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Harnessing Nature for Occupational Therapy: Interventions and Health Promotion

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Harnessing Nature for Occupational Therapy: Interventions and Health Promotion

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Abstract

Literature is beginning to emerge which states that participation in natural environments can be restorative, provide much needed physical activity and assist with health promotion and prevention of illness. Theories such as Attention Restoration Theory (Kaplan, 1995) and Biophilia Hypothesis (Wilson, 1993) support the benefits for participation in natural outdoor environments. Health benefits of participation in nature including accessing Vitamin D, improving balance, attention restoration, reduced myopia, stress reduction are widely present in literature. Despite the health benefits of participation in nature, occupational therapists rarely complete interventions in the natural environment. Principles of adult learning and occupational adaptation were used to create a 12-hour continuing education for occupational therapists to develop skills to use in natural outdoor practice. Data was collected from course previews, surveys about continuing education at sea and using principles of adult learning to create the course and utilize a new format ReLAP, in which continuing education focuses on reflection on current practice, learning new information relevant to intervention, applying and planning to use that information in practice.

Keywords: nature, occupational therapy, restoration, continuing education, adult learning

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Harnessing Nature for Occupational Therapy: Intervention and Health Promotion

Occupational therapy practice rarely occurs outside of four walls, or the built environment. Literature has emerged which states that participation in natural environments can be restorative, provide much needed physical activity and assist with health promotion and prevention of illness. Participation in natural outdoor environments is something that should potentially be promoted by occupational therapy. According to the Occupational Therapy Practice Framework, 3rd edition (AOTA, 2014), using approaches to intervention such as create, establish, maintain, modify and prevent; occupational therapists achieve outcomes related to enhancement of occupational performance, prevention, health and wellness, quality of life, participation and occupational justice. Various occupational therapy roles, including advocacy for time spent outdoors, education of others about its benefits and direct interventions outdoors, fall well within occupational therapy's scope of practice. Occupational therapy is perfectly aligned to promote health through outdoor participation and model the use of nature in interventions. The following capstone paper will describe the health benefits for participation in nature, development of a continuing education training course for occupational therapists, the goals of the continuing education training and the method to develop, implement and evaluate the training, results of data collection and discussion of the implications of the findings.

Background and Significance

In 2002, the World Health Organization issued a warning that a sedentary lifestyle could be among the ten leading causes of death and disability in the world. The organization stated that approximately two million deaths per year are attributed to physical inactivity (World Health Organization, 2002). Kobak et al. (2018) stated that the decrease in physical activity and increase

in sedentary behavior has been associated with an increased risk of overweight and obesity in children. Additionally, Mainella, Agate and Clark (2011) stated that on average, children spend approximately eight hours per day on electronic devices despite the American Medical Association's recommendation that children and adolescents have no more than two hours of screen time (i.e. TV, DVDs, video games, or cell phones) per day as a preventive measure against obesity (Prentice-Dunn & Prentice-Dunn, 2012). This high amount of technology usage increases children's risk for developing an array of issues, including diabetes, heart disease, and developmental complications (Mainella et al., 2011).

According to the Center for Disease Control (CDC, 2018a) in 2016 approximately 9.4% of children 2-17 years of age are diagnosed with ADHD. The current "toolkit" of available ADHD treatments contains two kinds of tools—pharmacological and behavioral interventions, such as stimulant medications, which are the primary treatment for most children with ADHD (Taylor & Kuo, 2011). Medication usage can have problematic side effects and therefore other avenues should be considered for health promotion and prevention for these children. Taylor and Kuo (2011) cited preliminary data that participation in open outdoor settings assists with ameliorating symptoms of ADHD.

The CDC (2018b) also reported the data from 2011-2014 that 17% of children and adolescents aged 2-19 years are obese. Liao, Intille, Wolch, Pentz, and Dunton (2014) reported that productive sedentary behaviors which are associated with healthier food choices and physical activity; whereas leisure-oriented sedentary behaviors such as watching television have been associated with greater risk of obesity-related health problems including type 2 diabetes, cardiovascular disease, and various metabolic risk factors. In addition, national data from the

Centers for Disease Control, as well as literature about various diagnoses including ADHD, obesity and cardiovascular disease are linked to sedentary behaviors and technology usage. Interventions for such ailments are generally remedied through medical intervention occurring in a built environment, neglecting alternative nature-based remedies for many of these ailments and general health benefits derived from participation outdoors.

Numerous studies have been published which identify the health benefits of engaging in the outdoor environment. These include higher levels of physical activity when children are outdoors (Gray et al., 2015); improved sleep quality (Harb, Hidalgo & Martau, 2015); reduction in myopia (Rose et al., 2008); and increased Vitamin D (Arljot, Thorn, Elm, Moore & Sundvall, 2017). In addition, there is evidence of improvements in rehabilitation (Raanaasa, Patila & Alveb, 2016) and emotional health (Bowler, Buyung-Ali, Knight & Pullin 2010) from viewing elements of nature and landscapes.

Despite the published and well-known benefits of people of all ages engaging outdoors, for play, rehabilitation and leisure, very few occupational therapists are considering the use of the natural outdoor environment in individual interventions, consultative roles and program development and publishing findings related to program evaluation or direct interventions. Occupational therapists, such as Angela Hanscomb (Timbernook, 2019) and Carly Rogers (Jimmy Miller Foundation, 2019), have described use of nature-based camps for prevention of sensory-based issues and treatment for post-traumatic stress disorder in Veterans, respectively. Amy Wagenfeld has promoted the use of gardening in a therapeutic capacity to promote learning, movement, physiological and psychological health (Winterbottom & Wagenfeld, 2015).

In addition to therapeutic gardening, there are many opportunities for occupational therapy to utilize the therapeutic elements of nature. A few examples which fall within occupational therapy's scope of practice include advocating to schools to create an edible garden tied to the curriculum; educating and encouraging pediatricians to prescribe nature visits; ensuring that access to natural outdoor environments exist despite socio-economic and disability status through program development and grants. In addition, various occupational therapy roles include advocacy for time spent outdoors, education of others about its benefits and direct interventions outdoors.

Occupational therapy is aligned to promote health through outdoor participation and model the use of nature in interventions. Occupational therapists are able to use these evidence-based health benefits of nature to promote health by utilizing the natural outdoor environment both in interventions and everyday occupational therapy practice. Engaging people outdoors for occupational therapy intervention and health promotion falls well within occupational therapy's scope of practice. Moreover, occupational therapy has primary roles of education and advocacy as well as direct intervention with individuals or groups. Finally, according to the Occupational Therapy Practice Framework, 3rd edition, using approaches to intervention such as create, establish, maintain, modify and prevent; occupational therapists achieve outcomes related to enhancement of occupational performance, prevention, health and wellness, quality of life, participation and occupational justice (AOTA, 2014).

Purpose of capstone project

The purpose of the capstone project is to develop a continuing education course grounded in evidence about adult learning principles and a novel type of continuing education format in which participants will create a plan to apply the knowledge learned.

Goals of the Capstone:

1. Develop a 12-16 hours continuing education training to educate occupational therapists about the importance of participation in outdoor environments.
2. Articulate 1-2 types of emerging evidence for use of adult learning strategies to promote learning and subsequent application of a new type of continuing education called ReLAP.
3. Describe the preferences of occupational therapists in attending a continuing education course in an immersive natural environment.
4. Assist occupational therapists with applying evidence-based literature and planning to use nature in interventions and health promotion at the individual, group and population levels.

Literature Review

The belief that nature is restorative is not a new concept. In 1865, Frederick Lee Olmsted, the landscape architect and planner responsible for designing New York's Central Park and establishing national parks such as Yosemite, stated that viewing nature is effective in producing restoration or recovery from such stresses such as cities and job demands (Ulrich et al., 1991). According to Ulrich et al. (1991) Olmstead emphasized "viewing nature employs the mind without fatigue and yet exercises it; tranquilizes it and yet enlivens it; and thus, through the influence of the mind over the body, gives the effect of refreshing rest and reinvigoration to the

whole system” (p. 204). Since Olmstead’s original visionary statement and subsequent design, several theories related to the importance and value of participating in nature have been offered.

The following literature review will describe the theories supporting participation outdoors, the relevant literature suggesting the need for participation outdoors and the health benefits of outdoor participation. The paper will describe occupational therapy’s potential role in health promotion and interventions outdoors. The paper will conclude by describing the use of occupational therapy theory, adult learning models and reflective practice within the development of a training for occupational therapy practitioners to arm them with foundational evidence-based knowledge and ideas of practice within a natural outdoor environment.

Theories Supporting Outdoor Participation

Attention Restoration Theory (Kaplan, 1995) and Biophilia Hypothesis (Wilson, 1993) describe the restorative properties and draw that humans have to nature. A seminal work by Kaplan (1995) describes Attention Restoration Theory which posits that participation in nature offsets everyday stress and attentional fatigue. The theory states that humans are forced to attend to the necessary but uninteresting aspects of daily life and therefore they become fatigued by directing their attention to these tasks. Conversely, participation in natural outdoor environments allows for recovery of directed action fatigue. This occurs through soft fascination, a property of engaging outdoors in which one does not exert attentional effort, which allows the mind to rest. The Biophilia hypothesis (Wilson, 1993) suggests that humans are genetically programmed to positively respond to natural environments that support success and survival and are drawn to life and lifelike processes. Finally, Nichols (2014) states that humans are drawn to the color blue (as in sky and water), though it appears infrequently in plants and animals, and overwhelmingly

choose blue as their favorite color “beating its closest competing color by a factor of three or four” (p. 87). Exposure to the wavelength that corresponds to blue has been shown to produce physical, cognitive and emotional benefits. In his book entitled *Blue Mind*, Nichols (2014) reports a 2010 study in which exposure to blue light increased responses to emotional stimulation in areas of the brain that involve attention and memory. These theories about how nature can benefit health and the restorative properties are essential to occupational therapy practitioners to understand and articulate reasons for promoting client’s participation in nature.

Health Benefits to Outdoor Participation for All

The health benefits of engagement outdoors are well represented in multi-disciplinary literature and described in detail below. These health benefits are relevant to occupational therapy practice as the profession’s guiding document, the Occupational Therapy Practice Framework, describes body functions, motor and process skills (AOTA, 2014) as essential to participation in meaningful occupations and for general health promotion.

Vital signs and immune system. Vital signs such as blood pressure, heart rate and sympathetic nerve activity are considered important indicators of health benefits. In a systematic review of 71 peer-reviewed articles, Sowah, Fan, Dennett, Hagtvedt and Straube (2017) found that exposure to sunlight lowers blood pressure. Lee, Park, Ohira, Kagawa and Miyazaki’s (2011) study found that when participants took leisurely forest walks there was a decrease in salivary cortisol levels. Li et al. (2007) from Nippon Medical School in Tokyo studies natural killer (NK) immune cells which are a type of white blood cell that sends self-destruct messages to tumors and virus-infected cells. Li et al. (2007) brought a group of 12 males aged 36-55 into the woods for 3 days and spent a few hours each morning hiking. By the end of the 3 days, blood

tests showed significantly increased the percentages of NK cells, lymphocytes and monocytes, although white blood cell count did not change.

It appears that even viewing living marine life inside of a built environment can have effects on vital signs. Through a mixed-methods study of 112 randomly selected aquarium visitors, it has been found that viewing aquariums with higher levels of marine life were associated with greater reductions in heart rate, greater increases in self-reported mood (Cracknell et al., 2015). This information is relevant for occupational therapists who are cognizant of client's blood pressure and heart rate and ongoing effects of stress such as elevated cortisol levels when engaging them in interventions. In summary, these studies represent the continuum of engagement with nature from aquariums in a built environment to nature walks which take place entirely outdoors, all of which show improvements in vital signs and immune response.

Balance. In a quantitative study in which 14 male and 10 female adolescents aged 19-21 hiked every day for 20 days, it was found that hiking has positive effects on balance with pre- and post-intervention static balance; with girls displaying more improvement in balance than boys (Citzoi, Kasa & Peja, 2016).

Physical fitness. Gray et al. (2015) completed a systematic review of articles related to physical activity, motor skills, musculoskeletal fitness, sedentary behavior and cardiovascular health. All eight of the included studies reported that physical activity was higher when children were outdoors than when they were indoors and five studies showed that total physical activity was 2.2 to 3.3 times higher outdoors than indoors. Children who spent one hour or more outdoors had 4.4% less sedentary time than children who spent less than one hour per

day outdoors. Results of this review indicate that time outdoors is positively related to physical activity and negatively related to sedentary behavior in children aged 3–12 years. Studies that examined habitual behaviors showed that children with higher amounts of time outdoors engaged in higher amounts of physical activity and lower amounts of sedentary behavior than children who spend less time outdoors. The potential reasons for decreased participation outdoors included over-scheduling of structured activities, children's socialization turning more towards videogames and screen time and heightened concern for safety outdoors; many of these barriers will be discussed later as well.

Vision. In a European study by Rose et al. (2008) parents of first and seventh grade students were asked to complete a survey of the activities undertaken by the children. These activities undertaken were considered to be completed either near point activities, activities completed at midpoint distance or outdoor activities. Near point activities included drawing, homework, reading, and handheld computer use. Midpoint distance activities included television watching, videogame playing, and computer use. Outdoor activities included playing outdoors, family picnics and barbeques, bicycle riding, bush walking, and outdoor sports. Children were also given a comprehensive eye examination to determine if myopia, an eye condition in which distant objects appear blurry and close objects appear normal, was present. Participation outdoors was found to be protective against myopia in children and minimized effects of near work activities (Rose et al., 2008). In addition, the authors stated that the connection between reduced myopia and outdoor participation may be related to the low accommodative demand in distance vision or light intensity, with higher light intensity outdoors than indoors and increased pupil restriction outdoors which results in less image blur. This study is highly relevant as it

provides potential justification to utilize interventions outdoors for prevention of myopia as well as to educate pediatricians about benefits to the visual system so that they can recommend participation outdoors to families and children.

