

Universal Design for Accessible Field Trips: Methods, Results and Recommendations



A Joint project of VCC
Science Department
Disability Services
Arbiter of Student Issues Office
Institutional Research

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Acknowledgements



**WE THANK THE VCC RESEARCH FUND
FOR THE CONTINUED SUPPORT OF
THIS PROJECT**

AND

**WE WOULD LIKE TO BEGIN BY
ACKNOWLEDGING THAT WE ARE ON
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MUSQUEAM AND TSLEIL-WAUTUTH
FIRST NATIONS.**



Why Fieldtrips?



- Addresses best practices for adult learning which is social, experiential, and collaborative (Knowles, 1980; Remenick & Goralnik, 2019).
- Meets basic psychological needs of adult learners by fostering autonomy and self-perceived competence (Dettweiler et al., 2017).
- Involves active learning with hands-on activities that incorporate “*focused reflection time and slower paced thinking*” (Worley, 2011).
- Outdoor field trips are beneficial in promoting wellness in diverse student populations (Gómez et al., 2014; Shellman & Hill, 2017).

Duty to Accommodate



The rationale for accommodating students is best outlined in the BC Human Rights Code and includes:

- Fostering a society in British Columbia in which there are no impediments to full and free participation in the economic, social, political and cultural life of British Columbia;
- Promoting a climate of understanding and mutual respect where all people are equal in dignity and rights; and
- Identifying and eliminating persistent patterns of inequality associated with discrimination.
- Creating equity "in the playing field"

Objectives



- Identify potential barriers that may prevent students with disabilities from fully participating in field trips.
- Use awareness of identified barriers in designing field trips to be inclusive and maximize academic capital of students.

Methods



- Create assessment checklists for indoor and outdoor field trip venues
- Assess current field trip sites for potential barriers in field trip participation:
Camosun Bog, Stanley Park (Beaver Lake trail),
Vancouver Aquarium,
Figurehead Park intertidal.



Methods



- Design a survey that identifies barriers to field trip participation for students who self-identify as having a disability
- Ensure the survey complies with ethical considerations in human research (informed consent, confidentiality, defined risks and benefits, access to survey results)
- Enlist Institutional Research to deploy an online survey to registered VCC students

Methods



- Institutional Research deployed the “Barriers to Fieldtrip Participation” survey on March 2, 2020 using a contact list of currently enrolled students provided by the Registrar's office.
- The survey was available online for 10 days
- A reminder email was sent a week later to students who had not responded to the survey.



Indoor Field Trip Accessibility Checklist



Building Exterior (Ontario BIA Association)	YES	NO
Accessible parking		
Ramps from parking area into building		
Pathway to building is stable, firm and slip-resistant		
Doorways are at least 36 inches wide		
Automatic doors		
Building Interior (Ontario BIA Association)		
Accessible washrooms		
Ramps to reach different levels		
Pathway surfaces are stable, firm and slip-resistant		
Doorways are at least 36 inches wide		
Automatic doors		
Signage (Queens University)		
Clear and sharp type style		
Font size is appropriate for the viewing distance		
Positioned at eye level or perpendicular to path of travel		
Text is glare-free and high-contrast to background		
Text is raised and/or in Braille		
Illumination is adequate		
Exhibits (Smithsonian)		
Open captioning for videos and audio exhibits		
Tactile elements in exhibits		
Assistive listening devices available		
Access services available with advance notice		
Clear line of sight to exhibits for those using mobility aids		
Printed materials available in Braille		
Printed materials available in large print		
Visual description audiopage available		

