Facilitating, Teaching, and Peacebuilding in a Natural Setting-

A review of literature

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Outdoor educational settings, coupled with experiential learning activities, can significantly impact positive outcomes in child and youth development across intellectual and academic domains. The inherent, attention focusing nature of outdoor experiences, the deep engagement of experiential learning in a creative and stimulating environment, and the positive social-emotional learning potential of these experiences all synthesize into enhanced academic achievement. Student engagement is one challenge of educating youth in a society focused on high stakes standardized testing. Students are instructed with the goal of passing mandated testing rather than educating the whole child. Some critical components of development are the proper education of the child as they interact with their peers and as they build their own sense of self.

The linkages shown will illustrate that children and adolescents in primary and secondary school systems can achieve higher levels of academic success if they are provided structured social emotional learning through outdoor experiential and adventure education programming than their counterparts who are not.

A review of literature to date also suggests the intertwined nature of climate action and peace. As human-made global warming increases so does the risk of violence as access to resources diminishes. Large scale global initiatives required to make substantive impact upon the degradation of the natural world require deep conviction to multilateral agreements. These must also coexist with local, grassroots efforts to sustainable living and community level action. As such, children and youth who have intentional opportunities to learning the processes of peace, conflict resolution, and collaboration will be better poised to take leadership roles not only in the future but during their emerging adulthood.

In scanning various multidisciplinary elements of literature on relevant topics, one can see a need for outdoor experiential education and its positive correlation to higher academic

achievement, affective growth, social skills development, and peacebuilding for a sustainable future.

Stewardship- Why Learn in the Outdoors?

The reasons for hosting academic learning in an outdoor, natural environment are many. These range from neurobiological to practical and include a strong morally compelling reason: the urgent need to address human-made climate change. The scientific consensus supporting human-made climate change is overwhelming and, to our current understanding, incontrovertible.

In his standout work *Last Child in the Woods*, journalist and author Richard Louv coins the term "nature deficit disorder" and calls for a reimagining of how our society perceives childhood interactions with and in nature (2008). He cites the growing distance between humanity and the natural world, technological advances, inaccurate perceptions of risk, and numerous social factors that have driven play and education indoors. Louv makes compelling arguments for the presence of adverse psychological impact brought about by a distancing of children from nature. This is supported by a variety of scientific disciplines such as neurobiology, psychology, medicine, ecology and evolutionary biology and more. Louv, along with a growing body of pediatric medical professionals, even recommend outdoor play as an intervention for a variety of adverse childhood developmental issues (Martinelli, 2020). The benefits cited in Martinelli's review of nature-based preschools include increased sensorimotor physical, mental health, planning, and risk assessment benefits as well as an increased stewardship for nature.

eko-STEAM "Building Bridges" activities help connect the students to the natural environment specific to their location and allows them to explore their connections to the natural and human histories of their region. In *Ropes of Ecology*, author Shawn Moriarty tells us that place-based education is "developed though making meaningful connections with the land on a physical and emotional level" (2018; p. 3). Place-based education benefits include what Daniel, Shores, and Faircloth describe as an "affective or emotional bond between people and place or setting" (2019; p. 248). They use the term "topophilia" to describe this affinity. It is this affinity to the experiences and location that eko-STEAM curriculum attempts to help build in children to develop in them a drive for environmental stewardship. Purc-Stephenson, Rawleigh, Kemp, and Asfeldt identify "building connections" as an outcome common to outdoor education programming (2019). They highlight one participant survey wherein the learner reflected upon their "ancestors that travelled" at the location of the program and felt connected to that place. They highlighted the sense of attachment that comes from understanding. Intentionally crafted yet freely explored activity in the greenspaces of the world can help children and youth develop the knowledge a connection essential to environmental stewardship while enhancing their academic understanding of STEAM centered learning. In *Earth Ed: Rethinking education on a changing* planet, Assadourian and Mastny identify a sense of place as an essential element of stewardship.