Sleep. Insufficient amounts of sleep have been linked to poor health. According to the Centers for Disease Control (2019) “Adults who were short sleepers with less than 7 hours of sleep per 24-hour period, were more likely to report being obese, physically inactive, and current smokers compared to people who got the recommended 7 hours of sleep per 24- hour period” (para 4). Coyle (2018) suggests that exposure to natural outdoor light has been documented to improve sleep quality because it helps to regulate the human body’s internal “sleep clock.” Additionally, he states that regular doses of bright natural light have also helped children to stay more alert during the day, elevate their moods and make it easier to sleep at night (Coyle, 2018).

Vitamin D. Vitamin D refers to a group of fat-soluble molecules that have a significant role in mineralization of bone, skeletal maturation, regulating the concentration of calcium and phosphate (Webb & Howler, 1988). A small amount of these molecules can be obtained from the diet, but about 90% comes from synthesis of vitamin D in the skin when exposed to ultraviolet B radiation from the sun (Webb et al. 1988). Severe vitamin D deficiency can cause osteomalacia in adults and rickets in the pediatric population. In addition, from a study in which umbilical cord concentrations of Vitamin D were measured, Reeves et al. (2014) reported that Vitamin D deficiency has been implicated as a causal factor in preeclampsia which can cause complications in birth and sometimes leads to maternal and neonatal deaths. Though occupational therapists do not specifically work with pregnant women as a target population, there is a role for education and health promotion for women of child-bearing age. Further, vitamin D is necessary

throughout the life span, therefore occupational therapists can make clients aware of the benefits of natural light daily for health promotion and prevention of disease.

Respiratory health. Asthma is a chronic lung condition which affects airways in the lungs. It is most often considered to be non-preventable but controlled by medication and exacerbated by environmental factors (CDC, 2018c). The Centers for Disease Control (CDC, 2018c) stated that 8.3% of adults aged 18 or older have asthma, as well as 8.3% of children 18 or younger. A total of 26.5 million Americans suffer from asthma, costing the United States 56 billion dollars per year (CDC, 2018c). Lovasi, Quinn, Neckerman, Perzanowski and Rundle (2008) state that the prevalence of childhood asthma in the USA increased by 50% from 1980 to 2000, with especially high prevalence in poor urban communities. Lovasi et al. (2008) completed a cross sectional, correlational study related to the density of street trees and prevalence of childhood asthma in New York City and found that areas with more street trees experienced a lower prevalence of early childhood asthma (Lovasi et al., 2008). This indicates that there may be potential preventative measures that can be taken to avoid asthma all together.

Mental and emotional health. Wood, Hooper, Foster and Bull (2017) stated that mental illness is a leading cause of disability globally and thus there is an increasing emphasis on mental illness prevention and population-based initiatives. Wood et al. (2017) completed a study called the RESIDE project in which the neighborhoods of 492 individuals were assessed and found that total area of parks (10-15 minute walk in all directions) was associated with positive mental health. This suggests that access to greater numbers of recreational sport and nature spaces may be associated with positive mental health. In relationship to design, they stated that these findings

support the need for park areas within urban environments and act as a “vital neighborhood ingredient for mental well-being” (p. 67).

Bowler et al. (2010) also completed a systematic review of participation outdoors and found that the most common health/well-being outcome was the measure of an individual’s emotions. Greater than two-thirds of the studies measured at least 1 emotion and overall the review revealed that negative emotions such as anger and sadness were reduced after exposure to a natural environment in comparison to a more built environment. In a 2014 literature review citing more than 110 articles related to the use of nature in coping with stress, Berto (p. 395) states “Natural environments protect people against the impact of environmental stressors and offer physiological, emotional and attention restoration more so than do urban environments. Natural places that allow a shift towards more positively-toned emotional states, positive changes in physiological activity levels, and in behavior and cognitive functioning are called restorative environments.” Moreover, Berto (2014) states that increased accessibility to forest and green spaces increase happiness and result in improved mood and concentration. Finally, Berto emphasizes that these green spaces lower stress, anger and depression in people of all ages.

Stress tolerance. Repeated long term exposure to *m.vaccas*, which is found in soil, and commonly consumed when fruits and vegetables are not thoroughly rinsed increases tolerance to stressful situations (Matthews & Jenks, 2013). In an experimental quantitative study conducted in 2010 reported by Williams (2017), mice exposed to *m.vaccas* showed less anxiety and produced more serotonin, a neurotransmitter associated with happiness. This suggests that spending time working in a garden, harvesting fruits and vegetables and consuming these foods with small amounts of soil intact can positively influence health.

Gill (2014) completed a systematic review and found that spending time in nearby nature leads to improvements in mental health and emotional regulation, both for specific groups of children (such as those with ADHD) and for children as a whole. In addition Gill stated that there is some support that conservation activities on school grounds and nearby open spaces are associated with improved psychosocial health.

Health Benefits for Specific Groups

Developmental disabilities. Hussein (2017) completed a study using qualitative interviews, observations and behavior mapping of activity participation. The study included children with special needs at 2 schools in which developmental play and sensory affordances of the space was considered. They found that, the sounds, sights, smells and tastes were more important than aesthetics to engage sensory users. Sensory garden spaces ultimately offered children with special needs sensory stimulation, physical mobility, and social interaction (Hussein, 2017).

Attention deficit hyperactivity disorder (ADHD). Taylor and Kuo (2011) surveyed families of over 1,000 children with attention-deficit hyperactivity disorder (ADHD). The families reported the least ADHD symptoms in “open space” which is defined as open green space. “Big trees” and “grass and open grass” were associated with milder symptoms than “built outdoors” and “deep indoors.” This suggests that there may be alternative, affordable, more accessible interventions beyond the two most common evidence- based treatments for ADHD which include behavioral therapy and stimulant medications. When working with children with ADHD, occupational therapists can consider the potential effects of wide open and grassy spaces on this population’s participation and occupational performance. In addition, this evidence can

influence the physical environments where OTs intervene as well as their advocacy and education efforts on behalf of the children to the school and parents.

Cuvo, May and Post (2001) completed a study comparing the use of Snozelean rooms, multi-sensory environments that help reduce agitation and anxiety, used to engage, encourage communication and stimulate the user (Snozelean, 2019) to traditional common indoor areas. In the study, Cuvo et al. (2001) used an alternative treatments design and observed three adults with severe developmental disabilities in indoor versus outdoor environments tracking, specifically, behaviors such as mouthing and body rocking, as well as engagement. There was some indication of an improvement in behavior during the outdoor activity compared to the indoor environments. This shows that there are potentially outdoor-based sensory opportunities that may rival the costly Snozelean rooms.

Autism spectrum disorder (ASD). Li et al. (2019) completed a study in which 22 qualitative interviews were conducted with parents of children aged with an ASD diagnosis. They asked questions related to how often the child go outdoors, if they participate in green space, what their perceived benefits of visiting green space for the child and barriers to taking their child to green space. They found that the perceived benefits were sensory, motor and emotional development. Conversely, the perceived barriers included inappropriate behaviors, sensory issues and phobias. Ultimately, Li et al. (2019) concluded that “it may be possible to guide children to functional play and grow these interests to influence their developmental trajectory” (p. 77)

The Ernie Els Foundation believes so strongly in nature’s therapeutic properties that they have funded a therapeutic garden in which children ages 5-21 with ASD spend at least 1 hour per

day outdoors in a sensory garden (Els for Autism, 2018). Izzy Paskowitz, the founder of Surfers Healing, a surf camp for children with ASD reports anecdotal evidence that children engaged in tandem surfing have increased joint attention and engagement during surfing and following the activity (Surfers Healing, 2018). Nichols (2014) described some of the theories as to why people with ASD appear to thrive at these surf camps. Nichols (2014) stated that water is visually stimulating, provides the body with hydrostatic pressure, increased blood flow to neurons in the frontal lobe through learning swimming skills. Nichols also claims that the attempt to balance and ride waves provides a focus and awareness of the present moment.

Depression. Gonzalez, Hartig, Patil, Martinsen and Kirkevold (2010) reported that the use of therapeutic horticulture resulted in decreased symptoms of depression. Using a convenience sample of 28 people with clinical depression, data were collected before, twice during, and immediately after a twelve-week therapeutic horticulture program, and at 3-month follow-up. Assessment instruments were the Beck Depression Inventory, Attentional Function Index, Brooding Scale, and Being Away and Fascination subscales from the Perceived Restorativeness Scale. Researchers found that the reduction in severity of depression persisted for up to three months after the conclusion of the therapeutic horticulture intervention.

Dementia. Several studies during recent years show that older adults are at risk for lower concentrations of vitamin D as a result of decreased dietary intake, skin absorption of Vitamin D and less time spent outdoors. In a recent study, Arnljots et al. (2017) collected blood samples collected from residents of 22 nursing homes in southwestern Sweden as well as age, gender, vitamin D supplement usage, lack of appetite in the last 3 months, diagnosis of dementia in the medical record and if the resident had received any antibiotic treatment during the last 6 months

as a marker of potential bacterial infection. The diagnosis of dementia in the medical records required a previous comprehensive history and physical examination by a physician, laboratory tests, cognitive function test and most often neuroimaging. The average number of hours outdoors per week during April to August was registered. They found that Vitamin D deficiency was common among nursing home residents and strongly associated with dementia. The older adults were observed to stay outdoors only for a few hours per week, likely with clothes covering most of their skin or in the shade. The results are important in clinical practice as it may prompt OTs to advocate for older adult's time spent outdoors in the sunshine as they can have vitamin D deficiency regardless of time spent outdoors.

Whear et al. (2014) completed a systematic review of both qualitative and quantitative studies involving people with dementia and the impact that garden and outdoor spaces have on symptom reduction. Benefits of the garden were thought to occur through 2 mechanisms: reminiscence and sensory stimulation. These mechanisms are thought to work by encouraging a relaxing and calming environment, while also providing an opportunity to maintain life skills and habits. The authors stated that other studies also have suggested that physical activity may have a role in slowing cognitive decline and in reducing falls, both of which can be attributed to the garden environment.

Nature Implications for Workers

Shift workers. Harb, Hidalgo and Martau (2015) completed a study investigating the effects of disordered work schedules which result in decreased daytime light. The author focused on Latin American shift workers who experience chronodisruption through night-shiftwork. Shift workers may sleep sporadically or may completely invert their sleep schedules both of which

cause increased exposure to electrical light in comparison to those who maintain normal sleep-wake cycles. The authors cite studies in which the light pattern has been correlated with an increased prevalence of several health issues such as obesity, psychiatric disorders, cardiovascular disease and breast cancer. In this quantitative study, Harb et al. (2015) found that depressive symptoms were positively correlated with cortisol levels and negatively correlated with melatonin levels at two times of day, 4 pm and 10 pm. This is relevant for health promotion as lower wage workers in the United States often work a “second shift” and do not sleep during a typical cycle. Occupational therapists can offer consultation about work life balance and adjusting daily routines to ensure that all people have access to natural light daily to potentially aid in prevention of depression, obesity and cardiovascular disease.

Indoor workers. Bjørnstad, Patil and Raanaas (2016) used the stress recovery theory, which states that natural environments can increase positive affect, to guide their study. The study collected data about workers’ contact with nature in Southern Norway. Seven office workplaces with a total of 562 workers between ages 17-69 who completed work tasks indoors for at least 4 hours per day were surveyed. They used 3 quantitative measures: The Nature Contact Questionnaire (NCQ) which consists of 16 questions, comprising three subscales: outdoor nature contact, defined as contact with natural elements outdoors during working hours, indoor nature contact, defined as contact with natural elements inside a building such as live plants, natural light and windows with a view of the outside, and indirect indoor nature contact as well as a scale of administrative support and stress. They found that employees reporting high exposure to indoor nature contact at work also reported a significantly lower prevalence of job stress, fewer subjective health complaints, and fewer days of sick leave than those with low

exposure. Furthermore, the introduction of indoor plants and windows with a view of nature enhanced perceived organizational support. This information is valuable to occupational therapists who work in ergonomics and as workplace consultants as these findings offer potential opportunities for health benefits to indoor workers.

Healthcare workers. In addition to implications for indoor workers, working in indoor environments may impact healthcare workers as well. Sowah et al. (2017) completed a systematic review of literature related to Vitamin D levels and occupations and found that rates of vitamin D deficiency among healthcare professionals were: healthcare students 72%, medical residents 65%, practicing physicians 46%, other healthcare employees 44%, and nurses 43%. Since vitamin D is produced through sunshine and adequate UV exposure, sunlight deprivation in indoor workers may put them at greater risk of developing vitamin D deficiency and its accompanying health risks. This information related to indoor work, especially for healthcare workers such as occupational therapists, can be powerful information to consider practicing outdoors for their health as well.

Barriers to Children's Outdoor Play

Louv (2008) described the term "nature deficit disorder" in which children are not spending as much time outdoors as in generations past. He stated that this could be due to several factors including over-scheduling but focuses mainly on safety and access as the issues. Currently, children are not likely to be able to roam their neighborhoods freely seeking to explore nature; rather due to fear of injury or abduction, they tend to stay closer to home and often in the home. Playgrounds where children could once climb and swing have eliminated any "risky play equipment" to ensure safety. Louv (2008) called for a return to unstructured play

outdoors and on playgrounds; therefore the perceptions of safety and liability must be considered.

