

**Research Topic:**

Outdoor Education in K-12 Schools

**Research Problem:**

Decreased engagement in the outdoors by children and youth.

**Purpose:**

To identify strategies to make it easier for teachers to engage students in outdoor activities

**Research Question(s)**

Does the framework of Adventure Learning engage students in learning activities around outdoor education and allow for teachers to feel more comfortable in engaging with outdoor education by providing relevant curriculum and resources around learning in outdoor environments.

**Research Parameters**Dates:

Limited initial search criteria from 2011-Present, with historical AL references used circa 2006

Search Terms:

Adventure Learning  
Adventure Learning +Motivation  
Outdoor Education  
Self Determination Theory Outdoor Education  
Adventure Education  
Barriers to Outdoor Education  
Barriers to Outdoor Education +teachers  
Benefits of Outdoor Education

Resource Locations:

Google Scholar  
UVic Library

## **Introduction - Learning “Out-of-doors”**

The terms used to describe an umbrella category of learning “out-of-doors” can be quite varied. Although not an exhaustive list, terms such as Adventure Education, Outdoor Education, Outdoor Learning, Adventure Learning, Wilderness Education, Wilderness Learning, and Environmental Education are all used to describe various ways individuals engage with the “out-of-doors” within structured, curriculum-based, instruction. These terms are often used synonymously, both in the research literature and by practicing instructors, leading to confusion regarding the pedagogical intent of the process being discussed (Thorburn & Allison, 2010). Adventure Education and Adventure Learning are both grounded in the concept of Adventure. The term adventure is used in a number of context in society today including Adventure Travel, Adventure Sports and Adventure Therapy. Adventure is broadly accepted to be about uncertainty of outcome (Beedie & Hudson, 2003) and the concepts of conflict and survival within Adventure Learning (AL) (Veletsianos & Doering, 2010) as well as risk-taking in Adventure Education (AE) (Henrickson, Doering, & Miller, 2013) echo this definition and present excitement in the learning environment for students. Before a discussion around the teaching and learning effectiveness of AL in particular is presented it is important to understand the reasoning behind using outdoor education in general within schools is important. To that extent, this review of literature will present a summary of youth activity levels and specific discussion regarding outdoor activity followed by sections on barriers to outdoor education, benefits of outdoor education, and an exhaustive discussion of Adventure Learning (AL) as a framework to implement Outdoor Education.

## Student Activity Levels

The activity levels of children and youth are declining. The Physical Activity Levels of Canadian Children and Youth (CANPLAY) showed a significant drop in the average daily steps for both boys and girls between studies in 2005 and 2014 (Canadian Fitness and Lifestyle Institute, 2014). A 2012 survey conducted by the David Suzuki Foundation found that 70% of respondents spent an hour or less a day outdoors. Active Healthy Kids Canada (2014) report card on physical activity generated an overall grade of D- for the activity levels of Canadian youth as compared to an overall grade of B to New Zealand Youth.

