IS EXPERIENTIAL EDUCATION…

association for experiential education

…EFFECTIVE?

While one research study may provide limited evidence to substantiate a claim, many studies analyzed together can provide irrefutable proof of effectiveness. The **meta-analysis** chooses several similar studies using stringent criteria, statistically estimates their merged impact, and combines them into definitive statements about the strength of the phenomenon being studied. Meta-analyses were used to determine that smoking is a health hazard, climate is changing, and teaching to learning styles is a myth. The following statements are based solely in meta-analyzed studies in experiential education (EE).

ADVENTUROUS in EE

INTRAPERSONAL: After attempting to overcome personal challenges by taking perceived risks, clients reflect on their successes and failures to gain **new found individual competence**. As a few examples, correctly facilitated challenges improve: confidence, resilience, self-concept, self-awareness, self-esteem, self-efficacy, and a shift from external to internal locus of control.

INTERPERSONAL: By attempting to resolve their naturally arising group conflicts, clients reflect on their successes and failures to gain **new found pro-social competence**. For example, correctly facilitated challenges enhance: trust, communication, cooperation, collaboration, leadership, planning, problem solving, decision making, and management of future conflicts.

ENVIRONMENTAL in EE

ECO-AWARENSS is an understanding of the interdependence among natural elements of an ecosystem and between those and humans. It is developed from **environmental education** and can result in local resource stewardship. It includes: affinity for place or nature connection and green or pro-environmental behaviors.

ECO-CONSCIOUSNESS is a profound deepening of appreciation for the natural that can lead to **sustainable and global environmental actions**. It includes mindfulness practices and how these connect humans to nature and environmental issues. However, eco-consciousness is vastly improved by mindfulness practices and nature immersion, but not environmental education.

NATURE in EE

When clients make a personal connection with nature, they perceive it as **health restorative** and they benefit from renewal and relaxation.

PHYSICAL HEALTH: **Nature-based exercise** can improve overall fitness and immune response; strengthen the cardiovascular and respiratory systems; lower heart rate, cholesterol, cortisol, adrenaline/epinephrine, and blood pressure; diminish fatigue, obesity, and all causes of mortality; boost immune function; and reduce exhaustion and risk of chronic diseases.

MENTAL HEALTH: **Immersion in nature** can greatly accentuate positive emotions; diminish negative emotions; decrease aggressiveness and anger; increase relaxation and vigor; bolster cognitive function and memory; reduce stress, anxiety, and depression; improve mental health disorders; and rejuvenate the soul or spirit.

Digital screen time in excess of two hours per day is detrimental to human development, while brief exposures to nature for a total of **two active hours per week in nature** are beneficial to human growth. The natural environment is known to contribute these life-affirming factors: ultraviolet sunlight, calming setting, tranquil sounds, clean air quality (due to presence of oxygenation and absence of urban pollutants), airborne negative ions, soil-based bacteria, and phytoncide antimicrobials secreted by plants.

(Thanks to James Neill) – Simon Priest

The DETAILS Simon Priest

ADVENTUROUS in Experiential Education

A meta-analysis of 166 studies (2,365 changes) demonstrated the powerful efficacy of adventure therapy compared with alternatives or no therapy and the maintenance of change after the program (Bowen & Neill, 2013). Significant impacts were noted on academics, behavior, clinical, family development, self-concept, and social development with older children showing greater gains than younger ones (Hattie et al, 1997; Neill & Richards, 1998).

A meta-analysis of adolescents in outdoor adventure programs showed consistent enhancement of self-efficacy as moderated by program duration (longer programs were more impactful) and initial mental health status (Fang et al, 2021). Similar results were found in meta-analyses of self-concept (Bedard, 2003; Fleischer et al., 2017) and self-awareness (Ferrell, 2017). A locus of control shift away from external (attributed to others) and toward internal (attributed to self) was noted in a meta-analysis of adventure program effects (Hans, 2000). Another meta-analysis of wilderness therapy outcomes found substantial gains in self-esteem, locus of control, behavioral observations, personal effectiveness, clinical measures, and pro-social measures (Bettmann et al, 2016).