Concerns about safety. Clements (2004) completed a study using an opinion survey to investigate mothers' experiences as children and their permitting of children to play outdoors. The researcher surveyed 830 mothers of children aged 3-12 and found that although 70 percent of today's mothers played outside daily when they were children though the ages of mothers were not provided. Despite the high numbers who played outside as children, only 31 percent of them allow their children to do so today. These parents indicated that concerns about crime and safety were a primary reason that they did not allow their children to play outside. Larson (2001) stated that structured activities that children engage in often take the place of the unstructured, outdoor-based, free play that children need.

Reductions in play. Play is the primary occupation of children, and literature suggests that preschoolers who spend much of their day engaged in play whether at home or in day care centers may also be missing out on nature opportunities. Sandseter (2012) conducted semi-structured interviews with seven early childhood education and care (ECEC) providers in both ordinary and nature-outdoor based kindergarten settings in Norway. They asked the providers about their perception of risk in children's play, and how they balance children's physical risk-taking with providing opportunities for developmental play. Overall, Sandseter found that the ECEC providers felt that children must have the opportunity to meet challenges to be able to manage them despite some safety concerns. The providers emphasized that children should get the opportunity to learn and discover and through their own experiences, determine what is safe while also offering opportunity for mastery of skills. This information

can be relayed to occupational therapists who work with pre-school aged children in early intervention settings in order to promote their development and opportunity for skill development.

Play Interventions and Occupational Therapy

A recent study by Lynch et al. (2017) described the use of play-based occupation for children in Ireland, Switzerland and Sweden. They found that most therapists used play as a means to an end and rather than focusing on the occupation of play, they used play for skill development. This is an important finding because several standardized assessments of play, the Revised Knox Play Scale and Test of Playfulness require observation of a child in both indoor and outdoor environments. Therefore, it is concerning that children are not offered as many opportunities for outdoor play as outdoor play often involves creativity and an opportunity for children to engage in risky play which challenges their motor skills and abilities. If children continue to remain indoors for play, then we as OTs risk children having a narrow repertoire of play skills which impacts the occupation of play, a child's primary occupation.

Tools for assessing barriers to outdoor play. An assessment called the Attitudes Toward Outdoor Play (Beyer, 2015) could be considered a key tool for occupational therapists to determine the experiences children and adults have had that might impact their prior and future participation outdoors. The tool uses a Likert Scale to gauge children's agreement with questions regarding nature participation which include for example: Playing outside in nature helps me think more clearly; I feel like I have freedom when I play outside in nature; I am afraid of wild animals or insects outside in nature and I am afraid of getting hurt if I play outside in nature. This

tool can be used as a pre-post test to determine outcomes for children who participate in structured outdoor programs.

Design and Environment

Thirty years before Richard Louv coined the term “nature deficit disorder”, a 1975 conference called the Children, Nature and Urban Environment symposium met in Washington, D.C. with the goal to imagine how cities could be designed with a more deliberate interweaving of natural and man-made elements so that children could enjoy more balanced contact with nature (Chawla, 2015). This balance with nature continues to be investigated. Manuel (2003) described the kid-sized wilderness spaces that are meaningful and valuable for children and that are now often removed in urban development. She discussed the concept of “designing with nature” and the importance of children engaging in natural spaces. In addition, Manuel discussed the play skills and physical activity which are promoted and important to well-being and health promotion in children. Jenkin, Frampton, White and Pahl (2018) suggested that reduced exposure to natural environments, through urbanization, may be undermining the self-regulation capacities of both adults and children.

Based on a hypothesis that natural play spaces promote engagement and play in children, Brussoni, Ishikawa, Brunelle and Herrington (2017) transformed two childcare centers from concrete and plastic spaces to more outdoor, natural spaces and videotaped children playing. They then analyzed the videos for pro-social behavior, engagement and play behaviors. They found an increase in space used, decrease in antisocial behaviors and increase in exploration of nature elements in the transformed spaces. They concluded that one can affordably create high quality, natural play environments which can have a significant and positive impact on children's

health and wellbeing. This finding is important as occupational therapists often work with children in early intervention in day care facilities. Children who have challenges with engagement and socialization may benefit from natural playscapes and occupational therapy can advocate for children and educate families and preschool workers about the importance of this type of design.

Wood et al. (2017) completed a study in which they used a measure of mental health and existing data from a neighborhood design project to explore the association between aspects of green space and mental health. They found that access to greater numbers of recreational sporting and nature spaces was significantly associated with positive mental health. In addition, their results indicated that both the amount of park space and proximity to home is significant to positive mental health. The authors state that this study is one of very few and that there is a need for more studies taking into consideration age, gender, life-stage in order to understand the relationship between greenspace and mental health. The findings of the above-mentioned study can be useful to occupational therapists who are interested in assisting with designing spaces to promote participation, socialization and mental health of clients and communities.

Current Therapeutic Uses of Nature

Limited evidence and peer-reviewed publications exist about the use of nature and the outdoor environment for rehabilitation purposes. The few areas where literature has emerged include inpatient rehabilitation settings and horticulture therapy.

Rehabilitation and use of nature. Raanaasa et al. (2016) completed a study in a rehabilitation center in Norway which are similar to rehabilitation settings in the United States. During the rehabilitation process, clients were exposed to varying levels of interaction with

natural, outdoor environments. These varied from panoramic window views of valleys and mountains to potted plant varieties commonly found indoors. They used a phenomenological approach to understand the significance of nature elements in clients' recovery. Individual interviews and focus groups were conducted. Themes emerged related to the exterior environment being pleasant to view, allowing for opportunities for reflection, symbols of life and made the clients feel they were being taken care of.

Park and Mattson (2009) completed a study in which 90 patients recovering from a hemorrhoidectomy were randomly assigned to either control or an intervention in which plants were present in patient's rooms. Live plants were placed half of the patients' rooms during postoperative recovery periods. Information collected for each patient included length of hospitalization, analgesics used for postoperative pain control, vital signs, ratings of pain intensity, pain distress, anxiety and fatigue. Each patient also completed an anxiety inventory. They found that viewing plants during the recovery period had a positive influence on health outcomes such as lower systolic blood pressure, and lower ratings of pain, anxiety, and fatigue than patients in the control group. Patients with plants also felt more positively about their rooms and evaluated them with higher satisfaction when compared with patients in similar rooms without plants. Regarding natural elements in health centers, it was said:

Health professionals should encourage the development of gardens in hospitals, hospices, schools and prisons. They should try to influence the design of new health service buildings by insisting that there are views of outside nature from every patient and staff room, and by placing internal plants in atria, communal areas, surgeries, clinics and staff rooms. (Thompson, 2018, p. 202).

Therapeutic and healing gardens. Horowitz (2012) stated that the American Horticultural Therapy Association (AHTA) defines horticultural therapy as engaging clients in horticultural activities facilitated by a trained therapist to achieve treatment goals which include improving social, cognitive, physical functioning and well-being. Settings for horticultural therapy include hospitals and clinics, psychiatric hospitals and mental-health programs, hospice programs, cancer centers, substance-abuse programs, assisted-living and senior centers, correctional facilities, community gardens, and schools (Horowitz, 2012).

Through a search in CINAHL, Ebsco and PubMed Central, Wagenfeld is one of the only occupational therapists both using horticulture and gardening in occupational therapy interventions and publishing about these interventions. Wagenfeld and Atchison (2014) stated:

Gardening as an occupation-based intervention has reach in its applicability to a wide range of clients, is flexible in how it can be implemented, does not require advanced training to carry out, and can be cost efficient. It is practical and readily translatable to multiple practice settings (p. 3).

Winterbottom and Wagenfeld (2015) authored a book titled *Therapeutic Gardens: Design for Healing Spaces*. They stated that a key consideration in design is that occupational therapists should be on the design team. They stated that OTs understand human structure, function and behavior as well as how to adapt the environment to support physical, social, sensory, cognitive and psychological needs. In addition to designing these healing spaces, OTs are equipped to remove barriers to foster participation and choose, organize and adapt features of the environment to fit people with their present abilities. Occupational therapists can use

horticulture/gardening in therapy, and do not require courses in horticulture as these skills are part of their OT training (A. Wagenfeld, personal communication, July 20, 2018).

In accordance with her beliefs that occupational therapists can use gardening in therapy, Wagenfeld and Atchison (2014) conducted a study of occupational therapy practitioners to determine how many were using gardening and other outdoor interventions in therapy and if so, what their motives were. A 15-question online survey about gardening as an occupational therapy intervention was emailed to Western Michigan University Occupational Therapy alumni and posted on four OT Connections groups and the AOTA LinkedIn site. Sixty out of 80 occupational therapy respondents stated that they used gardening in interventions mainly including watering and planting. Of the 80 respondents, 48 stated that they engaged clients outdoors in or outside of a garden. The remaining therapists utilized client rooms or the clinic. Ninety three percent of the occupational therapists stated that they used the intervention because it was meaningful to the client.

In addition to the therapeutic benefits of engaging clients in the occupation of gardening, occupational therapists can establish community gardens for participation of an entire community. Loftus et al. (2017) described perceived benefits of community gardens including “improved life skills, a better understanding and connection to food, improvement in willingness to work together, and increased pride in the community” (p. 509). In addition, Somerset and Markwell (2009) stated that school gardens are a proven effective tool to educate children about healthy eating and exploration of more varieties of fruits and vegetables. According to AOTA (2019) 19.9% of occupational therapists in the United States work in public school settings

where children can be engaged in edible gardens to address performance skills development as well as being exposed to healthy foods.

Models Guiding Continuing Education Course

Occupational adaptation. Occupational Adaptation (OA), a model created by Schkade and Schultz (1992), describes the internal processes which occur as a person attempts to adapt or overcome an occupational challenge and pursue competence. The three constants of the OA process are 1) the person's desire for mastery, 2) the environment's demand for mastery and 3) the resulting press for mastery (Schkade & Schultz, 1992). It can be argued that an occupational therapist's desire for mastery may take the form of the desire to expand his/her repertoire of interventions and to think creatively. In addition, in this technologically overwhelming world, perhaps occupational therapists, just like their clients, need restoration and can benefit from being outdoors when intervening or promoting others' health. The occupational response is the observable behavior or actions that occur as a result of the occupational challenge. Relative mastery is an evaluation, based on personal standards, of the occupational response. Similar to the role of client and therapist, in teaching occupational therapists about the literature that exists related to outdoor participation, the participant of the course is the agent of change and the presenter is the client's facilitator. In adopting a new lens and committing to consideration of the environment for function and participation, the participant occupational therapist is being asked to adapt. Therefore, the OA model fits that the "therapeutic process" is one in which the presenter is developing the client's adaptiveness rather than helping the participant adapt. Schultz (2000) described the therapists' role. Among others described, the best fit for the

purposes of the continuing education and presenter role include 1) acting as a facilitator and 2) presenting opportunities for the client to acquire new adaptive responses through self-generation.

Ecological models. Brown (2014) described the use of ecological models in occupational therapy practice. Brown stated that in the 1990s, three separate groups of occupational therapists created three models (Ecology of Human Performance, Person-Environment- Occupation- Performance and Person- Environment Occupation models), all of which consider occupational performance as the primary outcome of interest as well as the interaction between the person, environment and occupation. Brown stated that there was concern that environment was not getting enough attention, but rather the tendency for practitioners to focus on the person factors and neglect the influence of the environment. Brown described the assumptions of ecological models as the following: the environment is a major factor in prediction of successful and satisfying occupational performance. Therefore, interventions may be most effective if the focus on changing the environment or find a person-environment match rather than focusing exclusively on interventions that change the person.

In conclusion, there are many well-known benefits of participation in nature and occupational therapy is well suited to use this evidence to substantiate interventions outdoors as well as use of the natural outdoor environment for health promotion. The literature shows the benefits of nature participation with special populations such as ASD, ADHD, dementia, developmental disabilities, as well as those who have diagnoses of hypertension and asthma. As healthcare providers with a focus on mental health, physical well-being, development and rehabilitation, occupational therapy can use this information along with occupational adaptation

theory to reflect on current practices and delve into new arenas such as outdoor design, sensory gardens, therapeutic gardens and development of programs in nature.

Methods

A major deliverable for the capstone project is development of a continuing education course developed for occupational therapy practitioners to use nature in both intervention and health promotion. In order to fully develop this continuing education, one must consider: 1) using evidence to support adult continuing education practices; 2) techniques to promote reflective practice of practitioners; 3) marketing of the course and finally; 4) data collection in order to plan the time of year, duration of the event and cost that is most accessible to interested therapists. The following methods section will describe all 4 of these methods in detail and the plan for each of these methods.

Continuing Education

Andragogy. Knowles, Swanson and Holton (2005) described the notion of andragogy which is the art and science of helping adults learn. The authors state that learning in adulthood is very different from learning in childhood and that the learner, context and learning process must be considered. This idea initially described by Knowles in 1980, suggests adult learners are often both internally motivated as suggested by but also externally motivated as they learn to increase their earning potential and social capital. Smith (2010) describes the shift from teacher centered to student centered learning for adults. The use of collaborative learning with adults can be impactful as it promotes the individual to change and develop as a result of being part of a collaborative group in which to construct knowledge. This differs from traditional lectures and promotes problem solving. Strategies that will inform the continuing education include the above

mentioned collaborative model as well as the notion of epistemological development (Smith, 2010) which is described one in which the teacher initially acts as the transmitter of knowledge but then moves to the students being capable of creating knowledge. This is central to the continuing education process, as the plan for the continuing education course twofold: first, impart knowledge of the use of the natural outdoor environment by other disciplines, then transition into a workshop format with participants working in small groups. The second phase emphasizes the process of the participants discussing their ideas and how the foundational knowledge will inform ideas and plans. In order to test these assumptions about adult learning, an educational module was presented to park staff. This module related to teaching state park staff about various diagnoses of children who participate in programs, ways to adapt and grade program elements and an opportunity to apply these principles to a hands-on activity was presented. The pre and post educational module surveys can be found in Appendix A.

