2
Biology major with teaching certificate	1	
Social science major (e.g., psychology, anthropology)	2	
Education major	1	

Source. UTRGV SHIP-GEO Field Trip Surveys

Note. The demographic questions were different on the two surveys. For the April 2017 field trip, students were directed to select all racial categories that applied. Also, if a response option was not offered, the cell above is blank, except that for majors, students wrote in their responses.

Findings

To collect the Photovoice data, students were asked on the survey at the end of the field trips to share photos that they took, label them, and describe why the picture was significant, including people, location, event or activity, tools, and feelings that made each image symbolic or noteworthy. Their responses varied from person-to-person and reflected deep personal experiences.

Photo 1, "Gypsum"

Students described engaging with the Earth and affirmed skills in the geosciences. They talked about the professors' teaching, which was one of the jobs the project leadership team laid out for themselves. The students, interns learned from the professors about minerals and their uses. One student wrote the following account:

> *I don't usually find something I can name. And I feel satisfied that I can distinguish gypsum. Where I found this sample was actually among a bunch others because it was a gypsum outcrop. Professors were talking about it's mineral composition and the Calcium Sulfate. Also what it is mined for, fertilizer, plaster and wallboard. I hope more trips are like this with different types of outcrops.*

The enthusiasm that the faculty set out for themselves to communicate to students was directly picked up by the student who was looking forward to more opportunities to identify minerals. This phrase immediately warrants evidence that evaluators can compare to the process that the leadership team expected to occur as project activities roll out.

Missing Photo, "Unknown Rock or Mineral"

The data gathered in April 2017 included one major issue, several students present accounts but struggled to upload their photos. Here is a account in which one student discussed fascination with finding a rock or mineral in the field and not being able to identify it. Furthermore, in the account, the student referred to including a pickaxe to indicate scale per the guidance of the professor. The student wrote,

> *It's always fascinating to find something in the field that you absolutely cannot identify. with the little bit of knowledge that I have, eventually I will be able to describe what this might be or what I think it could be related to. What made this so fascinating was the localization of the rock or mineral. the surrounding rock more than likely being limestone or some kind of felsic rock clashes completely with this small dark piece. I included the pickaxe in reference to [the professor] always making sure to include something for scale and in his pictures he usually puts a pickaxe since he always has one on hand in the field.*

Not only does this account bring to life the budding geologist, but also the relationship with the professor as the student described knowing what professor would do as the scientist in a situation and his habit of carrying a pickax.

Photo 2, "Classroom #(N/A)"

Another student honed in on the teaching that went on during field trips. Beginning with the label for the picture, that is "Classroom #N/A," the student called the informal classroom setting of the field. In this picture, I believe, we have two of the professors on the left, one explaining what the the terrain with look like 1 million years ago with the volcano and the other listening intently at the bottom mid-screen. The University community of the geosciences with faculty learning alongside of students was meaningful to this student. The student also described satisfaction in the trip as an opportunity to ask questions in situ of one professor or the other. This student wrote,

> *[Our professor] of the Edinburg campus schools us all on the lay of the land and how it likely looked millions of years ago. Not only are the students learning, but other professors that were with the group as well. Additionally, being able to turn to either faculty member throughout the trip when a question arose was very satisfying in terms of gathering questions that I needed answered and explained.*

Again, in the picture, the faculty are demonstrating their enthusiasm for the field geosciences, and the student's account of the picture demonstrates that the student noticed it.

This data gathered through Photovoice rendered the job of the evaluator easy. From the perspective of evaluation, this project is achieving the expectation that faculty would communicate their enthusiasm about geosciences. It is evident in the data. Through the eyes of the student, it was documented. Through the words of the student, it's confirmed.

Photo 3, "Ancient Mound"

This photo follows the previous one. Taken by the same student as was Photo 2, it is the second in a triptych (Photos 2-4) in which the student drills down from the view of the landscape to this mound of volcanic ash to what's found in the ash. In this account, the student wrote, "Being able to physically touch part of earths ancient past of a more destructive and hostile environment really puts that time frame in perspective." Here the student continued to communicate enthusiasm for the Earth's history.

