

Environmental Outdoor Education and Exposure to Nature: The Positive Effects on Student  
Wellness and Academic Achievement

by

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## Table of Contents

Acknowledgements	Page 3
Introduction	Page 3
My Background	Page 4
Motivation	Page 6
Methodology	Page 7
Annotated Bibliography	Page 9
Articles on EOE and Wellness	Page 9
Section Summary	Page 30
Articles on Nature, Wellness and Achievement	Page 31
Section Summary	Page 51
Outline of Presentation to the Board of Trustees	Page 51
Conclusion	Page 53
References	Page 55

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## **Introduction**

The purpose of my final project is to evaluate the research literature that examines how Environmental Outdoor Education (EOE), and similar type activities, can improve student wellness and academic achievement through exposure to nature and the outdoors. This evaluation takes the form of an annotated bibliography, which I feel will not only satisfy my goal to know more about this topic, but will also be useful for future reference by other interested parties. I am not aware of any other such annotated bibliography at the University of Alberta or in Alberta in general. If I expect to advance EOE I thought it would be best to create a resource that others with similar interest can use and possibly add to the progress of EOE. I also include in my capping project a script of the possible presentation I hope to give to the Edmonton Public School Board elected trustees. My presentation would focus on how EOE can improve the academic achievement, as well as the mental and emotional well-being, of the students in Edmonton Public Schools. It is my goal that Edmonton Public School Board will take the

necessary steps to promote and advance EOE across the school board, so that it will become a highly valued and respected option that is taught by experts in the schools within which it is offered.

Research suggests that when adolescents participate in activities inherent in Environmental Outdoor Education, not only do they increase their physical well-being, but there also are measurable improvements in self-esteem, self-worth, confidence, and social well-being, as well as reductions in stress levels (Davidson, 2001; Hattie, Marsh, Neill, & Richards, 1997; McLeod & Allen-Craig, 2007). There are also studies that show how exposure to nature improves mental ability which can translate into improved academic success ( Berman, Jonides & Kaplan, 2008). The terms: Outdoor Education, Adventure Education, Wilderness Education, Outdoor Pursuits and Experiential Education are a part of Environmental Outdoor Education. In the following paper they all will be referred to by the term Environmental Outdoor Education.

### **My Background**

I have been an outdoor educator since I was 15 when I started working with Edmonton Parks and Recreation Day Camps as a volunteer leader. Educating youth on the different ways of enjoying the outdoors has been my passion from when I first began this position. I started out as a Leader in Training (LIT), where my job entailed working with the day camp leaders to create outdoor camping experiences for participants. Activities included various forms of camp crafts, games, songs, skits, and nature activities. After four years of volunteering, I then became a leader where I was in charge of camps throughout the Edmonton River Valley. One of the camps I worked at was the special day camp for kids with disabilities. Attempting to develop and find activities that were beneficial for the children, who had severe physical and mental disabilities,

was a stimulating learning experience and challenge. Taking games that I had played with able bodied children and trying to think of how I could adapt them to make it possible for the challenged participants to enjoy make me think creatively and forced me to consider the important parts of a game. For example, a simple game of tag was examined to determine the important aspects. Avoiding contact, quick movement to tag someone, speed to get away. With someone in a wheel chair speed would not be an issue but tagging would be so we adapted the game to make it enjoyable and accessible for all.

In 1991, I was an instructor as part of the City of Edmonton and Edmonton Catholic School Board joint outdoor pursuits program. Numerous Catholic Schools traveled to specific parks in Edmonton's River Valley to participate in outdoor pursuit activities. It was here that I learned many of the skills that I would later apply during my teaching of EOE in schools. I lead school groups of all grades in summer activities such as mountain biking trips to the River Valley, in-line skating, canoeing, camping, nature awareness, games, as well as cross-country skiing and snowshoeing in the winter. After seven years of being a day camp leader I became a day camp coordinator. It was my job to organize, supervise, as well as coordinate different day camps throughout the River Valley. As I progressed through the different levels of leadership in Edmonton Parks and Recreation Day Camps, I learned the value of getting children active in the outdoors, as well as exposing them to the natural environment.

I was hired by Edmonton Public School Board as an elementary teacher in 1996 where I worked in three different elementary schools teaching grades four and five. I taught elementary for four and a half years until I transferred to Avalon Junior High, where I became an Environmental Outdoor Education teacher. This is where I have spent the last 12 years of my career. In that time, I have built what I consider an exceptional EOE program, largely due to the

experience I gained during my summer jobs with Edmonton Parks and Recreation and the Edmonton Catholic School Board outdoor pursuit program. One of the reasons I was able to create such a strong EOE program at Avalon Junior High was because of my love for the outdoors which I worked hard to transfer to my students through various activities. My goal at the beginning of every school year has been for my students to develop a connection with the outdoors. To achieve this aim, I expose my students to various outdoor activities and experiences. Due to the success I have had with my EOE program, I have developed a strong reputation as a top environmental outdoor educator in Edmonton Public. I have often had teachers referred to me by the Physical Education Consultant for help and resources. My reputation has allowed me to improve other schools' Environmental Outdoor Education programs by organizing professional development opportunities for other environmental outdoor educators in the district. I also led a committee known as the EOE vision and mission committee whose goal was to create a mission statement, a vision statement, and an implementation plan for Environmental Outdoor Education for the Edmonton Public School Board. We have not completed our objectives and we will begin to work towards our goals soon.

### **Motivation**

Despite having a successful program at Avalon, I have constantly had to justify the value of the program to my administrators, as well as the school board. Questions like: is the cost of the field trips worth the expense? Is it necessary to have experience in teaching EOE or outdoor pursuits to teach an EOE class? Why should it be a full year course, wouldn't it suffice to just semester it? Lastly, EOE is just camping and hiking, it is far from academic like band right? Furthermore, I have witnessed other schools selecting their EOE teachers because those individuals have participated in some type of outdoor pursuit activity, not because they were

qualified or interested in teaching Environmental Outdoor Education. It is my opinion that the same questionable method of instructor selection would not occur for programs such as Band or Industrial Arts. One of the main reasons I decided to obtain my Masters degree in Environmental Education was that I hoped that I and my subject area might be viewed with the greater respect and legitimacy, and subsequently be given the chance to present my findings to the Trustees of Edmonton Public Schools, and try to convince them to support and advance Environmental Outdoor Education. It is my goal that EOE will be prized and valued, and that someday there will be a dedicated school board consultant specializing in Environmental Outdoor Education. Such an individual would be a great resource for teachers in the field. With the increasing concern about the health of the environment, it is also my belief, that if students participate in activities in the outdoors, they will develop an appreciation and love for the environment, and in so doing take steps to protect it. Although teaching others about the environment is not a part of my study, it is nonetheless an important aspect of any Environmental Outdoor Education program. My father always said “the outdoors is the world’s greatest classroom” and I couldn’t agree more. Through this project I will examine some of the ways that EOE can be valued as an important subject area.

### **Methodology**

I have chosen to do an annotated bibliography as the main section of my final Masters project for two reasons. First, my main goal is to develop a greater awareness of what the current research says on how Environmental Outdoor Educational type programs can improve student wellness, as well as academic achievement through interactions in nature. I will then take the findings to the Edmonton Public School Board, in hopes of convincing them to support and advance Environmental Outdoor Education for the benefit of students. Second, I want to provide

the University of Alberta and the EOE community with a resource that other students and researchers and the general public can use if they are looking into wellness and Environmental Outdoor Education. An annotated bibliography, I contend, will be a benefit to anyone interested in examining the current research and literature in general on Environmental Outdoor Educational type programs and student wellness. With an annotated bibliography, future researchers would be able to pinpoint various articles that they may need to use in order to support their research. It would also afford me the ability to look back and pick out specific articles that may help me advance Environmental Outdoor Education. I used a standard form of annotated bibliography where I summarized each article and then provide a short critique. I broke up the articles into applicable sections to aid anyone who intends to use it.

I have separated the articles into two categories; articles on EOE and wellness, and articles on nature, wellness and achievement. The articles in the EOE and wellness section directly relate to Environmental Outdoor Education because each article involves some type of outdoor education type program. I specifically searched out articles whose focus was on connecting outdoor education type programs to some form of wellness. I did this because I will be able to use the results as evidence to support my presentation to the board of trustees. I believe that if I have articles that prove that programs like EOE can and do have the potential to positively affect student wellness it will be easier to convince the board to support my ultimate goal. The nature, wellness and achievement section contains articles that show how being in the presence of nature improves wellness and can improve student achievement. This section relates to EOE in that many of the activities done in the course take place outside with some form of nature close by. I believe it is also useful for non-EOE teachers who may be encouraged to take

their students outside as part of their teaching practice because of research that encourages connecting with nature, and the benefits that come from it.