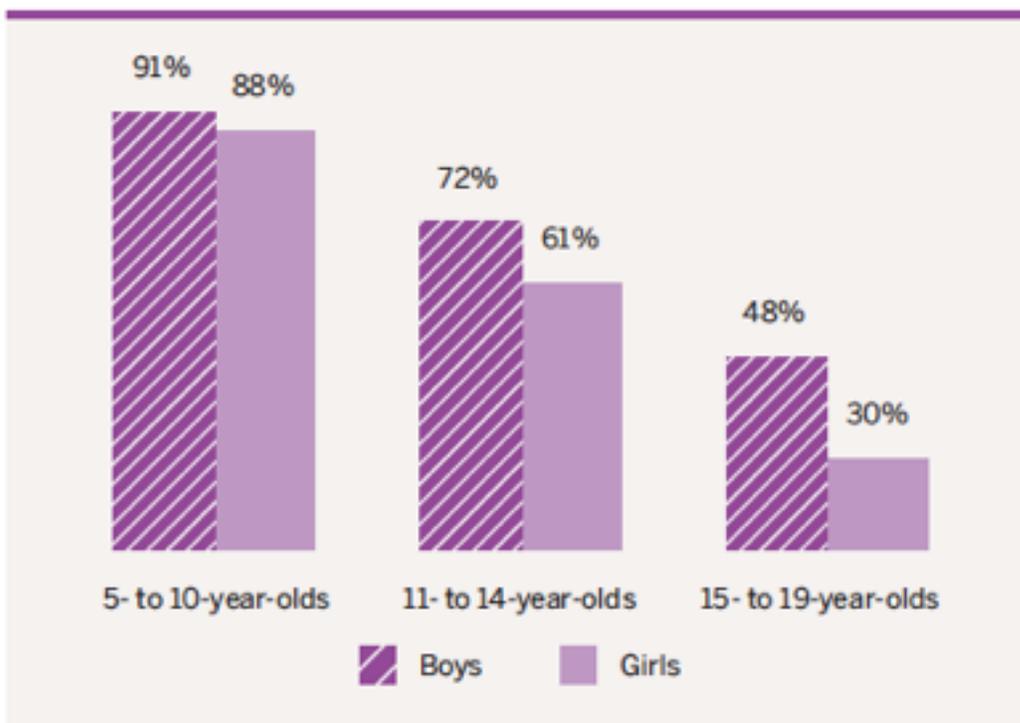


Table 1 - Percentage of Canadian Children and Youth who participate in unstructured after school play. (Canadian Fitness and Lifestyle Institute, 2014)

Activity for youth within the societal structures of Canada are becoming more dependant upon structured, organized, and facility based sport rather than a focus on unstructured play. As noted in the Active Healthy Kids Canada report (2014) New Zealand, a global leader in youth activity, has initiated a campaign around adventurous and unstructured play. The New Zealand campaign resulted in relaxed safety rules within playgrounds and a resulting increase in physical activity coupled with a decrease in bullying and injury. Modified guidelines on activity levels have recently been established. Tremblay *et.al.* (2011) has made a case for an increase to 60min a day of activity and that below established levels of activity for currently inactive youth demonstrated some health benefits. It is important to establish a culture in schools of encouragement for currently inactive youth to engage in physical activity. A focus on unstructured outdoor activity that is accessible to all should be encouraged over highly structured sport based activities that currently inactive youth lack the skills and motivation to participate in. Engaging peers and the home in participating within this unstructured activity model is also important.

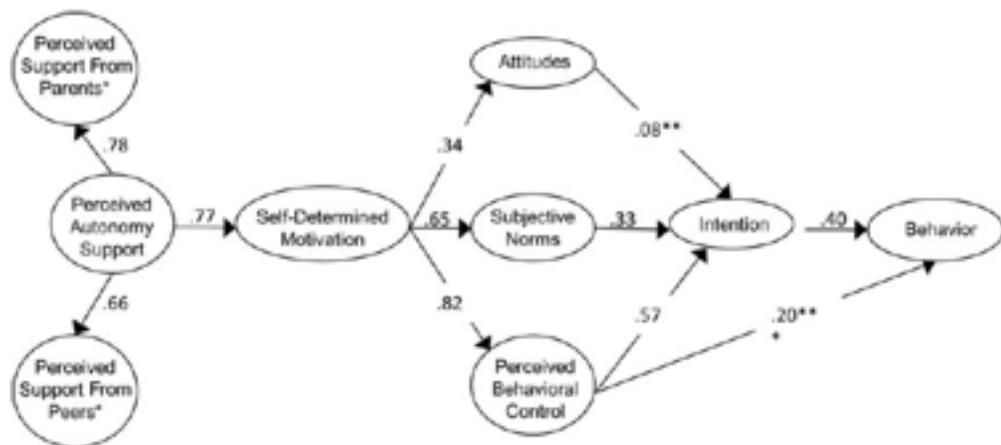


Image 1 - Structural model of relationships between variables affecting behaviour to participate in non-competitive outdoor activities (Christiana *et. al.*, 2014).

Youth participation in non-competitive outdoor activities are motivated by the understanding that participation is self-determined (Christiana *et. al.*, 2014). In other words, the more choice youth have the more likely they are to participate. The study by Christiana *et. al.* (2014) determined that this feeling of autonomy is directly linked to the perceived support youth feel from parents and peers (As noted in Image 1). As noted in table 1, there is a significant decline in the activity levels of youth as age increases and that gender also contributes to activity levels, suggesting that targeting individuals within these at risk groups (e.g., older youth girls) is of greater importance (Canadian Fitness and Lifestyle Institute, 2014). Motivating groups who are at risk to participate in outdoor activities should be a focus for schools.