Photo 4, "Souvenirs"

In the last photo of the triptych, the student wraps up what was personally meaningful about the trip. The student wrote, “Whether it be the memories of the days events or items of interest like the quartz collected in the volcanic ash pile in Rio Grande City,” indicating its full value. The memories and the quartz were both souvenirs to take away.

The same student explained that the value of the field trip when asked for comments or suggestions at the end of the survey. He worked

> *The trip was very involving of students and faculty, each instructor bringing their own expertise and opinions on different areas of interest throughout the trip. It was very insightful and motivating. I am extremely happy and appreciative of SHIP-GEO and it's efforts to create more involvement outside of the class room. It's not so much the content of lectures and labs that I seek to help me become a better Env sci student, rather the experience outside of the class my instructors give me and share that prepares me to live and think like an environmental scientist. The latter is what I see most valuable of these trips, and plan to take advantage of every opportunity.*

This response complements the pictures and accounts gathered through Photovoice.

Photo 5, "View from our Campsite"

In the account for this photo the student described an appreciation for nature as well as enjoying camping with friends, which many of the students were doing for the first time on the Choke Canyon State Park trip in April. The student wrote, "It was a great view to wake up from and we were away from the other campers. Also, putting up the tent was fun and had many laughs trying to put it up." In this account, the experience of camping itself was an opportunity to bond with peers. Moreover, almost half of students who joined the camping trip to Choke Canyon found it the most meaningful trip that they attended through SHIP-GEO; many students had never camped before.

Photo 6, "Wild Flowers"

This photo and the account from the camping trip demonstrated the student's appreciation of the beauty in the environment. The student wrote, "This photo was taken while hiking in Choke Canyon nature trails. It felt peaceful being surrounded by so much nature." With Photovoice, the student takes the reader, and the evaluator likewise, to the moment of hiking along the trail; the viewer gets down low at eye level with the flowers. With Photovoice, the students communicated with their experiences.

What Photovoice Missed

The Photovoice procedure either missed or barely touched two areas of student experiences that another open-ended survey question caught. Photovoice did not capture students' thoughts about careerpaths in geosciences that the field trips sparked, nor did it elicit thoughts about interaction with students and faculty. In contrast, on the surveys, when students were asked to share ways in which the trips were

meaningful, some described how the field trips piqued their interest in geology and careers in geosciences. This question also elicited accounts of the relationships they were building. Several students reported that they discovered a career path on their most meaningful field trip. As one student wrote, the Choke Canyon Camping trip "was the most meaningful to me because it sparked an interest in geology and I am now thinking of pursuing a career in geosciences." For a few students, it was the conversations they had with faculty, and sometimes alumni and other students, that inspired a career path or "what I want to do with my life." One wrote, "Resacas in Brownsville was the most meaningful to me because during that field trip I decided to change my major to environmental science. As I spoke to the faculty, alumni, and students I learned the importance of this field."

With Photovoice, students referred to the relationships obliquely as in observing the professor teaching the other or remarking the fun of setting up the tent with other students. On the other hand, when they listed ways trips were meaningful, the noted relationships explicitly. For example, one student described how the camping trip was most meaningful and wrote "I enjoy exploring and that is what the group and I did, and everyone was very kind and social I got to meet new friends who are majoring in ENVR Science or something similar to it." Another student wrote, "Highlights for me, being able to see different environments and form better relationships with faculty."

Why students' the decisions about career paths in geosciences or developing relationships did not surface in the Photovoice data is unclear. Pictures about minerals, scenery, or an ancient mound of volcanic ash focus on the process of doing geology. The decision that students described came out of conversations they had with the people who were on the trip. Students might realize the decision later on, but not at the moment of taking pictures. Similarly, nearly all of the photos students shared had rocks or landscapes as subjects. As we collect more data through Photovoice, we will keep our eyes open to see how the cognitive process of decision-making and thoughts about relationships come up in future data collection.

