Effective Use of Personal Assistants for Students With Disabilities: Lessons Learned From the 2014 Accessible Geoscience Field Trip

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ABSTRACT

In 2014, the Geological Society of America sponsored an Accessible Field Trip, designed to demonstrate best practices in accommodating a wide variety of participants with disabilities during a field experience. During the trip, an aide was deployed to assist two student participants with sensory disabilities, one with low vision and the other with deafness. The experiences and interactions between the assistant and the students were compiled into a thick description, which was subsequently analyzed through self-reflective case study. The lived experiences of the participants and the assistant are interpreted to describe the efficacy of personal assistants in field study. Effective assistants maintain an awareness that students with disabilities have varying comfort levels with self-advocacy. An effective assistant also facilitates a positive perception of the student with a disability within the full group. Key skills of the personal assistant include awareness of spatial placement, communication, and flexibility. Three fundamental recommendations are presented for the effective use of personal assistants: (1) open and continuous communication as part of pretrip planning, (2) trip leaders must be willing to be flexible and adaptable with their field sites and learning goals, and (3) trip leaders must recognize social and spatial parameters of assisting students with disabilities. Ultimately, trip planners must become familiar with the personal and cultural backgrounds and abilities of their students to plan for an effective instructional excursion. [DOI: 10.5408/16-185.1]

Key words: access, inclusion, disabilities, geoscience education, field studies

INTRODUCTION

Experiential and field-based learning opportunities that are accessible for students with diverse physical needs have traditionally been lacking, but are becoming increasingly available (Atchison and Feig, 2011; Atchison and Martinez-Frias, 2012; Stokes and Atchison, 2015; Collins et al., 2016). Inclusion of the needs of all students in the general education curriculum is not only best practice, but is also required by law (Individuals with Disabilities Education Act [IDEA], 2004). However, no set formula exists for manipulating the environmental factors involved in field-based education settings in order to help the student be most successful. Educators typically use evidence-based practices in order to accommodate students to the best of their ability. However, in some situations, instructors must improvise greater access to the learning environment, particularly when student(s) with disabilities (SWD) are present. When barriers to access for those students are reduced, academic inclusion and achievement improves.

As specified in the Individuals with Disabilities Education Act (IDEA, 1990), a least restrictive environment is a continuum of instruction for people who have disabilities. The least restrictive environment is an environment in which "[learners] with disabilities, including children in public or private institutions or other care facilities, are educated with [learners], who are not disabled" (IDEA, §B.612.a.5, 1990). Students with disabilities learn among peers with typical abilities following one of two models. Inclusion happens in schools when the SWD learns with typical peers for 100% of instructional time throughout the school day. Mainstreaming occurs when the SWD learns with typical peers for a few periods of instructional time and receives more specialized instruction from an intervention specialist. In schools, the general education teacher may receive support in order to provide quality instruction to students with disabilities, this could come in the form of consulting an intervention specialist, cooperative teaching, including supportive resource programs, or providing instructional assistants (Idol, 2006).

Personal Assistance in Educational Settings

The use of an assistant can enhance inclusion in a community of learning for a student with a physical or sensory disability by providing multiple opportunities for engagement, interaction, and communication with other students with and without disabilities (Yell, 2012). Assistance should promote a comfortable level of discourse within the learning community in order to provide the maximum level of independence that the students' abilities will allow. Regardless of the physical environment, an individual with a disability is able to adapt when given the appropriate support in the instructional environment (Taber-Doughty, 2015). Inclusion and access must also be facilitated in field-based environments, but the academic achievement for students with disabilities is often hindered as result of physical and psychological/social barriers. The barriers these students encounter in the field are often greater than for those without disabilities. For example, students with hearing impairment can be excluded from peer-to-peer interaction and/or discussion with the instructor. Students

Received 20 June 2016; revised 18 October 2016; accepted 19 December 2016; published online 14 March 2017.
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with vision impairments can be marginalized when field discussions focus heavily on visual inputs (e.g., rock orientations). Nevertheless, field experiences are crucial to learning in naturalistic disciplines such as Earth science.

Field work is beneficial because students are able to experience the subject matter content in a relevant context, and to practice and apply scientific skills (e.g., Elkins and Elkins, 2007; Maskall and Stokes, 2008; Riggs et al., 2009; Whitmeyer and Mogk, 2009). However, educators often struggle to plan field experiences in the face of time constraints and the need to modify the outcomes and accountability of the excursion. The anxiety of planning is further increased when educators must accommodate a wide variety of abilities while keeping the group safe, as well as keeping all students engaged. In many learning environments, some accommodations have been observed to be consistently successful for all students, regardless of disability (Crews and Zavotka, 2006; Langley-Turnbough, 2009). Such accommodations include (1) consistent design of instructions, expectations, and handouts; (2) maximum visual contrast and legibility in those materials; and (3) the use of plain language in all materials (e.g., Langley-Turnbough, 2009). Safety should be held at top priority in order to encourage the involvement of students with disabilities in the STEM fields. One consistent accommodation for increasing safety is the use of the buddy system (Langley-Turnbough, 2009). The buddy system assures that a pair of students will attend to each other's safety and engagement during field-based learning. These general accommodations can be applied without consideration of a specific disability. A personal assistant can be thought of as an "enhanced buddy" in mixed-ability pairings.