### **Annotated Bibliography**

#### **Articles on EOE and Wellness**

The following articles examine how different physical activities might improve a person's mental well-being. I have chosen these research papers because they all directly relate to EOE. For example, some involved research participants taking part in outdoor pursuit activities like backpacking, hiking, and orienteering. These activities can be found in quality EOE programs in schools within the Edmonton Public School Board; therefore, the positive effects on self-esteem, self-confidence, and a general feeling of mental well-being can be experienced at the school level. Some articles focus on combining EOE type programs with the counseling program, called adventure therapy, where subjects obtain psychological therapy while participating in an EOE type program. I understand that there is no formal counseling going on in an EOE program in any of the schools I am aware of; however, the positive effects of being outdoors and being active can still be experienced by students. All but a few of these articles have found that participating in physical activity outdoors can improve a person's mental well-being.

- 1) Barton, J., & Pretty, J. (2010). What is the best dose of nature and green exercise for improving mental health? A multi-study analysis. *Environmental science & technology*, 44(10), 3947-3955.

Barton and Pretty conducted a meta-analysis of ten UK studies that were looking at exposure to nature and level of exercise between males and females in different age groups in the

UK. They were specifically studying improvements in mental health. They found that exposure to any type of outdoor environment improved both the self-esteem and the mood of the participants. They also found that the younger age groups showed the greatest improvement compared to other age groups involved, and that the positive effects of environmental exposure decreased with age. The results further suggested that the biggest improvement came from approximately 5 minutes of activity, however, these effects then decreased the longer the participants were outside, but rose again when the activity was sustained over a whole day. The authors speculated that a reason for the improvement during short periods of time might be due to the types of activities done in that time, the shorter the activity the lower the intensity of the exercise, therefore the greater enjoyment. Longer term activities were ones that took place over many hours like hiking or camping where the intensity is again low. Greater improvement was also seen when participants took part in light physical activity. The authors felt that further research is needed on a larger scale to look at different population groups, length of time exposed to nature, and type of exercise done in various outdoor environments. They stressed that more work should be done on the health benefits of outdoor activities for children, and how they may carry through to later life.

2) Berman, D. S., & Davis-Berman, J. (2000). Therapeutic uses of outdoor education. ERIC Digest (December) 1-9.

The authors created a digest that categorized and examined various types of outdoor educational type activities, specifically: “adventure therapy programs, personal growth programs, college orientation, recreational and camping programs” (Berman & Davis-Berman, 2000, p.2) in the United States, and the effects on the emotional well-being of the different participants. They not only looked at outdoor programs that were focused on the participants’ emotional

therapy but also other programs whose main goals were outdoor participation. This publication provides an excellent definition of outdoor education and experiential learning. Their definition for Outdoor education is “Outdoor education involves democratic learning environments that stress an interactive process among students and teachers and experiential learning (Berman & Davis-Berman, 2000, p.2). They used Boss’s (1999) definition of experiential education as “learning by doing” (Berman & Davis-Berman, 2000, p.2). Berman and Davis-Berman described various forms of adventure therapy programs including: personal growth programs, Outward Bound, college adventure programs, recreation programs, and camping programs. This digest provides a good overview of the topic, and it would be useful for someone who is trying to narrow down their focus to a certain type of program. It also includes excellent references to other articles where one could look in order to obtain more information.

3) Boyes, M. (2000). The place of outdoor education in the health and physical education curriculum. *Journal of Physical Education New Zealand*, 33(2), 75-88.

Boyes conducted a historical evaluation of outdoor education in the New Zealand curriculum to suggest where outdoor education should be placed and how it should be provided in New Zealand. This article gives an excellent definition of outdoor education and a good perspective of how it has developed and changed over time in New Zealand. Boyes examined the uses of Outdoor Education through history in New Zealand and provides explanations for its influences. He concluded that outdoor education should hold an important place in the health and physical education curriculum in New Zealand not only because it provides physical benefits to the students, but also because it improves the emotional well-being of the participants as cited in Rubens (1998). Boyes also noted that outdoor education should play a greater role in students’ education in New Zealand in order to provide students with its physical and emotional

benefits, as well as to help them develop a relationship with the outdoors. Several of his recommendations might be transferred to the Canadian context. Boyes states that we need to maintain “the physicality of the experience while optimising the opportunities to understand people’s relationships in and with the outdoors” (p. 85).

- 4) Brand, D. (2001). A longitudinal study of the effects of a wilderness-enhanced program on behaviour-disordered adolescents. *Australian Journal of Outdoor Education*, 6(1), 40-56.

The author carried out a longitudinal study of 190 male subjects, using pre and post-test along with the Jessor and Jessor’s Problem Behaviour Proneness model to explore the potential long-term effects of a wilderness-enhanced program for male students with behavioural disorders. Brand stated that there was very little research done on the long-term effects of a program that used a wilderness aspect for students with behavioural disorders, so she completed this study to fill this gap. Brand used “a longitudinal research design with a pre and post-test” (Brand, 2001, p. 45). The study found that using a wilderness experience as part of a cognitive based therapy program provided an excellent starting point to help young males change and improve their behaviours. It was noted that the wilderness experience did not significantly improve behaviour in the short term, but partnered with therapy over a two year period, was related to positive effects (e.g. increased self-esteem, and commitment to school) as reported by the subjects.

- 5) Cain, J. (2003). In defense of adventure-based education and active learning opportunities. In S. Wurdinger & J. Steffens (Ed.), *Developing Challenge Course Programs for Schools* (Chapter 20). Kendall / Hunt Publication.

Cain used various forms of documentation to support the idea that adventure-based education improves student wellness and provides learning opportunities. He referred to sources ranging from historical, like John Dewey, to governmental through the New York Health Department, as well as various organizations specialized in adventure education. The most notable was the Association for Experiential Education. Cain also referred to various websites that focus on adventure education. It was his goal that the article would assist others in convincing their school administrations of the benefits of using adventure-based education. Cain used Maslow's concept of a hierarchy of needs as described in the chapter written by D.M. McGregor in the book *Great Writings in Management & Organization Behaviour* edited by Louis Boone (1984) to examine the benefits of EOE. Maslow's hierarchy of human needs has two basic levels of needs: physiological needs, and safety needs. These are followed by: social needs, ego needs, and self-fulfillment needs, each must be fulfilled to be able to reach the higher levels. He focused on meeting students' social needs to increase self-esteem, as he felt without meeting those needs, success, defined as the development of self-esteem, would be unlikely. He believed that students who participate in adventure education would be able to reach higher levels in Maslow's hierarchy. By encouraging the students to come together to work as a team in a social environment, as part of an adventure program, there would be a greater likelihood that they would progress to higher levels of learning. Cain felt that because adventure education takes place outdoors, students' senses would be more engaged, and subsequently their attention would be better. Together this would lead to personal improvement and an increase in learning which would lead to greater self-esteem. I felt Cain did an excellent job of examining the topic and, although it was based in the United States, it is applicable for use in Canada due to our similar struggle to keep children healthy and active.

6) Cook, E. C. (2008). Residential wilderness programs: The role of social support in influencing self-evaluations of male adolescents. *Adolescence*, 43(172), 751-774.

Cook completed a qualitative study to explore the potential elements of a residential wilderness experience that might improve young male participants' self-esteem. The 13 male participants, ages 12 to 16, were enrolled in a year-long residential wilderness program in the southeastern United States. The purpose of the residential wilderness program was to provide counselling to help the boys better deal with their behavioral and emotional problems. The organizers of the program used individual and family counseling, experiential learning, and outdoor challenges as part of their program. Participants were given a pretest questionnaire and interview and then four months after they participated in the program they completed a post-test questionnaire and interview. The tests measured "main-specific judgments of competence in nine domains as well as global self-worth (p. 757). Some of the questions explored which activities the boys perceived helped them the most. A major focus of the program and contention of the author is that social support from peers improves adolescence self-evaluations and leads to more positive outcomes.

The results of the study suggested that activities which encouraged cooperation and emotional expression helped the boys develop an improved self-image. Activities like cooperative games, canoeing, ropes course, and cooking encouraged cooperation among the participants and helped the boys enhance their self-esteem. The previous activities are all possible through EOE; however, students in normal EOE programs would not be as immersed in the wilderness experience as participants in this study, as the boys were enrolled in a year-long program that took place in a wilderness setting. That being said, some improvement in self-

esteem by EOE students in regular school programs could possibly be experienced by participating in the above activities.

- 7) D'Amato, L.G., & Krasny, E. (2011). Outdoor adventure education: applying transformative learning theory to understanding instrumental learning and personal growth in environmental education. *The Journal of Environmental Education*, 42(4), 237-254.