Key Issues and Implications

Photovoice is a powerful tool in the repertoire of evaluators, particularly for the study of the informal learning of college students on field trips, as these findings demonstrate. It provides rich evidence about students' experiences as they participate. Through Photovoice, students communicated enthusiasm about naming rocks and minerals and about doing geology. In their accounts of the photos, they also made references to the professors as well as the community of learners that included the instructors themselves. Photovoice afforded students a tool to relay what they valued in the stops along the trip and to document their perspectives of their developing relationships with nature, and, to some degree with peers and with faculty.

However, Photovoice did not perform well in surfacing students' decisions about their career path brought on through their experiences on the field trips. Those thoughts emerged more clearly when we asked a different question. It is not clear why this is the case, although it may pertain to the cognitive nature of decision-making. Similarly, more thoughts about the developing relationships with people were elicited when students were asked to give ways that the trips were meaningful. If the students had taken pictures of the people, perhaps the accounts would have included the relationships. It could be that the students do not know many people on the trip. How acquainted does one need to be to take a group selfie? We will continue to investigate these findings.

This application of Photovoice was a first foray for this evaluator. Logistical issues manifested. Although project leaders reported that students took pictures profusely during the trips, not many of them shared what they took through the survey. On the first iteration of data collection, students reported that they struggled to upload their photos to dropbox. This issue was technical, and the new procedures of emailing the images to the evaluator worked well on the second iteration of the method. Nonetheless, just about one-fourth of the students who completed the survey both times shared images. The data was collected online both times with the evaluator in absentia. Perhaps recruiting the project leaders to drum up interest and support for sharing is the next improvement to make.

References

Behrendt, M., & Machtmes, K. (2016). Photovoice as an evaluation tool for student learning on a field trip. *Research in Science & Technological Education, 34*(2), 187-203.

Davidson, E. J. (2005). *Evaluation methodology basics: The nuts and bolts of sound evaluation.* Thousand Oaks, CA: Sage.

Davidson, E. J. (2013). *Actionable evaluation basics: Getting succinct answers to the most important questions.* Auckland: Real Evaluation.

Oakden, J. (2011). *Waste Minimisation Act implementation: Evaluation of stakeholder perceptions*. New Zealand Ministry of the Environment. Retrieved from http://mfe.govt.nz/publications/waste/waste-act-stakeholder-perception-report-final/

Oliffe, J . L., Bottorff, J . L., Kelly, M. & Halpin, M. (2008). Analyzing participant produced photographs from an ethnographic study of fatherhood and smoking. *Research in Nursing & Health, 31*(5), 529-39.

Wang, C., & Burris, M. A. (1997). Photovoice: Concept, methodology, and use for participatory needs assessment. *Health Education & Behavior, 24*(3), 369-387.

Appendix

Evaluator's Description

A description of one of the SHIP-GEO field trips will give sense of what took place. In November of 2016, the evaluator participated in the Water Resources and Resacas trip to Brownsville, TX. UTRGV has two campuses, one in Edinburg and one in Brownsville. The trip started at the Edinburg campus with nine students, three faculty, and one alumnus. The PI passed out handouts with a brief explanation of resacas, an agenda for the day, and informative photos and diagrams. The group drove to Brownsville in University vans and met two alumni and the faculty member who led the trip and made a short presentation in a university lab. The group made several stops to visit resacas beginning with the Brownsville campus, then a middle-class neighborhood, the view of a religious school surrounded by water, and a city park. At the stops, the lead faculty member discussed the setting, the interplay between human needs to manage water and the environment and wildlife, civil engineering and policy, and history and remediation, and so on.

The field trip was a nonstop socially- and intellectually-engaging experience. Students asked questions of faculty members at the stops and in transit as they walked from the vans to points of interest. The discussions focussed on the geoscience of the moment as well as career pathways. For instance, one student was observed discussing how to get environmental engineering education at UTRGV by combining a civil engineering major and environmental science minor. At lunch, in a conversation about the trips, students expressed unbridled enthusiasm about the trips they had gone on and their intention to attend more. Overall, the faculty were friendly, responsive, and engaged with students.