### **Barriers to Outdoor Education**

As outdoor activity declines in children and youth it is important to recognize the potential of schools to act as ambassadors of the outdoors. It has already been noted by Christiana *et. al.* (2014) that perceptions of youth relating to parental and peer support are strong indicators of participation in non-competitive outdoor activities. Schools may also play a role in providing an environment conducive to participating in outdoor environments. Both perceived and real barriers to participation in outdoor activities exist within schools. Time, Cost, and Risk all contribute to classroom teacher's use of outdoor environments, or the lack thereof. Outdoor education experiences have traditionally been excursion style in nature, are disassociated from school based learning contexts, and lack support within the curriculum which lead to teachers who already lack the inclination to venture outdoors to justify their continued indoor practices (Thorburn & Allison, 2010). As activity level decline is associated with an increase in age, it is important to recognize a need for increased focus on introducing children of young age to

outdoor experiences within an educational context. In a study conducted on Pre-service Early Childhood Educators (ECE), subjects were presented with images of outdoor setting and these setting were ranked as most and least likely to be used for education purposes by the participants (Ernst & Tornabene, 2012). The sites most frequently chosen for use were playgrounds and pavilions within open wooded settings, while the study found that perceived barriers to use of outdoor settings for education purposes included lack of access (transportation), safety concerns, and lack of supervision (Ernst & Tornabene, 2012).

A study by Zink and Boyes (2006) determined that cost, crowded curriculum, demands on personal time, and safety were seen by teachers as leading barriers to outdoor education while the least negative impact on a teacher incorporating outdoor experiences into school was the motivation of students. A survey of Canadian youth respondents stated that work, chores, and school all impact the time available for outdoor activities and two thirds of respondents claimed access to outdoor or nature programs within their schools, effectively making an argument for the need of schools to foster engagement of youth in the outdoors (David Suzuki Foundation, 2012). In response to the barriers that teachers feel inhibit outdoor use, Thorburn & Allison (2010) found that access to support materials in the form of a website for teachers to “access information, risk assessment templates, curriculum linking materials, names of local contacts and other relevant information would be merited”, while Zink and Boyes (2006) research suggested that having access to skilled individuals to support outdoor activities was the most emphasized response to negating perceived barriers to participation. Creating activities that are low-risk, have meaningful connections to the curriculum, are free or low cost, and are activities which can be presented by teachers without special training will allow for outdoor experiences to be woven into the content of daily activities within classrooms (Thorburn & Allison, 2010).

## **Outdoor Education - Benefits**

It has been noted that comparative cognitive studies regarding outdoor education have been challenging to carry out, but in the limited number of cases where they have been performed the research has shown improvements in cognitive skill development while students are engaged in outdoor environments in comparison to classroom based learning (Dillon *et. al.*, 2006). Research into outdoor learning has also demonstrated children's ability to attain flow states in learning within outdoor education due to the decreased prevalence of teacher interruption, which has been associated with deep learning (Waite, Rogers, & Evans, 2013). While cognitive benefits are certainly an important aspect of outdoor educational outcomes, there are a number of other beneficial outcomes to outdoor education. Children and youth within Canada are living with mental illness. 1 in 5 Canadians have a mental illness, which translates to over 1 million youth aged between 9 and 19 years of age and 4 million within our population that have a mood or anxiety disorder (Mental Health Commission of Canada, 2012). In a 2011 study that exposed students to an outdoor education opportunity, results demonstrated a decrease in psychiatric symptoms for boys that included hyperactivity and conduct problems (Gustafson *et. al.*, 2012). Students need to be exposed to outdoor environments. Students who have participated in Outdoor Education programming have demonstrated statistically significant improvement in leadership ability, cooperative teamwork skills, and the ability to cope with changes and that these changes are retained at a high rate within individuals (Harun & Salamuddin, 2014). Students that become involved in programs that introduce them to nature are shown to spend more time outdoors than students that have not been involved in these activities

(David Suzuki Foundation, 2012). A 2009 study conducted by Charles suggested that cognitive flexibility and creativity are enhanced as a result of problem solving in natural versus highly maintained settings while Fjortoft has shown benefits to young children playing in natural environment to include better gross motor skills, balance and coordination compared to those using traditional playground settings (Ernst & Tornabene, 2012). A study of grade 6 students was undertaken to determine whether a 5 day intervention of face to face interactions without any screen time at an outdoor education school would improve non-verbal cues and the results indicated that students showed a significant improvement in their understanding of facial emotions in comparison to students with similar demographics (ethnicity, parental education, media use) who did not receive the intervention (Uhls *et. al.*, 2014).