In common practice, an assistant can serve as a sign language interpreter or notetaker, or can deploy computer-assisted real-time translation (CART). While performing these responsibilities, the assistant will manipulate his or her role and physical orientation based on the needs and abilities of the student. The assistant will act as a stand-in role if they feel that the student needs a significant amount of support in order to engage with the lesson presented by the instructor (Hemmingsson et al., 2003). The stand-in will either sit or stand next to the individual within the social circle of peers. An assistant may choose to give the student slightly more independence by sitting or standing several spaces away from the student in the "help teacher" role in order to increase social interaction with peers, but will be nearby and ready to assist when needed (Hemmingsson et al., 2003). If the student is fairly independent, the assistant may switch to a back-up role, in which he or she is entirely outside the social circle of peers, and the student may approach them or get their attention to ask for assistance when needed (Hemmingsson et al., 2003). Field settings pose more challenges to—and opportunities for—the use of sensory (i.e., the "five senses") assistants. However, the success of the assistant–SWD interaction relies on the ability of the SWD to self-advocate.

SELF-ADVOCACY AND PERCEPTION

Self-advocacy is the process whereby a person communicates opinions and needs in order to achieve a task (Harris and White, 2013; Gilley et al., 2015). One example of self-advocacy in the learning environment is when a student with low hearing ability requests to be positioned closest to the instructor, or requests that the instructor face him or her when speaking. Field trips can complicate self-advocacy, as the novelty of an outdoor setting and a preoccupation with safety can be disruptive to this process. Reduced self-advocacy can, in turn, act to disrupt the student's construction of identity within the social group, increasing his or her marginalization and reducing learning. For students with disabilities, identity construction in the learning environment is tied not only to self-advocacy skill, but also to perception.

The social model of disability (Davis, 2006) describes how a person's disability is defined based on how it is perceived by society, and by the way that person is able to function within society with his or her disability. The perception of a student's ability with other characteristics such as sex, age, and race establish individuals in a hierarchy and can place them at higher risk for exclusion and harassment. (Shaw et al., 2012). A student's perceived ability (by self and others) in the learning environment is shaped by the intersection of multiple socially constructed traits. In field-based learning, the intersection of these traits is confounded by the uncontrolled natural environment, (i.e., weather and terrain). For this article specifically, we focus on the trait of sensory ability.

PURPOSE AND GOALS OF THIS STUDY

We present a case study on the use of a personal assistant in a field trip designed for universal accessibility. Our goals were to determine how the deployment of a personal assistant for two students with sensory disabilities (hearing loss and low vision) would (1) facilitate their self-advocacy, (2) promote a more positive social perception of them and their disabilities within the learning community, and (3) improve their achievement of learning goals. We also sought to make recommendations and establish guidelines for the use of personal assistants for students with sensory disabilities in field-learning settings generally. In order to establish the context of this case study, an overview of the field trip is necessary.

SETTING AND STUDY POPULATION

A fully accessible geology field trip was offered at the Geological Society of America's annual meeting in Vancouver, British Columbia in October 2014. What made this experience different than any of the other field trips offered was that this trip paired students ($n = 15$; 10 women, 5 men) and geoscience faculty ($n = 15$; 9 women, 6 men) across content disciplines and geographic borders to learn from one another about the geology of the region, and the importance of studying in the natural environment. Participants were drawn from across the U.S., Canada, India, the United Kingdom, and New Zealand. Student participants included six graduate and nine undergraduates, 13 of whom were geoscience majors. Thirteen faculty members in geosciences, including three post-doctoral researchers, participated along with two representatives from major international geoscience societies. Eighteen of the 30 total participants, including four faculty participants, self-disclosed as having a physical, sensory, or cognitive disability. Prior to the trip, participant information was gathered through a Web-based survey. Of

the larger group of those who self-disclosed as having a disability, there were two individuals who had sensory-related disabilities and required one-to-one assistance on the trip. One participant is blind (Krista), the other is deaf (Tim). These names are pseudonyms to conserve the anonymity of the participants. The results of the survey provided an opportunity to understand the participants' educational levels and abilities, which was necessary information for preplanning accessible options for each participant. The survey responses revealed that Krista is a female undergraduate student with low vision at a state university and utilizes a service dog. Tim is a male doctoral student with deafness, also studying at a state university. Due to the needs and abilities of these two participants, they were assigned a personal assistant. Julie Hendricks, a second year undergraduate enrolled in Special Education, was selected due to her experience in working with individuals with hearing impairment and her knowledge of American Sign Language. Follow-up emails between the assistant and both of these participants provided additional detailed information about their individual accommodation requirements. Originally, the trip coordinators assumed that Tim utilized American Sign Language as his primary form of communication. However, this was never clearly articulated and they discovered 16 days prior to the trip that he uses Communication Action Real-time Translation (CART) services and does not know American Sign Language. CART services provide immediate captioning that translates voice into text (see https://nad.org/issues/technology/captioning/cart).