Outdoor Fieldtrip Accessibility Checklist

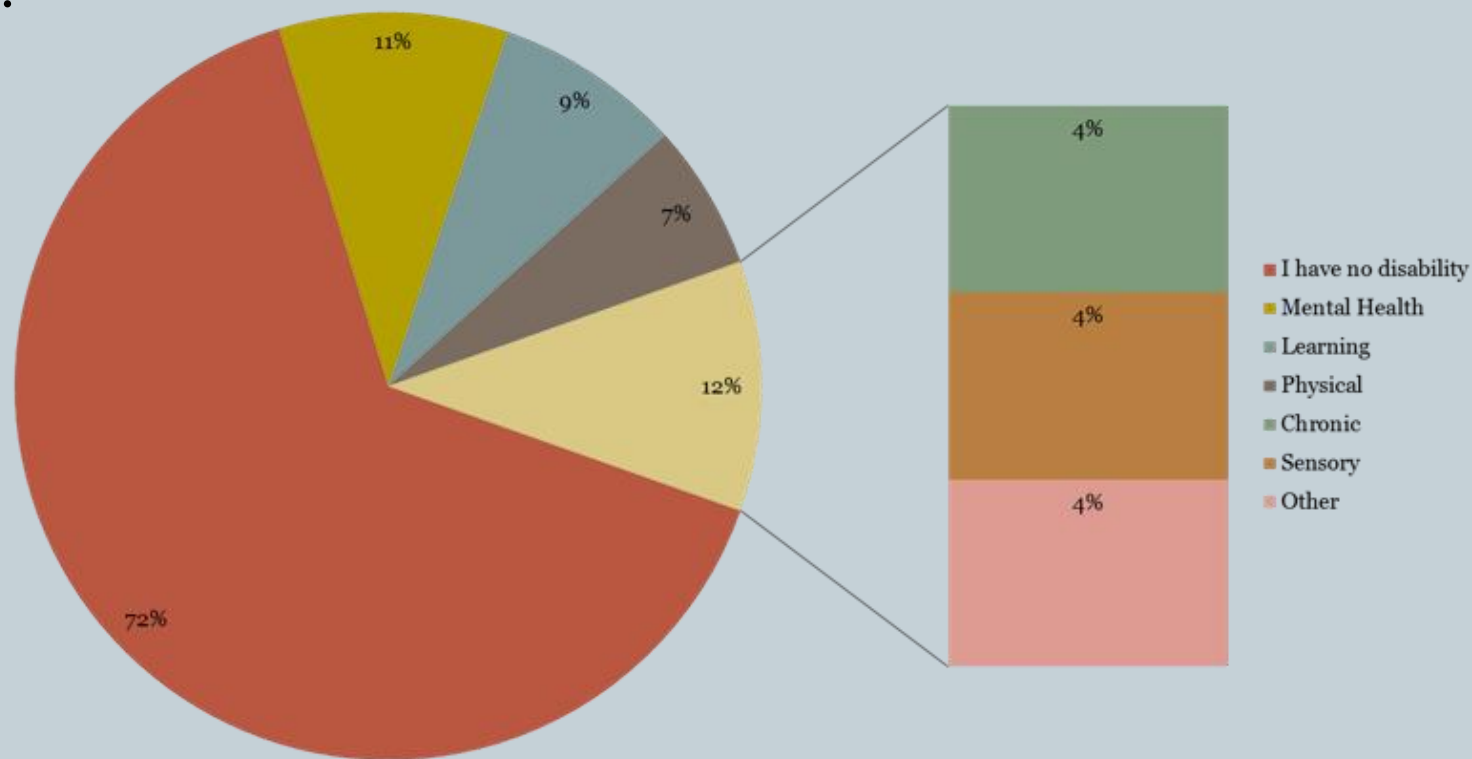


Park Facilities	YES	NO
Accessible parking available		
Pathways are stable, firm and slip-resistant		
Grade of pathway running slopes are < 5%, cross-slopes are < 2%		
Access to trailheads have a minimum width of at least 36 inches wide		
Accessible washrooms available close to observation sites		
Trails		
Trail surfaces are firm and stable and at least 36 inches wide		
Boardwalks are provided where trails are rocky and unstable		
Trail grades have running slopes of <5%, if >5%, there are resting areas within 200 feet		
Resting areas are at least 5 feet long and 36 inches wide, with grades <5%		
Trail signage		
Clear and sharp type style. Text is glare-free and high-contrast to background		
Font size is appropriate for the viewing distance		
Positioned at eye level or perpendicular to path of travel		
Text is raised and/or in large text		