Reflective practice. The proposed continuing education course will require participants to reflect on their current practices as well as how they utilize nature on a daily basis and consider to environment in interventions. McCoach and Smith (2016) describe the three steps towards reflective practice. The first is to reflect on self, your own values and beliefs. This may involve asking therapists to complete a values clarification sheet or consider types of knowledge that are utilized. These are Carper's (1978) fundamental ways of knowing described by Porter (2010) which include empirical, personal, ethical and aesthetic knowledge. Aesthetic knowledge is described as an awareness of the immediate situation and awareness of the client and his/her circumstances as uniquely individual, and of the combined wholeness of the situation.

The second step of reflective practice is to reflect on others and the third, that will be the emphasis of the course, is to reflect on our practice and larger issues such as health promotion and a belief that nature can be restorative, and beneficial for our clients' development and recovery. McCoach and Smith (2016) stated that the third level asks practitioners to consider factors beyond the immediate health care system, but within which both them and their practice is formed and bounded. This level is highly critical in that it requires practitioners to ask why and how things have become the way they are, and to consider the socio-historical context of their practice.

Self-direction. Another key aspect of the course relates to participants self-directing the types of foundational knowledge they would like to learn more about. St. Clair (2015) described educators who are committed to student- centered processes as being open to content and materials. This includes allowing participants to generate ideas about what they would like to learn. This will be discussed further in regard to the pre-work in which participants identify their area of practice and information they would like to learn more about. Another key point that St. Clair (2015) makes about adult continuing education courses is the importance of resources accessibility. By creating a web site and offering the materials for pre-work to the registered member, this makes the foundational information accessible. The pre-work involves the course participants access to a discussion board in which they can introduce themselves, discuss what they hope to get out of the course and their practice area as well as their current level of involvement/if any with using nature therapeutically. The website will also have at least 1 example or article related to the use of nature within a practice area. The course participants will be expected to read and browse through the resources and then answer various prompts (which

can be found in Appendix D) in order to gain the 4 hours of credit for this pre-work aspect of the course.

Marketing the course

Several articles Lefebvre (2000) and a text by Murray (2006) about best practices in marketing have been utilized to effectively market the course including disseminating information about the course, enlisting attendees and obtaining contact information for potential attendees, highlighting the innovative and different aspects of the course.

Course previews. One way to market the course is by offering short, introductory presentations at meetings of professional organizations such as local chapters in regions where this author has contacts such as Maryland Occupational Therapy Organization as well as the national organization The American Occupational Therapy Association. It was stated “More often than not, people need to be convinced before clicking on the “enroll” or “buy” button; giving them a free preview of your course may be just what they need” (Pappas, 2015, para 4).

Social media and website marketing. Lefebvre (2000, p.3) stated that when marketing, one must consider how we market materials in the “ever expanding palette of communication tools” and ever- changing marketplace of ideas and behaviors are constantly being shaped by the activities of public, private and civil society. The need for the resources to spread ones’ message with a solid communication strategy is critical. With regard to this forth step, it will be essential that a web site be created that states clearly the difference between this course and others, what the defining ideas such as within a vacation, reflective component and workshopping ideas. These ideas need to be communicated effectively and a professionally designed web site will provide this necessary foundation. The web site can also add key credibility (Trout & Rivkin,

2006). Marketing that the developer and presenter of this course is a Doctor of Occupational Therapy student and presenting an extensive reference list may offer the credibility needed to successfully market a course.

In addition to the use of social media and a website, other possibilities for marketing include use of social media. Lefevbre (2000) described the use of social marketing for social change which resonates because there is now a movement to get children into nature to combat sedentary behaviors and overuse of technology (Louv, 2008). For example, the literature supports the need to increase rates of vitamin D for improved cognition and prevention of disease. The marketing campaign for this continuing education course can aim to bring occupational therapists to the forefront of this movement.

Highlighting unique aspects of the course. Trout and Rivkin (2006) discuss the importance of differentiation and communicating how your product is different from a competitor's. They state that this method urges companies to identify their strengths. This course has many unique aspects which include the new approach for a continuing education developed by this author and termed ReLAP, an acronym for "Reflect, Learn, Apply and Plan." This new approach has several distinct features which include: 1) pre-work in which participants provide information about their current practice as well as answer reflective questions about their practice and involvement with nature; 2) the opportunity to be an active participant in which you explore ideas and resources provided; and 3) participants leave with a plan and resources to use in practice and consider how they can alter their practice to meet their clients' needs in occupationally-centered ways which promote health and prevent illness.

Another unique aspect of this course is that it involves a nature-based experience in which therapists can reflect on their experiences in nature and then translate them to practice with the knowledge provided. Because the course lasts over several days and part of a restorative vacation, the message is that through the restorative experience in nature, participants will be able to commit to making changes in their practice and be restored enough to do so when they return to their practice settings.

Marketing accessibility for therapists of all levels of experience. The last consideration for marketing the course is about mixing the audience of new practitioners with seasoned occupational therapists. Friedland et al. (2000) described cross-listing a continuing education for entry level practitioners and students. They stated “occupational therapists seek out continuing education courses when they wish to change practice areas, to qualify for re-entry to the profession, or to become eligible to take certifying exams when they move to a new jurisdiction” (Friedland et al., 2000, p. 185). They also stated that both new and seasoned therapists sought out increased knowledge and skills as well as had a desire to explore new areas of practice. The researchers offered a course evaluation immediately following the course and found overall that both student and practitioners liked the combined format, noting that the students/new therapists brought current theoretical knowledge and enthusiasm and that practitioners added their experiences in the field. This information is important, because this continuing education is relevant to new practitioners as well as those who are seeking the change their practice area and those who crave new ideas to alter their existing practice. For new practitioners, it offers an innovate approach to practice as well as a networking opportunity and a vacation that may be affordable with a newly secured job. The continuing education can also be

marketed as a way for seasoned practitioners to reflect on their practice and learn new skills such as grant writing for an edible school garden or collaborating with community partners for clients and health promotion.

Logistical planning. In order to offer a course which is tailored to the participants schedules and is feasible for pricing, it is important to hear from the potential audience as to their preference for destination, price and timeline of course. In order to gather preliminary data, occupational therapists from Nova Southeastern University, Towson University and a Florida Region 7 OT listserv will be invited to complete a survey. A short survey on Survey Monkey has been developed and can be found in Appendix B. The results of this survey will inform the choice of scheduling of the course in December over the holiday break or in the summer. The information obtained about the perspectives on the price point, will be helpful in choosing the cruise offering which meets the price point.

Post Program Data Collection

Data collection about the effectiveness of the continuing education course is essential to determining the value of the course as well as perceptions of the approach of Reflect, Learn, Apply, Plan. A survey via Survey Monkey has been created and can be found in Appendix C.

In conclusion, a new type of continuing education (ReLAP) has been proposed which involves practitioner reflection on current practice, integrating learning, applying the new knowledge and planning its application for the future. In addition, various methods are outlined above in order to support adult continuing education practices and promote reflective practice of practitioners. Multiple strategies for marketing the course and a plan for gathering post-program

data have been identified. The above- mentioned methods will be essential in order to develop an evidence-based continuing education course that is marketable and sustainable.

Results

The following chapter illustrates the results of the three surveys conducted to gather data to inform the capstone continuing education project. The first set of data involves results of pre and post survey of an educational module of seasonal staff at a State Park. The second data set describes data collected to assist with logistical planning of the proposed 12 hour continuing education course offered as part of a restorative cruise vacation. Finally, results of a 1- hour course preview entitled Harnessing Nature for Pediatric Occupational Therapy Interventions are presented.

Patapsco Valley Educational Session

As part of an ongoing relationship with Patapsco Valley State Park, and an effort to test adult learning theory, an educational module was presented to park seasonal staff in June 2018. This 90-minute educational module took place at a meeting room at the park. It was attended by seven seasonal staff and a director of educational programs. Based on a previous meeting, it was determined that the director felt that seasonal staff needed information related to various diagnoses children may present with and ways to adapt activities so that they could participate most fully in the structured programs. Information was presented about various diagnoses and ways to support performance in structured programs. The educational module concluded with hands-on integration activity creating a rain stick and adapting and grading based on child's skills and using new terminology to complete cases. Participants were given a pre- and post-survey. Two questions were asked both pre and post educational module. These questions were

1) How would you rate your understanding of different diagnoses, and 2) How capable do you feel adapting activities and spaces for differently-abled participants? The remaining five questions were asked following the completion of the educational module. The results are outlined below.

Table 1

Understanding of Different Diagnoses: Pre and Post Educational Module

Level of understanding	Pre-educational module (n=7)	Post-educational module (n=7)
Little knowledge	42.86% 3	0% 0
Adequate knowledge	42.86% 3	71.43% 5
Very knowledgeable	14.29% 1	28.57% 2

Table 2

Perceived Capacity: Pre and Post Educational Module

Level of perceived capacity	Pre-educational module (n=7)	Post-educational module (n=7)
Little capacity	28.57% 2	0% 0
Adequate capacity	57.14% 4	57.14% 4
Very capable	14.29% 1	42.86% 3

Table 3

Post-Educational Module Questions

Question	Yes	No
Information broadened understanding	85.71% 6	14.29% 1
information was comprehensive	85.71% 6	14.29% 1
Information easily recalled	85.71% 6	14.29% 1

Participants were asked how this new information would impact their ability to lead groups/interact with users with a variety of diagnoses. Examples of the seven responses include helping kids feel more included, broadening abilities to lead and interact, allow the staff to adapt and grade activities for varying capabilities and overall positive impact. When asked what topics they would you like to know more about or add to future educational sessions, six responses were given. It was found that staff wanted more information on how to accommodate children with physical disabilities, adapting activities, interactive strategies for different diagnoses and specifically information about visual and hearing impairments.

Cruise planning surveys

In order to offer a course which is tailored to the participants schedules and is feasible monetarily, it was important to hear from the potential audience as to their preference for destination, price and timeline of course. In order to gather preliminary data, a survey was sent to three different groups of occupational therapists. Surveys were sent through a Survey Monkey

link to the 16 full and part time faculty from the Department of Occupational Therapy at Towson University in Baltimore, MD; 45 occupational therapists who are also Doctoral students in clinical and research doctorate programs at Nova Southeastern University living and working in the 16 states representing the North, South, East and West coasts of the United States. Finally, the survey was sent through a listserv called The Florida Occupational Therapy Region 7 South Forum which offers educational and networking opportunities for occupational therapists and certified occupational therapy assistants (COTA). The results of this survey will inform the choice of scheduling of the course in winter months or in the summer. Additionally, this survey informs whether the first cruise sailing would be to the Caribbean or Alaska, two of the more conservatively priced locations which offer immersive nature experience through the cruise-based continuing education company. The information obtained about the perspectives on the price point will be helpful in choosing the cruise offering which is affordable to therapists. Eighty-two occupational therapists completed the survey. Questions included professional status and years of experience, ideal time of year and location for cruise, ideal sailing duration and ideal cost of the cruise. The results are shown below in Tables 4-7 and Figure 1.

Table 4

Professional Status

Status	Number (n=82)
<u>Student</u>	0% 0
New graduate (1-2 years as OT / COTA)	1.22% 1
3-5 years as OT / COTA	6.10% 5
5 or more years as OT / COTA	92.68% 76

Table 5

Ideal Timing / Location for Continuing Education at Sea

Location / Timing	Rank 1	Rank 2	Rank 3	No Response
Caribbean in summer (June)	36.58% 30	23.17% 19	36.59% 30	3.66% 3
Caribbean in winter (Dec 27-Jan 3)	30.49% 25	41.46% 34	24.39% 20	3.66% 3
Alaska in summer (August)	31.70% 26	31.70% 26	34.14% 28	2.44% 2

Figure 1

Ideal Timing / Location for Continuing Education at Sea

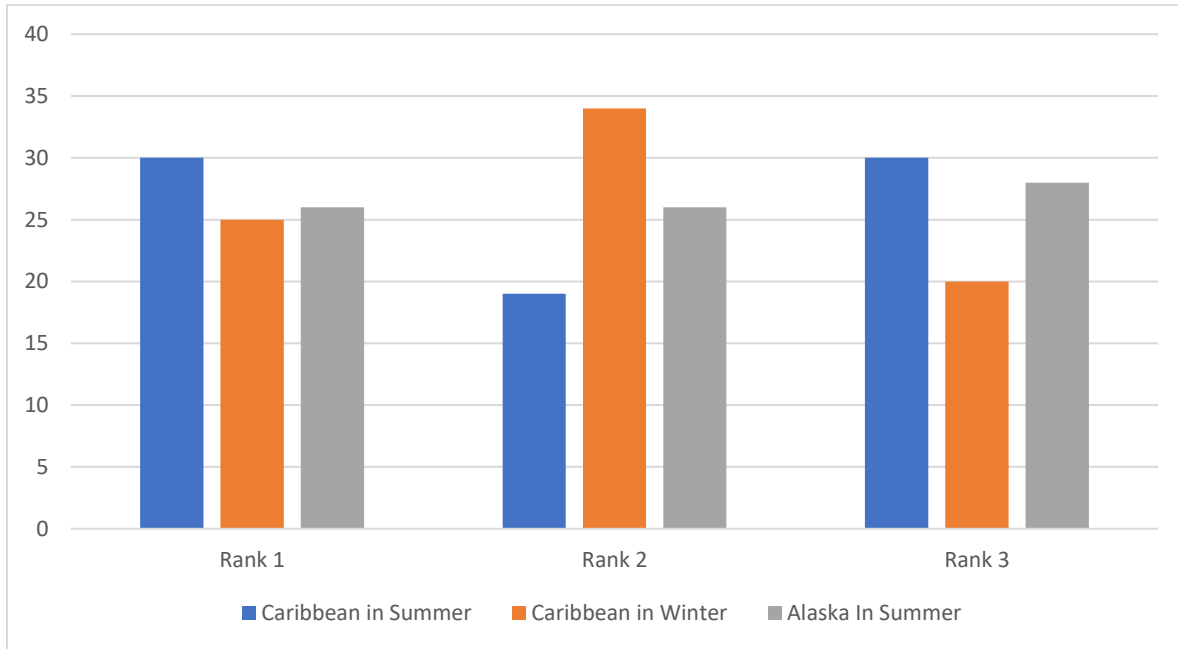


Table 6

Ideal Sailing Duration

Duration Options	Number (n=82)
5 day sailing with three- 4 hour CEU sessions	51.22% 42
7 day sailing with three- 4 hour CEU sessions	17.07% 14
5 day sailing with one- 8 hour session and one- 4 hour session	30.49% 25
No Response	1.22% 1

