Youth's Connectedness to Water Through a Manatee-focused Electronic Field Trip

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Introduction and Conceptual Framework

Electronic field trips (EFTs) synchronously connect students to subject matter experts through multimedia technologies (Beattie et al., 2020; Loizzo et al., 2019). EFTs can vicariously expose youth to prevalent environmental issues through animal models, which can positively impact youth's attitudes and behaviors toward the environment (Morgan & Gramann, 1989). Exposure to marine megafauna (i.e., large charismatic marine animals) through movie viewings and aquarium visits has positively changed human perceptions of and conservation practices to protect marine life (Mazzoldi et al., 2019). The following study focused on *The Water Around Us* EFT. It connected individual classrooms to two university scientists to learn about water quality and nutrient cycling in aquatic environments, how aquatic megafauna (i.e., manatees) impact water quality, and how humans are connected to water ecosystems. Three graduate students and a faculty member developed and facilitated four 30-minute EFTs via Skype in the Classroom in early March 2020 and moved the EFT to Facebook Live for the remainder of March - April 2020 due to the COVID-19 pandemic. The conceptual framework of Connectedness to Water (CTW; Warner & Diaz, accepted) guided the study. CTW is the phenomenon that the more people feel connected to water, the more likely they are to protect it (Warner & Diaz, accepted).

Purpose and Objectives

The purpose of the study was to establish how participation in the *The Water Around Us* EFT affected youth's level of connectedness to and understanding of water. This study aligns with Research Priority 2: New Technologies, Practices, and Products Adoption Decisions of the AAAE National Research Agenda (Lindner et al., 2016). The following objectives guided the study: (a) document youth participants' connectedness to water through the CTW framework after completion of the EFT and (b) identify specific topics youth participants gained awareness of through the EFT.

Methods

All students participating in the EFT (n = 60) were the population, and non-probability, purposive sampling methods were used to choose the sample. Researchers selected an eighth-grade class at PK Younge as the sample because they were one of the two classes that were able to participate in the Skype in the Classroom version of the EFT (i.e., pre-COVID). There were 19 students in the sampled classroom, and all of the students completed the survey after the EFT for a 100% response rate. A cross-sectional, survey design was used to collect data to meet objective one. Researchers used the CTW instrument (Warner & Diaz, accepted) to examine student participants' feelings toward and their relationships with water after participating in one of the *The Water Around Us* EFTs. The students were asked to share their level of agreement or disagreement with 11 statements on a 5-point, Likert-type scale for the CTW instrument. Individual item means and standard deviations for the CTW statements are reported in the results section. Additionally, survey questions asked students to provide (the top three things they learned) from *The Water Around Us* EFT to address objective two. The frequency of the written responses to the prompt *provide the top three things the students learned* are also reported.

Results

The students' level of agreement with the CTW statements are reported in Table 1. The students most frequently responded to the free response prompt *provide the top three things the students learned* by reporting learning manatee poop provides food for other organisms (n = 16) and manatees are threatened, in danger, or killed as a common result of human and environmental impact *(*n = 14).

Table 1

Students' Level of Agreement with CTW Statements

	M	***SD***
I appreciate the plants and animals that live in the water around me	4.11	0.66
I have a deep understanding of how my actions affect the water around me	3.95	0.97
I think of humans as part of the water cycle	3.58	0.77
I feel a relationship with the animals and plants that live in the water around me	3.39	0.78
I often feel a sense of oneness with the water around me	3.32	0.82
I think of the water around me as a community to which I belong	3.26	0.73
I feel as though I belong to the water around me as equally as it belongs to me	3.21	0.71
Like a drop of water can be part of the ocean, I am connected to the water around me	3.21	0.86
I feel that everyone and everything connected to the water around me shares a common energy	3.16	0.60
I often feel part of the water cycle	3.16	0.69
I often feel like I am only a small part of the natural world around me, and that I am no more important than the water in the streams or the fish in the rivers	2.84	0.69

Note. Real limits of the scale: 1.00 -1.49 = *strongly disagree*, 1.50 -2.49 = *disagree*, 2.50 -3.49 = *neutral*, 3.50 -4.49 = *agree*, 4.50 -5.00 = *strongly agree*

Conclusions and Recommendations

The sample of students who were studied *agreed* with the CTW statements "I appreciate the plants and animals that live in the water around me", "I have a deep understanding of how my actions affect the water around me", and "I think of humans as part of the water cycle." The students reported *neutral* sentiments for the remaining CTW statements. The CTW statements that the students' reported the highest levels of agreement with indicated more of a connection to the animals that inhabit water, rather than to the entire water ecosystem. This finding contradicts previous literature that stated there is a larger, positive impact on students' attitudes toward environmental issues when animal models are presented (Morgan & Gramann, 1989). While students reported learning about marine megafauna (i.e., manatees; Mazzoldi et al., 2019), extended exposure to or incorporating in-person experiences with the large marine life may be needed to increase students' connection to and attitudes toward the entire water ecosystem. Perhaps, providing additional educational experiences focused on the water ecosystem following the EFT could increase students' connection to water beyond their interest in marine megafauna (i.e., manatees). It is imperative students grasp broader water ecosystem concepts, in addition to specific animal concepts, to fully be connected to water. Thus, future experimental research could help identify if exposure to charismatic versus non-charismatic marine megafauna via an EFT has an impact on students' level of CTW and understanding of the entire water ecosystem and lead youth to changes in water behaviors.

References

Beattie, P. N., Loizzo, J. L., Kent, K. W., Krebs, C. L., Suits, T. E., & Bunch, J. C. (2020). Leveraging Skype in the Classroom for science communication: A Streaming Science – Scientists Online approach. J*ournal of Applied Communication, 104*(3). https://doi.org/10.4148/1051-0834.2328

Leopold, A. (1949). *A Sand County Almanac: With essays on conservation from Round River*. New York: Ballantine Books.

Lindner, J. R., Rodriguez, M. T., Strong, R., Jones, D., & Layfield, D. (2016). New technologies, practices, and products adoption decisions. In T. G. Roberts, A. Harder, & M. T. Brashers (Eds.), *American Association for Agricultural Education National Research Agenda: 2016-2020*. Department of Agricultural Education and Communication. http://aaaeonline.org/resources/Documents/AAAE_National_Research_Agenda_2016-2020.pdf

Loizzo, J. L., Harner, M. J., Weitzenkamp, D. J., & Kent, K. (2019). Electronic field trips for science engagement: The Streaming Science model. *Journal of Applied Communications, 103*(4). https://doi.org/10.4148/1051-0834.2275

Mazzoldi, C., Bearzi, G., Brito, C., Carvalho, I., Desiderà, E., Endrizzi, L., Freitas, L., Giacomello, E., Giovos, I., Guidetti, P., Ressurreição, A., Tull, M., & MacDiarmid, A. (2019). From sea monsters to charismatic megafauna: Changes in perception and use of large marine animals. *PLoS ONE*, *14*(12), 1–35. https://doi.org/10.1371/journal.pone.0226810

Morgan, J., & Gramann, J. (1989). Predicting effectiveness of wildlife education programs: A study of students' attitudes and knowledge toward snakes. *Wildlife Society Bulletin*, *17*(4), 501-509. http://www.jstor.org/stable/3782720

Warner, L. A., & Diaz, J. M. (accepted). Amplifying the theory of planned behavior with connectedness to water to inform impactful water conservation extension program planning and evaluation. *Journal of Agricultural Education and Extension.*