Defining Outdoor and Adventurous Education

Outdoor and adventure education is described by Ewert and Garvey as being an expansion of camping and outdoor education within the context of experiential education (2007). They illustrate an evolution of the first such programs in the 1950's by Kurt Hahn, the founder of

Outward Bound. For the purposes of their chapter within *Adventure Education: Theory and Applications¸* they utilize the definition of experiential education from Kraft and Sakofs in 1988:

> Experiential education is the process of actively engaging students in an authentic experience that will have benefits and consequences. Students make discoveries and experiment with knowledge themselves instead of hearing or reading about the experiences of others. Students also reflect on their experiences, thus developing new skills, new attitudes, and new theories of ways of thinking.

This definition of experiential education, presented by the Association of Experiential Education, is in line with the foundational theory of experiential learning presented by David Kolb in 1984. In his work, *Experiential Learning: Experience as the Source of Learning and Development¸* Kolb studied the work of Dewey, Lewin, and Piaget and described a cycle of concrete experience, reflective observation, abstract conceptualization, and active experimentation leading to more concrete experience. During this cycle, the learner is exploring and interacting with their environment, solving problems, and building knowledge. This work has been broadly applied in the settings of experiential education and outdoor adventure education for decades. Kolb describes learning as "the process whereby knowledge is created through the transformation of experience" (p. 38). A comparison of the intersection of this definition of OAE with the work of Kolb shows that participants are engaged throughout the learning process and illustrates the potential for SEL development during such engagement when applied in the modern context of the field.

Building Knowledge: Social-emotional Learning and Academic Performance

Bridgeland, Bruce, and Hariharan cite several concerning issues facing modern education (2013). One they note is by Stillwell and Sable in that "more than one million school-aged children

do not graduate with their peers" (2013, p. 11). In their report, they utilize a definition of social and emotional learning (SEL) as outlined by the Collaborative for Academic, Social, and Emotional Learning (CASEL) and survey a "nationally representative sample" (p. 14) of "more than 600 teachers" (p.9) regarding varying aspects of education including topics like student engagement and performance, curriculum content, and others. Their definition of SEL relates to "the process through which adults and children develop social and emotional competencies in five areas: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making" (p. 16). This far-reaching survey of professional educators provides a solid base from which to make determinations of the legitimacy of the findings and recommendations of this report. It also provides a concise definition of the core concept of social and emotional learning.

Bridgeland, Bruce, and Hariharan also cite research by Durlak, et al. (2011) that shows "students who receive SEL instruction have academic achievement scores an average of 11 percentile points higher than students who did not participate in SEL programs" (2013, p. 6). This definition of SEL, as reported by 8 out of 10 teachers, will be a "major benefit" to students in the classroom learning core academic content (p. 6). In drawing upon this research, it is clear that empirical data supports the inclusion of SEL programs in core curriculum. It is equally clear that eighty percent of professional educators also support such an addition.

Supporting Knowledge: Outdoor Settings and Academic Performance

Outdoor settings are an ideal place to enhance academic performance. In the modern context of high-stakes standardized testing and financial pressures upon administrators to maintain the status quo of rote classroom learning, one would not be remiss in questioning the time and resources spent to take groups of children and youth out of the classroom and into the

schoolyard or woods to learn STEAM material. The perceived risk involved in outdoor activity, coupled with the presumption that such activity is not "real learning" can make implementation of programs such as "eko-STEAM: Building Bridges" challenging. Despite this, there is a growing body of cross-disciplinary research supporting the "place" of learning as the outdoors.

Neurobiology and Evolutionary Supports

There are several indicators that our bodies are affected significantly by time spent in nature. These often result in positive affects neurobiologically and neurobehaviorally. In the academic context with children and youth populations, attention and attention disorders are specifically positively impacted by time spent in nature. Atchley, Strayer, and Atchley (2012) explain that academic learning requires intense commitment of higher order thought processes in the executive regions of the human brain. Immersive "attention restoration therapy" in natural settings can help significantly restore creativity and problem-solving. They identified a "measurable cognitive advantage" when subjects spent time truly immersed in natural settings for a sustained period of time.