Table 7

Reasonable Costs (including Lodging, Child-care, Food, and Entertainment)

Cost Options	Number (n=82)
\$700 per person for a 5 day cruise (children are half price in same cabin)	43.90% 36
\$900 per person for a 7 day cruise (children are half price in same cabin)	14.63% 12
Must be less than \$700 for a 5 day cruise	37.80% 31
Other	3.66% 3

Course Preview

A one-hour course preview was presented at the Maryland OT Association (MOTA) Conference in November 2018 which twenty one surveys were completed following a one- hour course preview with the focus on using the natural outdoor environment in pediatric OT interventions. The course offered a summary of peer reviewed literature about the health benefits of participation in nature, specific pediatric populations in which interventions outdoor have proven to be helpful and concluded with a variety of programs in which OT could be involved. When asked to rate confidence in the subject matter following the presentation, using a sliding scale in which 100 is highly confident and 0 is no confidence, the average score was 85/100. When asked how likely they are to apply the knowledge learned to your practice area to their practice area, on a sliding scale of 0 being very unlikely and 100 being very likely, the average was 88/100. Table 8 below displays the results of a question asking if the course covered

expected content. Nine respondents answered “why or why not,” example responses included that it gave the participants a great understanding of the benefits of nature, sparked the participants interest to use natural strategies in the future. One respondent said that it informed her about the need for nature and available programs, and one respondent liked the presentation of resources and the use of literature. Table 9 shows the results of relevant ideas that were presented. Finally, 16 comments related to the desire for more information revealed that people wanted more information about designing natural playgrounds, specific interventions in nature, detailed strategies for parent education and funding sources to implement and sustain programs.

Table 8

Course Content Meet Expectations

Options (Yes / No)	Responses (n=21)
Yes	100.00% 21
No	0.00% 0

Table 9

Relevant Ideas Gained from the Course that Can be Used in Practice

Ideas	Responses
Preschoolers in Nature	52.38% 11
Natural Playground development	47.62% 10
Edible gardens	66.67% 14
Nature and park prescriptions	66.67% 14
Accessibility of parks	33.33% 7
Education of parents, teachers or pediatricians	71.43% 15
Outdoor interventions	85.71% 18

Interview of Stakeholder

In November 2018, an interview was conducted with the owner of a continuing education platform. The course was accepted for a course preview which will last one hour and be taped on April 11, 2019. Through the interview with Fawn, she discussed the importance of including case studies for the participants to integrate information at the conclusion of the course. This information was valuable in planning for this course preview as well as considering its utility for the larger 12 hour continuing education course.

Discussion

As the data in the results section suggest, providing an educational session increased both perceived knowledge and capacity of the park staff. Prior to the educational module, 42% of the staff indicated that they had little *knowledge related to different diagnoses of children* who may attend their programs. Results of the post-educational module indicate that 0% of those same participants felt that they had little knowledge. The number of those who felt *adequately knowledgeable* changed from 42% to 71% and following the educational module, one additional staff person felt she had become very knowledgeable. Similarly, 28% of participants indicated that they felt they had little *capacity to adapt activities and spaces* prior to the educational session. After the educational session, 0% felt they had little capacity. The number who reported adequate capacity remained steady at 57% and the number who felt that they were very capable changed from one to three respondents. Additionally, 85% of the participants stated that the *information presented broadened their understanding of diagnoses* and felt the *information provided to be comprehensive and recalled easily*. In sum, the educational module used principles of adult learning described by Hansman and Mott (2010) in which emphasizes the importance of providing highly relevant information and active problem solving of adult learners. Similarly, the course utilizes collaborative learning and epistemological development (Smith, 2010) in which adults learn and change as being part of a collaborative group and move from being recipients of knowledge to capable of creating knowledge. This educational module used principles of adult learning successfully as it increased participants perceived knowledge and their perceived capacity to lead and develop programs, effectively moving from the recipients of knowledge to the users and creators of knowledge. The larger continuing education

course will use a similar epistemological development process in which participants are presented with relevant information, offered active problem-solving opportunities and an opportunity to apply this knowledge and plan for future practice and potentially contribute to an increased evidence-base in our discipline. The continuing education course will dedicate much of a 4 hour session to participants applying the new information gained and using available resources to plan for future practice.

In addition to gathering data about how the principles of adult learning can be applied to the continuing education course, data was also gathered about the ideal location of this highly interactive continuing education course. A total of 82 occupational therapists completed a survey asking them to indicate their preference of location and duration of a nature-immersed environment to explore when not participating in the continuing education course. An interesting finding of the cruise planning surveys is that all three options, *Caribbean in Summer*, *Caribbean in Winter* and *Alaska in the Summer* are almost equally popular. Additionally, the overwhelming preference for price and duration was a five-day cruise (51% of respondents) with the 12- hour continuing education broken into four hour blocks and a price point of \$700 per person for the five day cruise (43.90% of respondents). This informs the planning of the continuing education course that it can occur in Winter or Summer but that the chosen cruise should be five days in duration, offer 12 continuing education credits over 3 days at sea and cost no more than \$700 for the five-day cruise experience. Another goal of the immersive nature experience is to guide participants to reflect on their current practice and use of nature. McCoach and Smith (2016) described the three steps towards reflective practice which can all be accomplished in this continuing education at sea. The first step is to reflect on self-, their own values and beliefs. They

will be asked secondly, to reflect on others and finally, consider the factors beyond the immediate health care system which is highly critical and asks them to consider why and how they have arrived at their current practice context. In addition to the reflective piece, another assumption made based on attention restoration theory (Kaplan, 1995) is that time in nature is restorative and stress reducing and that an audience who is more restored will be more readily available for learning. de Bloom, Geurts and Kompier (2012) found that short vacations (4-5 days) were associated with positive changes in health and wellbeing but did not offer lasting after- vacation effects. Because the intent of this course at sea is to offer participants an immersive experience in nature (active or passive) to reflect on their own perceived value of nature, it is promising that the most popular duration was 5 days and aligns with the literature. Additionally, this immersive experience in nature will likely provoke the participant to consider intervention applications more fully than in only experiential learning within a classroom or conference room. Memon (2017) described immersive learning experiences as those that give more holistic and life-like experiences than experiential learning and an opportunity to be involved as they would in real life which promotes learning. He stated “Immersive learning ventures to extract the individuals from their environment and immerses them into a completely different environment altogether” (para 6).

The final survey, which reflects data gained post-course preview entitled *Harnessing Nature for Pediatric Occupational Therapy*, informed the content on the highly interactive, reflective and nature-immersed continuing education course. The course preview data represents survey data collected from 21 occupational therapists (likely pediatric therapists given the course title) was valuable to both market the course as well as gather data about the information

provided and its usefulness and relevance to the participants. As shown in the results section, 100% of respondents found the *content to meet expectations*, 85% reported that they were *confident in the subject matter* and 88% indicated they were *likely to apply the knowledge to their area of practice*. This information is relevant as it indicates that the literature provided and disseminated is relevant to participants, but it is also perceived to be useful to their practice. An important aspect of a continuing education course is for participants to leave the course ready to use the knowledge they have gained in their practice. Several qualitative responses indicate that participants appreciated the literature, left with a greater understanding of the benefits of nature and the resources available. Greater than 47% of participants indicated 6/7 of the topics were described as *relevant ideas for practice*. This indicates that the majority of topics should remain in the larger continuing education course. Additional topics that were desired include natural playground design ideas, education of families and funding for projects. These results seem sensible because advocacy, planning and utilizing natural playgrounds is a key way that school-based occupational therapists, which make up 19.9 % of occupational therapists in the United States in 2014 (AOTA, 2019), can contribute to children's outdoor play. Education for families is also extremely important because not all therapists will inherently know how to engage families and convey the sense of urgency of children's increased participation outdoors. As the literature suggests, participation in the natural outdoor environment can increase Vitamin D levels, pro-social play, decrease stimming behaviors, among other benefits that are useful information for parents. Additionally, providing information and resources about funding sources is extremely important because it is unlikely that schools have these funding streams for edible gardens, natural playgrounds and other outdoor materials and supplies that can be used in

interventions. These topics will be researched and incorporated with examples into the larger continuing education course.

Finally, it was seen that Occupational Adaptation (OA) (Schkade & Schultz, 1992), which was used to inform this course preview, proved to be an applicable theory to describe the learning and transformation that can occur in this new type of continuing education. Within the previously discussed ReLAP model of continuing education, therapists will reflect on their practice, learn new information which is pertinent to their practice and offers the opportunity for the participants to apply and plan for how they will expand their use of the natural outdoor environment. The three constants of the OA process are essential to consider and include: 1) the person's desire for mastery, 2) the environment's demand for mastery and 3) the resulting press for mastery (Schkade & Schultz, 1992). In the context of participating in both the course preview and the larger continuing education course, the occupational therapist participant's desire for mastery takes the form of the desire to expand his/her repertoire of interventions and to plan and implement interventions using the natural outdoor environment.

Additionally, Schkade and Schultz (1992) describe other aspects of OA which include the occupational response and relative mastery and can be seen in the transformation that occurs as a result of participating in this continuing education course. The occupational response is the observable behavior or actions that occur as a result of the occupational challenge. In the larger continuing education course, this observable behavior or action will be seen by the participant creating a concrete plan of how to use this information in practice and setting goals for implementation of use of nature in practice. Relative mastery is an evaluation, based on personal standards, of the occupational response. In the course preview, each participant was asked to

indicate topics that he or she found relevant and was likely to use in practice. In the larger continuing education course, each participant will create a tangible, achievable plan that he/she believes it possible to carry out given the information and resources provided. Schultz (2000) described the therapists' role in the OA process to be similar to the role of client and therapist in occupational therapy intervention. The parallels exist within teaching occupational therapists about the literature that exists related to outdoor participation, resulting in the participant of the course becoming the agent of change, with the presenter as the client's facilitator. In adopting a new lens and committing to consideration of the environment for function and participation, the participant occupational therapist steps into the context of opportunity for adaptation. Therefore, the OA model fits that the "therapeutic process" is one in which the presenter is developing the client's adaptiveness rather than helping the participant adapt. In addition, the course offers the occupational therapist participants the opportunity to achieve their desire for mastery and provides the tools to plan to use interventions in nature so that they can appraise their occupational response as successful.

All continuing education courses provide information to therapists, but how do we ensure that the information they learn is recalled and used in practice? This can be solved with the two final steps in the ReLAP process: *Apply* and *Plan*. By bringing the participants together into small groups to "workshop" ideas, create a plan and uncover resources, the participants will be highly engaged and involved in problem solving (Smith, 2010); generate ideas and identify their plan for the future (St. Clair, 2015), and internally and externally motivated (Knowles et al., 2005) to increase their own knowledge and to advance practice and the external rewards that may accompany advanced practice. In addition, they will be asked to retrieve the information from

their memory and notes and apply it. This process of retrieval will be crucially important for adult learners to utilize this information in the future and apply it to practice. Karpicke and Blunt (2011) suggest that retrieval of information is more effective than elaborative studying. This indicates that the process of adult learners brainstorming ideas and using this information they have learned to develop their plan for the future as well as how they articulate the importance of using nature in practice, will be effective for future recall and use of these strategies. This, paired with the immersive nature based experience, will likely yield substantial learning and the ability for the participants to apply the knowledge they have gained through lecture, immersion in nature, recall of information and problem based learning through the principles of adult learning. The use of the *RELAP* model of continuing education and dissemination of this model has implications for practice and continuing education development. Both the format of the continuing education, the immersive experience in nature and the use of nature in occupational therapy interventions could affect how occupational therapy continuing education courses are presented and larger consideration of context for occupational therapy interventions.

The three areas of data collection have informed the larger continuing education course using marketing principles, and principles of adult learning to create a twelve-hour continuing education course that uses elements of reflection, learning, application and planning. A limitation of this data collection was related to small sample size and convenience sampling of the course preview as well small sample size when testing principles of adult learning with park staff. The continuing education course was created using the existing literature to provide evidence that OT can and should be using elements of the larger natural, outdoor environment for intervention; and

that there are already many existing opportunities for OT to be involved in this emerging vision of practice.

Finally, future steps for this clinician and for development and dissemination of information about this topic include applying use of nature at the individual, group and population levels and considering an ecological approach in which all aspects of the environment: direct environment (microsystem) to the culture level (macrosystem) are considered. Additionally, a framework to assist therapists in choosing nature elements and spaces within natural environment to intervene will be developed and piloted as this clinician continues to immerse herself in providing interventions outdoors and gathering relevant data.