### **Adventure Learning**

As previously discussed, a number of barriers to outdoor education exist and include lack of curriculum support, cost, and risk (Ernst & Tornabene, 2012; Thorburn & Allison, 2010; Zink and Boyes, 2006), while research into implementation of outdoor education cites access to support materials and skilled individuals as ways to support educators (Thorburn & Allison, 2010; Zink & Boyes, 2006). Adventure Learning is one avenue that may allow for the support of educators in their outdoor education endeavours.

Adventure Learning (AL) is a recent educational framework informed by four theoretical constructs; Experiential Learning, Inquiry-Based Learning, Authentic Learning and Open-Ended Learning Environments (Veletsianos, 2012). An initial definition of the AL framework is presented by Doering (2006) as “a hybrid online educational environment

that provides students with opportunities to explore real-world issues through authentic learning experiences within collaborative online learning environments”.

1. A research curriculum grounded in Problem-Solving
2. Collaboration opportunities between students, experts, peers and content.
3. Use of the Internet for curriculum and learning environment delivery.
4. Providing authenticity with media and text from the field in a timely manner.
5. Provide synched learning opportunities.
6. Pedagogical guidelines for the curriculum and online learning environment.
7. Adventure-based.
8. Identification of a specific issue and location of exploration
9. Authentic narrative situating the learning experience.

Table 2 - Guiding principles for Adventure Learning (Veletsianos & Kleanthous, 2009)

Initially, seven principles were devised to guide users (Doering, 2006), while two more principles were added in 2010 to present the an AL 2.0 framework as currently used as indicated in table 2 and figure 2.



Figure 2 - Guiding principles of AL 2.0 (Henrickson & Doering, 2013)

Traditionally, AL has been presented within an expedition style construct with teams of experts traversing harsh landscapes and presenting media artifacts of the trip (Doering, 2006; Doering & Veletsianos, 2008; Miller, Veletsianos & Doering, 2008; Veletsianos & Doering, 2010). Recent iterations of the AL framework have been used in less epic

endeavours, with learning experiences resulting from smaller scale activities that were more local in nature (Brant *et. al.*, 2013; Hendrickson & Doering, 2013; Hill & Mills, 2012; Veletsianos, 2013). Research on the implementation of the AL framework has delineated into a number of categories: Motivation, Engagement, Narratives, Adventure, and Collaboration.

### Motivation

Student motivation has been shown to increase as a result of AL implementation in learning environments (Doering *et. al.*, 2010; Moos & Honkomp, 2011). In the Doering *et. al.* (2010) study 90% of respondents commented that the connection to the sled dogs was what drove motivation within the online environment and over 80% of teachers stated that dogs were the common discussion by students outside the classroom. The Self-Determination Theory is based on 3 universal needs (Competence, Relatedness, and Autonomy) and when these needs are met individuals function and grow optimally (Deci & Ryan, 2008). Moos and Honkomp (2011) argue that AL satisfies all three needs as follows:

Autonomy: encouragement of problem solving via facilitation of independent thought and promotion of student initiative.

Competence: mastery and control of environment

Relatedness: collaboration within environment satisfies belonging

In the study by Moos and Honkomp (2011), a statistically significant increase in all Motivated Strategies for Learning Questionnaire (MSLQ) intrinsic motivation subclasses were seen, and students showed feelings of success (Competence) and that they wanted to learn and go to Africa (Intrinsic Motivation). Limitations in the research of learner motivation within AL result from a limited body of research as well as the

difficulty in separating the novelty factor of AL from the actual learning environment (Moos & Honkimp, 2011).

### Engagement

Student engagement has also been a key component of the body of AL research. A qualitative study of 110 grade 4 and 5 students noted that the ability to share, interact and create something relevant to their lives as well as the variety of components online (photos, video) contributed to both task persistence and focus (Cognitive Engagement) while 77% of the respondents said that they either learned more or had more fun with this project than others they had completed in school (Emotional Engagement) (Hendrickson & Doering, 2013). Adventure is seen as an important component of the motivation of learners. Adventure immerses learners in the entire experience and is a key motivator in the student's use of the online environment outside of class time to see what happens next in the narrative (Henrickson, Doering & Miller, 2013). The multiple learning engagements that are part of AL made engagement in the learning possible through multi-media (video, pictures, online games) and participation in chats and the open-ended learning experience (collaboration zones, chats, trail reports) allowed for students to engage by means they found interesting (Veletsianos & Doering, 2010).

