

Bridging Natural and Digital Domains: Attitudes, Confidence and Interest in Using Technology to Learn Outdoors



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A summary of Hougham, R. J, Nutter, M., & Graham, C. (2018). Bridging Natural and Digital Domains: Attitudes, Confidence, and Interest in Using Technology to Learn Outdoors. *Journal of Experiential Education* 41(2), 154-169.

Project EARPOD (Engaging At-Risk Populations Outdoors, Digitally) is a study that tackles the issue of whether mobile technologies would detract from outdoor-based environmental education programs for students. Given the widespread concern that technology may obstruct the learning process (e.g., Cuthbertson et al., 2004), there exists a need to better understand the influence of mobile technologies as a learning tool in informal science learning (ISL) centers, including outdoor-situated nature centers.

In their implementation of the DOTS approach (Digital Observation Technology Skills), which blends mobile technologies with traditional modes of environmental education pedagogy, Hougham and colleagues (2018) research how the incorporation of technology into an environmental education program influences students' attitudes and experiences with nature while using digital devices (surface tablets with digital microscopes). Secondly, Project EARPOD addresses the issue of scalability in adopting mobile technologies for use by students across different socioeconomic backgrounds.

Digital technology supports students' confidence and interest in using technology for learning purposes

Pre- and post-lesson assessment results from 136 Wisconsin students ranging from ages 7 to 14 years suggest that students' interest in observing natural phenomena, such as plants and birds, increase as a result of using digital technologies provided to them during an environmental education program (Hougham et al., 2018). Additionally, students' confidence in their knowledge of mobile technologies and its uses as a learning tool increase. This evidence contests the argument that technology is a detractor from meaningful engagement with the outdoors (Cuthbertson et al., 2004). Hougham and colleagues instead suggest that the Project EARPOD experience and associated digital technology piqued the students' interest in observations of natural specimens, like plants, during an environmental education lesson

Digital technology that is embedded into existing curriculum contributes to students' learning experiences in the outdoors

Hougham and colleagues acknowledge that the “nontechnological components” of Project EARPOD's lesson plans may have also contributed to the students' positive experiences. Being able to use traditional environmental education tools, such as hand lenses and dichotomous keys, allows students to engage with observational practices at a macrolevel, which can prepare and later support students as they experience using digital technologies to observe more detailed parts of a plant specimen at the microlevel. Project EARPOD's blend of traditional environmental education practices with technology-enhanced activities support the success of the DOTS approach. As such, implementing digital technologies to support experiential learning in the outdoors is best achieved if the technology is intentionally embedded into established environmental education curriculum, rather than developing a new program around the technology itself. Furthermore, adapting new technologies into preexisting curriculum also allows for easier scalability to different educational organizations and content areas. In following these recommendations, environmental educators can leverage digital technologies beyond the rampant trend of social networking and entertainment and instead as a means for engaging in science-based outdoor learning experiences.

Digital technology can provide students with a deeper observation of natural phenomena

Adopting minimal technologies, such as Project EARPOD's tablet and associated digital microscope, can facilitate students' engagement with natural phenomena at a level of detail that would be inaccessible without the technology, such as observing a plant specimen's veins up close. With this in mind, it is critical that educators who opt to utilize technology as part of their outdoor-based lessons do so in order to achieve a task-technology fit,

as opposed to incorporating a technology for the novelty effect alone. In short, technology should be used to facilitate a learning experience that would have been otherwise inaccessible with a more basic, non-technological learning tool.

Implications for practitioners

- Mobile technology use in outdoor settings can increase students' interest in nature and their confidence in using mobile technologies: incorporating technology into environmental education programs introduces students to technology as a learning tool to further their scientific inquiries.
- Mobile technology, when integrated, should fit into pre-existing environmental education curriculum: this allows for ease of adoption by educators across different settings and provides students with multiple modes of engagement.
- Mobile technology should adequately fit the learning activity so that the student's experience is enhanced: digital learning tools should be adopted as a means to facilitate a learning experience that would have otherwise been missed with a more basic method.

References

- Cuthbertson, B., Socha, T. L., & Potter, T. G. (2004). The double-edged sword: Critical reflections on traditional and modern technology in outdoor education. *Journal of Adventure Education and Outdoor Learning*, 4, 133-144. doi: 10.1080/14729670485200491
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