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Appendix A: Educational module for Park Staff

Pre- module

1. How would you rate your understanding of different diagnoses?

Very knowledgeable	Adequate Knowledge	Little Knowledge
5	3	1

2. How capable do you feel adapting activities and spaces for differently-abled participants?

Very capable	Adequately capable	Little Capability
1	3	5

Topics you hope to learn about today:

Post module

3. How would you rate your understanding of different diagnoses?

Very knowledgeable	Adequate Knowledge	Little Knowledge
5	3	1

4. How capable do you feel adapting activities and spaces for differently-abled participants?

Very capable	Adequately capable	Little Capability
1	3	5

5. Did the information provided broaden your understanding of the diagnosis? Why or why not?

6. Did you find the information to be comprehensive (i.e. - would provide you with the basic information you would need to assist an individual with that diagnosis)?

7. Do you feel that you could recall this information easily?

8. How will this new information impact your ability to lead groups/interact with users with the above stated diagnosis?

9. What topics would you like to know more about/ add to future educational sessions?

Appendix B: Exploration of Course at Sea

1. What is your professional status?

Student

New Graduate

3-5 years at COTA/OT

Greater than 5 years as OT/COTA

2. If you were to attend a continuing education course at sea, rank the ideal time and location

Caribbean in Summer

Caribbean in Winter

Alaska in Summer

3. What would be the ideal sailing duration and format for a 12 hour CEU course?

5 day sailing with three - 4 hours CEU sessions

7 day sailing with three - 4 hour CEU sessions

5 day sailing with one 8 hour session and one 4 hour session

4. Cruises are all inclusive of lodging, child-care, food and entertainment. A reasonable cost is:

\$700 per person for a 5 day cruise

\$900 per person for a 7 day cruise

Must be less than \$700 for a 5 day cruise

Appendix C: Course preview post-survey

1. Following the learning portion of the course, how confident are you about the subject matter?

Very confident ----- Low confidence

2. Did the course cover the content you were expecting?

YES NO

Why or why not?

3. How likely are you to APPLY knowledge learned to your practice area?

Very likely ----- Highly Unlikely

4. Circle all of the relevant ideas gained from this course that you may use in practice

Preschoolers in Nature

Natural Playground Development

Edible Gardens

Nature and Park Prescriptions

Accessibility of Parks

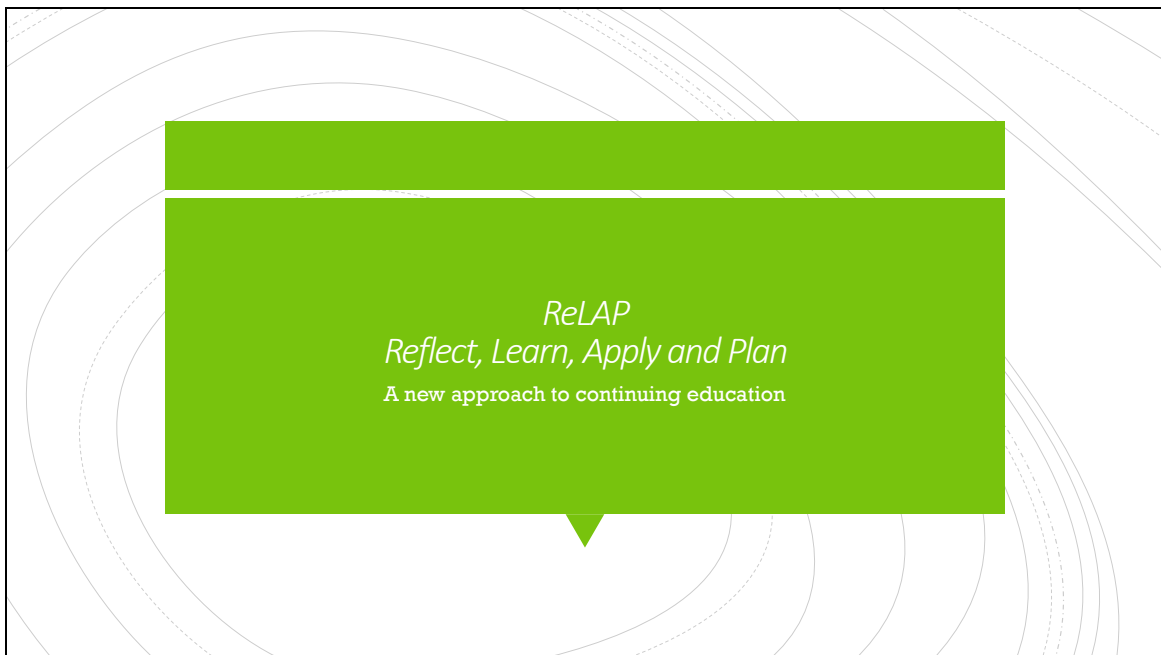
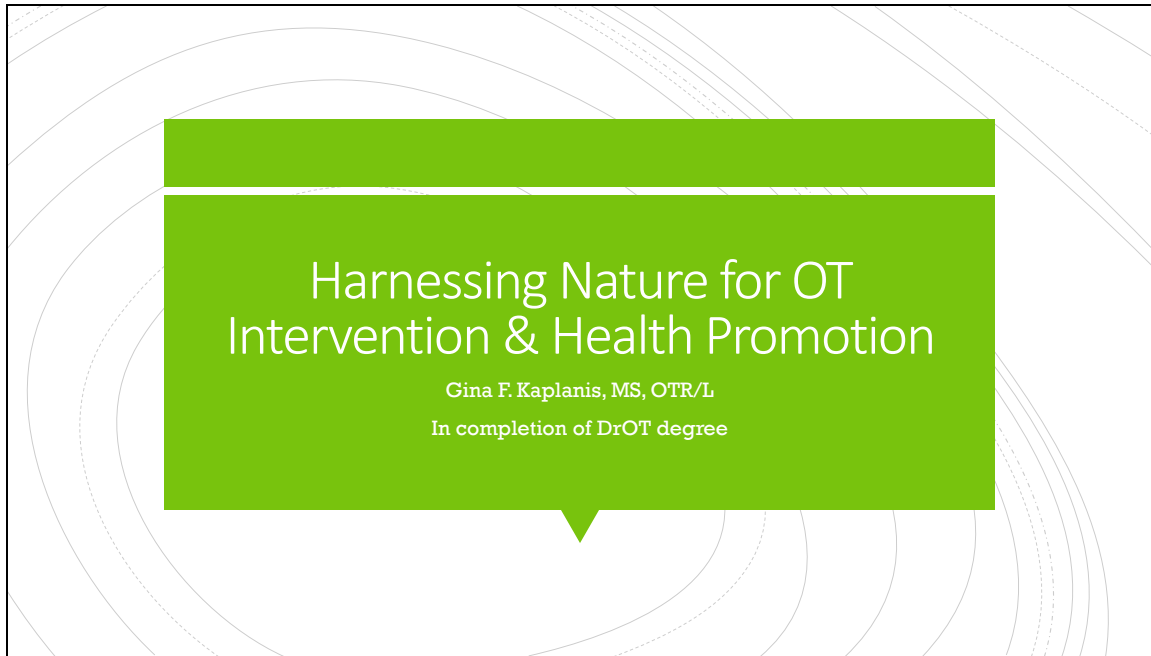
Education of parents, teachers or pediatricians

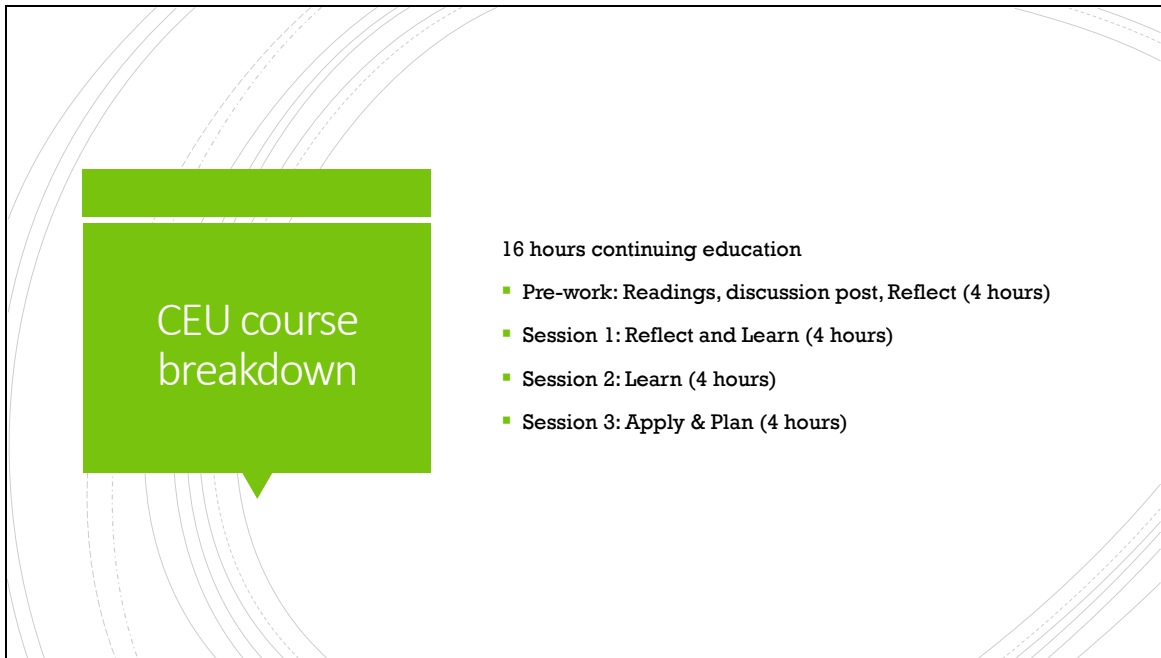
Outdoor interventions

Other _____

5. What topics would you like to learn more about?

Appendix D: Continuing education slides



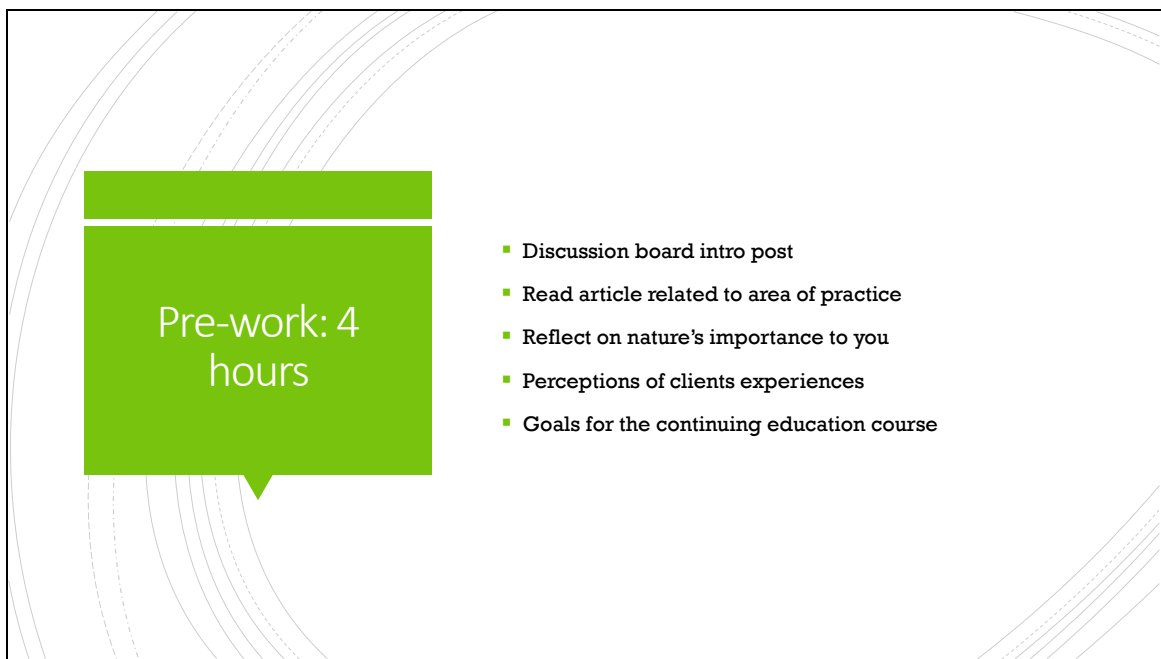


CEU course breakdown

16 hours continuing education

- Pre-work: Readings, discussion post, Reflect (4 hours)
- Session 1: Reflect and Learn (4 hours)
- Session 2: Learn (4 hours)
- Session 3: Apply & Plan (4 hours)

This slide features a green callout box on the left containing the text 'CEU course breakdown'. To the right, it lists a total of 16 hours of continuing education, broken down into four components: Pre-work (4 hours), Session 1 (4 hours), Session 2 (4 hours), and Session 3 (4 hours). The background consists of light gray curved lines.



Pre-work: 4 hours

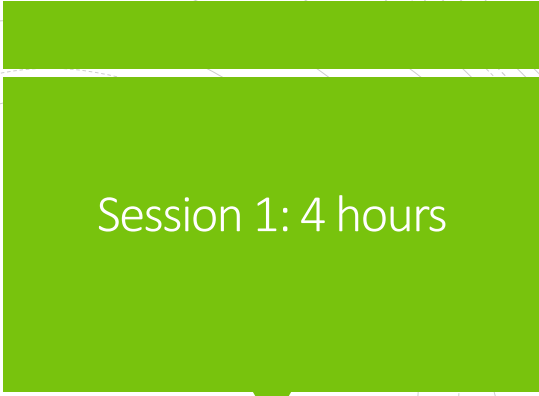
- Discussion board intro post
- Read article related to area of practice
- Reflect on nature's importance to you
- Perceptions of clients experiences
- Goals for the continuing education course

This slide features a green callout box on the left containing the text 'Pre-work: 4 hours'. To the right, it lists five tasks for the pre-work: Discussion board intro post, Read article related to area of practice, Reflect on nature's importance to you, Perceptions of clients experiences, and Goals for the continuing education course. The background consists of light gray curved lines.