D'Amato and Krasny conducted a qualitative study with twenty three adults who completed an outdoor adventure program. The researchers' intent was to explore any benefits the participants perceived they had and what may have led to these perceived benefits. D'Amato and Krasny used transformative learning theory to explain the results of the study. They used participants from Outward Bound courses and National Outdoor Leadership School (NOLS) courses to ensure they sampled a cross-section of experiences from different organizations. D'Amato & Krasny found that twenty one of the twenty three participants commented on the positive physiological benefits from spending time in nature. The participants referred to feeling more balanced, comfortable and at peace, as well as having a better sense of self and obtaining mental clarity because of their time in the courses. They also commented on feeling less stress from their daily lives after participating in the adventure program. Many subjects reported being able to take the benefits from the course and carry them over into their real life, thus experiencing the benefits over the long-term. A number of participants did report a feeling of being 'let down' once returning back to their normal lives, and of missing their experiences from the course. Lastly, many commented on how they had developed a closer connection with nature, and how much they want to return to the wild. Even though this study was focused on adults I believe it would transfer very well to children in school as children are just a open to connecting with nature as adults.

- 8) Davidson, L. (2001). Qualitative research and making meaning from adventure: A case study of boys' experiences of outdoor education at school. *Journal of Adventure Education & Outdoor Learning*, 1(2), 11-20.

Davidson conducted a qualitative study looking at the effects that EOE might have on the self-image on school aged boys. She looked at grade twelve boys who attended a private school in New Zealand, and found that their involvement in EOE was associated with a significant increase in life skills, positive attitudes, confidence, and self-worth. Some of the activities the boys took part in were rock climbing, nature awareness kayaking, as well as other outdoor pursuits. Davidson not only used a survey, she also observed the boys for six weeks. Through the challenges they faced in the outdoor activities, the boys were able to learn how to think positively about themselves, giving them skills to manage difficulties faced later in life, and thus the tools to be able to live a happier life. Davidson also commented on how some of the boys later contacted their teacher to thank them for their experiences from the previous year. I found this article to be very informative, and it reaffirmed my contention that experiences in the outdoors can have long-term effects on participants after they have completed an EOE program.

- 9) Ewert, A.W., McCormick, B. P., & Voight, A. E., (2001). Outdoor experiential therapies: implications for TR practice. *Therapeutic Recreation Journal*, 35(2), 107-122.

The authors examined the benefits of using outdoor therapy as part of a therapeutic recreation program. This article discussed different forms of experiential therapy and provides a good background for each. The authors' findings were that participants in these programs showed improvement in overall wellness, especially in what they described as the "self-systems" (Ewert et al., 2011, p. 119). Self-systems are self-esteem, self-control, self-concept and other

personal control mechanisms. The authors suggest that the outdoor therapy programs described in the article should be considered by therapists for various types of clients. Although this article is not specific to education, I suggest the findings can be transferred to the classroom because teachers deal with so many different types of students and any potential improvement to their self-concept is worthwhile.

- 10) Ewert, A., & Yoshino, A. (2011). The influence of short-term adventure-based experiences on levels of resilience. *Journal of Adventure Education and Outdoor Learning*, 11(1), 35-50.

Ewert and Yoshino explored whether the resilience scores of participants in short term adventure education experiences would change and which, if any, specific experiences the participants said affected them. Ewert and Yoshino (2011) define resilience as “the presence of an adaptive system that uses exposure to stress to provide resistance to future negative events” (p. 36). The authors used a mixed methods approach containing a pre and post-test as well as interviews that took place two to three years after the experience. The researchers used eighty-five students for their research that were split into two groups. Half the group were enrolled in a semester-long traditional classroom course with desks, and instructors lecturing, while the second group participated in a course held in the spring of 2006 and 2007 which included a three week adventure based expedition which involved rock climbing, winter camping, desert travel, and a three day solo experience, much like an Outward Bound program. The classroom group was used as the control and did not participate in any outdoor experience as part of the course.

The results of the experiment showed that students who participated in the three week outdoor experience reported enhanced levels of resilience compared to the control group.

Further to that, six themes emerged from the interview process that took place two to three years post-trip. Those themes were: perseverance, self-awareness, confidence, social support, responsibility to others, and achievement. These results strongly suggested that the participants gained a lot more than just resilience from their three week experience.

11) Garst, B., Scheider, I., & Baker, D. (2001). Outdoor adventure program participation impacts on adolescent self-perception. *Journal of Experiential Education*, 24(1), 41-49.

Garst, Schneider, and Baker used a mixed methods approach to examine the impact that an outdoor adventure trip might have on urban adolescents' self-perception, and to understand if any influences from their outdoor adventure trip transferred to the participants' home environments. They defined self-perception as containing eight domains: scholastic competence, physical appearance, athletic competence, social acceptance, job competence, behavioral conduct, close friendships, and romantic appeal. They used both qualitative and quantitative data collection pre-trip, post-trip, and four months (delayed-post) following the outdoor experience. The reason for obtaining data four months after the trip was to find out if they were any longer-lasting effects, as they said most research to date only included post-trip data collection. The youth participants were from the Southwest United States and attended different youth centers. The subjects were split into three groups and attended three different three-day outdoor adventure trips in a park managed by the US Forest Service. While on the trip, the youths participated in activities such as initiative tasks, hiking, caving, and other environmental educational programs. The study found that there was an immediate increase in perceived social acceptance, but that this gain diminished over the four-month period as measured by the post-test. Garst, Schneider, and Baker also reported that behavioral conduct increased greatly, as a result of the trip, and that this factor did not decline in the four months following the outdoor

adventure. The results also suggested that many of the behavioral changes transferred to the participants' home environments. Overall, the authors reported that the outdoor experience enhanced participants' self-perception.

The results from this research clearly translate to an EOE program as in many EOE programs the students participate in similar activities as the ones used for this study. However, the authors indicated that a minimum of three days is required so adolescents can feel separated from their normal life. This could be accomplished through three-day camping trips with EOE students.

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

Gustafsson et al. used a quasi-experimental, non-equivalent groups design to investigate how EOE might improve the mental health of school aged children. They recruited participants from two elementary schools in Sweden; the test school was in a rural area while the control school was in an urban setting. The researchers wanted to know if outdoor experiences had a greater effect on elementary aged students' well-being than indoor activities. They found that the test group did not show any significant improvement compared to the control group. However, there was a slightly greater improvement noted when the two groups were compared based on gender, with boys experiencing a greater benefit. The reviewers recognized the limitations of their research, the first being that the schools were quite different in terms of their location, (i.e., one rural and one urban) and their socio-economic status. Further, the test school was considered more environmentally and socially privileged than the control school. I believe

that the subjects were poorly selected for the study as the test group already spent more time outdoors than the urban school, prior to participating in the study. I think that the study should be redone using two groups of students who have equitable experience outdoors, to see if exposure to nature truly improves well-being. I also believe that the selected groups should be an equal mix of both genders to make it more applicable to both populations.

13) Hattie, J., Marsh, H. W., Neill, J. T., & Richards, G. E. (1997). Adventure education and outward bound: Out-of-class experiences that make a lasting difference. *Review of Educational Research*, 67(1), 43-87.

Hattie et al. conducted a meta-analysis to construct an overview of the effects of adventure programs on participants. They looked at self-concept, locus of control, and leadership, among other variables. The study found that adventure programs had a positive impact on participant's self-esteem, leadership abilities, social skills, and academics. Furthermore, it was found that the longer the duration of the program, the greater the influence it had on the participants, and the longer the positive effects were retained. The authors explained that physical fitness was not the main goal of each program. Rather, the intent was to challenge the participants in adventure activities within unfamiliar environments. This was done to encourage the subjects to examine their weaknesses and strengths so they could persevere and overcome challenges. Group development, as well as personal growth, were the goals of the program. Hattie et al. found that, based on a comparison of their pre-test and post-test results, adventure programs did more to improve self-concept than indoor classroom based programs that focused on self-concept. Hattie et al. (1997) concluded that "it seems that adventure programs have a major impact on the lives of participants and this impact is lasting" (p. 70). I found this

meta-analysis to be very beneficial and found that it supports the idea of full year EOE programs in schools because the longer the program the greater the effect it should have on students.

- 14) Hlasny, J. G. (2000). *The effects of an outdoor experiential education program on a student's self-concept and their perceptions of the program* (Doctoral dissertation, University of Wisconsin).

Hlasny endeavored to determine if short-term outdoor experiences would have an effect on students' self-concept the same as long term outdoor experiences like Outward Bound have shown to have. He selected forty-five students from the University of Wisconsin to participate in three different outdoor experiences: map and compass, canoeing techniques, and outdoor skills. The students were given the choice of which of the three activities they wanted to participate in. The map and compass trip included one two-hour classroom session and a three-day out trip; the outdoor skills class had two, two-hour classroom sessions and a three-day out trip, and the canoe class consisted of one two-hour class and a three-day canoe trip. The students participated in a pre-and post-tests using the Tennessee Self-Concept Scale Second Edition. The researcher also chose five students from each trip who showed the most significant changes in self-concept to be interviewed. Taken individually there was little difference in improvement in self-concept within each trip, however, when all three trips were combined to create a larger sample size there was a significant improvement in self-concept between the pretest and the post test. Results from the interviews revealed seven common themes amongst the participants: teamwork, having fun and making friends, personal growth, enjoyment of the outdoors, personal calming and solitude, adventure and challenge, and trust.