In addition to providing information to the assistant on the two focus participants, the survey was also used to decide pairings for partners during the field experience. When creating these partner groups we focused on strength-based ability pairings, meaning that we placed individuals with a strength in a sensory or physical function with an individual who had a strength in a different sensory or physical function. For example, participants who were strong and physically able to hike up terrain were placed with a participant who had a strength in a sensory ability or had a rich background of experience in the field so that the two could collaborate and work together to resolve any limitations they may have on their own. Other factors that affected these pairings were ease of communication, shared experiences, familiarity of working with people with disabilities, education level, and any other preferences or specifications indicated by the participants. The survey also helped with troubleshooting for transportation and hotel accommodations.

The field trip and our research on it took the group of participants to six locations along Canada Highway 99, the Sea-to-Sky Highway, between downtown Vancouver and Whistler, British Columbia (see Fig. 1). Each of these stops focused on the geologic history and processes that have shaped the British Columbia region over time, creating both dramatic landscapes and some of the most severe natural disasters in the world. For further discussion of the field-trip setting, see Gilley et al. (2015).

METHODOLOGY, RELIABILITY, AND TRUSTWORTHINESS

This is a self-reflective case study, and we are participant-action researchers who are stakeholders and activists for inclusive learning. Instead of transcripts or observations that are theme-coded, our method was to analyze the data in the form of narrated experiences. In a self-reflective case study, the narration comes from a single source; in this case, author Hendricks. Two broad sets of experiences are narrated: (1) pretrip preparation, and (2) integration of strategies to promote access and inclusion during the trip. From these experiences, we extracted meaning by observation and reflection. Through our reflective analysis, we provide interpretations of actions, events, and interpersonal exchanges.

Results and reflections are presented via thick description in accordance with qualitative inquiry (Feig, 2011; Creswell, 2013). We use "Reflections" rather than "Conclusions" in this paper because accommodation and accessibility can never be over and done, nor settled once and for all. Inclusion is a site-specific, iterative and ongoing process.

In a study of this kind, trustworthiness is documented by establishing authenticity (Feig, 2011; Creswell, 2013). Reliability of our extracted meaning is established through triangulation (Lincoln and Guba, 1985), a process of using multiple investigators to check the integrity of interpreted data that is analogous to that of interrater reliability. We established authenticity of experience by triangulating with the recorded observations of two detached, third-party observers conducting an independent study of the trip. Institutional review board approval was obtained from five institutions whose researchers were associated with the 2014 Accessible Field Trip.

DESCRIPTION

This narrative is written from the first-person perspective of author Hendricks, whose interactions with the two participants Krista (low vision) and Tim (hearing loss) form the basis for the interpretations and recommendations of this study.

Before the Trip: Materials and Preparations for Multiple Learning Environments

In order to accommodate the range of mobility and sensory abilities of the group (see Atchison and Gilley, 2015), we employed the principles of Universal Design for Learning (UDL; Meyer and Rose, 2000) in all instructional planning. Primary strategies included using instructional materials in multiple formats that represented the geoscience content, and the representation of the visual, tactile, and auditory components of the field experience to promote inclusive participant engagement. Each facet of instruction was designed to incorporate multiple methods of sensory engagement and interaction with the content.

I served as an assistant to both Krista and Tim. Prior to the trip, I communicated via email with Tim about how to best achieve comfortable integration with individual and group discussions among and between his peers and the trip leaders. In order to provide an alternative method of access to these conversations and discussions, Tim and I agreed that the best way to interact during the trip was for me to scribe communicated directions and conversations through various CART technologies, including voice-to-text apps for a smartphone, as well as pen and paper when necessary. I am fluent in American Sign Language (ASL), but Tim does not use it. I did not know this until a few