Discussion board

- Introduce yourself, practice area and experiences
- Why interested
- What outdoor activities you and family do, post a picture
- Peruse articles and read at least 1 related to your area of practice
- Watch selected video
- Prior to the class, engage in one of the activities Florence Williams discussed. Reflect on that experience
- Contrast that experience to your perceived experiences of clients
- See my example
- Read 5 people's posts about nature reflections



Session 1: 4 hours



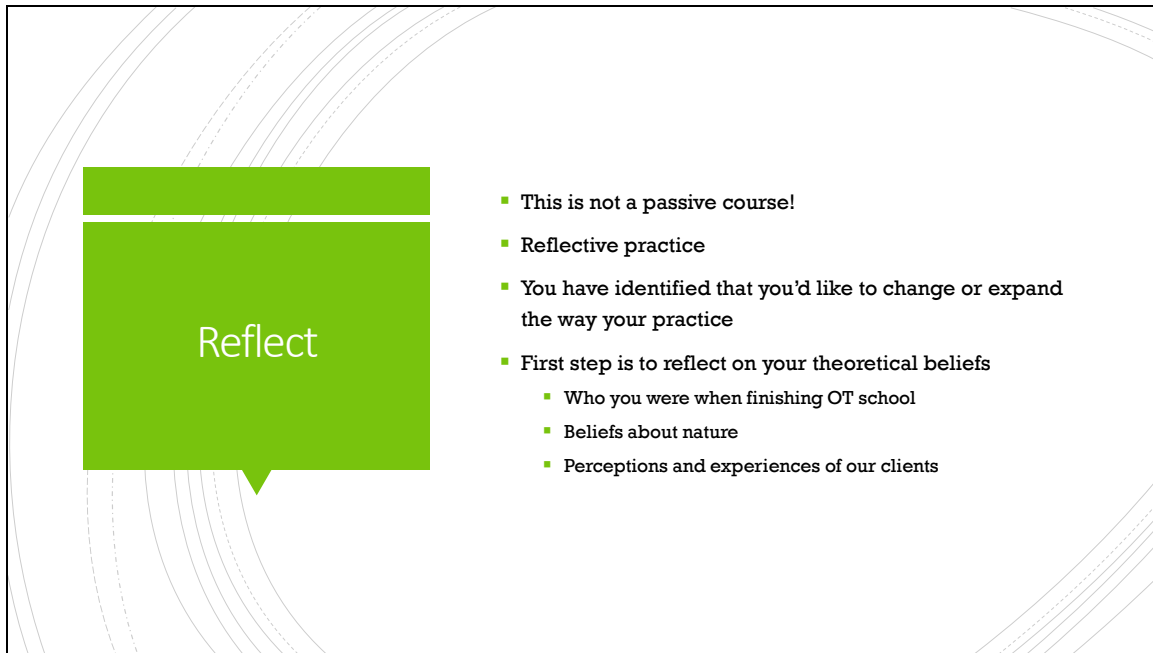
NATURE

*Viewing nature employs the mind
without fatigue and yet exercises it;*

*Tranquilizes it and yet enlivens it; and
thus, through the influence of the mind
over the body,*

*Gives the effect of refreshing rest and
reinvigoration to the whole system*

-Olmstead



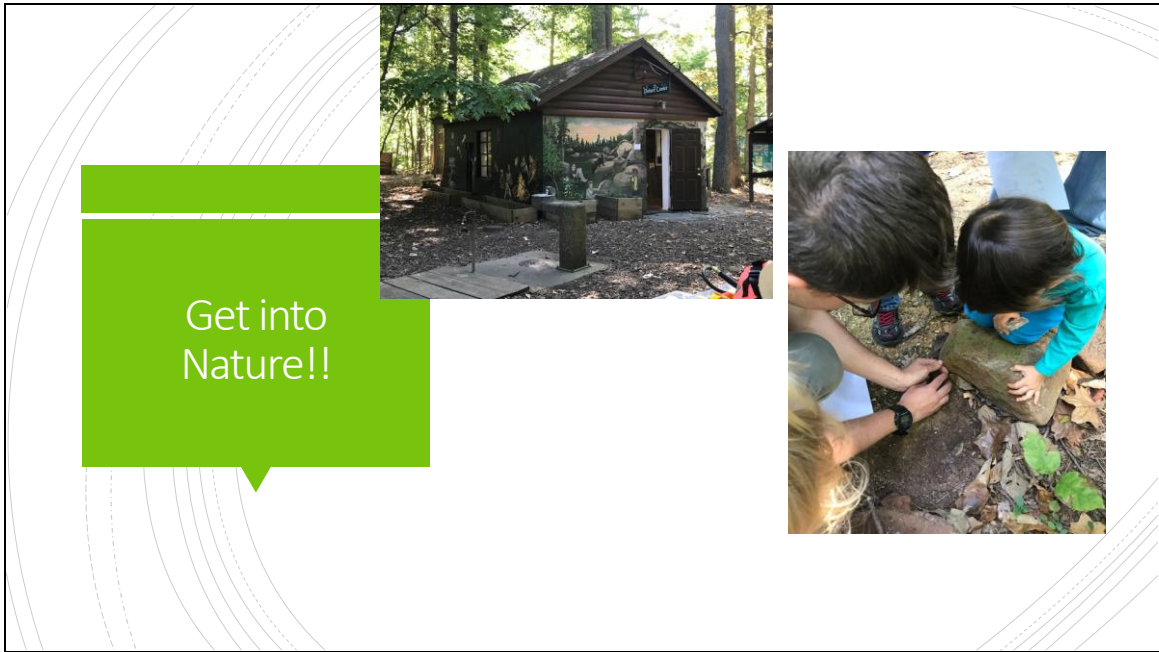
Reflect

- This is not a passive course!
- Reflective practice
- You have identified that you'd like to change or expand the way your practice
- First step is to reflect on your theoretical beliefs
 - Who you were when finishing OT school
 - Beliefs about nature
 - Perceptions and experiences of our clients



Why I'm here and my journey

- Pediatric Occupational Therapist
- 15 years practice with kids in school, early intervention, private practice, community consultation, using simulated surfboard
- Program Development and Evaluation Concentration in DrOT post-professional program at Nova Southeastern University



LEARN

Health Issues
Plaguing US

- Obesity
- CV disease
- Depression
- Anxiety
- Dementia
- Autism
- ADHD

This slide features a green title 'LEARN' at the top center. Below it, on the left, is a green speech bubble containing the text 'Health Issues Plaguing US'. To the right of the speech bubble is a bulleted list of seven health conditions: Obesity, CV disease, Depression, Anxiety, Dementia, Autism, and ADHD. The background consists of faint, concentric circular lines.

Nature Deficit Disorder

This slide features a large green speech bubble in the center containing the text 'Nature Deficit Disorder'. The background consists of faint, concentric circular lines.

Nature can ameliorate sx of

- Dementia
- Autism Spectrum Disorders
- Attention Deficit Disorder
- Stress
- Hypertension
- Vitamin D deficiency
- Emotional distress
- Attentional fatigue

Identifying trends
Scaffa and Brownson (2014)

- **Getting kids out into nature and off of technology** (Louv, 2008; 2016)
- Overscheduling of children
- Risk-adverse society
- **Increased risk of sedentary behaviors lead to obesity** (Prentice-Dunn & Prentice- Dunn, 2012)

Theory supporting participation outdoors

- Biophilia Hypothesis
- Attention Restoration Theory
- Stress-recovery

Health Benefits for All

Vital signs and Immune system

- Lee et al. (2011) study results found positive impact on vital signs with nature walks
- Viewing aquariums with higher levels of marine life were associated with greater reductions in heart rate, greater increases in self-reported mood (Cracknell et al., 2015).

Vitamin D

- A small amount of these fat-soluble molecules can be obtained from the diet, but about 90% comes from synthesis of vitamin D in the skin when exposed to ultraviolet B radiation from the sun
- Deficiency in Vitamin D has been linked to a number of diseases including metabolic disorders, autoimmune conditions, psychiatric, respiratory and cardiovascular disorders, and cancers as well as osteoporosis and osteomalacia

Physical Activity and Balance

- **Balance.** In a study in which 24 total male and female adolescents aged 19-21 hiked every day for 20 days, it was found that hiking has positive effects on balance with pre- and post-intervention static balance; with girls displaying more improvement in balance than boys.
- **Physical Activity.** Gray et al. (2015) physical activity was higher when children were outdoors than when they were indoors and five studies showed that total physical activity was 2.2 to 3.3 times higher outdoors than indoors. Children who spent 1 hour or more outdoors had 4.4% less sedentary time than children who spent less than 1 hour per day outdoors.

Vision and Sleep

- **Vision.** Rose et al. (2008) parents complete a survey of the activities undertaken by the children. Participation outdoors was found to be protective against myopia in children and minimized effects of near work activities (Rose et al., 2008).
- Natural, bright light improves attention and **sleep** (Harb, 2015).



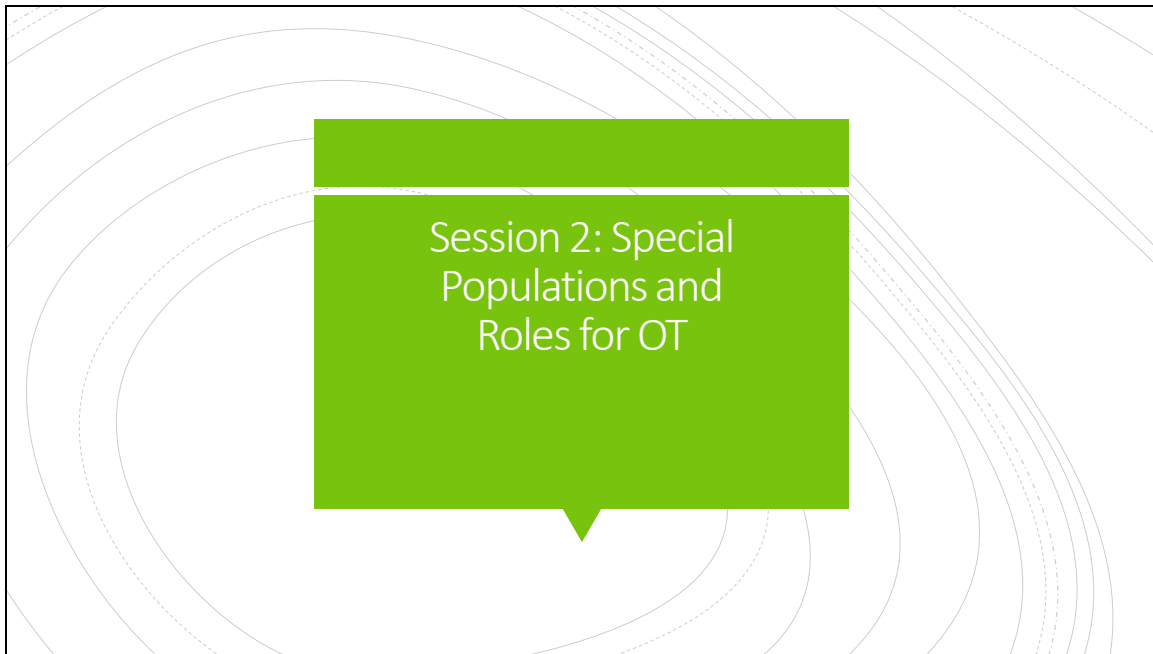
Indoor workers

- Bjørnstad, Patil & Raanaas (2016) found that employees reporting high exposure to indoor nature contact at work also reported a significantly lower prevalence of job stress, fewer subjective health complaints, and fewer days of sick leave than those with low exposure



Healthcare workers

- Sowah et al (2017) completed a systematic review of literature related to Vitamin D levels and occupations and found that rates of vitamin D deficiency among healthcare professionals were: healthcare students 72%, medical residents 65%, practicing physicians 46%, other healthcare employees 44%, and nurses 43%.



Special Populations

- Sensory garden spaces ultimately offered children with special needs sensory stimulation, physical mobility, and social interaction (Hussein, 2017).
- Taylor and Kuo (2011) 1,000 children reported by survey online families of children with ADHD reported the least symptoms when children played in open areas with grass and big trees
- Older adults with dementia benefitted from reminiscence and sensory stimulation.
 - encouraging a relaxing and calming environment
 - providing an opportunity to maintain life skills and habits.

The slide features a green speech bubble containing the title text, set against a background of light gray concentric circles and curved lines.

ASD and nature

- Li et al (2019) 22 interviews conducted with parents of children aged with ASD diagnosis
- How often does your child go outdoors?
- Is green space a part of his or her outdoor experience?
- Please describe the last time you took your child to a green space.
- What are the benefits of visiting green space to your child?
- What are the barriers that may prevent you from taking your child to a green space?
- What are your concerns?