This study directly relates to EOE because the outdoor experiences done as a part of the EOE program would be considered short-term unlike the multi-week long Outward Bound trips that a lot of the research has been focused on. This dissertation can then support the view that EOE improves student wellness, specifically improving self-concept.

15) Lugg, A. (1999). Directions in outdoor education curriculum. *Australian Journal of Outdoor Education*, 4(1), 24-32.

Lugg's position paper focused on how outdoor education needed, at that time, to evolve in Australia within the Victoria Provincial school system. She described the place of outdoor education in the then curriculum. As well, Lugg noted the problems facing outdoor educators, one of which was trying to convince administrators of the worth of outdoor education. She looked at the development of curriculum at the time. Lugg raised many points as to why outdoor education is valuable and important to students, stating that, in one case, it is a very popular option that inspires students. She concluded that outdoor education deserves a greater role in the curriculum. However, she suggested outdoor educators needed to establish common goals and direction. Lugg also emphasized that outdoor education should be taught by experienced and specialized outdoor education teachers, not by "anyone who has been bushwalking or is trained in physical education." (p. 31). I found this article very applicable because Lugg states exactly what I believe to be the problem here in Edmonton Public School Board, which is that many principals choose their EOE teachers because they do outdoor pursuit activities, and not because they are trained EOE teachers.

16) Neill, J. T., & Dias, K. L. (2001). Adventure education and resilience: The double-edged sword. *Journal of Adventure Education & Outdoor Learning*, 1(2), 35-42.

The purpose of this study was to seek support for the contention that adventure type programs improve participants' psychological resilience. Neill and Dias recruited subjects from a twenty-two day Outward Bound Australia trip to see if the participants' resilience increased upon completing the course. The authors describe resilience as a person's ability to maintain, recover, or improve one's mental health after dealing with a life challenge. They believed that by challenging the participants in an outdoor setting that they would be able to translate the resilience they developed on the trip into future life challenges not necessarily based outdoors. The authors were of the view that the challenges the participants would face in the Outward Bound program combined with a supportive social group would create a situation where resilience could be enhanced.

The forty-nine participants, whose mean age was twenty-one, completed the Resilience Scale test before the trip and then again after. The Resilience Scale test is a "twenty-five item self-report questionnaire" (p. 37). A control group of similar age did the pretest and five weeks later completed the post-test. Some of the activities the participants took part in were initiative tasks, ropes course, food preparation, bushwhacking, canoeing, rock climbing, and a three-day solo sit. All of these activities can be done in a secondary school course except perhaps the 3 day solo sit. The results showed there was a large overall improvement in the Resilience Scale scores for the experimental group and only a marginal change in the control group. The participants in the experimental group also commented that there was a high level of perceived social support amongst the group, however, there was little perceived support from within the control group.

As we want our students to be able to deal with life challenges this article provides strong evidence that effective EOE programs with quality activities can increase students resiliency which, I suggest, will improve their mental well-being.

17) Passarelli, A., Hall, E., & Anderson, M. (2010). A strengths-based approach to outdoor and adventure education: Possibilities for personal growth. *Journal of Experiential Education*, 33(2), 120-135.

Passarelli and Anderson discussed how using a strength-based educational philosophy with an outdoor adventure program can improve participants' attitude about themselves and others. Strength-based education comes from positive psychology, a field where psychologists study the effects of positive experiences on people. In an educational context, a strength-based approach refers to activities within which participants discover their strengths, and a program is developed to help each person use and improve upon these strengths. Such actions are taken in accordance with the belief that people will show greater improvements if their "natural talents" (p.122) are focused on, instead of only decreasing their weaknesses. With the understanding that outdoor experiences have been shown to increase feelings of self-worth, Passarelli and Anderson wanted to see what, if any, improvements in participant self-esteem would occur by combining the two disciplines. It was hypothesized that when people take part in "activities that involve the exploration and application of one's strength, [will] produce a positive emotional response" (p. 122) and that positive emotions can be built up which can be drawn upon in challenging situations.

The participants took the Gallup Organization's Clifton Strengths Finder (CSF) test, which evaluates a person's strengths like leadership, compassion, creativity, etc., before they had taken part in a college course with a focus on ecotourism that took place in another country. As part of the study abroad course the students took part in various outdoor activities like "hiking, rappelling, canyoning, snorkeling, and surfing" (p. 124). The students were then given two surveys at the end of their course to assess their personal growth and awareness of their strengths. The researchers also used the students' final reflection papers to search for results.

Passarelli and Anderson found three areas where personal growth took place due to the strength based educational approach: mindful learning, enhanced relationships, and overcoming physical challenges. Once the students found out about their strengths they were better able to apply them in various situations. For example one student found out they had strong leadership qualities and became more confident in taking a leadership role. Students were also able to set personal goals to improve upon their strengths and learn ways in which to apply them. Secondly, the students were able to use their strengths to build and maintain relationships within the group. Some students talked about how they were able to use her strengths to build the relationships and build trust with fellow students. One student spoke about discovering one of her strengths being "harmony (relating to others by looking for areas of agreement)" (p. 128), which she found useful when trying to resolve a conflict between classmates. She spoke about the satisfaction she felt by being able to help her classmates through the conflict. Lastly, students talked about using their strengths to overcome some of the physical challenges involved in the course. For example, one student spoke about using his achiever strength, which is striving to satisfy his will to succeed, to push through the physical demands of activities like a long three-hour hike. The

authors suggested that the results show that using a strength-based approach helped the students develop their strengths and led to their personal growth.

In an EOE setting, I contend that discovering students' strengths, pointing them out to them, and setting up situations where the students can use their strengths, will add to their self-worth and self-confidence because students will feel special and successful in areas. At the teenage level any success and development of self-worth is important.

18) Smith, H., & Penney, D. (2010). Effective, exemplary, extraordinary? Towards an understanding of extraordinary outdoor leadership. *Australian Journal of Outdoor Education*, 14(1), 23-29.

Smith and Penney used a conceptual framework to create a definition for helping determine effective, exemplary and extraordinary leaders. The authors employed different leadership theories to conceptualise each of the three levels of leadership. They were able to come up with qualitative descriptors for the three levels which, they feel, will further the research in this area. I felt this article is a valuable resource for people to use to improve their leadership skills, as to be an effective Outdoor Education teacher one needs to be an effective leader. The clear descriptions of the differences between an effective, exemplary, or extraordinary leader provide educators with the ability to see what traits they may have and where they may fit in one of the three levels of leadership. With this knowledge they have the potential to be able to develop in areas that they may be lacking. It is my belief that leadership is a skill and by knowing what makes a person an extraordinary leader one can work towards that classification by knowing what is needed. If outdoor educators are able to improve their

leadership abilities then they will be able to provide better outdoor programming for their participants and thus, increase the potential for improving their students' well-being.

19) Thompson Coon, J., Boddy, K., Stein, K., Whear, R., Barton, J., & Depledge, M. H. (2011).

Does participating in physical activity in outdoor natural environments have a greater effect on physical and mental wellbeing than physical activity indoors? A systematic review. *Environmental Science & Technology*, 45(5), 1761-1772.

Thompson Coon et al. (2011) reviewed the available literature on participating in physical activities inside, as compared to outside, with respect to the impact on the well-being of the participants. The purpose of the review was to determine if there was evidence regarding the superior health benefits of outdoor exercise to support a national campaign to encourage people in the UK to exercise outside, and to do so for longer periods of time. The authors pointed out that "40-50% of individuals terminate gym memberships within a year of joining. Anecdotal evidence suggested that the long-term adherence to exercise conducted in the outdoor natural environments and urban green spaces may be superior to that of indoor exercise interventions" (p. 1762). They used various methods to search for the articles and were often not satisfied with the test procedures, the location of the green spaces, the quality of data collection, and other factors. The results from all the studies examined did indicate that participating in physical activities outdoors, when compared to those exercises indoors, improves the physical and mental well-being of the participants. Participants reported a decrease in tension, confusion, anger, and depression, while noting an increase in positive engagement and energy. They also commented on enjoying the activity more than when it was done outside compared to indoors.

Seeing that EOE contains various physical activities that take place outside I would conclude that the results from this article would transfer over to the activities in Environmental Outdoor Education. By taking the students outside to cross-country ski I would argue that even a short class done in the school field would provide greater benefit emotionally and physically to the students than would a standard physical education class done in a gymnasium.

20) Wang, C. J., Liu, W. C., & Kahlid, A. (2006). Effects of a five-day Outward Bound course on female students in Singapore. *Australian Journal of Outdoor Education*, 10(2), 20-28.