One early meta-analysis of outdoor adventure programs with "at-risk" adolescents demonstrated that youth who attended were 62% better off than those who did not (Cason & Gillis, 1994). Another meta-analysis compared the pro-social behaviors of adolescents in outdoor programs with those not outdoors and found greater gains outside. Furthermore, more parents reported better post-program behaviors on return from the outdoors than the not outdoors group. However, more youth self-reported that their behavior had improved more with the not outdoor program than with the outdoor one (Gillis et al., 2016). The meta-analysis for delinquent youth found lower recidivism rates for the outdoor program compared with others, but with therapy and activity intensity determining the greatest reduction in negative behaviors (Wilson & Lipsey, 2000).

ENVIRONMENTAL in Experiential Education

Two meta-analyses of pro-environmental or green behaviors showed that these improved from environmental education activities in classrooms and outdoor nature (Zelezny, 1999; Varela-Candamio, Novo-Corti & Garcia-Alvarez, 2018). A meta-analysis found strong attachment to or affinity for place influences stronger pro-environmental behaviors and the association is greater for visiting tourists than residents (Daryanto & Song, 2021).

Comparing natural with urban settings, a meta-analysis concluded that nature was perceived to be more restorative than urban settings (Menardo et al., 2019) due to the strength of connections and pre-existing environmental attitudes and knowledge. One meta-analysis established that participants connected to nature tended to be happier and more satisfied with life than those not connected (Capaldi, Dopko & Zelenski, 2014). Another meta-analysis confirmed the value of nature connection to general enjoyment and well-being (Djernis et al, 2019). Two more meta-analyses found that nature connected participants experienced better hedonic wellbeing (enjoyment and pleasure) than the unconnected people (McMahan & Estes, 2014), while their eudaimonic well-being (peace and contentment through meaningful living) was also greater than for the unconnected folks (Pritchard et al, 2020).

In a literature meta-synthesis of environmental education research, 121 unique environmental outcomes were identified and organized into several broad categories with percentages of research addressing each category reported (Ardoin et al., 2018). Environmental education outcome research found more improvements in ecological understanding (knowledge 68%) and attitudes toward nature (disposition 61%), but less about the skills (competence 26%) and actions (behaviours 20%) necessary to make a difference in environmental stewardship.

An early meta-analysis found that the motivating factors for pro-environmental behaviors were knowledge of issues, knowledge of action strategies, locus of control, attitudes, verbal commitment, and an individual's sense of responsibility (Hines, Hungerford & Tomera, 1987). Twenty years later, researchers replicated the meta-analysis and added environmental attitude, behavioral control, and personal morals to the mix of psychosocial determinants of pro-environmental behaviors (Bamberg & Möser, 2007). Another meta-analysis confirmed a strong correlation between nature connection and pro-environmental behaviours, indicating people who feel connected will do more to protect nature (Mackay & Schmitt, 2019).

More recently the importance of mindfulness has come to the forefront of sustainable development and meta-analyses have strongly associated mindfulness with connectedness to nature (Schutte & Malnouff, 2018). One meta-analysis found that mindfulness practices can be an effective method to positively influence emotional regulation, empathy, and connectedness to environmental issues (Gómez-Olmedo et al., 2020). Another meta-analysis established a strong correlation between connection to nature and pro-environmental behaviours with deeper connections bringing stronger behaviours (Whitburn, Linklater & Abrahamse, 2019).

An additional meta-analysis of human-nature connectedness (HNC: how much people view themselves as a part of the environment rather than apart from it) found participants with high HNC demonstrated more pro-environmental and sustainability behaviours than those with low HNC. HNC was vastly improved by mindfulness practices and nature immersion, but not environmental education (Barragan-Jason et al., 2022). Therefore, environmental education appears potent at developing ecological comprehension and local stewardship, while nature immersion and mindfulness contribute to global sustainability and pro-environmental behaviors.

NATURE in Experiential Education

"Green" exercise is British term for physical exertion in land-based natural environments. These can range from walking in urban nature corridors, through hiking across alpine meadows, to backpacking in remote wilderness. Any kind of active exercise qualifies and water-based ones have also been labelled "blue" exercise.