Benefits and Barriers

Sensory development	Inappropriate behaviors
Motor development	Safety issues
Emotional development	Phobias

(Li et al, 2019)

ASD and nature interventions

- Natural elements hold children's attention for extended periods of time. A narrow, fixed interest can be guided into broader interests and constructive activities (Gagnon, 2002, p.3).
- Nature has infinite elements that seem to allow every individual to find their special interests.
- It may be possible to guide children to functional play and grow these interests to influence their developmental trajectory.
- (Li et al, 2019, p.77)

Therapeutic Value of Nature

- Raanaasa, Patila and Alveb (2016) inpatient rehab themes emerged:
 - the exterior environment being pleasant to view
 - allowing for opportunities for reflection
 - symbols of life and significant for feeling that the people were being taken care of
- Horticulture Therapy




The downside

When nature is *not* restorative:

Not all natural environments may be restorative. Dense wooded areas, for instance, may not be restorative as they can evoke a sense of **fear** of getting **lost** or being attacked and they may require concentration to find ones way around.

(Gatersleben & Andrews, 2013)



Who isn't participating in nature?

Infrequent users were more likely to be

- Female
- older
- poor health

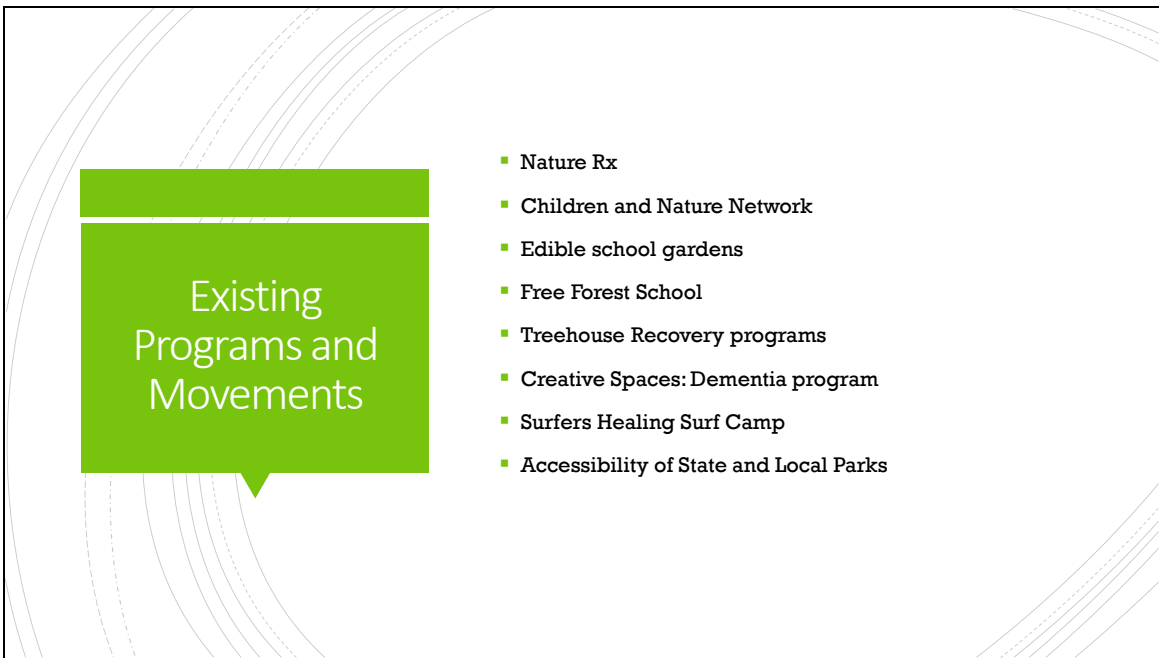
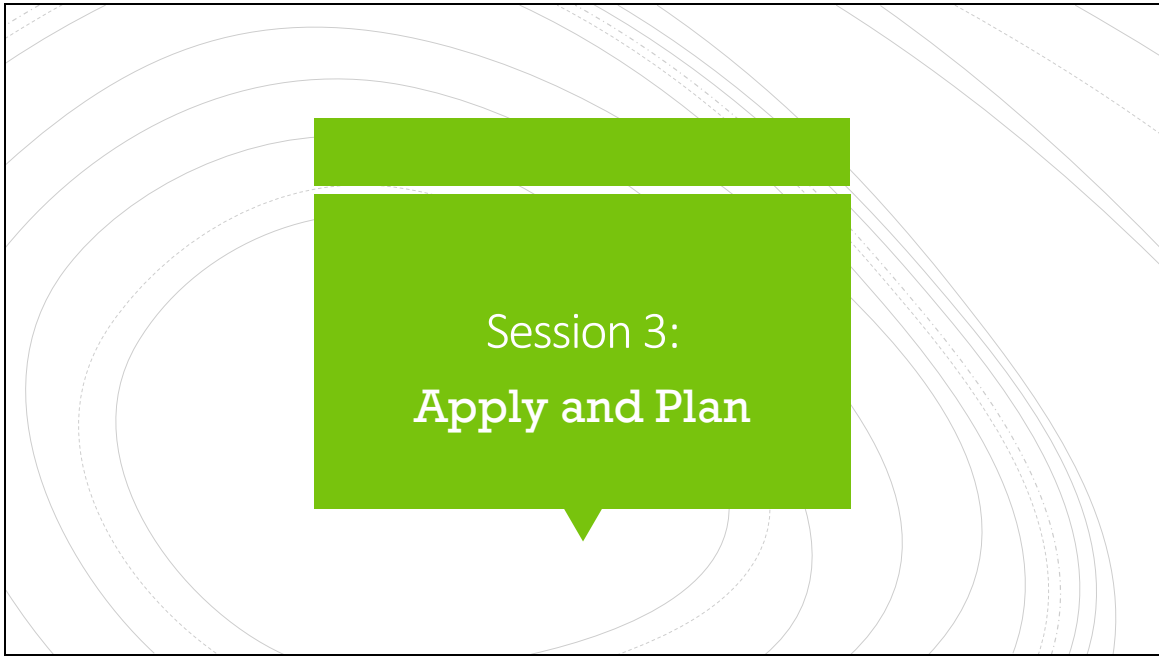
(Boyd et al., 2018)

Barriers or “reasons” for lack of visits


- Proximity to natural spaces is related to income such that poorer areas are often more distal, with access a particular challenge for parents with small children, older adults and people living with impairment or disability
- Safety concerns, with fear of crime and physical and/or verbal abuse
- Lifestyle norms and social expectations

(Boyd et al., 2018)


Session 2 Wrap



- Nature Rx
- Children and Nature Network
- Edible school gardens
- Free Forest School
- Treehouse Recovery programs
- Creative Spaces: Dementia program
- Surfers Healing Surf Camp
- Accessibility of State and Local Parks



Park &
Nature
Prescriptions



<https://www.childrenandnature.org/>



Edible school gardens

- <https://www.wholekidsfoundation.org/landing-pages/school-gardens-landing>

The slide features a green speech bubble on the left containing the text 'Edible school gardens'. To the right, there is a bulleted list with a single green link: 'https://www.wholekidsfoundation.org/landing-pages/school-gardens-landing'. The background consists of light gray curved lines.



Free Forest School

<https://www.freeforestschool.org/free-forest-school-find/>

The slide features a green speech bubble on the left containing the text 'Free Forest School'. To the right, there is a green link: 'https://www.freeforestschool.org/free-forest-school-find/'. The background consists of light gray curved lines.

Treehouse:
Nature and
Addiction
Recovery

<https://www.treehouserehab.org/getting-back-to-nature-to-support-addiction-recovery/>

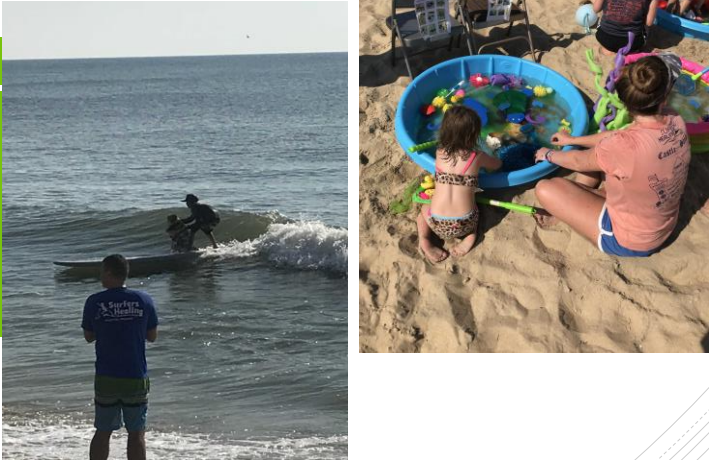
This slide features a green speech bubble on the left containing the title. The background is white with faint, curved lines in the corners. A URL is provided to the right of the speech bubble.

Creative Spaces:
Dementia
Program

<https://www.sensorytrust.org.uk/projects/creative-spaces/index.html>

This slide features a green speech bubble on the left containing the title. The background is white with faint, curved lines in the corners. A URL is provided to the right of the speech bubble.

Surfers Healing
Surf Camp



Accessibility and
use of State and
Local Parks

<https://dnr.maryland.gov/Publiclands/Pages/accessforall.aspx>

Patapsco Valley State Park Cycling Trails

<p style="text-align: center;">Avalon/ Glen Artney Area Grist Mill Trail</p> <ul style="list-style-type: none">•Patapsco Valley State Park's most accessible cycling trail•2.3 miles of paved pathway•Pathway width of 8 feet•Peak grade of 4.7 degrees•Only trail that permits the use of electric-powered equipment, including powered wheelchairs and other propulsion assist devices	<p style="text-align: center;">McKeldin Area Plantation Trail</p> <ul style="list-style-type: none">•Moderate difficulty•Quarter mile of relatively flat gravel terrain•Past the quarter mile mark is not accessible for those utilizing adaptive cycling equipment•Handicap parking within 100 feet of the start of the trail	<p style="text-align: center;">Orange Grove Area River Road Trail</p> <ul style="list-style-type: none">•Alternative to the Grist Mill Trail for those who are seeking more of a challenge•Paved for the first .36 miles and then turns to gravel for the remaining half mile•Trail width of 14 feet•Peak cross slope of 6.8%.•The trail extends 0.8 miles to the Bloede Dam, but is most accessible up to the quarter mile mark for those using adapted cycling equipment
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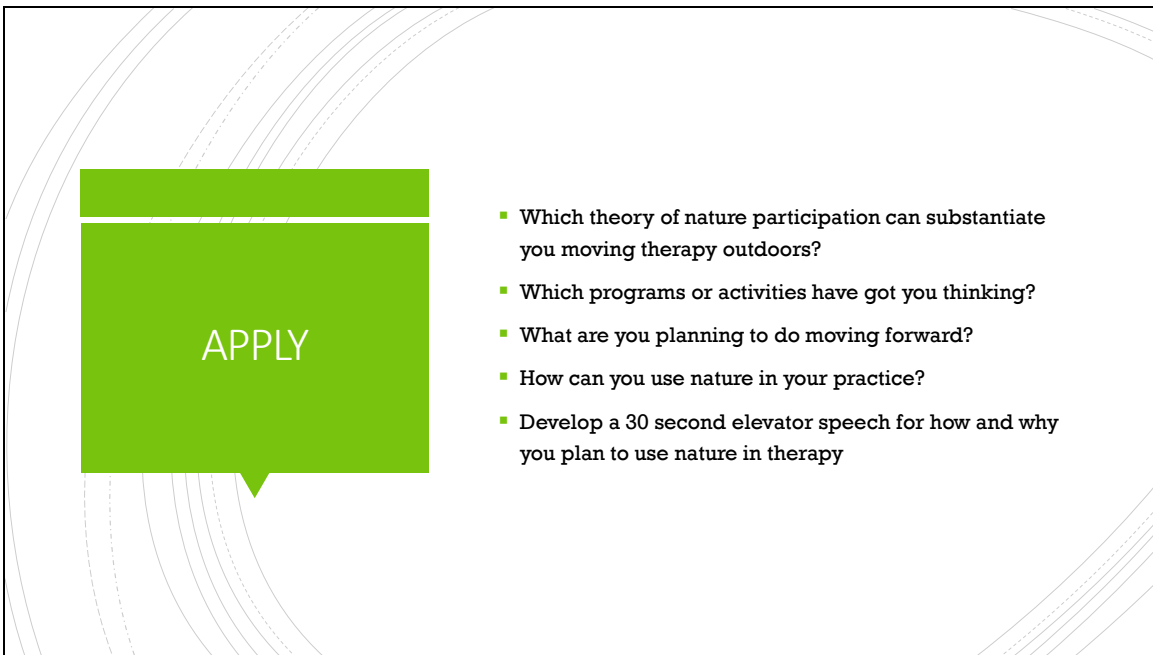
Policy and Advocacy

- https://www.nwf.org/~media/PDFs/Be%20Out%20There/CKN_action_guide.ashx
- Steps to take in individual practice, at state, national and policy levels

A slide with a green speech bubble containing the word "Explore". To the right is a bulleted list of resources. The background features faint, curved lines.


Explore

- Take some time to explore the various Special Reports located at the National Wildlife Federation
- <https://www.nwf.org/Home/Kids-and-Family/Connecting-Kids-and-Nature/Special-Reports>
- *Connecting Children to Nature in the Digital Age*
- *How Getting Dirty Benefits Kids*
- *Sleep*

A slide with a green speech bubble containing the word "APPLY". To the right is a bulleted list of reflection questions. The background features faint, curved lines.

APPLY

- Which theory of nature participation can substantiate you moving therapy outdoors?
- Which programs or activities have got you thinking?
- What are you planning to do moving forward?
- How can you use nature in your practice?
- Develop a 30 second elevator speech for how and why you plan to use nature in therapy



Working in small groups of Ots with similar interests:

- Write at least 1 goal for using nature in therapy moving forward
- Find 1-2 local partners or find local programs that exist
- Identify potential funding and partnerships
- Share with your group



- Printed and distributed from Capstone References