Although there has been little research done on the effects of outdoor adventure programs with young female participants, this article was an attempt to determine what effects outdoor adventure programs have on young girls in a Singapore school. Specifically the authors wanted to find out if there was an improvement in the girls' personal skills, social skills, interpersonal skills, leadership, and self-esteem after they took part in the outdoor course. Wang, Liu, and Kahlid did a short literature review to show that much of the research that had been done up until the drafting of their article was focused on male participants, and that these previous studies showed that outdoor adventure type programs did in fact improve the areas Wang, Liu, and Kahlid were examining in their study. Another purpose for this study was to determine if the outdoor program provided by the Singaporean Ministry of Education was worthwhile to the students.

The authors studied 149 secondary school female students ages 13 to 16 years who participated in a five-day outward discovery course through Outward Bound Singapore. The course is a compulsory component of the physical education curriculum in Singapore. The girls completed a pre-trip questionnaire which took place a week before the trip and then a post-trip

questionnaire which took place immediately upon the completion of the course. The questionnaire examined the girls' opinions of their: behavior, leadership, social skills, interpersonal skills, and their self-esteem. There were also questions that related to their motivation for taking the program. The girls scored relatively high in the leadership, social, and interpersonal skills on the pre-trip questionnaire and had moderate levels of self-esteem before the course. At the end of the course the participants scored much higher in all areas and they reported that they were very satisfied with the overall course. These results were not a surprise to the authors as very similar results were found in other experiments done on mostly male participants. It was also found that the girls who had a higher motivation prior to the course did better than those who are not as motivated.

The results of this article clearly show the value of EOE type programs and how they can improve the self-esteem, leadership, and social skills of the girls participating in different EOE programs. The majority of the research I have found is often focused on male participants. However, often half or more of those in my past EOE classes are girls. With this article in hand I am able to claim that EOE is beneficial for all students of both genders which, I believe, adds more validity to my project.

21) Wells, N. M., & Evans, G. W. (2003). Nearby nature: a buffer of life stress among rural children. *Environment and Behavior* 35, 311-330.

Wells and Evans used a mixed methods approach to explore the effects of “nearby nature” (p.1) on grade three to five students in a rural school. They wanted to find out if being close to nature would have an influence on the stress levels of these students and how it might impact their well-being. They studied 337 students and involved their parents, teachers, and the

school principal in the study. The authors found that being in close proximity to nature reduced the students' stress levels and improved their well-being compared to students with limited proximity to nature. The researchers rated the amount of stress students had from different sources such as family divorce, illness, school requirements, etc., as low, medium, or high. The authors found that regardless of the level of stress the student had, being able to see nature reduced their stress compared to those students who did not have a proximity to nature. I would extrapolate their results and suggest that spending time in nature through EOE would have a similar effect.

### **Summary of Articles on EOE and Wellness**

Although this section of the bibliography is not exhaustive I suggest it supports a view that there is a growing amount of research on the benefits of EOE type activities as well as the value of spending time in nature. The majority of the literature I was able to find came from Australia and New Zealand with some from the United States and Europe. To date I have been unable to find any articles from Canada. For a country that values exploring its National Parks and wild areas, there should be more research on how Canadians benefit from being active in our outdoors. With the increasing concern over our growing obesity rate (CBC, 2012), the promotion of the benefits of wellness through programs like EOE should be a focus of Provincial curriculum designers, policy makers, school boards, and others. Canadians have a wonderful resource that is just on the other side of our school doors, and which has been shown to provide so many benefits, but many don't take full advantage of their school fields and green space, nor do we research what is being done in our country. It is my hope that someday soon EOE will be recognized for the special program it is and be supported and promoted across Canada. If a large

school board like Edmonton Public Schools can make EOE a priority, it would give greater opportunities for researchers to study the subject in Canada.

The EOE and wellness section examines different ways of improving wellness through the use of outdoor education type activities. Articles from Barton and Pretty (2010), Hattie, et al. (1997), and Thompson Coon, et al. (2011) all support the view that there are measurable improvements in mental well-being, self-esteem, mood, and social skills through participating in outdoor educational type activities. D'Amato & Krasny (2011) and Garst, Schneider, and Baker (2001) reported that the positive effects on a person's self-esteem, confidence, and problem-solving continue well past the completion of an outdoor adventure. I found Cain's (2003) use of Maslow's hierarchy to measure the improvement in participants social skills and their extrapolation that the improvement would have a positive effect on higher levels of the hierarchy quite interesting because I never thought of nature and spending time in it as such a profound way of fulfilling needs to help students reach higher levels of needs. I was glad to find Wang & Kahlid's (2006) study on the positive effects of outdoor educational type activities on girls because I found the majority of the articles focused primarily on male subjects. Overall, I believe the selected articles encourage and support the advancement of EOE.

### **Articles on Nature, Wellness and Achievement**

The following section contains articles that examine how being exposed to nature can have positive effects on subjects' mental abilities and mental and physical wellness. Improvement in creativity, attention, decreased blood pressure, and alertness are just some of the benefits of being outdoors. Some articles do not even take place outdoors and just measure the impact of seeing nature on a subject's well-being. This section not only relates to EOE but has a

lot of transferability to any subject in school in that any teacher can take their students outside for a class or put pictures of nature up on a projector. Simple actions like these do not take a lot of preparation however they can make a difference.

I am placing the following article at the start of this section, out of alphabetical order because it is referred to by so many of the articles I chose for this section. Kaplan's work on Attention Restoration Theory, in my opinion, was ground breaking and is the key to this section.

22) Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology, 15*(3), 169-182.

This article examined how nature might restore a person's level of attention; Kaplan calls it Attention Restorative Theory (ART). ART, is Kaplan's theory that a person can restore their directed attention by spending time in or looking at nature. He describes the two types of attention namely directed attention (voluntary) and involuntary attention. Directed attention has limits; it takes effort to maintain directed attention and when it is used up it must be allowed to be restored. Involuntary attention requires no effort and is needed to restore directed attention. One way of restoring directed attention is sleep. Kaplan says that while an individual is in involuntary mode directed attention is able to rest. He goes on to explain fascination, which he splits into hard fascination and soft fascination. Hard fascination is when a person completely focuses on something, for example watching a car race. Soft fascination is when somebody is walking through the woods and their attention is wandering from one thing to another.

Kaplan describes three ways a person can restore their directed attention: 1) being away from an activity for short period of time, or changing one's attention, for example looking out a window. 2) The new environment must be rich enough to create the image of it being

completely different from the environment that a person is currently in (Kaplan refers to this as extent), for example inside an office compared to being in a forest. 3) The environment should be compatible with what one is trying to achieve so, for example, that when a person is trying to relax the environment must be considered relaxing.

Kaplan goes on to say how natural environments provide the necessary tools to restore one's directed attention. Such a setting has fascination, extent, and compatibility all of which are needed to restore attention. Kaplan refers to studies from Hartig (1991) one of which involves the comparison of vacationers and found that those who vacationed in a wilderness type area were able to proofread better than those who did not. Hartig also found that all of the requirements to restore attention were perceived to be present in the wilderness area. Hartig's second study looked at how well being in nature improved participant's directed attention. He used the Necker cube as a way of measuring attention and found that those who took a break in a natural setting showed better attention recovery than those who stayed inside.

Kaplan also referred to Cimprich's (1992) and (1993) studies of cancer patients and their recovery using walks in nature. One group used walks in a natural area as part their recovery and the other did not. The group that went outside showed greater improvements than the group who did not. Lastly Kaplan referred to Tennyson and Cimprich's (1995) study which looked at the restorative benefits of a natural view from a dormitory window and found that those students who had a natural view rated themselves as more effective in daily life compared to those without a window.

Kaplan went on to discuss the causes of stress, the different types of stress, and their effects on attention. Kaplan concludes that "experience in natural environments can not only

help mitigate stress; it can also be prevented through aiding in the recovery of this essential resource” (p. 180). Kaplan concluded that reducing stress allows for people’s attention to be restored.

23) Atchley, R. A., Strayer, D. L., & Atchley, P. (2012). Creativity in the wild: Improving creative reasoning through immersion in natural settings. *PloS one*,7(12), e51474.

Atchley, Strayer, and Atchley (2012) completed a research study exploring the effects that immersion in nature would have on replenishing some of the lower levels of the executive attentional system, which is the part of the brain that controls attention. As part of the study the participants were immersed in nature for four to six days and they were unable to bring any technological devices that would demand their attention. The researchers based their study on Kaplan’s (1995) Attention Restoration Theory (ART) which looks at how nature can restore human attention. ART “suggests that nature has specific restorative effects on the prefrontal cortex-mediated executive attentional system which can be depleted with overuse” (Atchley, Strayer, & Atchley, 2012, p. 1). It is believed that the more people use technology the greater the demand it puts on people’s attention systems, and that by being in a natural setting, these attentional systems are able to be restored.