Illumination is adequate		
Trail obstacles/hazards		
There is adequate warnings (eg. signage) for hazards ahead		
Edge protection is provided where trails are higher than surrounding area		
Edge protection is at least 3 inches high		
Protruding objects are < 80 inches above trail surface		
Tread obstacles on trail surface are < 1 inch high and guardrails are < 42 inches high		
Openings in path surfaces are small enough to avoid wheels going through		
Vegetation is cleared 2-5 feet on either side of trails		
Spaces for viewing are wide and long enough for maneuvering/turning around		
Assistive Devices		
Beach/trail assistive devices are available		
Audio guides are available		

The Results



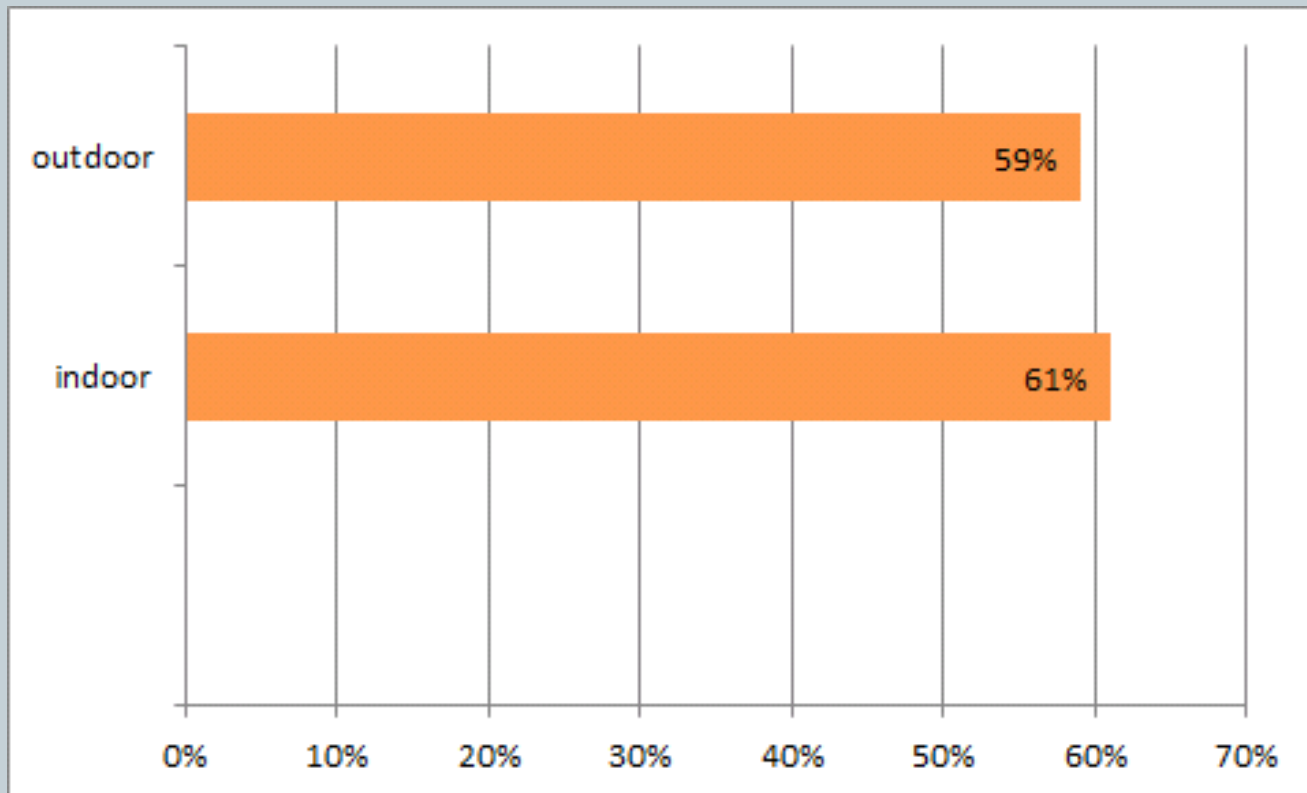
Of the resulting 465 responses, 28% self-identified as having a disability. Disabilities mentioned included mental health (11%), learning, (9%) physical (7%), chronic (4%), sensory (4%), or other conditions (4%).



