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USING WATER PURIFICATION DEVICES IN GROUP INTERNATIONAL STUDY ABROAD TRAVEL

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Introduction

Plastic waste is a large problem throughout the world with disproportionate impacts on developing countries that lack adequate waste management (Figure 1).

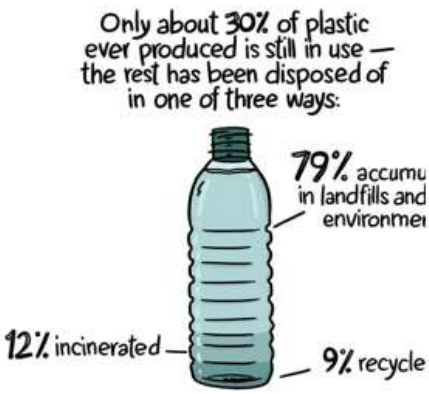

Figure 1. Of all plastics produced, very few have been recycled (McCormick 2020).

Learning Abroad participants may be instructed that drinking bottled water is the best way to ensure water safety, resulting in contributions to plastic waste in areas that are poorly equipped to handle the waste. Independent international travelers commonly use water purification devices to address water safety issues in countries where drinking water is a concern (Figure 2), yet the promotion of water purification devices by Learning Abroad offices is uncommon. The aims of this research included an exploration of participant views on water purification methods and identification of practices used by Learning Abroad offices to either integrate more sustainable drinking water practices on trips or otherwise reduce the number of single-use plastics used by participants.

Figure 2. Worldwide map showing countries where waterborne viruses can be found in drinking water (Grayl, n.d).

Background Research

Background research was conducted to understand the environmental impact of plastics, the features and effectiveness of various water purification methods (e.g., boiling, filtration), and how other PAC-12 institutions were provisioning drinking water and educating trip participants about options for obtaining safe drinking water.

Figure 3 highlights the estimated waste and cost generated from a one week Learning Abroad program. The background research also helped formulate targeted questions for two separate surveys, which underwent the IRB review process prior to implementation.

Figure 3. Waste and cost estimation from the use of single-use, 1-liter bottled water in one week across various scales.

The first survey targeted Learning Abroad trip participants in four programs sponsored by the University of Utah. Program participants visited India, Mexico, Ghana, or Cuba between 2018 and 2019 (Table 1). These trips varied in length; two trips lasted one week and two trips lasted four weeks. Questions in the survey asked participants about prior exposure to and use of water purification methods, along with their comfort in using water purification devices or methods while in their Learning Abroad programs. Two treatment groups were identified based upon whether participants were exposed to water purification device use while on the trip. Seventeen responses were received from this survey, with four responses from India, nine from Ghana, one from Mexico, and three from Cuba.

Country Where Trip Occurred	Trip Duration	Exposure to Water Purifying Device on Trip?	Number of Respondants
Ghana	4 weeks	No	9
Kaza, India	4 weeks	Yes	4
Cuba	1 week	No	3
Mexico City, MX	1 week	Yes	1

Table 1. Survey responses by trip.

The second survey targeted representatives of Learning Abroad offices within PAC-12 and NAFSA Region 2 institutions. This survey asked questions about how drinking water was addressed in pre-trip education, as well as during trips, to understand how other institutions were addressing drinking water needs and single-use plastic pollution associated with Learning

Abroad trips. This survey was distributed by the University of Utah Learning Abroad Director, Katrina Brown, and received eight responses.

Survey Results

Surveys from participants showed that most participants surveyed had prior knowledge of, or experience with, water purification devices. Participants were most familiar with boiling or filtering water, and least familiar with UV pen technology (Figure 4).

Figure 4. Prior water treatment experience and use.

Over 50% of respondents were very confident in the use of water purification methods and devices with an additional 23% reporting they were somewhat confident (Figure 5). Nearly all the participants stated they would be either extremely likely or somewhat likely to use a water purification method in the future (Figure 5).

Figure 5. Participant confidence and likelihood of future use of water purification methods and devices.