### Narratives

Narratives have typically been presented by the expedition team within the AL framework. Students in a 2010 study by Veletsianos and Doering describe the excitement they felt in following the trips by detailing the conflicts, survival, and bravery demonstrated throughout the excursion and were very excited to read the updates that

were posted every Monday morning while also expressing a sadness for the experience to end, noting that they wanted to “continue following along.” The fact that the team did not say goodbye at the end did not provide a sense of closure to the students and resulted in a modification of the expedition final trail report in subsequent years to include thanks and farewell messages from the team. The ability to provide narrative to the learning experience provides purpose, continuity and coherence and Veletsianos (2010) describes a research situation where multiple pieces of the experience were tied into a uniform whole via establishment of a sequence and storyline. Narratives can also be provided by students involved in the AL programming. In a 2013 study by Miller, Hougham & Eitel a template was created called the trail report that captured the day’s experiences from the participants perspective which became a useful reflective tool, provided individualization, and acted as a procedural tool as well while also providing teachers with a formative assessment tool and reinforced a culture of inquiry with the students.

### Adventure

Adventure has shown to help students gain an understanding of the global context with students noting that they understood remote locations and cultures better as a result of the learning experience and teachers also commenting on a desire to be part of the learning community as a result of the adventure aspect of the experience and the perception of the learners excitement in the adventure (Hendrickson, Dowering & Miller, 2013). Veletsianos & Doering (2010) suggest that to create effective long term learning experiences to sustain interest and intrigue, environments designed with intrigue,

tension, fun, excitement and interaction are integral aspects of the learning. In other words, designing uncertainty in the outcome (Adventure) is important to keep the interest of the learner.

### Collaboration

Collaboration is a central theme in the AL framework. Collaboration was a strength identified by one teacher due to the well integrated approach rather than an add on scenario (Veletsianos & Doering, 2010). An AL STEM (Science, technology, engineering, and math) integration program aligned with indigenous knowledge constructs presented research that students thrived when the collaborative opportunities were realized between students, teachers, and knowledge keepers and the overall experience of learners was enriched as evidenced from improvements in personal projects of students after the collaboration occurred (Miller *et. al*, 2013).

### Creation and Implementation of the AL Curriculum

The design of creative curriculum must be carefully examined in order to provide a scaffolded learning experience supported from inquiry and problem-based pedagogy so that learning becomes participatory and individuals immerse themselves in authentic practice (Veletsianos, 2013). Linking of the curriculum to localized exploration has been shown to be a key part of the success of AL programs (Miller, Hougham & Eitel, 2013). Implementation of the AL framework within individual classrooms differed dramatically. In one study (Doering *et. al.*, 2010) the percentage of classrooms that integrated AL was highest within the elementary system and specifically within the social studies content area, while most teachers used that AL project as an enrichment opportunity and only 6% of respondents used the project as a replacement for their current

curriculum. Teachers use the same online environment in different ways. In a pilot investigation into implementation of the AL program, some teachers used iPads and had students view trail reports individually while others viewed the content as a group (Miller, Hougham & Eitel, 2013). The curriculum design of AL in the form of three levels of integration (Experience, Explore, Expand) presents flexibility for implementation and is seen as a benefit by teachers (Veletsianos & Doering, 2010). Phenomenological inquiry is the concept of determining the universal essence of a concept from individual lived experiences, while Moustakas' bracketing technique attempts to set aside the experiences of investigators in order to provide a fresh perspective (Creswell, 2007). The use of phenomenological inquiry to assess AL presented researchers with a practical guide to implementing mini-AL environments as presented in table 3 (Miller, Veletsianos & Doering, 2008).

1. **Define** the issue or problem
2. **Identify** the geographic location and populations related to the problem
3. **Develop** a curriculum that address the issues
4. **Explore** the locale
5. **Share** the collected data
6. **Collaborate** with students in the classroom and online.