The Results



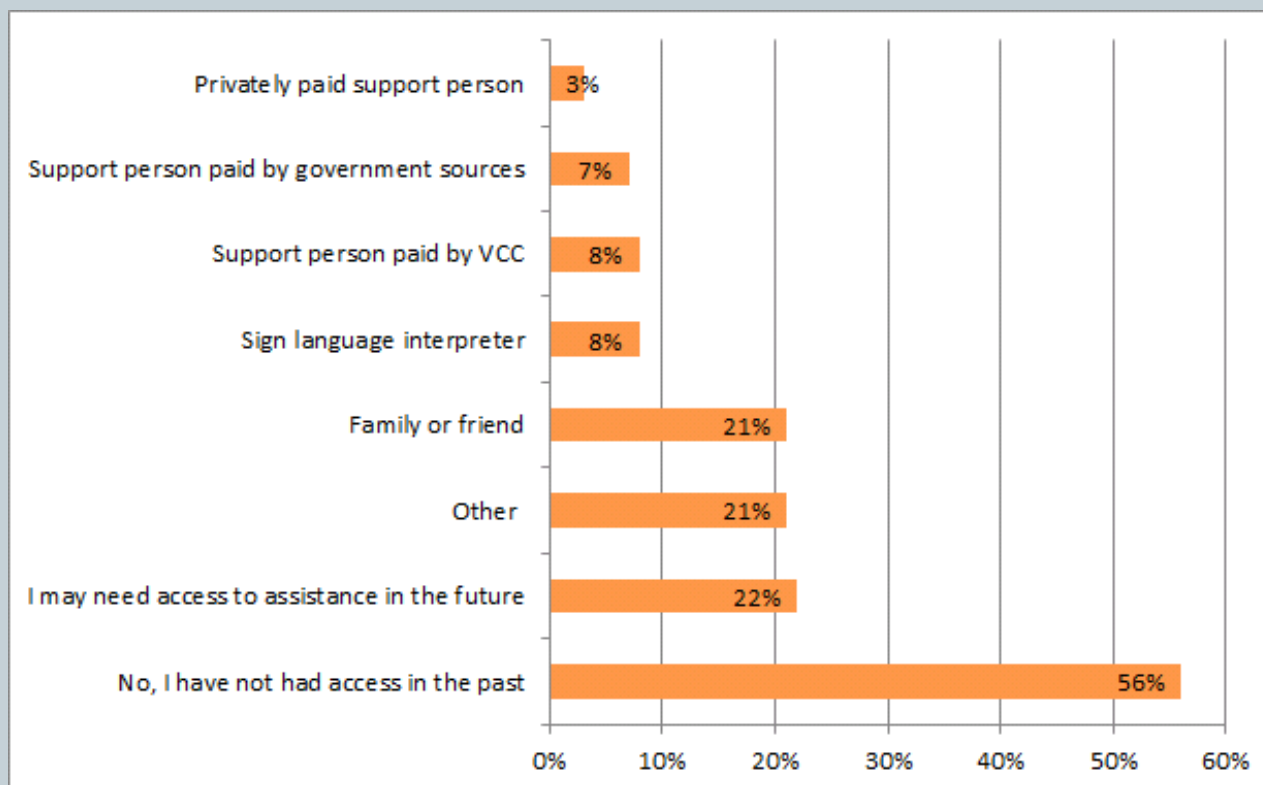
Q. Is the barrier you faced or expect to face related to participation in an indoor or outdoor field trip?



