Facilitating Effective DRR Education and Human Survival:
Intentionally Engaging the Transformative Education – Paradigm Shift Spiral

P. T. Buergelt[a,b] & D. Paton[a,b]

[a] *Faculty of Health, University of Canberra, Canberra, Australia*
[b] *College of Health & Human Sciences, Charles Darwin University*

INTRODUCTION

The period in which we are living is […] a turning point in the very history of the earth itself. We are living a period of the earth's history that is incredible turbulent and in an epoch in which there are violent processes of change that challenge us at every level imaginable. The pathos of the human being today is that we are totally caught up in this incredible transformation, and we have significant responsibility for the direction it will take. What is terrifying is that we have it within our power to make life extinct on this planet. Because of the magnitude of this responsibility for the planet, all our educational ventures must be keep in mind the immense implications of our present moment. This is the challenge for all areas of education. For education, this realisation is the bottom line. When setting educational priorities, every educational endeavour must keep in mind this immense implication of our present moment.

(O'Sullivan, 2002, p. 2)

Over the last few decades, research has repeatedly shown that the education strategies used to develop the disaster risk reduction (DRR) capabilities and relationships required to reduce the risk of extreme natural events and facilitate the development of adaptive capacities have been ineffective (Buergelt et al., 2017). While this state of affairs could be interpreted as education per se not working, a critical exploration and analysis of the worldview and beliefs underpinning current and alternative education approaches suggests that a different explanation warrants consideration. In this chapter, we firstly propose that the ineffectiveness of current DRR education efforts derives from being based on the totalitarian, mechanistic, positivistic, rational and capitalistic worldview prevailing in Western cultures to maintain its power. We secondly suggest that adopting the Indigenous metaphysical, nature-based, unified and egalitarian worldview can represent a more appropriate foundation for developing effective DRR education and the social-ecological relationships required to facilitate the

development of sustainable DRR beliefs and practices based on the principle of people living in harmony/balance with nature, themselves and others (Griffith, 2014). These relationships, in turn, can represent a context for cultivating the individual and collective adaptive capabilities that contemporary DRR seeks to develop (Buergelt at al., 2017). Transformative pedagogies are required to create this paradigm shift.

To set the scene for this discussion, we first explore the nature and importance of philosophical worldviews. We then discuss how the fundamental beliefs of the Western worldview are the source of disharmonious relationships between humans and nature, disease and 'natural' disasters and how these beliefs create educational strategies that disempower people to maintain the status quo. Next, we examine how the prevailing Western worldview is challenged by a new worldview within the Western culture: social constructionism. This examination builds the bridge for being open to, and understanding, the Indigenous worldview. Following, we will explore how the Indigenous worldview comprises fundamental beliefs that aim at having people living in harmony with nature and thus creates a framework for embedding in every aspect of culture and society educational strategies and practices that foster the development of enduring harmonious socio-environmental relationships. Living in harmony with nature, self and others, in turn, supports the development and application of DRR outcomes as a result of its fundamental focus of empowering people. We conclude with a discussion of transformative educational pathways that could be adopted to facilitate the adoption of the empowering thinking and action that is implicitly evident in Indigenous beliefs and practices.

WORLDVIEWS, LEARNING PROCESSES AND EDUCATION

> *Every transformation of [the human species]... has rested on new a metaphysical and ideological base; or rather, upon deeper stirrings and intuitions whose rationalised expression takes the form of a new picture of the cosmos and the nature of humanity.*
> (Mumford, 1957, p. 179)

The philosophical worldviews people hold, the ways people are learning and the

education strategies that flow from them, create in a dialectical dance the world we live in and influence DRR. The underlying worldviews comprise people's fundamental beliefs about the origin and development of the universe (cosmology), the nature of the world/reality (ontology) and what can be known, what constitutes valid knowledge epistemology and what constitutes the most valid and reliable way to establish knowledge (Babbie, 2010; Denzin & Lincoln, 2011, 2017). What people believe about the origin of the universe influences aspects of realty they can see and believe can be known, and what they believe constitutes valid knowledge. The interpretations derived from these worldviews drive people's actions.

The worldviews people come to hold derive from iterative processes of continuously learning from interpreting their experiences. How people interpret their experiences, in turn, is influenced by the culture prevailing where they live through socialisation processes. Cultures socialise their members into their particular ways of thinking. The meanings people attribute to their experiences are predominately learned through informal interactions with other people (e.g., education, television, magazines, music, internet) (Denzin, 2004; Williams, 2008). Over time, the worldviews we learned can become so entrenched that they become habitual, taken-for-granted and unconscious.

Whether the fundamental worldviews, and the ensuing social systems and individual ways of thinking and behaving, are serving members of these culture are reflected in the health and wellbeing of its members and by the longevity of a culture (O'Sullivan, 2002). The culture and society created based on the Western worldview have become dysfunctional; they create suffering and environmental disasters rather than fulfilling its objectives of ensuring the health and well-being of citizens and other living creatures (O'Sullivan, 2002). This dysfunctionality extends to DRR, resulting not only in public education practices being ineffective and peoples' individual and collective capacity to respond to extreme natural events declining, but also contributing to the risk of extreme natural events and disasters increasing, (Buergelt et al., in press; Paton & McClure, 2013). Consequently, if we are honest

3

with ourselves, we have to admit that the Western worldview is no longer serving us and thus inappropriate. Let us turn to critically illuminating how the current Western worldview created this crisis.