Table 3 - A practical guide for implementation of mini-AL environments (Miller, Veletsianos & Doering, 2008)

Traditional expedition-style AL frameworks are being replaced by smaller scale programs due to the availability of Web 2.0 tools that allows for the implementation of AL. Technology and social media in particular has enabled students to have meaningful interactions between other learners and experts and learners can follow the events of professionals (experts) in real time which allows them to have vicarious experiences via the professional and this connection can heighten the learning experience (Veletsianos,

2013). These small-scale AL programs allow the learner to immerse themselves in the learning environment instead of gazing from the outside, creating more meaning in the learning (Hill & Mills, 2013). In a new enactment of the AL framework, AL@ pilot programs were studied to understand how local AL programming could be implemented (Miller, Hougham & Eitel, 2013). Technology challenges discussed included the ability to build in collaborative and interactive components and that it was important to recognize what technology the local educational institute supported. The website host (Wordpress) and other media tools used for the programs were chosen for their low cost and ease of use (Photos - Lightroom, Video - Handbrake for compression and Vimeo for hosting). Miller, Hougham & Eitel (2013) also discussed the importance of incorporating authentic narratives and created a template called the trail report that captured the day's experiences from the participants perspective.

The design of creative curriculum must be carefully examined in order to provide a scaffolded learning experience supported from inquiry and problem-based pedagogy within all small-scale AL programs (Veletsianos, 2013). While traditional AL programs are typically situated inside classrooms, emerging uses for the AL framework has students moving into outdoor spaces. It is important that educators discuss the purpose for the outdoor learning so that the experience does not become a reiteration of the traditional learning environment of the school, but is transformed into an authentic learning experience (Waite, Rogers, & Evans, 2013). It is also important that connections to the curriculum are made and even activities presented before excursions in order to provide more meaning to the outdoor activity (Dillon, *et. al.*, 2006). A physical journey to engage in place can promote further interactions with individuals involved in

distance education and location can be very important to students (Hill & Mills, 2013). Students come to “own” their learning experiences as evidenced by intimate knowledge of the geographical place and people associated with the AL program (Veletsianos & Doering, 2010) and use of mini-AL programs that situate the learning within localized spaces can take advantage of that ownership so students gain an appreciation for place. A goal of AL environment is to generate critical thinking within the learner in order to engage them in an issue and inspire them to find local and global solutions to that issue and the AL environment [www.we-explore.com](http://www.we-explore.com) is available for User-Driven AL implementation (Hendrickson, Doering & Millar, 2013).

## References

Active Healthy Kids Canada (2014). Is Canada in the running? The 2014 active healthy kids Canada report card on physical activity for children and youth. Toronto: Active Healthy Kids Canada.

Beedie, P., & Hudson, S. (2003). Emergence of mountain-based adventure tourism. *Annals of Tourism Research*, 30(3), 625-643.

Canadian Fitness and Lifestyle Institute (2014) 2011-2014 physical activity monitor bulletin 1: Physical activity levels of Canadian children and youth.

Retrieved from: <http://www.cflri.ca/sites/default/files/node/1353/files/Bulletin%201%20CANPLAY%202011-2014%20National.pdf>

Christiana, R. W., Davis, M., Wilson, M. G., McCarty, F. A., & Green, G. T. (2014). Factors related to rural young adolescents' participation in outdoor, noncompetitive physical activity. *Research quarterly for exercise and sport*, 85(4), 509-518.

Creswell, J.W. (2007) *Qualitative inquiry & research design: Choosing among five approaches*. Thousand Oaks, CA: Sage Publications

David Suzuki Foundation (2012) Youth engagement with nature and the outdoors: A summary of survey findings.

Retrieved from: <http://www.davidsuzuki.org/publications/downloads/2012/youth%20survey%20findings%20summary.pdf>

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology*, 49(3), 182-185.

Dillon, J., Rickinson, M., Teamey, K., Morris, M., Choi, M. Y., Sanders, D., & Benefield, P. (2006). The value of outdoor learning: evidence from research in the UK and elsewhere. *School science review*, 87(320), 107.

Doering, A. (2006). Adventure learning: Transformative hybrid online education. *Distance Education*, 27(2), 197-215.

Doering, A., Scharber, C., Riedel, E., & Miller, C. (2010). "Timber for President": Adventure learning and motivation. *Journal of Interactive Learning Research*, 21(4), 483-513.

Doering, A., & Veletsianos, G. (2008). Hybrid online education: Identifying integration models using adventure learning. *Journal of Research on Technology in Education*, 41(1), 23-41.