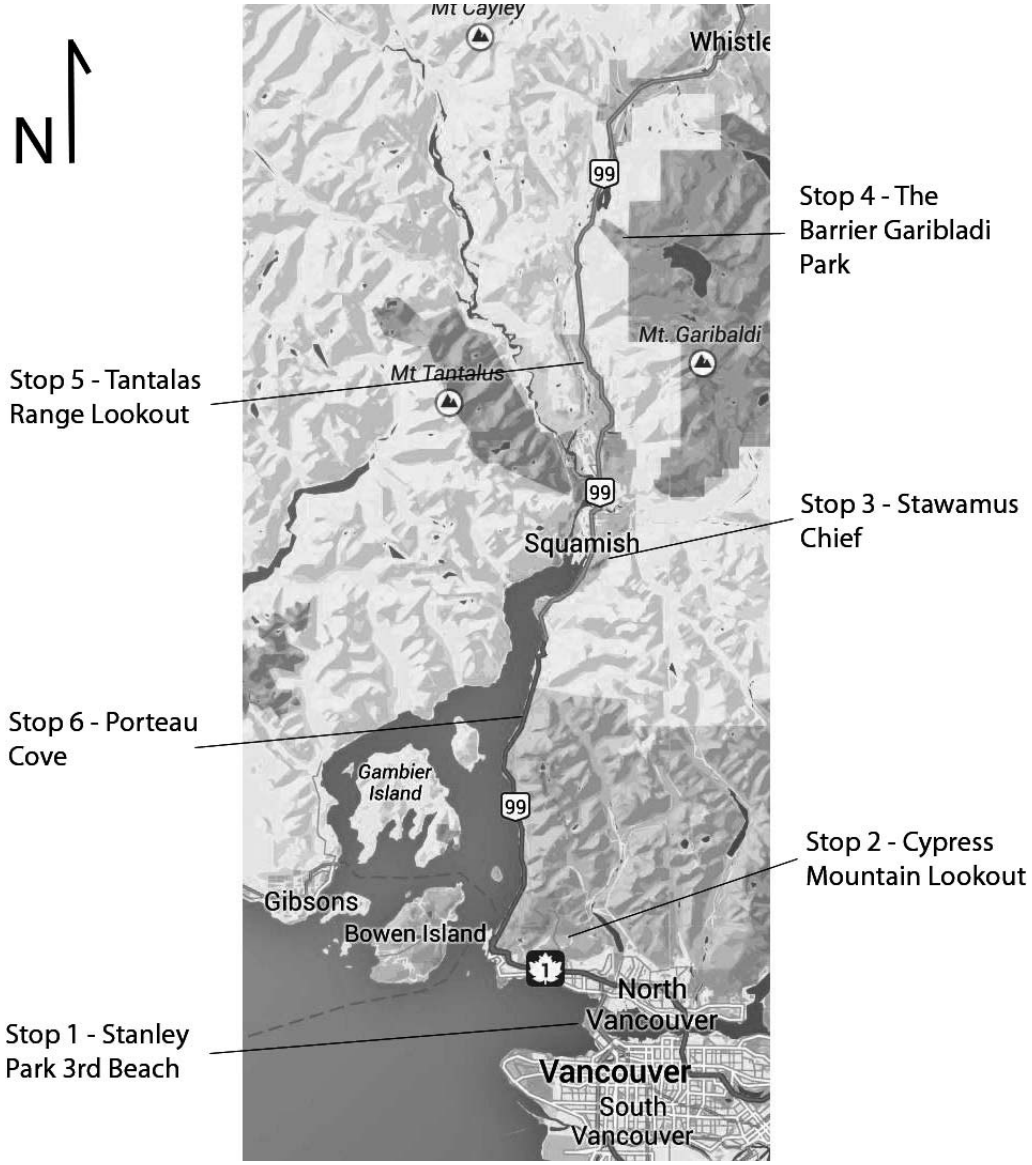

FIGURE 1: 2014 Accessible Field Trip stops along Highway 1, the Sea-to-Sky Highway.

days prior to the trip, and therefore I had to alter my planned communication strategy to fit his needs.

I designed three models of tactile maps (Fig. 2) for use by low/no vision participants, with different materials such as fabric, differing grades of sandpaper, or puff paint cross-hatching to depict the various land formations and regions. These materials allowed students who are blind to correlate different landforms with the distinct changes in texture on the maps. Additionally, the field guide was translated into audio format to ensure that all students had access to the written content.

Events Before, During, and After the Trip

Upon meeting in our shared hotel room in Vancouver, Krista introduced her service animal to me and explained the proper etiquette for working with service animals (e.g., only pet the dog when it is on break, only Krista could give the dog food and treats, and give clear directions [i.e., right, left, to the curb, stop] while walking). She also gave me some advice on the basic etiquette of working with individuals who are blind, such as where to walk, when to warn of approaching danger, and how to guide her. These are examples of Krista engaging in self-advocacy.

The evening before the trip, I traveled with Krista to the first group meeting in which the schedule and other logistics were discussed. Upon arrival at the meeting I switched to assisting Tim, due to his needs of engaging in a community-level discussion between peers and the trip instructors. I began my interactions with Tim by first introducing myself, and then I immediately began transcribing the main conversation onto paper. After finishing the first sheet I sensed that my hand might be blocking his view while I wrote and that the method was not very efficient, drawing a lot of attention. I asked him in writing, "Is this working for you?" In response, he told me to use his laptop instead (passive self-advocacy). Before leaving the meeting, I advised Tim that during the excursion the next day, I would be using my phone and tablet to transcribe conversations to him, and that he would not need to bring the laptop. He agreed to this plan and offered his tablet if needed. I then departed with Krista.