Dominant Western worldview: Source of disharmonious relationships, suffering and disasters

Fundamentally, Western cultures commonly ascribe to a totalitarian cosmology and to mechanistic, positivistic and rational ontologies and epistemologies (Griffith, 2015; Reason, 1995). In the Western view of cosmology, the universe was created by a single male God through a single command. Because Christian theologies perceive respect for and protecting nature as challenging God's authority and will, nature is treated disrespectfully and destroyed (Griffith, 2014, 2015). The mechanistic, positivist and rational worldview believes that reality exists independent of thought and knowledge is based on a dualism between mind and reality. According to this perspective, there exists a:

> "real world made up of real things we can identify, operating according to natural causal laws which govern their behaviour laws which we can deduce by analysing the operation of the component parts. Mind and reality are separate: the rational human, drawing on analytical thought and experimental methods, can come to know the objective world. So the objective world spawns the objective mind, which becomes detached, analytical and thus in the end uncaring and cold. Human progress is dependent on the processes of science, the purpose of which is the pursuit of knowledge for its own sake." (Reason, 1995, p. 2).

Western ontology does not believe the existence of invisible aspects of reality and separates nature, land, law, medicine, song, story, dance, and painting (e.g., natural sciences, geography, legal studies, medicine, social sciences, philosophy, humanities, art) (Griffith, 2015). This separation extends into DRR; it is something that is seen and treated as being independent of nature, people's everyday lives and societal processes (e.g., community development). People socialised in the Western world, typically assumes that there exists only one absolute reality or truth which can be known. Because reality is believed to be an

objective view of the world – a mirror of what we see, all that humans know they know from their sensory experiences of the outside world (Reber, 1995). Consequently, people in Western cultures typically only acknowledge aspects of reality that can be observed, operationalised, and measured (objective facts) as knowledge (Sexton, 1997). Nonphysical concepts, like consciousness, thoughts, spiritual beliefs, are not viewed as valid knowledge and thus, typically not included in scientific analyses. This aspect has led to DRR being dominated by approaches derived from the natural sciences and engineering, rather than from people's lived experience and their underlying cultural and societal influences.

From the perspective of this worldview, knowledge is *posteriori* and humans learn by building an internal representation of reality based on their experiences (Gergen, 1985). Experts are seen as possessing intelligence and knowing; people are seen as not knowing and passively receiving knowledge. The lived experience of people and their perspectives are not seen as valid knowledge. According to this worldview, reality, including human behaviour, is governed by mechanical system of laws and hence knowledge is stable, ahistorical and enduring, and can be accumulated (Gergen, 1985). This view underpins the belief that defining these laws will allow explaining, predicting and controlling human behaviour. Because this worldview assumes that individuals' behaviour is the outcome of external forces determined by universal laws, people believe that individuals' behaviour exists independently of the world, including the natural environment (Diesing, 1991).

People also presume that nature (body) and mind are separate (Cartesian mind-body split) (Misra, 1993). Western philosophers like Socrates and Descartes championed the belief that only humans have intelligence, that nature could not teach anything, and that abstract scientific knowledge is more valid than people's own knowing (Reason, 1995). Scientific discoveries based on positivism, in tandem with capitalism and Christianity, fundamentally shifted how humans interact with nature (Clover, 2002; Griffith, 2014). The positivistic reductionistic scientific worldview disconnected humans from nature and many of the issues

5

we experience from the living conditions created by capitalism (Rowe, 1990). As a result, members of Western cultures commonly grow up disconnected from nature; become alienated from, and dishonouring, nature, their bodies and their experiences; and lose their innate and concrete embodied knowing (Reason, 1995). They also commonly perceive their relationship with, and value of nature, largely in anthropocentric terms (Clover, 2002; Paton et al., 2015).

Being conditioned to perceive themselves as being separated from nature means that people believe they are independent of nature and can exist without nature. This resulting anthropocentric belief sees nature as a resource to be conquered, owned, controlled and managed (Buergelt et al., 2017; Bhasin, 1992; Paton, Buergelt & Campbell, 2015). Nature is perceived as only having a value as an amenity that is useful to humans and a resource that can justifiably be exploited to benefit people. Therefore, people in Western cultures are capitalizing on the resources and amenities sourced from nature and undervaluing both nature (in its own right) and the importance of maintaining harmonious relationships with nature for their survival (Buergelt et al., 2017). As a result of these views, DRR has focused on controlling, managing and combating nature rather than identifying and addressing human agency in the causation and prevention of disasters.

Despite the tangible indicators of climate change and the growing incidence of disasters, most Western people remain generally unaware of, and abrogate their responsibility for, their role in causing extreme natural events and disasters occurring (Buergelt et al., 2017). The Western worldview hinders people experiencing, perceiving and understanding the intrinsic value of nature, that they are one with nature, interact with nature in dialectical ways and are dependent on nature for being themselves and for their health/wellbeing. Because they are largely unaware of their reciprocal relationships with nature, people miss seeing that the ensuing disharmonious relationships they created with nature increases the risk of extreme natural events occurring.

Taken together, the Western worldview led to increasingly disharmonious relationships

between human beings living in Western cultures and the rest of nature resulting in humanity experiencing an emotional, psychological, political, and socioecolgocial crisis (Clover, 2002; Grande, 2000; Griffith, 2015; Reason, 1995). Importantly, increasingly disharmonious socio-environmental relationships are contributing to the occurrence of extreme natural events, and to their impacts being more serious and enduring (Buergelt, Paton, Campbell, James & Cottrell, in press; Paton, Buergelt, & Campbell, 2015). However, it is challenging for Western people to become aware of this worldview. The fundamental beliefs are largely taken-for-granted and unconscious; the objective mind created by this worldview cannot see the lens it has created and how and why this lens itself is its own creation (Reason, 1995). Educational approaches and programs created by this worldview thus tend to disempower people as they are designed to socialise people into the Western cultures to maintain the status quo and to produce a capable workforce (Griffith, 2014).