Kuo and Taylor (2004) report reductions in inattention and impulsivity after experiences in natural settings. They describe a fatigue that arises after prolonged exposure to environments that require deliberate attention amidst a variety of attention-attracting stimuli. They purport time in nature as restoring directed attention capacity and even potentially as a supplemental activity to improve outcomes of clinical treatments for children with Attention-deficit/ hyperactivity disorder. They reported that for children with ADHD, large group settings indoors can create significant symptoms whereas similarly sized activities outdoors had no such negative impact (2004).

Kuo, Barnes, and Jordan (2019) report widespread evidence for a reduction of stress amongst children in natural settings, going so far as to support the presence of vegetation through classroom windows being better than "built views". They report that children experiencing a day of learning outdoors have reduced levels of cortisol, a naturally produced adrenal chemical that impacts stress, motivation, and fear. Willis (2007) describes in detail a large body of research on the negative impact on learning caused by stress and the positive impacts of "joyful" learning.

Literature Supporting Direct Intellectual Achievement

Dismore and Bailey (2005) assessed the positive impact of outdoor and adventurous experiences upon theoretical or academic learning. They identified threefold implications for outdoor and adventurous activities- intellectual, affective, and social development. Utilizing activities such as raft building, team building games, initiative games, and wall climbing, they investigated areas of learning such as mathematics, reading comprehension, writing, and self-confidence. They identified a practical application of academic knowledge such as mathematics as a positive outcome of student engagement resulting in retention of material. For instance, the children gained knowledge of fractions, perimeter, and area while building rafts. They reported increased vocabulary from the experiences as well as the students were more capable of utilizing technical words they learned in the activities. They further found that structured reflection helped to improve these outcomes.

In a review of field trips as a tool to enhance science learning, Behrendt and Franklin, (2014) identified as key outcomes: firsthand experience, increased interest and motivation, learning relevance, observation and perception skills, and promoting personal and social development. They describe positive academic outcomes, career interest, and increased performance from academically challenged or 'at risk' students. Acknowledging growing financial constraints for

such activities, they recommend campus field trips wherein the children explore the school grounds.

Creativity is a key component of academic achievement. Bento and Dias (2017) connect items in the outdoor environment with open-ended materials that spark creative application. In a traditional classroom setting, objects that specifically represent an item of learning such as a model of a building, wherein a series of parts that must be assembled into a whole, will certainly engage an intellectual process of following instructions, logical application of steps, and more. In an outdoor setting, however, children must explore alternate utilizations for natural objects and their interactions with human-made items. For instance, a series of tree branches and be fastened into a makeshift wall with a tarp to create a shelter. This process of innovation is key in advancing the STEAM disciplines.

Kuo, Barnes, and Jordan (2019) cite a growing body of research that indicate higher academic achievement amongst students participating in outdoor learning programs than peers in regular programs. They further report that these findings have been seen across a wide variety of disciplines, student demographics, and instructional methodologies.

Moore (2014) describes an increased environmental literacy in students engaged in outdoor learning. This culminates in an increased understanding of ecology, natural systems and processes, and human-made impacts upon nature.

Building Skills: Adventurous Educational Settings and Social Emotional Development

There is a strong and consistent correlation between outdoor and adventurous activities and increases in positive affective qualities such as confidence (Dismore & Bailey, 2005; Ewart & Garvey, 2007; Behrendt & Franklin, 2014; Becker, Lauterbach, Spengler, Dettweiler, & Mess, 2017), attention-harnessing (Kuo & Taylor, 2004; Kuo, Barnes, & Jordan, 2019), self-analysis

(Ewart & Garvey, 2007), group development (Dismore & Bailey, 2005; Ewart & Garvey, 2007). There is further exploration of the interchanging roles students play in an outdoor setting, moving fluidly from teachers to learners and back (Bento & Dias, 2017) as they navigate their shared experiences.