The Results



Q. Have you had or could you have access to any of the following to assist you on a post-secondary field trip?



Barriers



Mental Health Challenges (11%)

- anxiety/panic disorder and depression due to situations outside of regular routine
- making one's way to and from strange destinations
- working with unfamiliar people
- being in large crowds
- claustrophobia
- perceived inability to leave the environment
- agoraphobia
- being required to wear body-fitting attire (eg. swimsuit)
- post-traumatic stress disorder
- timed deadlines at the field trip site
- fear that no one will talk to me or work with me



Barriers



Learning Challenges (9%)

- not understanding verbal explanations or instructions
- overstimulation
- distraction by surroundings
- lack of language proficiency
- fear of acting out inappropriately
- not understanding personal boundaries in an unfamiliar situation

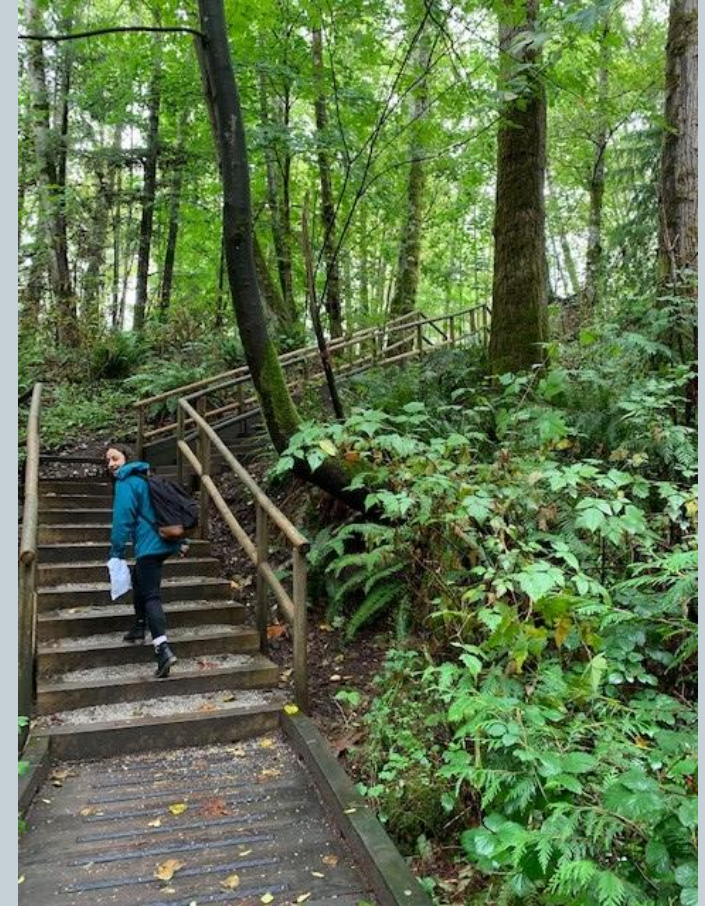


Barriers



Physical Challenges (7%)

- physical demands of walking long distances (most commonly cited physical barrier)
- permanent limp and balance issues
- fear of injury due to fragile bones
- lack of room to maneuver mobility devices
- negotiating rough terrain
- inability to run, bend, lift or climb
- unable to perform special skills such as bike riding or swimming



Barriers



Chronic Conditions (4%)

- chronic pain and fatigue
- underlying health issues (asthma, Crohn's Disease, arthritis, lupus, Celiac Disease)
- severe allergies to pollen and other environmental allergens
- chronic condition requires immediate access to restrooms
- sensitivity to sun exposure, resulting in pain
- fainting in over-heated areas



Barriers



Sensory Challenges (4%)

- can't hear the guide or instructor due to ambient noise or secondary conversations
- voice distortion due to microphones or public broadcast systems
- films without captioning
- lack of sign language interpreter
- discomfort due to loud noises, especially in echoing spaces
- unable to wear sensory aid (eg. spectacles) in some circumstances, such as under water
- unable to get close enough to guide or instructor to hear, see, or touch



Barriers



Other Barriers (4%)