Education in Western societies is given to people at designated times typically during childhood and young adulthood or for specific purposes during adulthood (e.g., preparing people for disasters). Education focuses primarily on the visible observable aspects of the world. Knowledge is passed on by experts who teach specialised and abstract theories created by discipline-specific quantitative research. Knowledge is taught in subjects that separate knowledge into distinct components including nature (natural sciences), land (geography), law (legal studies), medicine, story and song (social sciences and humanities), dance and painting (art). Knowledge is taught by passing on theoretical or conceptual information via books or online sources, and via teachers/experts standing in front of a room lecturing to a large number of students. It is easy, quick and cost-effective education.

However, as Freire (2017) argues, traditional Western pedagogy perpetuates Western cultures and, in the process, weakens and oppresses citizens by treating them as lacking knowledge and needing to be educated rather than acknowledging and drawing out their innate embodied knowledge. Western pedagogy reinforces the weakening and oppressing of

citizens by modelling oppressive attitudes and practices. That is, citizen apathy, which commonly citizens are blamed for, is not the fault of citizens but results from the traditional Western pedagogies inherently disempowering people to keep them manageable and to maintain the power of the ruling few.

The renowned cultural historian and ecologist Thomas Berry (1993; cited in O'Sullivan, 2002) and acclaimed author Susan Griffith (1995, cited in O'Sullivan, 2002) suggests that the current Western worldview is dysfunctional for our present circumstances. They call for urgently reassessing the Western worldview and to transform towards a worldview that will heal and guide us. O'Sullivan (2002) emphasises that altering the course requires transforming the underlying worldview and the whole cultural system. The social constructionist worldview that has been emerging in the last decades is assisting us reassessing the current totalitarian, mechanistic, positivistic and rational Western worldview and might be a valuable bridge towards appreciating the Indigenous worldview.

Social constructionist worldview challenging the predominant western worldview

Many writers and commentators are suggesting that the current worldview or paradigm of Western civilization is reaching the end of its useful life. It is suggested that there is a fundamental shift occurring in our understanding of the universe and our place in it, that new patterns of thought and belief are emerging that will transform our experience, our thinking and our action. ... we can see the costs of this progress in ecological devastation, human and social fragmentation, and spiritual impoverishment. So if we fail to make a transition to new ways of thinking ... our civilization will decline and decay. ... This emergent worldview is multifaceted: it has been particularly described as systemic, holistic, more feminine.
(Reason, 1995, p. 42)

The totalitarian, mechanistic, positivistic and rational worldview is being challenged by the social constructionist worldview. This new worldview emerged at the end of the 20th century in response to advances in relativity, quantum mechanics and the notion of the self-regulating universe. These advances show that nature and humans are one and deeply connected in a symbiotic relationship, and that people are active autonomous beings that are self-regulated (Reason, 1995).

Social constructionism assumes that reality is multiple, relative, historical, transitory, and unknowable rather than singular, objective, and knowable (Sexton, 1997). Knowledge is seen as constructed reality, invented, and ambiguous rather than representative of reality, discovered, objective, and certain (Reason, 1995; Wortham, 1996). To make sense of their environment, people construct knowledge in relation to the particular culture at a particular time through actively interpreting their perceptions. That is, perception is not directly representing the natural world but is mediated, organized, enriched and interpreted (Reber, 1995). Constructed meanings are neither final nor definite. Because each individual experiences a unique set of events within their life, each individual constructs a unique reality. Diversity is valued rather than a problem to overcome (Sexton & Griffin, 1997).

From the perspective of this worldview, knowledge is also relative; it changes across time and depends on varying historical and cultural arrangements (Gergen, 1985). The constructive nature of knowledge implies that knowledge is generated by individuals themselves rather than determined by universal laws as empiricists propose; knowledge is something people co-create through interacting with the environment rather than as something people have (Hayes & Oppenheim, 1997). The knowledge individuals can gain is only limited by their current genetic makeup (Plotkin, 1995), and the prevailing culture and society (Nightingale & Neilands, 1997; Hayes & Oppenheim, 1997). Consequently, people can change their reality through the way they act and interact within the limits set by their environment. Knowledge being contextual implies that humans can proactively adapt to their environment by constantly creating new knowledge and that everything humans do involves their body (Goncalves, 1997). Mind and body are inseparable. As a result, this worldview considers nonphysical concepts, like thoughts, opinions, or consciousness, as meaningful.

To shed light more onto how individuals and cultures construct knowledge and learn, we utilize systems theory (Bronfenbrenner, 1977; Nelson & Prilleltensky, 2010) and symbolic interactionism (Blumer, 1969; Charmaz, 2014). Both social paradigms suggest our minds

"initially operate through preconceptions; these preconceptions not only shape our interpretations of the world but also impinge on the world itself." (O'Sullivan, 2002, p. 3). Our minds constantly create the world and society; the world and society and cultural systems create our minds (Smith, 2015).

This co-creative dance between people and society means, on the one hand, humans are autonomous beings that can through symbolic interactions construct, negotiate, modify, resist or reject the meanings they learn. People are active agents who are inherently capable of actively creating their own experiences/world and of thinking about their actions rather than responding mechanically to stimuli in their environment (Flick, 2019; Williams, 2010). Reality and knowledge are not independent of the humans mind - what people perceive is not merely what they observe. Instead, what they observe is created by properties of the observers' mind, by cognitive and affective operations (Reber, 1995) that function to integrate and synthesise new stimuli with previous experience/knowledge to construct new knowledge. This continuous learning process allows people to modify their knowledge during their life time in response to changes in their environment. Thus, it is not important whether knowledge is true but whether knowledge is viable, for only viable knowledge enables people to create outcomes that serve them. Hence, constructing meaning assists people to evolve and adapt.