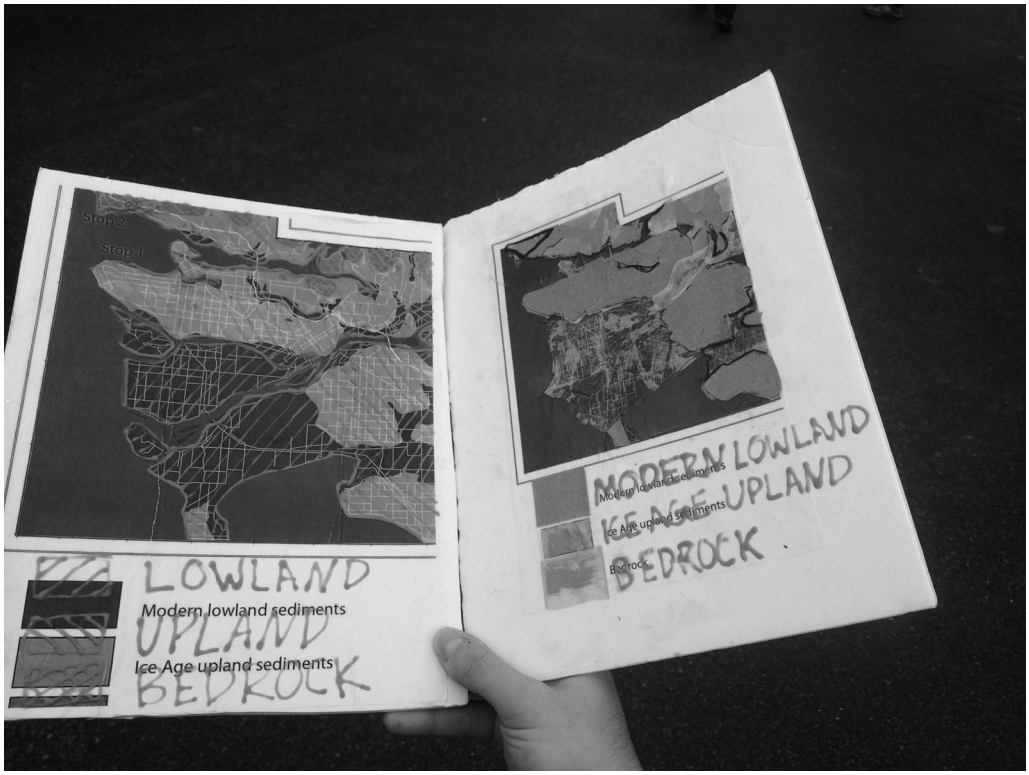

FIGURE 2: Two of the three tactile geologic maps used during the 2014 Accessible Field Trip (image from Stokes and Atchison, 2015).

That night, Krista asked me about my career plans and how I was connected to the field trip. After I shared with her that I was brought on the trip to support her and other students with sensory disabilities, I discussed my personal training to be a special education intervention specialist. She immediately wanted to share her past experiences in special education. In the past, she was in a self-contained classroom in which students with disabilities were segregated for a few years before being moved to an inclusive, mainstreamed classroom. She felt that one of the most important things for a teacher to do is to get to know each student as an individual. She had one teacher in particular who made a special effort for her to be included in her general education class. We also talked about her community college experience and how she was deciding on a major. She explained that one of the major reasons she wanted to go on this inclusive field trip was to see if she would be able to function as a blind woman in the geosciences. By the end of the trip, Krista told me that she wanted to switch majors to Human Services, not because she could not function and navigate in the field, but because she realized she had greater interest in supporting individuals with disabilities in an advocacy-oriented career.

On the day of the trip Krista and I walked together to the meeting location and boarded the bus. After she had boarded and met her partner, I switched to Tim. On the way to each stop, I transcribed all information given by the trip leaders—and any local conversations around him or involving him on the bus. When first seated on the bus I tried opening up the application on my tablet that translated voice into text for him to utilize. However, since there was no internet and limited cellular coverage, the application was unusable. I sat one row ahead of him at the end of my seat so that he could both view the tablet and see the trip leader. When in the field I began by using my tablet for transcribing but soon realized that it was hard to both type and position for his use while standing. Tim and I decided my mobile phone would be more maneuverable and effective. During each of the stops I stood 1–2 m away and checked in with him periodically. He would often seek me out by making eye contact or gesturing for me to come closer if he needed help communicating. When facilitating conversation between him and another person, I would then stand approximately 30 cm in front of Tim and off to his side, creating a triangle between the three of us (Fig. 3).

During our return from the field experience Tim discussed some important memories from his past with me. He mentioned that he was very enthusiastic about coming on the trip because of its accessibility. Assistants and aides had not been a resource that was available to him growing up in outside the U.S. He also shared with me some of his research on tectonics, using his hands to gesture and explain plate movement.

The next day, I walked with Krista to the posttrip debriefing meeting and stayed with her for most of the meeting. Tim was giving a research presentation at the conference during the meeting time. Student and faculty participants met in separate focus groups to discuss their experiences during the trip.

INTERPRETATIONS

As the assistant, Hendricks learned information about the participants' ability to self-advocate through conversation and observation. Tim and Krista differed from one another in areas such as education, socioeconomic status, gender, culture and lived experiences, types of accommodations requested/used, and, of course, their personalities. Krista's academic experiences are shaped by her cultural

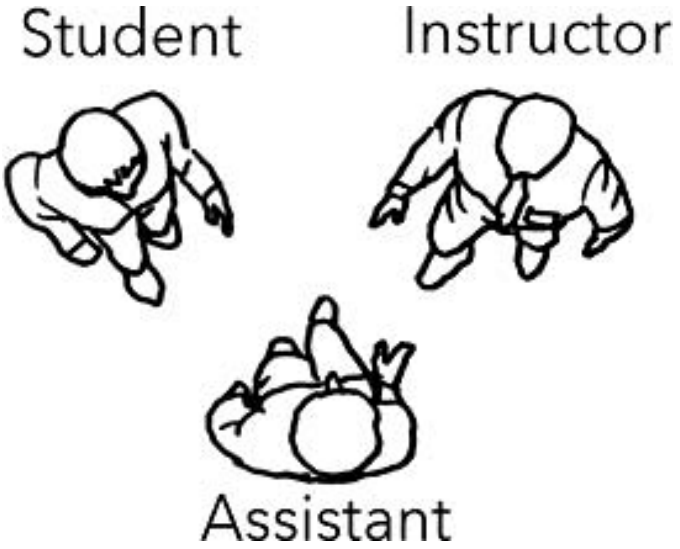

FIGURE 3: Diagram of idealized positioning between student with disabilities, assistant, and instructor in an experiential learning environment.