The fifty-six participants (twenty-six females, thirty males) took part in different Outward Bound backpacking trips. Half of the participants were given the Remote Associates Test (RAT), which is a higher order cognitive task before the trip and the other half was given the test on the fourth day of the trip. The results were that the group that took the test on the fourth day of the trip had a 50% increase in performance over the pre-trip group (Atchley, Strayer, & Atchley, 2012). The authors believed that the improvement might be due to the slower rhythms

that demand our attention in nature, and which allows the brain to recover. Also, the researchers posited that due to the lack of technology on the trip participants were better able to focus on the task when taking it on the fourth day. The authors believe that people who use less technology, and spend more time in the outdoors, will show a far greater improvement than those who just limit their technology use, but do not expose themselves to nature. The authors did admit that further study is required as it is not known if the removal of technology was the cause of their findings, or if it was the immersion in nature as this is the first study done on this topic they could find.

24) Berman, M. G., Jonides, J., & Kaplan, S. (2008). The cognitive benefits of interacting with nature. *Psychological Science, 19*(12), 1207-1212.

Berman, Jonides, and Kaplan set out to compare the restorative effects of being in nature or an urban setting on participant's directed attention. Their experiments were based on Kaplan's Attention Restoration Theory (ART). The authors did two experiments: the first experiment involved the participants taking tests to deplete their directed attention then have the subjects go for a fifty-five minute walk in a natural setting. After the walk they took another exam to see how much of their directed attention was restored. The other half of the participants went for a fifty-five minute walk in an urban setting and then took the same test as the nature walk group. A month later the two groups switched roles and re-took the tests. The results of experiment one indicated that those people that went on the nature walk were able to replenish their directed attention much better than the group that went for the urban walk. The second experiment involved looking at pictures: some were of nature and the others were of urban settings. Once again the group was split into two separate groups and were given exams to deplete their directed attention. Group one looked at pictures of nature while group two looked

at pictures of an urban setting. The group that looked at the pictures of nature were able to restore their directed attention much better than those who looked at pictures of urban settings.

These experiments relate to EOE for the reason that if students are able to go outside and participate in activities in a natural environment their attention should be restored quicker than if they just stayed in the school. Once their attention has been restored they should be able to perform much better in school. This would possibly then translate to better academic performances of these students.

26) Cervinka, R., Röderer, K., & Hefler, E. (2012). Are nature lovers happy? On various indicators of well-being and connectedness with nature. *Journal of health psychology, 17*(3), 379-388.

The authors examined the relationship between well-being and connectedness with nature through the use of questionnaires with five studies of 547 participants. The Connectedness to Nature Scale developed by Meyer, and Frantz and the Trier Personality Inventory developed by Becker were used. Cervinka, Röderer, and Hefler (2012) completed five separate studies of people aged 15 to 87 in Austria. The questionnaires were administered in private homes and in public places close to the city of Vienna. After each study the authors refined the questionnaire to ensure that they got valid and reliable data. It was found that people who were closely connected with nature had a higher sense of meaningfulness which related to having a purpose in life. The authors also discovered direct links between well-being and connectedness with nature, such that the more connected with nature people are, the greater their feelings of fulfillment, social connectedness, coherence with others, and satisfaction in life. The researchers also found that the more connected people were with nature, the more positive their self-evaluation.

If an EOE program is able to connect their students to nature effectively this then should improve the student's well-being. Connection to nature can be achieved through multiple outdoor activities where students learn to enjoy nature as well as through educational activities that explore natural history and ecology. Some specific activities could be planting trees, picking up garbage in a city park, as well as bird, animal, and plant identification. By providing students with a sense of ownership of the outdoors, I propose this connection to nature can begin.

26) Davis, B., Rea, T., & Waite, S. (2006). The special nature of the outdoors: Its contribution to the education of children aged 3-11. *Australian Journal of Outdoor Education*, 10(2), 3-12.

The authors conducted a qualitative study using interviews with adults and children. The purpose of the article was to explore the use of the outdoors as a place to teach students in the 3-11 age range. The researchers primarily examined two different schools in the UK: Forrest School and Hallwell Lodge (which is a residential outdoor education centre). Both locations used the outdoors as their classroom. The paper found that teaching children outside had its challenges as the environment, namely weather, is not very predictable. However, children enjoyed the space and freedom to explore what the outdoors afforded them. The authors discovered that "the outdoor environment may promote an emphasis on learning to live together and learning to be" (p. 9). They also found that students might be able to develop natural values. I have been interested in programs for younger children that take place primarily outside like that offered by Forrest school. I feel it is one option that EPSB might be able to look at in the future.

27) Dowdell, K., Gray, T., & Maloneb, K. (2011). Nature and its influence on children's outdoor play. *Australian Journal of Outdoor Education*, 15(2), 24-35.

This observational study looked at the differences in how children play and socialize by comparing two different early childhood centers. The first center was a nature focus center that took place primarily outdoors, while the second center was completely indoors in a large warehouse type building. The children in the indoor center had very limited access to the outdoors. There was a window that was too high for the children to see out of; its main purpose was to provide light. The centre had a plant and an aquarium which were they only connections to nature in the space. The authors reported that the children that played outside showed less negative interaction with their peers, and more creative play. Furthermore, the outdoor environment provided the students with more authentic learning. The children in the indoor center had more behavioral issues, needed more direction, and lacked teachable moments. Another interesting finding from the study was that the students in the indoor center showed more instances of risky behavior as compared to those children in the outdoor center. I believe this study provides evidence of the many benefits of teaching children outside rather than keeping them indoors all day.

28) Hansmann, R., Hug, S. M., & Seeland, K. (2007). Restoration and stress relief through physical activities in forests and parks. *Urban Forestry & Urban Greening*, 6(4), 213-225.

The purpose of the study was to determine and explore the restorative effects of visiting an urban park in Zürich, Switzerland. Specifically, the researchers wanted to find out if by visiting a forest the participants' headaches, level of stress, and how balanced they felt changed

after spending time in a forest. Hansmann, Hug, and Sealand referred to both stress reduction theory and attention restoration theory as a basis for their research. Both theories involve the use of natural environments to improve the well-being of people. The researchers surveyed a total of 164 people who were visiting the park. The participants were interviewed before they entered the forest and then again after they exited, to assess if there was any improvement in their well-being, if they had headaches, and if they were gone, and if the stress that they were feeling beforehand decreased. As part of the survey before they entered the park the participants were asked what their main source of stress was for that day, if they had headaches, how they cope with stress, and what part of the forest they feel would be best to help them recover. The results showed reductions in stress, headaches, and a general feeling of wellness after spending time in the forest. It did not seem to make any difference what part of the forest the people were in or what activities they participated in.

One major weakness of the study was that the participants were already on their way to the park and were clearly possibly using the park to deal with their stress. It would have been better if they used participants who did not use a natural setting to deal with their stress to see what improvements they may find through connecting with nature. Clearly this study directly relates to EOE and how through its activities in the outdoors student's well-being will be improved.

29) Hartig, T., Mang, M., & Evans, G. W. (1991). Restorative effects of natural environment experiences. *Environment and behavior*, 23(1), 3-26.

Hartig, Mang, and Evans wanted to verify findings from Kaplan and Kaplan (1989) and Ulrich (1979) as well as other researchers who based their experiments on the two previously

mentioned research articles through the use of stronger experimental methods. Hartig, Mang, and Evans did two studies to explore the extent of the restorative benefits of spending time in nature. Study one involved examining the effects of an extended wilderness backpacking trip compared to other types of vacations or no vacation at all. The second study, was an extension of the first study. However, they used a random selection of college students to see if the effects of walks in a nature park, an urban setting, or a relaxing situation had restorative benefits.

Study one used experienced backpackers as subjects. Some of the participants went on a four to seven day backpacking trip, while others went on non-nature focused vacation; for example a car trip to visit family, and the third group did not participate in any form of vacation at all. All three groups were issued pre-and post-tests as well as a follow-up test twenty-one days after the first post test. Generally, the results suggested that prolonged wilderness experience did have restorative effects. One surprising result was that after completing four to seven day backpacking trip the participants had an increased feeling of sadness which was attributed to the completion of the trip and the knowledge of having to go back to their normal lives. Results from the test twenty-one days after the post test showed that the backpacking group had increased levels of happiness compared to the other two groups which may suggest a preloading of positive emotions that can be drawn upon at a later date.

Study two was done to extend some of the findings from study one under a more controlled environment. The authors used a more robust experimental design that employed random assignment of college students to either a nature walk, a walk in an urban setting, or a relaxing environment. All three groups were given a pre-and post-test to measure their emotional states as well as their level of directed attention. Like many of the previous studies, results suggested that the participants who took part in the nature walk had higher ratings of

overall happiness and had higher restoration levels of their directed attention. The authors concluded that experiences in natural settings are more restorative than experiences in urban settings and that despite their belief that the experiment designs on previous studies were not sound the results remain the same.

30) Lee, K. (2011). The Role of Outdoor Recreation in Promoting Human Health. *Illuminare: A Student Journal in Recreation, Parks, and Tourism Studies*, 9(1), 47-58.