On the other hand, human agency is constrained or expanded by the physical and social context in which action is contemplated and occurs. People constantly try to make sense of their environment and to create equilibrium with their changing environment through adapting to changes. Because much of life is routine, people unconsciously interpret what others say, adapt their responses and respond with largely taken-for-granted habitual actions (Blumer, 1969; Charmaz, 2014). Habitual actions enable individuals to respond to situations with economy of thought and action (Dewey, 1922). Interpretations and actions are largely unconscious unless interrupted by change or challenge such as extreme natural events. If the routine of situations is disrupted by unusual experiences people are forced to change their

interpretations and actions because they do not work anymore (Denzin, 1992). As a result, people redefine their selves. For this reason, epiphanic experiences often represent turning-point experiences in individual lives, which result in reconstructions of the self/identity.

The two-way reciprocal creative process happens through minds organising themselves and maintaining homeostasis to achieve equilibrium or balance/harmony between our internal cognitive presumptions/interpretations and perceptions/experiences by self-monitoring interactions with the environment and adjusting interpretations and actions based on this feedback (O'Sullivan, 2002). When we can make sense of the world and accomplish our goals there is no need for adjustment. However, when there is a persistent mismatch a cognitive crisis occurs old habitual modes of perceiving and interpreting become dysfunctional. When worldviews become dysfunctional, people and societies need to evolve and shifting their cognitive systems or viewpoints in ways that enable them to deal with the new situation; people and society need to adapt by transforming themselves.

Because the social constructionist worldview argues that knowledge is co-created by people interacting and exchanging knowledge (Gergen, 1985), it follows that, to be effective, education must be conducted in collaboration with others; people need to able to construct knowledge together. This worldview empowers citizens to build their individual and collective adaptive capacities to improve their situation.

By challenging the reality that the totalitarian, mechanistic, positivistic and rational Western worldview created, the social constructionist worldview assists becoming aware of the operation and impacts of this worldview (Denzin & Lincoln, 2011). The constructivist paradigm validates the Indigenous worldview - a worldview that has proven its value as it has enabled Indigenous peoples to survive for millennia and to still be alive despite the brutal forces of colonialization. Both paradigms hold similar tenants, but the Indigenous worldview is more comprehensive and sophisticated. It is to a discussion of the Indigenous worldview we turn now.

Metaphysical, nature-based, unified and egalitarian worldview: Source of harmonious relationships, health/wellbeing and DRR

This section provides insights into the sophisticated Indigenous worldview of Indigenous peoples living Australia, this worldview is comparable to those of other Indigenous peoples around the world (Griffith, 2015). The Australian Aboriginal cosmology is laid down in the creation or dreamtime stories. According to these stories several female and male metaphysical beings or ancestor spirits created the land and all creatures by travelling across undifferentiated space and engaging in totemic acting out what they had dreamed (Broom, 1994; Griffith, 2015; Lawler, 1991). Importantly, throughout their travels they discovered through observation, experience, and learning both behaviours that created harmony and thus joy, health and well-being and those that interrupted harmony and thus created pain, chaos and disease (Lawler, 1991). These creation stories not only share of how the world was created but also act as a guide for humans how to interact with nature and each other in ways that maintain harmony. Thus, obedience to, and maintaining of, the dreamtime/nature laws is paramount for Indigenous peoples as this ensures the "fertility, stability, and security of the entire society" (Lawler, 1991, p. 260).

Ontologically, Indigenous people distinguish between two different yet equally real realms of existence or realities (Lawler, 1991; Myers, 1986). One reality is the physical, visible objective world, which is the ordinary external world which humans can experience through their senses (land). The other reality is the metaphysical, invisible subjective world, which is transcendent to, and immanent in, nature (dreaming/spiritual). These two modes of reality are believed to be mutually exclusive yet inextricably and dialectically intertwined: the invisible world creates and influences the visible world and the visible world re-creates and influences the invisible world. Australian Indigenous people live in and shift between both worlds. Experiencing the physical world gives access to the invisible world and thus to

12

realizing metaphysical creative powers (Lawler, 1991). Hence, Australian Aboriginal peoples value growing their awareness by honing their cabilities to distinguish aspects of the physical world. As a result, they are able to communicate with nature and each other more effectively.

Australian Indigenous peoples view all creatures as one and equal (Posey, 1999). They believe that there exists an essential creative life force or spirit (Broome, 1994; Griffith, 2015; Lawler, 1991). All creatures consist of the common universal consciousness of this primary creative force. That is, all creatures, including humans, share a common origin (i.e., all creatures are manifestations of the greater cosmos) and every aspect of the natural world contains the spirit of the metaphysical energy that created the world. Therefore, all creatures, including humans, are intimately connected - every creature within the universe influences human beings; human beings influence every creature within the universe.

While every creature is a manifestation of the greater cosmos, the life force expresses itself in many forms in the visible world. As a result, Indigenous people see all creatures as people like them and are aware of the interdependencies with all creatures. They see nature as allies - they look after the land; the land looks after them. Because humans and nature are seen as being related and interdependent, Indigenous people relate to nature based on the fundamental cultural values of reciprocity, respect, kindness, gentleness and restraint.

Australian Indigenous peoples recognize and value the wisdom of all creatures. For them all nature is 'knowledgescape' (Griffith, 2015). Nature is seen as sharing the same consciousness of the ancestors and thus containing all the knowledge of the original creation. Therefore, for Indigenous peoples nature is an extension of mind and body and is their greatest teacher. Earth is seen as a library in which books are the different aspects of nature. They see and understand the knowledge of animals and plants. In their eyes, exploring any phenomena of nature, including humans, provides insights into the inner working of the universe. This unity and intimate relationship inspires and obligates Indigenous people to adore, respect and keep the earth in its original purity and potency as nature contains all the

mystery and knowledge of the original creation. As a result, Indigenous peoples know nature intimately like family, care for nature and feel responsible for looking after land.

As a consequence of this intimate, reciprocal relationship, the self of Australian Aborigine is located in the land and they draw deeply from harmonious relationships with the land for their physical, psychological and spiritual health and well-being (Griffith, 2015; Lawler, 1991). If their self is separated from the land, both their sense of self and the land are diminished and suffer disease. Their awareness of this intimate unified relationship inspires and obligates Indigenous people to value, respect and keep nature in its original purity and potency. In fact, for Australian Aboriginal peoples the recreating and passing on of the physical world or nature is the purpose of their life.