Modern outdoor and adventurous programming utilizes experiential activities that challenge individuals and the group as a whole to work together to solve problems, overcome obstacles, and build relationships. Ewert and Garvey identify several outcomes of these programs that overlap SEL components (2007). They list moral development, personal growth, group development, and leadership development as observable outcomes of programming (pp. 28-31). They describe a process wherein participants "analyze their behavior and the behavior of others" and develop "moral reasoning" (p. 28). This overlaps every area of SEL programming. Their area of defined personal growth reports that OAE programs enhance "self-concept, self-esteem, confidence, and personal motivation" but they caution that such growth occurs best with "skillfully designed adventure education curriculum with trained and experienced leaders" (p. 29). Personal growth impacts self-awareness, self-management, and social awareness as described by SEL. They also illustrate group development through Tuckman and Jensen's five stage theory of forming, storming, norming, performing, and adjourning. This cycle explains the group dynamics of learning about, negotiating with, building cultural norms, performing tasks, and closing with one another (p. 29). The nature of the activities provides students with opportunities to build SEL relationship skills and engage in collective and individual responsible decision-making. The fourth area discussed by Ewert and Garvey is that of leadership development. This promotes "inspiring mutual vision", "empowerment", and "encouragement" (2007, p. 31). These skills help achieve Bridgeland, Bruce, and Hariharan's outcomes of "explicit social and emotional skills instruction",

"improved attitudes about self, others, and schools", and "positive social behavior" (p. 16). Well facilitated outcomes meet all five core components of SEL and do so in a manner that engages the student throughout the experience. This level of active engagement that is achieved through outdoor learning processes highlighting SEL outcomes correlates to increased academic performance as illustrated in a number of studies.

An assessment of such studies includes Durlak et al's meta-analysis of hundreds of SEL programs "involving 270,034 kindergarten through high school students" (2011, p. 412). They reported "significant positive effects on targeted social-emotional competencies and attitudes about self, others, and school" as well as "academic performance". They assert wide-scale applicability and success across different grades and school types (p. 417). The large-scale aggregation, review, and comparison of illustrative data in this study undeniably links SEL learning with academic performance. With that link and that of outdoor and adventurous experiential programming to SEL, the translation to academic performance becomes clear.

Building Wisdom: Facilitating peacebuilding skills as a key element to combat climate change

Large scale, long term human security and climate change are heavily interconnected. Shirley Scott (2015) accentuates "robust evidence and high agreement" amongst experts that human security is threatened as a result of human-made climate change. In order to successfully engage multilateral efforts to combat human-made climate change, people and nations must feel secure. Their immediate safety requirements will override more long-term hazards brought about by a changing global climate. According to the Institute for Economics and Peace (2019) some of the nations most at at-risk for natural hazards related to climate change have the weakest

capacity to address the situations facing them. That group of multinational experts also cautions of a strong relationship between extreme weather events and population displacement. Such displacement often leads to conflict. The United Nations (n.d.)[1] estimates that 1.2 billion people, of which 70 million are indigenous peoples, are dependent upon forested areas. They further estimate that land degradation is endangering "between $235 bill and $577 billion in annual global crop output" due to a loss of pollinators. The U.N. estimates that arable land loss approaches 35 times its historical rate.

There are several key interventions that can take place to combat the rising effects of global human-made climate change. The United Nations (n.d.)[1] created several goals to sustain biodiversity. They recommend a mixture of education, systemic, and advocacy efforts such as fair and equitable sharing of resources, limiting the impact of invasive alien species on local ecosystems, the integration of ecosystem and biodiversity values into planning at national and local levels. To combat climate change directly, they further recommend improving education and awareness, and capacity building for climate related planning focused in part on youth.