Ernst, J & Tornabene, L. (2012). Preservice early childhood educators'

perceptions of outdoor settings as learning environments. *Environmental Education Research*, 18(5), 643-664

Gustafsson, P. E., Szczepanski, A., Nelson, N., & Gustafsson, P. A. (2012). Effects of an outdoor education intervention on the mental health of schoolchildren. *Journal of Adventure Education & Outdoor Learning*, 12(1), 63-79.

Harun, M. T., & Salamuddin, N. (2014). Promoting social skills through outdoor education and assessing its' effects. *Asian Social Science*, 10(5), p71.

Hendrickson, J., & Doering, A. (2013) Adventure learning and learner engagement: frameworks for designers and educators. *Journal of interactive learning research*. 24(4), 397-424

Henrickson, J., Doering, A., & Miller, C. (2013). Toward user-driven adventure learning: Combining inquiry-based adventure with technology-enhanced learning. In *World Conference on Educational Multimedia, Hypermedia and Telecommunications* (Vol. 2013, No. 1, pp. 1184-1192).

Hill, B., & Mills, J. (2013). Situating the 'beyond': adventure-learning and Indigenous cultural competence. *Discourse: Studies in the Cultural Politics of Education*, 34(1), 63-76.

Mental Health Commission of Canada (2012). Making the case for investing in mental health. Retrieved from: [http://www.mentalhealthcommission.ca/English/system/files/private/document/Investing\\_in\\_Mental\\_Health\\_FINAL\\_Version\\_ENG.pdf](http://www.mentalhealthcommission.ca/English/system/files/private/document/Investing_in_Mental_Health_FINAL_Version_ENG.pdf)

Miller, B. G., Doering, A., Roehrig, G., & Shimek, R. (2012). Fostering indigenous STEM education: Mobilizing the adventure learning framework through snow snakes. *Journal of American Indian Education*, 51(2), 66-84.

Miller, B. G., Hougham, R. J., & Eitel, K. B. (2013). The practical enactment of adventure learning: Where will you AL@?. *TechTrends*, 57(4), 28-33.

Miller, C., Veletsianos, G., & Doering, A. (2008). Curriculum at forty below: A phenomenological inquiry of an educator/explorer's experience with adventure learning in the arctic. *Distance Education*, 29(3), 253-267.

Moos, D.C., and Honkomp, B. (2011) Adventure learning: Motivating students in a minnesota middle school. *Journal of research on technology in education*. 43(3), 231-252

Thorburn, M., & Allison, P. (2010). Are we ready to go outdoors now? The prospects for outdoor education during a period of curriculum renewal in scotland. *The Curriculum Journal*, 21(1), 97-108.

Tremblay, M. S., Warburton, D. E., Janssen, I., Paterson, D. H., Latimer, A. E., Rhodes, R. E., ... & Duggan, M. (2011). New canadian physical activity guidelines. *Applied Physiology, Nutrition, and Metabolism*, 36(1), 36-46.

Uhls, Y. T., Michikyan, M., Morris, J., Garcia, D., Small, G. W., Zgourou, E., & Greenfield, P. M. (2014). Five days at outdoor education camp without screens improves preteen skills with nonverbal emotion cues. *Computers in Human Behavior*, 39, 387-392.

Veletsianos, G. (2012). Adventure learning. In Seel, N. (Ed.). *Encyclopedia of the Sciences of Learning* (pp. 157-160). Springer Academic.

Veletsianos, G. (2013). A small-scale adventure learning activity and its implications for higher education practice and research. *in education*, 16(1).

Veletsianos, G., & Doering, A. (2010). Long-term student experiences in a hybrid, open-ended and problem based adventure learning program. *Australasian Journal of Educational Technology*, 26(2).

Veletsianos, G., & Kleanthous, I. (2009). A review of adventure learning. *The International Review of Research in Open and Distributed Learning*, 10(6), 84-105.

Waite, S., Rogers, S., & Evans, J. (2013). Freedom, flow and fairness: exploring how children develop socially at school through outdoor play. *Journal of Adventure Education & Outdoor Learning*, 13(3), 255-276.

Zink, R., & Boyes, M. (2006). The nature and scope of outdoor education in new zealand schools. *Australian Journal of Outdoor Education*, 10(1), 11-21.