Nature has also highly influenced how Indigenous peoples organized culture and society. They practice democracy based on the model nature provides for democracy: 'ecocratic wisdom' (Griffith, 2015). The intimate connection between people and the land means that living in harmony with nature is essential for the physical, psychological and spiritual survival and thriving (Garnett et al., 2008). Hence, Australian Indigenous culture and society, is designed to protect nature by ensuring that people live in harmony with nature (Griffith, 2015). Ecological truths are encoded in the stories that are repeatedly told through ceremonies/rituals, song, dance and painting intricately connecting Aboriginal people with nature and country to constantly recreate and nurture these intimate relationships.

Because of their worldview, Aboriginal people did live in harmony with nature and looked after nature. They developed over millennia individual, cultural and social capabilities of living together in harmony with nature and each other that enabled them to adapt to change, to survive and to thrive (Broome, 1994; Griffith, 2014, 2015; Lawler, 1991). The metaphysical, nature-based, unified and egalitarian beliefs lead to Indigenous peoples developing an education that aims at enabling people distinguishing ever finer subtleties of

live to gain deeper knowledge of nature to access the creative powers and living in harmony/balance with nature, themselves and others (Griffith, 2015).

Metaphysical, nature-based, unified and egalitarian worldview creates education that empowers people

The knowledge and education strategies used in Aboriginal cultures are highly sophisticated (Buergelt et al., 2017; Buergelt & Paton, in press; Griffith, 2015; Lawler, 1991; Yunkaporta, 2019). Knowledge and education have been skillfully, diligently and systematically created over at least 60,000 years of observation, experience and insight, and passed on for as many years (Lawler, 1991). Indigenous education strategies are ecologically informed, emotionally charged and morally binding (Lawler, 1991). Living in nature, and learning from nature, is at the core of the education (Griffith, 2015; Yunkaporta, 2019). The education methods are used implicitly and continuously in all interactions among and between people and nature throughout life and are oral, experiential, multimodal and collective (Buergelt et al., 2017).

In alignment with the cosmological, ontological and epistemological worldview Indigenous peoples hold, the purpose of education is to draw out from within people both physical and spiritual wisdom so they discover their true primordial nature and understand life intimately and holistically, reflecting the true meaning of the Latin source of education *educare* 'to draw out' and 'to lead' (Buergelt & Paton, in press; Buergelt et al. 2017). Accordingly, education focuses on both the visible and invisible aspects of the world (Griffith, 2014). All vital elements of life including nature, land, law, medicine, ceremony, story, song, dance, painting and living are seen as united rather than fragmented as in Western education and as needing to be in harmony for health and well-being to be present (Buergelt et al., 2017). Everybody teaches everybody constantly the local nature-related knowledges created over millennia. New and deeper knowledge is introduced in stages in accordance with

the maturation of the mind; it is only given when elders passing on that knowledge determine through deep listening and observation that people are ready to understand that knowledge and to use the knowledge responsibly. In each initiation new language and experiences are given that enables the initiate to connect the visible physical and invisible metaphysical worlds to comprehend the invisible realms.

Engaging in the transformative quests especially via arts and nature is central to Indigenous education (Buergelt & Paton, in press; Buergelt et al., 2017). Directly experiencing our true nature and acquiring the wisdom of the ancestors required engaging in a quest that challenged physically, psychologically and spiritually. Nature and arts are the allies of this quest. Nature is seen as reflecting the true nature of humans for humans are intimately connected with nature; they are nature and nature is them. Accordingly, the more people interact with and know about nature, the more they get to know about ourselves and the spiritual, invisible world. Hence, nature is seen as a friend and teacher, which cradles and restores, imbues with diverse ways of knowing and provides challenges required for cultivating critical capabilities and maturing. Entomologically, arts is rooted in the Latin *artus* referring to 'joints and connecting the parts' and the German word for arts *Kunst* is linked to 'knowledge' and 'to know how, to be able', indicating that arts is capable of encoding, carrying over and connecting us with our inner wisdom, which is the true knowledge of the ancestors (Buergelt & Paton, in press). Thus, diverse forms of arts are deeply embedded in all parts of life.

Indigenous education strategies synergize many, if not all, the elements that Western science increasingly discovers as critical. They indicate that Indigenous peoples had, and in many cases continue to have, an excellent understanding of how people learn (Lawler, 1991). Because of the sophisticated holistic education, Indigenous people are 'landknowers' (Griffith, 2015). As a result, traditionally, Aboriginal peoples are highly sensitive to the knowledge embedded in the land. Bennett (1999) explains how dream time stories connect

Aboriginal people with country and how these stories contain highly complex knowledge systems of ecological understanding with the power of generating and determining social behaviour to maintain harmony. Thus, each group has specific ceremonies, stories, songs, dance and other cultural and spiritual ties that link them to the local knowledge embedded in the specific place where they live. Consequently, maintaining direct links with country are crucial for maintaining knowledge and obligations to maintain those connections form the core of individual and collective identity (Posey, 1999).

Children learn their relational positions and roles in the kinship system, the emotions and their sharing, and the dramatization of emotions through experiencing intimate relationships (Lawler, 1991). Children are involved with their kin to create a "sense of the world as an extension of the self" and to expand their concerns to the entire world (Lawler, 1991, p. 248). Emotions that foster that purpose are reinforced; emotions that detract from that purpose are discouraged and punished. Language and thought are being carefully connected to lived experience and perceptions in ways that encourages finer distinctions (Griffith, 2015). The language is always linked to the earth's topography so that the physical world is retained in and mirrors the psychic world and the psychic world is retained in and mirrors the physical world. This way nature and creatures including people create and reflect each other in a circle of reciprocity.