Lee conducted a thorough literature review to identify benefits to human health by people participating in outdoor recreation in backcountry and urban settings. He not only focused on the cornerstones of nature theory of Kaplan and Ulrich, but also examined numerous other studies that demonstrated the immense value to mental health by spending time in the outdoors. Lee's motivation was three American surveys that showed a decreasing trend in the use of the outdoors and an increase in sedentary lifestyles. He wanted to illustrate the benefits of using the outdoors as a means of promoting healthy lifestyles to the American public. He split his article into four sections: benefits and opportunities, urban and neighborhood parks, nature, and organized activities and programs. The majority of his literature review was on the nature section where he looked at the various literature that is based on the restorative effects of nature. Lee found that outdoor programs are valuable in any outdoor setting, be it in the backcountry or in a city park. The important variable to remember is that nature is essential to human health as described by the articles reviewed by Lee. This article would be an excellent place to begin to build a resource list for future study as Lee reviewed many excellent articles.

31) Maller, C. J. (2009). Promoting children's mental, emotional and social health through contact with nature: a model. *Health Education*, 109(6), 522-543.

Maller did a qualitative study using face-to-face interviews with teachers and principals to explore their perceptions of the benefits of using hands-on activities in nature on their students' mental, emotional and social health. The author goes on to describe various responses from the different participants about the types of hands-on activities done in their schools and the effects they had on their students. Using the responses, Maller designed some excellent diagrams showing the many benefits of the different types of outside activities on children's mental, emotional and social health as they clearly show all the benefits in a way that one can quickly and easily read them. She concluded that there were many advantages to a child's mental, emotional and social health via them partaking in activities in nature, and that the more hands-on the activities the greater the benefit. I appreciate the diagrams in this article because they are so simple yet clear and feel it is well researched and supports my view of the benefits of teaching children outside through activities such as outdoor education.

32) Mitchell, R. (2012). Is physical activity in natural environments better for mental health than physical activity in other environments?. *Social Science & Medicine* 91, 130-134.

The purpose of this study was to evaluate the results from other research that examined whether physical activity done in a natural environment improves the mental health of participants. These studies and their conclusions were investigated in relation to their veracity because they were done over a short period of time and with small control participant types. Mitchell examined the results of physical activity in a natural environment on a population level using the Scottish Health Survey 2008. He concluded that doing physical activity in natural environments is associated with a reduction in the risk for poor mental health and that

participating in different activities in various types of natural environments may produce other positive psychological effects. As well, Mitchell stated that there should be a strong push to promote physical activity and access to protected natural environments, for physical activity to take place in, for the promotion of mental health. As part of the discussion, Mitchell found that those who use forests or wooded areas for physical activity had about half the risk of having poor mental health compared to non-users. He also found that when you add an additional natural environment per week, there was a 6% lower risk of poor mental health. He concluded that the results from his study do show that the results from the small-scale studies are transferable to larger populations.

Again the research demonstrated that when people participate in various activities in the outdoors they can improve their mental well-being. Because EOE students have the possibility of participating in various types of physical activity in different natural environments the research from this study supports the view that the EOE students might improve their mental well-being by participating in the course.

33) Nicholls, V., & Gray, T. (2007). The role of stillness and quiet when developing human/nature relationships. *Australian Journal of Outdoor Education*, 11(1), 21-28.

The authors conducted a qualitative study using “field notes, interviews, conversations, photographs, recordings, and reflective memos” (Nicholls & Gray, 2007, p. 23) based on grounded theory. The purpose of the article was to see how humans can make a connection with nature by being still and silent in a natural environment, and to determine if being still also had an effect on the adventure therapy process. Nicholls and Gray found that there were numerous benefits to being still and quite in the outdoors; feelings of calm, personal reflection, free flow of

thoughts, and an appreciation for nature that might not have been there before. Often participants were hesitant to be out in nature due to a fear of the unknown, but after a number of sessions were seeking ways to do it on their own.

A major part of my Environmental Outdoor Education program is having my students sit under a tree in the school grounds once a week for ten minutes. This paper supports my view that it is a valuable activity that should be encouraged throughout the district. The paper's focus is to increase the bond people have with nature which I wholly support.

34) Park, B. J., Tsunetsugu, Y., Kasetani, T., Kagawa, T., & Miyazaki, Y. (2010). The physiological effects of Shinrin-yoku (taking in the forest atmosphere or forest bathing): evidence from field experiments in 24 forests across Japan. *Environmental Health and Preventive Medicine, 15*(1), 18-26.

Park et al. contributed to the research on the physiological and psychological effects of Shinrin-yoku also known as forest bathing in Japan. They did a review of the literature as well as a field experiment involving people's use of twenty-four forests across Japan. They measured the physiological (pulse rate, systolic blood pressure, diastolic blood pressure, heart rate variability, parasympathetic nervous activity, sympathetic nervous activity, saliva cortisol concentration, and saliva three immunoglobulin A concentration) and the psychological effects on the participants from the forest bathing. The researchers used twenty-eight participants averaging 21.7 years of age. The participants were split into two groups and both groups had physiological readings done before and after the test. The experiment was broken into two rounds; in round one the first group would sit and look at a forest for fifteen minutes and then walk through the forest for fifteen minutes while the second group sat and looked at in urban

setting for fifteen minutes then walk through the urban setting for fifteen minutes. In the second round, groups were switched and the urban group went to the forest setting and the forest group went to the urban setting.

The results of the experiment showed that the participants who viewed and walked in the forest had decreased pulse rate, lower blood pressure; a decrease in indicators of stress. The authors stated that “from the perspective of physiological anthropology, human beings have lived in the natural environment for most of the 5 million years of their existence. Therefore, their psychological functions are most suited to natural settings” (p. 23). The authors stated that the results from the psychological tests supported the view that a forest environment could reduce people’s feelings of depression, anger, tension, fatigue, and confusion while enhancing psychological vigor. This study clearly relates to EOE and could be used to encourage non-EOE teachers to take their students outside periodically.

35) Pretty, J., Peacock, J., Sellens, M., & Griffin, M. (2005). The mental and physical health outcomes of green exercise. *International journal of environmental health research*, 15(5), 319-337.

Pretty, Peacock, Sellens, and Griffin conducted research to see if there was a benefit to individuals from participating in physical activity while being exposed to natural scenes in the form of pictures. They selected 100 adult participants from the University of Essex in the UK, and split them into five groups. Each group ran on a treadmill for twenty minutes while looking at specific sets of pictures except for the control group who did not look at any pictures. The pictures were split into: rural pleasant, rural unpleasant, urban pleasant and urban unpleasant. Each group was shown a set of thirty photographs during their exercise session. The participants

took part in pre and post-tests to examine their mental state, heart rate and blood pressure. There was little difference in heart rate and diastolic blood pressure between all five groups. The greatest difference was in the systolic blood pressure for the rural pleasant group, which was lower than the others and was followed by urban pleasant, rural unpleasant, and lastly urban unpleasant. All five groups showed an improvement in self-esteem however the rural pleasant group scored slightly higher than the rest. Pretty et al. concluded that exercising in pleasant environments may improve overall health, when compared to just exercising alone. As EOE activities are done outdoors it stands to reason that the students will experience health benefits by participating in activities in a pleasant outdoor environment.

36) Reese, R. F., & Myers, J. E. (2012). EcoWellness: The missing factor in holistic wellness models. *Journal of Counseling & Development, 90*(4), 400-406.

Reese and Myers presented the idea of EcoWellness as the “missing link to wellness models and counseling” (p. 400). The idea of EcoWellness is to use nature or exposure to nature as a means to increase the mental wellness of patients. The authors base this concept on holistic wellness models and counseling, a psychological method of combining the mind, body, and spirit to improve a person’s overall health. Reese and Myers (2012) define EcoWellness as “a sense of appreciation, respect for, and awe of nature that results in feelings of connectedness with the natural environment and the enhancement of holistic wellness” (p. 400). The authors completed a thorough literature review of various articles relating to counselling and in which nature, or connecting with nature was mentioned. The results, as described by Reese and Myers, clearly suggest that being in or connecting with nature has a far greater positive affect on wellness than remaining indoors.

The authors list three basic dimensions of EcoWellness: access to nature, environmental identity, and transcendence. Access to nature entails that people have the ability to experience a healthy natural environment with as little pollution as possible. The closer the access to nature the greater the increase in wellness people will have. Environmental identity is described as people being able to identify the differences between positive environments, which contribute to well-being, and negative environments, such as the concrete jungle, which detract from wellness. The authors found that when children before the age of eleven spent time in wild nature, they had a greater chance of developing more environmental attitudes and beliefs when they are adults, and that they identified with nature more than those children who did not spend time outdoors. Lastly, transcendence is when people develop deep feelings of interconnectedness and unity with all living things. This can be broken down into spirituality, and community connectedness. Spirituality occurs when one develops a greater awareness of some type of spiritual being as one develops this connectedness with nature. Community connectedness is when individuals start to consider the needs of other living things as much as their own after being exposed to natural environments.