heritage as the U.S.-born daughter of immigrants, her degenerative vision, her experience in requesting disabilities services at her college (i.e., notetakers, Braille facilities). She described a feeling of "double jeopardy" whenever she had to ask a peer or classmate for help, because she thought they had lower expectations of her because of her ethnicity. This led her to communicate her needs very clearly to teachers and assistants in order to allow her the maximum amount of independence in class and around peers. Her service dog provided another facet of independence in her daily life. Krista was very forthcoming about her needs and has a strong sense of self-advocacy; upon our first meeting she asked "Have you ever met a blind person before?" She also willingly provided information about where an assistant should walk in relationship to her as she interacted with others, and how to interact appropriately with her service dog. She also asked Hendricks if she was comfortable with Krista holding onto her arm for guidance. This comfort in self-advocating could be a product of many prior experiences.

Tim's experiences differ immensely. He grew up outside the U.S., without disability resources that met his needs. His preferred method of assistance prior to the trip was automated closed captioning services rather than interpreters. Because of this, he now relies heavily on his own ability and not the help of an assistant although, because of his deafness, he may not be able to fully participate in the learning community. Unlike Krista, Tim generally chose not to self-advocate. Hendricks often had to ask him if the strategies she was utilizing were effective or if they needed to be altered.

Tim and Krista's difference in self-advocacy is potentially attributable to the differing resources available to them in the past as well as the nature of their disabilities. Tim's hearing disability is congenital and less apparent; Krista's visual disability is degenerative over time, and readily apparent to others. In the past, Tim was often forced to figure things out for himself, while Krista had more resources and support available to her. As a result, their comfort with and use of a personal assistant was necessarily different. This differing use was predicated on their different cultural backgrounds and abilities.

Hendricks was forced to develop an understanding of their needs. She realized that not all students require, nor are comfortable advocating for, similar accommodations. This informed her spatial positioning, techniques of communication, and responses to changing circumstances in the field. Hendricks needed to alter specific strategies being used for each participant. As she was not aware of the impact that their cultural backgrounds would have on each participant's ability to effectively integrate into the learning community, her flexibility was essential in ensuring successful engagement with the content as well as participant conversations.

Observing Krista's display of comfort in self-advocating helped Hendricks to determine that the most successful version of assisting her was a "back-up" approach (Hemmingsston et al., 2003). In a back-up approach, the assistant stands out of the immediate vicinity of the individual while staying close enough at hand that the individual can easily get their attention to ask for help. In a classroom environment this approach would look like a teacher walking around while students worked on their assignments and assisting a struggling student only when the student requests assistance. This was the most appropriate method for Krista because she must advocate her needs to an assistant through gesturing or verbal request in order for the method to be successful. We observed that Krista responded well to this method, which was also the least restrictive environment in which she had ample opportunity for participation within the ordinary flow (Yell, 2012) of conversation and discussion with the rest of the group.

Tim had lower comfort in self-advocating, which led to Hendricks choosing the "help-teacher" approach as the best form of assisting (Hemmingsston et al., 2003). In the help-teacher approach, the assistant stands within the immediate vicinity of the individual so that they may assess if assistance is needed, without blocking conversation flow. In a classroom, this would look like a teacher's aide who stands off to the side during instruction but steps in to assist the individual when it appears he or she is struggling. This was determined to be the most appropriate model for assisting Tim because Hendricks was able to judge whether assistance was needed without requiring Tim to self-advocate. As a result, Tim was given the opportunity to participate in the ordinary flow of formal and informal conversations to the greatest extent possible (Yell, 2012) that also matched his own comfort levels.

RECOMMENDATIONS FOR THE USE OF PERSONAL ASSISTANTS

Our interpretation of this field experiences yields specific recommendations for assisting students with a sensory disabilities in a field-based learning environment. Our principal recommendation is this: *Get to know the personal and cultural backgrounds and abilities of your students beforehand*, as discussed in the Interpretations section above. This process is scaffolded by three recommended best practices that align to this principle recommendation. These best practices are: (1) proper preplanning and logistics, (2) flexibility and adaptation when necessary, and (3) social and spatial techniques of assisting. These three best practices are

dependent upon the assistant knowing the student, and knowing that the student is dependent upon employing these best practices. This is a recursive interrelationship of teaching that is inclusive of students with diverse physical and sensory abilities.