Aboriginal education seems to contain and synergise all the elements that Western science increasingly discovers as critical: continuous, focus on comprehending, action learning, experiential learning, transformative education, discovery education, using different modes that engage all senses, and scaffolding. In particular, the Indigenous pedagogy is consistent with Freire's (2017) pedagogy of the oppressed; a critical pedagogy approach that empowers educators to liberate people from oppression by consciously co-creating knowledge in a two-way education process that is characterised by authentic dialogues, critical thinking and constant interaction of theory and practice.

17

A growing body of empirical evidence generated by Western science from different disciplines demonstrates now what Indigenous peoples across the world have always know namely that nature spaces and living in harmony with nature is the source of mental and physical health, well-being and individual and collective adaptive capacities (Buergelt et al., 2017; Paton et al., 2015). In particular, growing up in nature, and with people who value nature, instils in people a desire and the ability to live in harmony with nature and to develop collaborative and cooperative relationships with other people and place (Griffith, 2014; Paton et al., 2015; Thompson et al., 2008). Harmonious relationships between people and nature also contribute to DRR by increasing people's sense of belonging to people and places (Paton et al., 2015).

Based on the above discussion we suggest that Indigenous worldviews, knowledges, sensitivities and practices hold rich potential for learning and elaborating how to develop cultures, societies and individual and collective adaptive capacities capable of addressing current challenges humanity is facing and (re)creating health/well-being of humans and nature. Consequently, (re)learning the capability of living in harmony with nature is a key to reducing the risk of extreme natural events and disasters (Buergelt et al., 2017). Accordingly, there is merit in listening to and learning form Aboriginal people and working together with them to integrate and transcend both knowledge systems. Indigenous and non-Indigenous peoples collaborating two-way might be the key transformative pathway required to shift beliefs and practices in ways humanity needs to survive and thrive.

To create individual, cultural and social shifts required to enhance DRR, a transformation of the fundamental beliefs Western cultures hold about cosmology, ontology and epistemology is required. Due to the Western worldview being so entrenched in all aspects of Western life, achieving such a shift is unlikely to arise easily (Berkes, Colding, & Folke, 2003). Thus, transformation needs to be intentionally created and facilitated. Transformative learning and education, which we explore next, can accomplish this task.

TRANSFORMATIVE LEARNING AND EDUCATION

Social change cannot happen without individual psychic change; physical health cannot be separated from planetary well-being; self-conceptions cannot be carved off from conceptions of the anima mundi. We make our world, and our world makes us, in some obvious and in some very subtle ways. This transformative potential is to be celebrated.
(Morrell & O'Connor, 2002, p. xx)

The question is, however, how this transformative potential can be accomplished – how does education needs to look like to be effective in reducing the risk of extreme natural events occurring and building individual and collective adaptive capacity? From our exploration, we identified, in addition to (re)learning from Indigenous peoples, transformative learning and education as a key transformative pathway.

Transformative learning and education emerged to restore social justice, peace and nature by addressing inequalities and the destruction of the environment (Morrell & O'Connor, 2002). Transformative education challenges the view that emerged from the Western worldview that education needs to serve solely the global marketplace and suggests a more integral transformative vision (O'Sullivan, 2002). Drawing from various types of Indigenous knowledges to shape their pedagogical strategies transformative learning creates;

> "experiencing a deep, structural shift in the basic premises of thought, feelings, actions. It is a shift of consciousness that dramatically and permanently alters our way of being in the world. Such a shift involves our understanding of ourselves and our self-locations; our relationships with other humans and with the natural world; our understanding of relations of power in interlocking structures of class, race, and gender; our body-awareness; our visions of alternative approaches to living; and our sense of possibilities for social justice and peace and personal joy." (O'Sullivan, Morell & O'Connor (2002, p. xvii).

Transformational experiences can fundamentally alter people's ways of thinking and thus, how they are perceiving the world, feel and act (Erhard et al., 2013; Mezirow, 1997, 2012; Willis, 2012).

Transformative learning creates shifts in being that enhance people's awareness, authenticity, responsibility, openness and formal and post-formal operational thinking skills such as perceiving the invisible world, thinking holistically and interdependently, seeing

interactions between past-present-future, being receptive to new information and critically questioning information, critically reflecting on their experiences and interpretations, managing their thinking and taking other people's perspectives (Buergelt et al., in press). People become more capably of effectively engaging in discourse or dialogue to arrive at a best dependable, tentative working judgement regarding a belief; developing beliefs, feelings and actions that work better; taking actions based on their reflective insights and critically assessing the outcomes of their actions. Transformative learning empowers citizens' critical thinking and increases the likelihood of them becoming more socially responsible agents of their lives and the communities in which they live. Transformative learning lays the foundations for citizens to learn how to take effective social actions (Mezirow, 2003).

The transformative learning literature is increasingly expanding the view promoted by Mezirow (1991) that transformative learning occurs through rational ways of being and knowing by generating mounting evidence of extra-rational ways of being and knowing (Buergelt & Paton, in press). According to Mezirow (1991, 1997, 2003), transformative education aims at intentionally initiating and facilitating rational transformative learning processes that enable people to shift or reframe their frame of reference. Transformative education utilizes discursive and critical dialectical processes that challenge people's taken-for-granted frames of reference to encourage them to critically reflect on and examine the assumptions they and others hold, and to see alternative points of view and redefine problems from a different perspective (Mezirow, 1997). The dialectical processes entail examining, questioning, challenging and revising perceptions (Mezirow, 1991).