According to this article, there is a greater trend to use nature as part of the counseling regime, therefore I suggest that by exposing EOE students to the outdoors, the health benefits described in this article and some of the means to increase student wellness, would possibly also take place in an EOE class. EOE teachers may not use the outdoors to delve into some childhood issues their students may have; however, just developing the connectedness to nature may provide some healing to those students and generally improve the overall wellness of all their students.

37) Taylor, A. F., Kuo, F. E., & Sullivan, W. C. (2001). Coping with ADD The surprising connection to green play settings. *Environment and Behavior*, 33(1), 54-77.

Taylor, Kuo, and Sullivan set out to explore if there was a relationship between spending time outdoors and improvement in attention in children diagnosed with ADD. The results of their study found that when children participate in activities in green settings, their attention issues are far less severe than when they are indoors with no exposure to nature. The research was done through questionnaires given to parents of children with ADD. The parents were asked many questions, some of which involved rating what activities decreased their child's attention difficulties, and which made them worse. The parents were not informed of the purpose of the study so as to ensure their answers would be unbiased. The article describes what ADD is, how it is tested for, and complications children with ADD may have. The authors also described the Attention Restoration Theory developed by Kaplan (1995) as it formed the basis for their research. Taylor, Kuo, & Sullivan suggest that further research needs to be done in this area. As well, they stated that one shortcoming of their study was that it was done within a short period of time, specifically during autumn. The authors would like to know what changes might occur if the study was done in the summer when the children's attention was not being depleted due to schoolwork.

38) Ulrich, R. S. (1979). Visual landscapes and psychological well-being. *Landscaperesearch*, 4(1), 17-23.

Ulrich completed this study while working on his research of the views from a hospital bed. The purpose of the study was to determine what effects views of nature would have on the feelings of anxiety and how those effects are compared with views of an urban environment

lacking any nature. The basic design of the experiment was to show fifty slides to the participants; one group saw only pictures of nature while the other group saw pictures of only urban environments. He used forty-six students from the University of Delaware who just completed a course examination. He chose this time as he assumed that their anxiety level would be high after just completing an exam. The participants took a survey which measured their emotions and anxiety levels then they were split into two groups to watch the two types of slide presentations. After the presentations, the participants retook the evaluation survey to ascertain if their emotional states had changed. The results suggested that the individuals that were exposed to the natural scenes felt significantly better than those who looked at the urban scenes. The urban scene group showed an increase in anger, sadness, and aggression after viewing the urban photos.

This study is important because it added to the research Ulrich was doing in regards to the patients in the hospital, which showed the positive effects of looking at nature on the mental well-being of the participants. I would then argue that EOE students participating in the course would improve their mental wellness when the instructor takes them outside for an activity.

39) Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science*, 224(4647), 420-421.

This study marked the beginning of Ulrich's studies on the health benefits of nature. He examined the restorative influences of hospital rooms with a view of a natural setting compared to rooms with a view of a brick wall on the recovery of patients who had undergone cholecystectomy surgery. The study took place between 1972 and 1981 in a Pennsylvania hospital and information was taken from records kept on each patient by the nurses on the ward.

Results of the study showed that the patients with the window view of the trees, spent less time in the hospital than those with a brick wall, used less narcotic type pain medication, and received less negative comments on their charts in regards to being combative or other challenging behaviour from the nurses compared to the patients with a view of the brick wall.

I chose this article because it is cited quite often in the literature I have read to date and I feel it has applications in a school setting as many classrooms do not have a view of the outdoors especially views of trees. By taking EOE students outside into nature I feel studies like Ulrich's demonstrate the positive effects the outdoors can have on people's health.

40) Wells, N. M. (2000). At home with nature effects of "greenness" on children's cognitive functioning. *Environment and Behavior*, 32(6), 775-795.

Wells researched the effect on low income families' cognitive functioning of moving from a home with no natural surroundings to one with natural surroundings. One reason Wells gave for doing this study was there was very little research in this area. She stated that what research was available showed that children who lived in a high-rise housing tended to exhibit more behavioral problems, had more restricted play, and had poorer physical health than those that lived in low-rise single-family dwellings. She chose seventeen children to participate in the study which took place over two years. The children were first examined when they lived in low income housing developments with very little natural surroundings; they were then re-examined a year later when they moved to better housing with better access to nature. The children were evaluated using the Attention Deficit Disorders Evaluation Scale (ADDES). The children's mothers were also interviewed before and after the moves and both interviews took place during the summertime to ensure that change in vegetation was not an issue.

The results of her study showed that there was a 19% improvement in the children's attention post move and that the effects of a natural environment had a profound effect on the children's cognitive functioning. Wells stated that the improvement "is striking particularly considering the modest sample size of seventeen. These findings suggest the power of nature is indeed profound" (Wells, 2000, p. 790).

### **Summary of Articles on Nature, Wellness and Achievement**

The nature, wellness and achievements section evolved to become the most influential area to me. The research done by Kaplan (1995) on Attention Restoration Theory I find is the most transferable and interesting out of everything I have read. I contend his research goes beyond EOE and can be applied to any teacher and subject in the educational system. If I ever considered doing a PhD I think I would use his theory as the backbone for research on how to improve student achievement through nature. Atchley, Strayer, and Atchley's (2012) research on attention and creativity restoration was based on Kaplan's theories. The article by Ulrich (1984) on how viewing nature improves wellness can also be transferred into a classroom by teachers showing students pictures of natural settings on their smart board. This might make a difference on students' attention. Articles on green exercise and Japanese forest bathing also transcend EOE and can be applied to any classroom setting.

### **Outline of Presentation to the Board of Trustees**

As previously mentioned I intend to organize a presentation to the Board of Trustees of Edmonton Public School Board. The purpose of this presentation is to attempt to convince some of the board members to support the idea that Environmental Outdoor Education is a worthwhile program that is beneficial to students and that it warrants more support. I believe that focusing

on student wellness, being one of the school board's district priorities, may be the best way to garner their support. I intend to have former Environmental Outdoor Education students do the majority of the presentation as I have been led to believe that the Board of Trustees likes student presentations the most and they tend to be the most effective in changing perceptions. The presentation will not only involve former EOE students from Avalon, but also students from two other highly successful EOE programs in the district, namely Londonderry Junior High School, and D. S. MacKenzie Junior High School. Students from all three schools would talk about the benefits they experienced by participating in Environmental Outdoor Education at their respective schools. Specific benefits would be related to self-esteem, stress, mental well-being, physical well-being, as well as how EOE encourages lifelong learning. I would work with the students' teachers to prepare the students for the presentation. We could ask questions of them that are intended to pull out the answers we are seeking. As part of the presentation, I intend to use the results from the annotated bibliography to reference current research to legitimize Environmental Outdoor Education and provide scholarly support for EOE. Specifically, I would refer to how outdoor educational type activities regardless of the duration have positive impacts on student wellness. I would also refer to Kaplan's research and how viewing nature can have positive effects on student's attention which could translate into improvements achievement. By focusing on student wellness and achievement I would be addressing to of school board's directives. I also hope to be able to present the mission statement, vision statement, and implementation plan that were developed by committee in December 2011; however some updating will be needed before it can be presented.

I anticipate that some trustees might possibly bring up concerns of risk and cost. Student safety is always paramount in school and unfortunately some of the activities in EOE are deemed

to be high risk, for example backpacking and any activities involving open water. I would counter their concerns by saying that all activities, indoors or out, have inherent risks however, as long as the instructors are well-trained and supported, these risks are very manageable. The benefits to students participating in these activities far outweigh the risks. I do foresee difficulty in defending the concerns of cost especially now after EPSB cut the physical education and health consultant department last June. These activities do cost more especially if you have to take buses and pay for guides and unfortunately many schools and students do not have the funds to pay for them however, walks in the river valley or even sitting in the school yard under a tree cost very little yet can have so many positive effects.

### **Conclusion**

The purpose of my course-based Masters Final Project is to provide me with something that I can immediately use to improve my teaching and to ultimately use this project to convince the Edmonton Public School Board to support, value and advance EOE in the district. I contend that this annotated bibliography fulfills this requirement. The annotated bibliography will provide me with not only a useful document I can refer to in the future, but also a base of evidence that Environmental Outdoor Education and exposure to nature can improve student wellness and increase student achievement. The annotated bibliography can also be beneficial to those interested in examining Environmental Outdoor Education in the future at the University of Alberta. A well thought out presentation to the Board of Trustees could also increase the chances of me achieving my goal of having Environmental Outdoor Education supported and respected in Edmonton Public Schools. It is my belief that by having the annotated bibliography

completed around when I return to work will give me more time to prepare for the presentation to the board and provide me with something to show the teachers from the other schools, who I hope will participate in the presentation.

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