- unable to get to field trip site due to lack of transportation or unfamiliarity with route
- lack of weather-appropriate clothing or specialized equipment
- economic obstacles (eg. entrance fees, specialized equipment or weather-appropriate clothing)



Recommendations



Site selection

- ensure site is accessible
- minimize travelling time
- allow students to travel from the school to the field trip venue together
- select easy transport route
- venues should have no or minimal cost to participate
- anticipate barriers



Recommendations



Pre-trip preparation

- collaborate with Disability Services about courses and programs with field trips
- create a safe environment for open dialogue with students about potential disability barriers
- clear instructions and expectations
- assign small groups with familiar partners
- clear directions to site location
- practice procedures and in-field activities ahead of time
- better awareness of and training for instructors regarding mental health and cognitive challenges
- make students aware of support services from the institution or field trip venue.

Recommendations



In-site Preparation



- allow students time to catch up if moving from stop to stop
- provide lots of breaks in between activities
- allot space close to the guide, instructor or speaker for those who need to be closer
- make students aware of accessibility support that is available from the post-secondary institution or field trip site
- ensure students are working with someone they are comfortable with
- provide quality, well-trained assistants

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References



- Beck, C., Klemow, K., Paulson, J., Bernstein, A., Lam, M., Middendorf, G., Reynolds, J., Belanger, K., Cardelus, C., Cid, C., Doshi, S., Gerardo, N., Jablonski, L., Kimmel, H., Lowman, M., MacRae-Crerar, A., Pohlad, B., Roode, J. de, & Thomas, C. (2012). Add Ecology to the Pre-Medical Curriculum. *Science*, 335(6074), 1301–1301. <https://doi.org/10.1126/science.335.6074.1301-a>
- Behrendt, M., & Franklin, T. (2014). *A Review of Research on School Field Trips and Their Value in Education*. 11.
- Bersch, G. T., & Lund, C. L. (2002). Learning communities in remote retreat settings. *New Directions for Adult and Continuing Education*, 2002(95), 73–82. <https://doi.org/10.1002/ace.70>
- Bratman, G. N., Hamilton, J. P., & Daily, G. C. (2012). The impacts of nature experience on human cognitive function and mental health. *Annals of the New York Academy of Sciences*, 1249, 118–136. <https://doi.org/10.1111/j.1749-6632.2011.06400.x>
- Coker, J. S., & Porter, D. J. (2015). Maximizing Experiential Learning for Student Success. *Change: The Magazine of Higher Learning*, 47(1), 66–72. <https://doi.org/10.1080/00091383.2015.996101>
- Cooke, M. L., Anderson, K. S., & Forrest, S. E. (1997). Creating Accessible Introductory Geology Field Trips. *Journal of Geoscience Education*, 45(1), 4–9. <https://doi.org/10.5408/1089-9995-45.1.4>
- Dallimer, M., Irvine, K. N., Skinner, A. M. J., Davies, Z. G., Rouquette, J. R., Maltby, L. L., Warren, P. H., Armsworth, P. R., & Gaston, K. J. (2012). Biodiversity and the Feel-Good Factor: Understanding Associations between Self-Reported Human Well-being and Species Richness. *BioScience*, 62(1), 47–55. <https://doi.org/10.1525/bio.2012.62.1.9>
- Denoyelles, A., Cobb, C., & Lowe, D. (2012). Influence of Reduced Seat Time on Satisfaction and Perception of Course Development Goals: A Case Study in Faculty Development. *Journal of Asynchronous Learning Network*, 16, 85–98. <https://doi.org/10.24059/olj.v16i2.257>
- Dettweiler, U., Lauterbach, G., Becker, C., & Simon, P. (2017). A Bayesian Mixed-Methods Analysis of Basic Psychological Needs Satisfaction through Outdoor Learning and Its Influence on Motivational Behavior in Science Class. *Frontiers in Psychology*, 8, 2235. <https://doi.org/10.3389/fpsyg.2017.02235>
- <https://doi.org/10.1093/heapro/dai032>
- Feig, A. D., Atchison, C., Stokes, A., & Gilley, B. (2019). Achieving Inclusive Field-based Education: Results and Recommendations from an Accessible Geoscience Field Trip. *Journal of the Scholarship of Teaching and Learning*, 19(2). <https://doi.org/10.14434/josotl.v19i1.23455>