To create a shift in worldviews, Sutton (1989) argues for a fundamental shift in attitudes towards ourselves and about our relationship with nature in ways that (re)develop an effective partnership with the rest of nature. Transformative education needs to critically questions and challenges current education and how it has contributed to the current world, and be linked to individual and collective spirituality, subjectivity, ecology, interconnectedness, local places,

diversity and communion (O'Sullivan, 2002). More specifically, O'Sullivan (2002) proposes that transformative learning must include education that stimulates the awareness that the current worldview and associated cultural practices are dysfunctional; develops the capacities to manage denial, despair and grief and to take responsibility for the world we created; critically examines the worldview and associated masculine hierarchical power structures that creates the current world; and addresses the saturation of information that leads to an unconscious civilisation.

Clover (2002) emphasises that transformative education needs to address the ecological crisis. Ecological knowledge and knowing, a lived process of knowing that has been built and refined through cumulative process among generations over millennia though the interaction of age-old knowledge and daily lived experiences in a changing environment, gave cultures and societies the expertise to function and survive. However, ecological knowing is rapidly eroded and silenced through Western education and urbanisation to give more power to Western socialisation that maintains the status quo:

> "The so-called age of Enlightenment…forced all other learning and knowledge into darkness… [rendering] invisible other ways of knowing such as native or traditional knowledge, people's spirituality, and especial all women's knowledge" (Shiva, cited in Clover, 2002, p. 161)

Clover (2002) suggests that this transformation can be accomplished by transformative education being reconceptualised within a holistic ecological framework that focuses on human-nature relationships and being based on peoples' cultural and ecological identities that reflect their relationships with the places in which they live. Education needs to weave environmental issues into cultural, political and economic discourses. It is about learning to live in harmony with nature and each other (Clover, 2002). It is about building upon people's knowledge and avoiding knowledge being in the hands of few irresponsible people, challenging cultural homogenisation, consumerism whilst promoting life-centred ecofeminist values (Bhasin, 1992). Therefore, education needs to create opportunities for people to imagine and work towards life-centred forms of development via education practices that are

lodged in place using nature and communities as sites for learning, focusing on experiencing and studying interrelationship between humans and the rest of nature.

To realize the benefits of this approach, educators need to be facilitators who create a supportive and trusting environment that makes it safe to explore, experiment, express and share, and learn from mistakes; provide the knowledge and support required for constructing coherent meaning; nudge transformation through questioning and model transformed attitudes and behaviours (Stewart, 2012). At the heart of this approach are actively creating genuine two-way interaction with people to dissolve barriers to gaining new knowledge and to co-construct knowledge.

However, over the last decade, extra-rational transformtive pathways are gaining increasing recognition (Buergelt & Paton, in press; Nicolaides et al., in press; Taylor & Cranton, 2012). These extra-rational transformative learning pathways include most importantly nature (e.g, O'Sullivan, 2002, 2012; Lange, 2012); creative arts (e.g., Kokkos, 2021; Kasl & Yorks, 2012; Lawrence, 2012; Tyler & Swartz, 2012) and soul work and spirituality (e.g., Dirkx, 2012; O'Sullivan, 2002, 2012). These extra-rational transfromative pathways are consistent with the key characteristics of Indigenous education, pointing to Indigenous education being intrinsically transformative.

CONCLUSION

In conclusion, accomplishing DRR requires a shift from the Western worldview towards the Indigenous worldview. The increase in magnitude and frequency of extreme natural events and disasters, and the ineffectiveness of current DRR education strategies, is the result of the totalitarian, mechanistic, positivistic and rational worldview that dominates in Western cultures. The Western culture and society created based on the Western worldview have become dysfunctional; they create suffering as a result of emotional, psychological,

political, and socioecolgocial crisis and the devastation of the very source of our existence (Buergelt et al., 2017; O'Sullivan, 2002; Clover, 2002; Reason, 1995).

This cultural and societal dysfunctionality renders DRR efforts ineffective. The Western worldview results in education practices that disempower citizens and a culture and society that disconnects people from nature and creates humans living in disharmonious relationships with nature (Buergelt et al., 2017; Freire, 2017). Disharmonious relationships increase the risk of extreme natural events and disasters, and that undermines the individual and in the collective capacity to respond to extreme natural events (O'Sullivan, Morell, & O'Conner, 2002; Paton & McClure, 2013). Consequently, the Western worldview is inappropriate for our current circumstances and there is a pressing need to transform our ways of being and thinking towards a worldview that will heal us and guide us towards creating a culture and society that supports health/well-being and thriving (O'Sullivan, 2002).

Social constructionism challenges the Western worldview and validates the Indigenous worldview. While the social constructionist and Indigenous worldviews hold similar tenants, the Indigenous worldview is more comprehensive and sophisticated. The metaphysical, nature-based, unified and egalitarian beliefs Indigenous peoples across the world hold led to them creating cultures and societies that create harmonious relationships with nature and health/well-being (Broome, 1994; Griffith, 2014, 2015; Lawler, 1991). Thus, Indigenous worldviews hold a rich potential for developing cultures, societies and individual and collective adaptive capacities capable of accomplishing humans and nature being healthy.

To create the fundamental individual, cultural and societal shifts required to develop DRR, a transformation of the philosophical beliefs Western cultures hold is required. Due to the Western worldview being so entrenched in all aspects of Western life and enabling people in power to maintain their power, achieving such a shift is unlikely to arise on it is own (Berkes, Colding, & Folke, 2003). Consequently, this transformation needs to be intentionally created and facilitated. Besides (re)learning from Indigenous peoples, transformative

education pedagogies hold great transformative potential. Both education strategies provide a wealth of alternative and innovative ways that could be used by the DRR community to co-create with citizens pedagogies and knowledges that empower them to live in harmony with nature, themselves and others. That is, transformational education and transformation of worldviews are interdependent and happen in an iterative spiral-like process. To reduce the risk of extreme natural events and ensure human survival this transformative education – paradigm shift spiral needs to be intentionally engaged.