Foundational knowledge, lived experience, and intentional education in the structures of cooperation are essential for youth education. Children need to be empowered to make active decisions within experiential learning, experiment with the decisions they make, and work through the consequences of their decisions. This combination of intentional, facilitated lived-experience and actual consequences is essential for values-based education. In his book, "World Peace and Other 4th-Grade Achievements" teacher John Hunter (2014) discusses the concept of an "empty room" as a space of individualized and collective opportunity to actively learn and apply knowledge within a framework of peace education. He assets that this is critical to active, experiential learning wherein students have been provided a foundation of knowledge but are

also empowered to explore that new knowledge in a context of their own device, make their own ethical assessments of their experiences, and chart their own course of action based upon this construction. This is the practical application of process that allows them to build wisdom with a relatively safe space of facilitated experiment. In particular, Hunter creates intentional conflict inherent in his "World Peace Game" and allows the children to experience that raw conflict. From there they are able to develop key social-emotional elements necessary for success in life and academics. These experiences take the learner across each of the dimensions of social-emotional learning as outlined by Bridgeland, Bruce, and Hariharan (2013).

We need not wait for youth to become adults in order for them to make significant positive impact on the apathy surrounding human-made climate change. "The Greta Effect" was widely reported to have been a key impact in carbon reduction efforts by non-governmental entities as Greta Thunberg, at the time 15 years old, led global awareness efforts and sparked thousands of school walkouts across the planet (Laville, 2019; Chow, 2019). With proper supports, education, and empowerment, children and youth can be active leaders of peacebuilding and climate change from which adult policymakers can draw energy, take direction, and obtain policy guidance.

Building Peace through Intentional Program Design

With the necessity of peace between varied peoples to accomplish successful, global interventions on climate change and other issues, it is essential that modern educators provide learning experiences focused on peacebuilding. The foundations of peace are fruitful relationships between varying peoples that align with different levels of process and structure between formalized groups. This rarely if ever start at or are fully realized with the most senior levels of governance (Lederach, 2016). The largest groups

of people within a given population must be aligned with the concepts of peaceful

coexistence with "others" in order for true peace to exist. Viewing the concept of

peacebuilding as an active process realized from this perspective, it is essential that

children be given space to learn these concepts. From this point, they may develop into

adults empowered to practice peace at a local level or act as leaders to build the structures

required to maintain formal peace between groups. Educators can develop academic

curriculum that involves experiences specifically designed to help students build essential

skills necessary for self-governance and democratic practices and the application of

individual and collective wisdom. These activities must include space for children to

actually impact the outcomes of the learning, realize the implications of their outcomes,

and build tools essential to finding their voice and agency in the processes that surround

their lives (MacNeill, 2006).

Self-governance through democratic practices of governance is essential for peaceful

coexistence in the modern global context. Children must be given the foundational tools with

which to construct skills essential for cooperative existence, especially in a time where

cooperatively built structures are critical to maintain peace in a nuclear age wherein humanity

faces human-made climate change that threatens modern existence. The instruction of democracy

at a curricular level is not a new idea. Einarsdottir, Purola, Johansson, Broström, and Emilson,

(2014) conducted a review of early childhood curriculum in Nordic countries with focus on how

the teach democracy. They describe democracy as a fundamental value of instruction within a

framework of ethical skills; establish students rights and participatory processes. Creating space

for caring relationships is the responsibility of the teacher. There is a distinct focus on

"competence values"; this involves not only the what but the how of learning and the specific

inclusion of values-focused instruction in early childhood education along with academic content.