Recommendation 1: Preplanning and Logistics

The importance of proper planning cannot be overstated. Preplanning enables instructors to identify barriers to learning and plan specific accommodations, contingencies, and alternate activities in the face of unforeseen natural circumstances. For example, a trip leader will need to keep in mind optimal spatial placement of the assistant as field stops warrant. Spatial placement is dependent on what technological devices are used, and the need to adapt to external factors (e.g., dead batteries in a device, closed-off wheelchair ramps). This simple act of forethought keeps the students' abilities in mind. Ongoing communication with students before and during the trip is crucial. Communication beforehand allows for accommodations to be designed into the instruction, and locations to be selected that promote complete engagement and interaction of all students. Open communication during the trip allows students to share concerns and to self-advocate when a situation arises that is presenting a barrier to full participation (Atchison and Gilley, 2015). Open and early communication also gives trip planners more lead time to modify transportation arrangements if, for example, a wheelchair lift is needed.

Although not typically considered an accommodation, forethought should be given to the availability of rest stops and bathroom facilities. Trip planners should recognize that a group of students with mixed physical and sensory abilities will likely have varying lengths of time needed to utilize a rest facility, and the itinerary should be planned accordingly. The itinerary should be also planned such that the learning objectives for each location are articulated, beyond "seeing the geology." Trip planners must be willing to remove a stop if it does not allow for the inclusive participation of all students, and/or its alignment to the overall learning goals are not clear.

We recognize that many field trips are planned before the first day of class. Therefore, emphasis must be placed on flexibility and adaptation. The effort to understand the needs of accommodated students as members of a learning community goes beyond the "required accommodations" on an emergency medical form, and must include authentic, personal contact. We argue that this is not burdensome; first, it applies to all students, and second, it is part of constructing a safe and effective learning environment.

In settings where ASL is used, we recommend that instructors utilize the *Signing Earth Science Dictionary* (TERC, 2016) as a resource for ASL interpreters. It is important for students and assistants to know content-specific vocabulary to avoid repetitive finger spelling while interpreting. This is a particular concern in scientific fields. Consider the term "carboniferous," which has thirteen letters that an interpreter must spell out individually every time it is used in a lecture. The *Dictionary* provides more efficient signs for such content-specific terminology. In fact, use of this resource by all students presents a compelling mnemonic to engage everyone. While this recommendation does not originate from our research, it complements our other best-practice recommendations.

We further recommend that any simple maps used on the trip be supplemented with tactile maps. One way to do so would be having students design their own tactile maps as a pretrip activity. Students could also contribute to the translation of written field guides into audio format. These strategies are relatively straightforward to adopt on an as-needed basis. These accommodations are not limited in impact to students with disabilities; they provide a multisensory experience to all students.

Recommendation 2: Flexibility and Adaptability

While the bulk of planning a field experience occurs prior to the trip, unforeseen circumstances can arise that require contingency planning. While it is true that this is pervasive in field settings, particular flexibility is warranted in the case of accessible field trips. Effective modifications can be both simple and complex. We argue that the most important aspect of an accessible field trip is the focus on the learning objectives through the lens of accessibility; that is, making sure that the students are able to learn the content without undue worry about how unforeseen complications will impact them, how their involvement will impact the group's learning, or possible negative impacts on their self-advocacy and perception. On the 2014 Accessible Field Trip, for example, time at the stops and travel time were lengthened or shortened by the trip leaders as their monitoring dictated. One reason this was necessary was the need to give Krista's service animal resting breaks, which we did not anticipate in the early planning stages of the trip. Another reason is that the trip planners budgeted estimates for bathroom breaks, and adjustments were needed to more properly accommodate participant needs.

Some changes made for Tim were adjusting the spatial relationship between him and his communicative partner on the fly, which aided the visual flow of conversation through maintaining eye contact and ensuring his view of the transcribing device. Additionally, it was necessary to alternate technologies that corresponded to the changing environments throughout the trip. These alternatives included a laptop when group conversations were held indoors, a tablet when transcribing conversations on the bus, and a smartphone when communicating in the field. All of these devices were held by the assistant in front and slightly to the left of Tim. These adjustments were not unduly onerous; they mostly required awareness on the part of the trip leaders and the assistant. These examples show that the time impacts for faculty at-large would not be so great as to be impossible. For example, slowing the rate of information delivery during instruction and conversations ensures all participants are included, promoting understanding versus "check-listing" the stops. This not only accommodates the assistant-to-student interaction, but often will help other students in their processing of the information. Conscientious geoscience faculty are already be committed to best practice, and increasing inclusiveness should be attendant to that.

Students with sensory-related disabilities such as blindness or deafness may face significant safety hazards and inclusion barriers in field-based learning environments. We recommend that instructors have conversations with their students with disabilities—and their assistants—in order to determine if back-up or help-teacher approaches would be most appropriate in a given situation. In order to

encourage full inclusion and ideal safety conditions, we recommend having assistants work 1:1 with students with sensory-related disabilities in field environments, especially those involving high altitude, unstable terrain, and impeded contact to the instructor, similar to the field environments typically experienced in geoscience excursions.

Recommendation 3: Recognizing the Social and Spatial Implications of Assisting

In the Description section, Hendricks noted how her positioning impacted how Tim received real-time information. She positioned herself in such a way that, not only was she transcribing the instructors, but also she was able to capture peer-to-peer interactions happening in the group. This capturing furthered Tim's inclusion within the community by not limiting input from only the instructors. He was then able to participate socially, contributing to his peers' positive perception of him both as an individual and a colleague.