Compared to control groups (whose participants did not receive green or blue exercise), a meta-analysis of experimental groups (those who received green or blue exercise) showed multiple RCT studies that improved physical or mental health with possible impacts on quality of life (Yen et al., 2021). Comparing exercise conducted outdoors with indoors, another meta-analysis of RCT studies showed better cognitive performance, less exhaustion and perceived stress, and more vigour and positive emotions as a result of nature-based exercise (Brito et al., 2022).

Comparing exercise in an actual outdoor setting with exercise in a virtual green one, one meta-analysis found that positive emotions increased in the actual outdoor settings, but not in the virtually simulated counterparts (Browning et al., 2020), likely due to elements present in the natural environment such as ultraviolet sunlight, airborne ions, and immune boosting bacteria in soil. Living closer to blue space, having larger amounts of blue space in nearby locations, and spending time in contact with blue space were associated by meta-analysis with better health, higher physical activity, and higher restoration levels in participants (Georgiou et al, 2021). A meta-analysis of blue space and health indicated that time spent near water bodies in cities had positive effects on obesity, all mortality causes, and general human health (Smith et al., 2021).

A meta-analysis of regular time spent in green spaces showed clear physiological health benefits such as diminished cholesterol, cortisol (stress-related hormone), heart rate, blood pressure, heart rate variability (relaxation indicator). These benefits were linked to reduced risk of type II diabetes, stroke, general mortality, asthma, hypertension, and coronary heart disease (Twohig-Bennett & Jones, 2018). Another meta-analysis correlated increased nature exposure with decreased cortisol, heart rate variability, and systolic and diastolic blood pressures (Yao, Zhang & Gong, 2021). Older adults, active in outdoor green spaces as opposed to active indoors, showed reductions in the likelihood of all causes of mortality and total cardiovascular disease (Yuan et al., 2021). The more green space surrounding participants, the less likely they were to die earlier than expected (Rojas-Rueda et al., 2019). This included lower mortality rates for people who were surrounded by greenery in their residential environments (Kua & Lee, 2021).

Meta-analyses have confirmed the psychological value of nature connection to treatments of mental health disorders (Kotera, Richardson & Sheffield, 2020), enhancement of positive affect (McMahan & Estes, 2015), and stress reduction (Yao, Zhang & Gong, 2021). A meta-analysis of RCTs of nature-based outdoor activities found these improved depression, reduced anxiety, and generally improved positive emotions, while reducing negative emotions (Coventry et al., 2021).

One meta-analysis attempting to determine the best dose of green exercise or activity in nature for improved mood and self-esteem (mental health indicators) found that the best return on time invested was to take multiple, short bursts of exposure or participation (about 5 minutes) versus half a day or all-day events and light exercise was more impactful than vigorous (Barton & Pretty, 2010). Another meta-analysis examined the best type of green exercise for improved endothelial function (cellular membrane that lines blood vessels and releases compounds to aid blood clotting, lower blood pressure, and improve immune response) and found singular aerobic green exercise and repetitive resistance training in nature to be beneficial (Ashor et al., 2015).

A meta-analysis comparing exercise in green space and wild settings with exercise in non-green space and urban settings found green exercise to not only decrease negative emotions (anxiety, tension, anger, depression, and fatigue), but also to increase positive emotions (vigor, comfort, natural feeling, and relaxation). Further analysis suggested that wild environments might be more effective than other green spaces at improving positive emotions (Li et al., 2022). Authors have suggested a minimum of two hours per week of **active** time outdoors in nature for optimal well-being (White et al., 2019).

A final meta-synthesis and narrative review examined the health benefits of Shinrin Yoku (Japanese forest bathing) applied in Canada and found green physiological, psychological, and environmental contributions (Mathias et al., 2020). Physiological contributions involved strengthening the cardio-respiratory system, lowering heart rate, cortisol, adrenaline/epinephrine, and blood pressure, and

boosting immune function and natural killer cells (white blood cells critical to immunity). Psychological contributions included decreased aggressiveness and depression, increased relaxation and vigor, improved cognitive function and memory, and diminished stress, anxiety, depression, and anger. Environmental contributions entailed decreased light intensity, increased calming and tranquil sounds, good air quality (highly oxygenated without city pollutants) from tree transpiration, photosynthesis, and canopy shaded cooling, plant secretion of antimicrobial antibiotics (phytoncides that induce lymphocyte immune response), and airborne negative ions that may positively influence negative feelings.

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