Leaders in any age must be able to utilize their personal and collective wisdom to build connections across in-group/ out-group dynamics and peacefully address issues faced. Heto and Indangasi (2020) propose that fully realized coexistence must be built from a shared and lived experience that culminates in what we call wisdom. From the perspective of eko-STEAM curriculum development, each activity is a place for exploration of individual and collective experience and shared challenges. From this platform, children can build their experiences and responses to challenges within an environment. The eko-STEAM environment is designed in a way that students can face challenges in a safe, facilitated environment but still experience actual consequence of decisions and behavior. From these experiences, children can gain academic knowledge critical for modern society, build social-emotional skills essential for success, experience ups and down of life, and do so in a value-based framework steeped in democracy and peacebuilding skills development.

Challenges to Academic Learning Outdoors

Stress and anxiety have numerous negative impacts on academic performance, learning ability, recall, and more according to Galla and Wood (2012). They conducted a study investigating the impacts of emotional self-efficacy on standardized math exams and showed that the ability to self-regulate stress emotions had a positive impact on the student's success. Galla and Wood do acknowledge that, while their sample was "racially and ethnically diverse", their study involved mostly middle-class, two-parent households and cautioned against generalizing the results. Building this self-efficacy is a cornerstone

of outdoor and adventure education through the use of the "comfort zone model". Brown

(2008, p.3) asserts that the "comfort zone model… is widespread within adventure

education literature." This model, he summarizes, is "based upon the belief that when

placed in a stressful or challenging situation people will respond, rise to the occasion and

overcome their hesitancy or fear and grow as individuals" (p. 3). The use of this model in

structured and well-facilitated outdoor and adventure programming can potentially translate

to generalized skill building useful in the classroom including increased self-efficacy, self-

awareness, and self-management.

Brown raises further concern with the field's use of Festinger's theory of cognitive

dissonance concerning "how a person deals with inconsistency between their cognitions" (p 7). He

questions the efficacy of adventure programming, through using unusual activities with possibly

limited relevance, in creating consistent dissonance at all (p. 7). His concerns are repudiated by

Bailey, et al's 2017 report describing research conducted in comparing self-reported data from

adventure program participants and electroencephalography or "EEG" (2017). In this study,

participants wore monitoring gear while engaged in programming. Several measurements were

taken related to anxiety, approach motivation, and self-reported data. They concluded that their

data was indicative of the presence of cognitive dissonance (p. 162) and further found that negative

anxiety existed briefly before being replaced with positive "affirmation of success" and compared

this to "self-efficacy, resilience, and coping" (p. 165). While their study was extremely limited in

scope (only 10 individuals) the results do indicate the potential for OAE activities to expand a

participant's ability to better cope with negative emotion, thereby potentially translating that to

higher academic success.

Given the concerns by Galla and Wood about the limited socio-economic scope of their research, we must consider the applicability to poor, underserved populations (2012). Caldas et al. conducted research into the proper methodology for assessing adventure programming for inner-city youth (2016). While the overall impact is not yet known, their work provides solid data assessment tools that have been validated.

Conclusion

Given the complexity of educating youth today, especially in the context of climate change and global socioeconomic upheaval, it is clear that educators need to provide them tools beyond the core curriculum if they are to succeed. In order to achieve high levels of academic success, students in both primary and secondary schools need to develop core social and emotional learning skills that complement their educational pursuits. Traits such as resilience, problem solving, self-awareness, teamwork, and the ability to regulate emotions are just a few that will contribute to their education in core curriculum areas. Each of these skills align with a strong foundation in skills necessary for building peace. The knowledge built through instruction, skills built through application of knowledge, and the wisdom built through individual and collective experience are essential for people to understand and build peace across groups.

At its heart, eko-STEAM curriculum is social and science education framed within the broader context of experiential learning in a natural setting. It seeks to achieve several learning objectives: science learning applicable to modern academic needs, immersive social-emotional learning, nature-based learning to foster a connection to place essential to environmental stewardship values, and intentional alignment of student learning with peacebuilding skills. These objectives are realized through a curriculum that includes comprehensive integration of Next

Generation Science Standards, educator tools for facilitating experiential learning in a natural

setting, and demonstrable student learning outcomes that illustrate not only content learning but the

wise application of shared, lived experience.

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