References



- Fierer, N., Ferrenberg, S., Flores, G. E., González, A., Kueneman, J., Legg, T., Lynch, R. C., McDonald, D., Mihaljevic, J. R., O'Neill, S. P., Rhodes, M. E., Song, S. J., & Walters, W. A. (2012). From Animalcules to an Ecosystem: Application of Ecological Concepts to the Human Microbiome. *Annual Review of Ecology, Evolution, and Systematics*, 43(1), 137–155. <https://doi.org/10.1146/annurev-ecolsys-110411-160307>
- Gilley, B., Atchison, C., Feig, A., & Stokes, A. (2015). Impact of inclusive field trips. *Nature Geoscience*, 8(8), 579–580. <https://doi.org/10.1038/ngeo2500>
- Gómez, E., Urzúa, A., & Glass, C. R. (2014). International Student Adjustment to College: Social Networks, Acculturation, and Leisure. *Journal of Park and Recreation Administration*, 32(1). <https://js.sagamorepub.com/jpra/article/view/2972>
- Hendricks, J. E., Atchison, C. L., & Feig, A. D. (2017). Effective Use of Personal Assistants for Students With Disabilities: Lessons Learned From the 2014 Accessible Geoscience Field Trip. *Journal of Geoscience Education*, 65(1), 72–80. <https://doi.org/10.5408/16-185.1>
- Jackson, L. (2003). The relationship of urban design to human health and condition. *Landscape and Urban Planning*, 64, 191–200. [https://doi.org/10.1016/S0169-2046\(02\)00230-X](https://doi.org/10.1016/S0169-2046(02)00230-X)
- Knowles, M. S. (1980). *The Modern practice of adult education: From pedagogy to andragogy*—UNESCO Digital Library. <https://unesdoc.unesco.org/ark:/48223/pf0000049475>
- Langley-Turnbaugh, S. J., Wilson, G., & Lovewell, L. (2009). Increasing the Accessibility of Science for All Students. *Journal of Science Education for Students with Disabilities*, 13(1), 1–8.
- Legislative Services Branch. (2015, July 30). *Consolidated federal laws of Canada, Access to Information Act*. <https://laws-lois.justice.gc.ca/eng/const/page-15.html>
- Luck, G. W., Davidson, P., Boxall, D., & Smallbone, L. (2011). Relations between urban bird and plant communities and human well-being and connection to nature. *Conservation Biology: The Journal of the Society for Conservation Biology*, 25(4), 816–826. <https://doi.org/10.1111/j.1523-1739.2011.01685.x>
- Maller, C., Townsend, M., Pryor, A., Brown, P., & St Leger, L. (2006). Healthy nature healthy people: “contact with nature” as an upstream health promotion intervention for populations. *Health Promotion International*, 21(1), 45–54.