Survey results from Learning Abroad offices showed that most of the arrangements for drinking water during trips were left to the trip leaders, students, and lodging/facilities. The most common methods for managing drinking water on trips were the purchase of water in 5 gallon or larger quantities and direct filtration or purification at the facility where participants were staying (Figure 6). Boiling and pre-trip participant education were less common methods of addressing drinking water during trips (Figure 6).

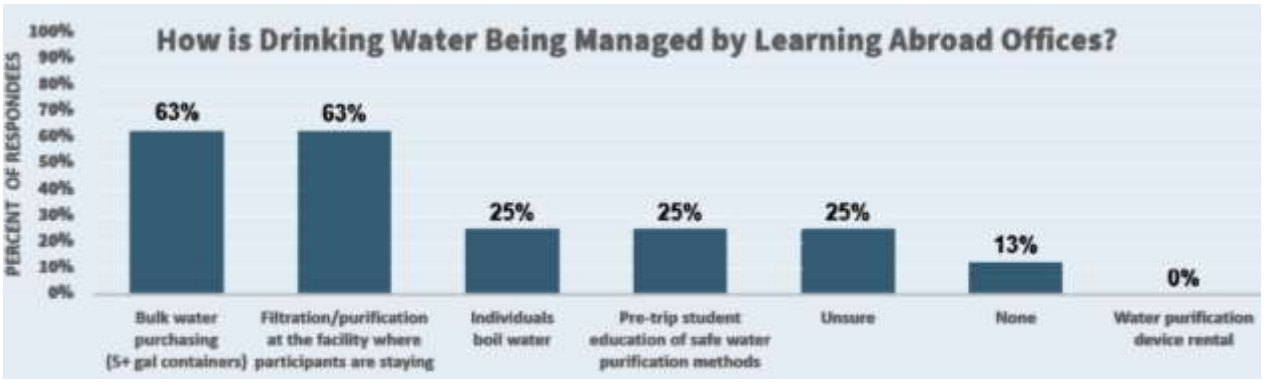

Figure 6. Drinking water management by Learning Abroad Offices.

The survey showed that most institutions were addressing drinking water safety either in their faculty training, program orientations, or both (Figure 7). However, only four of the eight respondents reported that water purification methods or devices were addressed in their program orientations or pre-trip materials (Figure 7).

Figure 7. Survey results from Learning Abroad offices.

Campus Partnerships

A campus partnership was established with the University of Utah Learning Abroad Office and allowed for the examination of methods and processes used to address drinking water on learning abroad trips. This information was used in conjunction with survey results to produce several products designed to address identified gaps.

Educational slides and printed materials about water purification options were created for future participants and trip leaders (see example in Figure 8). A table of recommended devices and costs was compiled to assist both the Learning Abroad Office and participants in selecting water purification devices for use during their trips. A flow chart was created for the Learning Abroad Office to easily identify short-term (1-4 week) programs where water purification would be needed. Finally, several examples of how the Learning Abroad Office could foster device use by students were created, including purchase of individual water bottles for participants, in-house ownership or rental of devices by the Learning Abroad Office, or partnering with trip leaders and Outdoor Recreation for in-trip use.

Figure 8. Educational slide created for the University of Utah Learning Abroad Office.

Opportunities, Recommendations, and Future Research

Learning Abroad offices can reduce participants' use of single-use plastics by including education about water purification methods and devices in pre-trip orientations. Education is one of the easiest and lowest-cost methods in which Learning Abroad offices can address the issue of single-use plastic waste generated by participants in study abroad programs (Figure 9).

Figure 9. Highlighted opportunities on how to change education of water purification in Learning Abroad programs.

Institutions could facilitate access to water purification devices through rental programs, providing filtration water bottles in trip materials, and by purchasing and maintaining a set of purification devices for use on trips. Further progress could be incentivized by including university travel and Learning Abroad programs into the ASHEE STARS Sustainability Campus Rating system. Surveys should be expanded nationally to further assess gaps, barriers, and implementation strategies for water purification device use within learning abroad programs.

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