The personal assistant's careful positioning was a spatial parameter crucial to inclusion. We specifically recommend that instructors ensure that the assistant is (1) not just "standing around," but in a position such that a student needing communication accommodation can see what is being transcribed; (2) that multiple forms of communication technology—in this case a phone, pen, and paper—are available; and (3) verification that the assistant can use the technology effectively. In cases in which sign language is used, we recommend that instructors ensure that relevant peer-to-peer conversations are also interpreted through signing. Alternatively, another student who is adept at texting can transcribe peer discussions while the sign interpreter focuses on the instructor.

Student engagement through facilitated observation, communication, and exploration is the ultimate goal of any assistant–participant relationship. In her role as the trip assistant, Hendricks served all participants with sensory disabilities. She assumed an interpreter's role because of her prior training and each of the participants' needs. In the absence of a dedicated assistant, the instructor should be prepared to step into this role. Faculty may resist what they perceive as a logistical complication, negatively impacting the overall learning goals. However, assisting can be as simple as positioning the student nearby, and/or pairing another student to collaborate on a multisensory experience. As stated previously, these basic strategies to keep all students engaged in the community of learning enhances one's self-efficacy, and promotes widespread advocacy within the entire group and a positive perception of everyone as equal participants.

LIMITATIONS OF THIS STUDY

As a self-reflective case study, this research is not meant to be generalizable to all circumstances of the use of personal assistants. Generalizability to other populations may be limited because of (1) the inherent diversity of the lived experience between the participants and researchers, (2) overall group dynamics, (3) the physiographic parameters of the trip's location(s), and (4) the fact that this was a case study of two persons and not more. Instead, this study is meant to illuminate the use of personal assistants by description and reflection. This study is site-specific to one particular trip and one specific group.

Future studies should include policy analyses to explore how inclusive instructional strategies to overcome student-specific barriers to learning can be deployed in the face of these barriers. We suggest further work with a variety of deaf or blind participants using varying accommodations, such as American Sign Language, braille, visual aids, and service animals, perhaps as control and experimental groups. Learning gains among these groups could be compared as a function of accommodation

REFLECTIONS

The broadest impact of inclusively designed instruction is to foster the diverse contributions of an entire community of learning. Students with diverse physical and sensory abilities will engage with and observe a situation or scientific phenomenon much differently than would an individual with more typical abilities. The learning community is therefore strengthened by the inclusion of multiple perspectives, rather than just those of students without disabilities. Students with sensory-related disabilities should be provided opportunities to engage and participate in the instructional environment in a way that highlights their own strengths and abilities. Often, these experiences are enabled through accommodations such as the use of personal aides or assistants in addition to other various instructional modifications. Such accommodations apply both to inside and outside of the traditional classroom. Our three recommendations can be contextualized as follows:

1. Preplanning and logistics. When designing a lesson or activity, well-developed learning objectives are as important as determining the methods the students will utilize to interact and engage with the content. Thus, barriers that impede access to learning should be given as much consideration in the design process as the learning objectives and anticipated outcomes. Integrating alternative methods of inclusive instruction has the potential to mitigate barriers to learning and maximize the strengths of each individual student. Instructors should also be prepared to accommodate the apparent and nonapparent needs of all students so they may accomplish the objectives of the lesson.
2. Flexibility and adaptability. The assistant must remain flexible to adapt to the unique instructional environment (Skar and Tam, 2010). To enable a successful learning experience for the student, personal assistants should be aware of the instructional objectives, understand their roles, and be willing to manipulate and make modifications to the instructional resources as well as their interaction with the student as needed (Hemmingsston et al., 2003).
3. Recognizing the social and spatial implications of assisting. In our experiences, we have observed that many individuals with a physical or sensory disability develop a natural sense of resiliency, often because of the necessity to overcome obstacles that impede daily living. This resiliency also impacts their ability to advocate for themselves both in and out of the

classroom. In some instances, however, barriers exist that preclude students with disabilities from participating safely. In the geosciences, students are often placed in multiple types of learning environments, including remote field sites, that require physical conditioning and ability to traverse difficult terrain while working long hours in the unpredictable elements of nature. Students with physical or sensory disabilities usually have significant differences in how they observe, explore, and even communicate in a new environment. For some students with disabilities, expectations of comprehension and retention in an uncontrolled environment are unreasonable without the help of assistance. Allowing personal assistants, whether or not they are also the instructor, to observe each individual's personality and ability to self-advocate will enable effective decision-making with regard to the assisting approach to use with each participant. This in turn allows the students to meet the learning goals of the field trip.

As experiential learning opportunities become more available for individuals with disabilities, educators in many disciplines can benefit from addressing the needs of those individuals appropriately. These students' needs can be addressed through preplanning, accommodating on the fly, and using personal assistants. Educators may need to use any one or a combination of these techniques to reach their students and can utilize these guidelines to lead their preparation for an accessible classroom or field environment.

Acknowledgments

Financial support for this research was provided by the National Science Foundation (Award No. ICER-1441185) and the Society of Exploration Geophysicists (SEG). This project was conducted with in collaboration with Alison Stokes and Brett Gilley, with assistance from the International Association for Geoscience Diversity (IAGD). We give special acknowledgment to the Geological Society of America's *On To the Future* program for funding student participation in the 2014 Accessible Field Trip.

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