References



- Mawdsley, R. D. (1999). Legal issues involving field trips. *School Business Affairs*, 65(9), 28-31.
- Michie, M. (1988). Factors influencing secondary science teachers to organise and conduct field trips. *Australian Science Teacher's Journal*, 44(4), 43-50.
- Mutz, M., & Müller, J. (2016). Mental health benefits of outdoor adventures: Results from two pilot studies. *Journal of Adolescence*, 49, 105–114. <https://doi.org/10.1016/j.adolescence.2016.03.009>
- National Disability Authority. (2020). *What is Universal Design | Centre for Excellence in Universal Design*. <http://universaldesign.ie/What-is-Universal-Design/>
- Orsega-Smith, E., Mowen, A. J., Payne, L. L., & Godbey, G. (2004). The Interaction of Stress and Park Use on Psychophysiological Health in Older Adults. *Journal of Leisure Research*, 36(2), 232–256. <https://doi.org/10.1080/00222216.2004.11950021>
- Pryor, A., Carpenter, C., & Townsend, M. (2005). Outdoor education and bush adventure therapy: A socio-ecological approach to health and wellbeing. *Journal of Outdoor and Environmental Education*, 9(1), 3–13. <https://doi.org/10.1007/BF03400807>
- Rapport, D. J., Howard, J., Lannigan, R., & McCauley, W. (2003). Linking health and ecology in the medical curriculum. *Environment International*, 29(2), 353–358. [https://doi.org/10.1016/S0160-4120\(02\)00169-1](https://doi.org/10.1016/S0160-4120(02)00169-1)
- Remenick, L., & Goralnik, L. (2019). Applying Andragogy to an Outdoor Science Education Event. *The Journal of Continuing Higher Education*, 67(1), 24–36. <https://doi.org/10.1080/07377363.2019.1629804>
- Robinson, C. J., Bohannan, B. J. M., & Young, V. B. (2010). From Structure to Function: The Ecology of Host-Associated Microbial Communities. *Microbiology and Molecular Biology Reviews*, 74(3), 453–476. <https://doi.org/10.1128/MMBR.00014-10>
- Rogers, P., & Lucas, N. (2016, Winter). *Feature: The Time is Right to Prioritize Well-Being in Higher Education | Bringing Theory to Practice*. Bringing Theory to Practice Newsletter. <https://www.bttop.org/news-events/feature-time-right-prioritize-well-being-higher-education>

References



- Saunders, C. D., Brook, A. T., & Eugene Myers Jr, O. (2006). Using Psychology to Save Biodiversity and Human Well-Being. *Conservation Biology*, 20(3), 702–705. <https://doi.org/10.1111/j.1523-1739.2006.00435.x>
- Shellman, A., & Hill, E. (2017). Flourishing through Resilience: The Impact of a College Outdoor Education Program. *Journal of Park and Recreation Administration*, 35(4). <https://doi.org/10.18666/JPra-2017-V35-I4-7779>
- Smith, V. H., Rubinstein, R. J., Park, S., Kelly, L., & Klepac-Ceraj, V. (2015). Microbiology and ecology are vitally important to premedical curricula. *Evolution, Medicine, and Public Health*, 2015(1), 179–192. <https://doi.org/10.1093/emph/eov014>
- Steinfeld, E., & Maisel, J. (2012). *Universal Design: Creating Inclusive Environments*. John Wiley & Sons.
- Walter, P. (2013). Greening the Net Generation: Outdoor Adult Learning in the Digital Age. *Adult Learning*. <https://doi.org/10.1177/1045159513499551>
- Weld, J. D. (1990). Making Science Accessible. Special Students, Special Needs. *Science Teacher*, 57(8), 34–38.
- Worley, K. (2011). Educating College Students of the Net Generation. *Adult Learning*, 22(3), 31–39. <https://doi.org/10.1177/104515951102200305>

References



Accessibility Assessment Checklist

Ontario BIA Association: Accessibility Smart Business Project (November 2016). [online resource]. <http://obiaa.com/wp-content/uploads/2014/09/Accessible-Buildings-Checklist-OBIAA.pdf>

Queens University Accessibility Guidelines. Section 6: Signage. [online resource].
<http://www.queensu.ca/camplan/reports/aguide/6-o.pdf>

Smithsonian. Accessibility for Visitors: Making All Visitors Feel Welcome. [online resource].
<https://www.si.edu/visit/VisitorsWithDisabilities>

Mountains Recreation and Conservation Authority. (2010). Malibu Parks Public Access Enhancement Plan. Retrieved from
http://www.keroul.qc.ca/DATA/PRATIQUEDOCUMENT/269_en.pdf

Parks Canada. (2008). Accessible Trails and Parks Assessment Toolkit. Retrieved from
http://www.keroul.qc.ca/DATA/PRATIQUEDOCUMENT/266_fr.pdf