We have a critical choice to make. We can continue to cling to the worldview that creates suffering and the extinction of life including us or we can wake up, accept responsibility and intentionally engage in educational endeavours that transform our dysfunctional Western worldview towards Indigenous worldviews that has been successful in creating a world that enabled humans to adapt to change, to survive and to thrive. DRR scholars and practitioners around the world are in a unique position to play a vital role in leading this transformation. Will you accept this leadership and focus your energies on creating this transformation?

References

Babbie, E. R. (2010). *The practice of social research* (12th ed). Belmont, CA: Wadsworth Cengage.

Berkes, F., Colding, J., & Folke, C. (2003). *Navigating social-ecological systems: Building resilience for complexity and change*. Cambridge: Cambridge University Press.

Blumer, H. (1969). *Symbolic interactionism: Perspective and method*. Englewood Cliffs, NJ: Prentice-Hall.

Broome, R. (1994). *Aboriginal Australians* (2nd ed.). Sydney: Allen & Unwin.

Bruner, E. M. (2004). Ethnography as narrative. In M. Bal (Ed.), *Narrative theory: Critical concepts in literary and cultural studies* (pp. 131- 144). New York, NY: Routledge.

Buergelt, P. T., & Paton, D. (in press). Restoring the transformative bridge: Remembering and regenerating our Western transformative ancient traditions to solve the riddle of our existential crisis. In A. Nicolaides, S. Eschenbacher, P. T. Buergelt, Y. Gilpin-Jackson, M. Mitsunori & M. Welch (Eds.), *The Palgrave handbook on learning for transformation*. New York: Palgrave Macmillan.

Buergelt, P. T., Paton, D., Campbell, C. A., James, H., & Cottrell, A. (in press). *Killing two birds with one stone: Utilizing natural hazard threats to develop adaptive and thriving communities, and reduce the risk of disasters*. In R. Wallace (Ed.), Northern research futures: Northern Research Futures. Canberra: ANU Press.

Buergelt, P. T., Paton, D., Sithole, B., Sangha, K., Campion, O. B. & Campion, J. (2017). Living in harmony with our environment: A paradigm shift. In D. Paton & D. Johnston (Eds.), *Disaster resilience: An integrated approach* (2nd ed) (pp. 289-307). Springfield, Ill: Charles C. Thomas.

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32*, 513-31.

Charmaz, K. (2014). *Constructing grounded theory: A practical guide through qualitative analysis*. London, England: Sage.

Clover, D. E. (2002). Toward transformational learning: Ecological perspectives for adult education. In E. O'Sullivan, A. Morrell & A. O'Conner (Eds.), *Expanding the boundaries of transformative learning* (pp. 159 - 172). New York: Palgrave.

Denzin, N. K. (1992). *Symbolic interactionism and cultural studies: The politics of interpretation*. Oxford, England: Blackwell.

Denzin, N. K. (2004). Symbolic interactionism. In U. Flick, E. von Kardorff & I. Steinke (Eds.), *A companion to qualitative research* (pp. 81-87). London, England: Sage.

Denzin, N., & Linclon, Y. (2011). *The SAGE handbook of qualitative research* (4th ed.) London: Sage.

Dewey, J. (1922). *Human nature and conduct*. New Jersey, NJ: The Quinn and Baden Company.

Diesing, P. (1991). *How does social science work?: Reflections on practice*. Pittsburgh: University of Pittsburg Press.

Dirkx (2012). Nuturing soul work: A Jungian approach to transformative learning. In E. W. Taylor & P. Cranton (Eds.), *The handbook of transformative learning theory, research and practice* (pp. 116 – 130). San Francisco, CA: Jossey-Bass.

Erhard, W., Jensen, M. C., & Granger, K. L. (2013) Creating Leaders an ontological/phenomenological model. In S. Snook, N. Nohria, R. Khurana (Eds.), *The handbook for teaching leadership*. New York: Sage.

Feng, S., Hussain, L & Paton, D. (2018). Harnessing informal disaster education for community resilience. *Disaster Prevention and Management*, *27*, 43-59.

Flick, U. (2019). *An introduction to qualitative research* (5th ed). London, England: Sage.

Freire, P. (2017). *Pedagogy of the oppressed*. New York: Penguin.

Gergen, K. F. (1985). The social constructionist movement in modern psychology. *American Psychologist*, 40, 266-275.

Goncalves, O. F. (1997). Foreword. In T. L. Sexton, & B. L. Griffin (Eds.), *Constructist thinking in counselling practice, research, and training* (pp. 157-173). London: Teachers College Press.

Grande, S. (2000). American Indian identity and intellectualism: The quest for a new red pedagogy. *International Journal of Qualitative Studies in Education, 13*(4), 343-359.

Griffith, J. (2014). *A country called childhood: Children in the exuberant world.* Berkeley, CA: Counterpoint Berkeley.

Griffith, J. (2015). *Savage grace: A journey in wildness*. Berkeley, CA: Counterpoint Berkeley.

Hayes, R. L., & Oppenheim, R. (1997). Constructionism: Reality is what you make of it. In T. L. Sexton, & B. L. Griffin (Eds.), *Constructist thinking in counseling practice, research, and training* (pp. 19-40). London: Teachers College Press.

Kasl, E., & Yorks, L. (2012). Learning to be what we know: The pivotal role of presentational knowing in transformative learning. In E. W. Taylor, & Cranton, P. (Ed.), *The*

handbook of transformative learning: Theory, research, and practice (pp. 503 – 519) San Francisco, CA: Jossey-Bass.

Koch, G. (2013). *We have the song, so we have the land: Song and ceremony as proof of ownership in Aboriginal and Torres Strait Islander Land Claims*. Canberra, ACT: Native Title Research Unit, Australian Institute of Aboriginal and Torres Strait Islander Studies.

Kokkos, A. (2021). *Exploring art for perspective transformation*. Leiden: Brill.

Lange, E. A. (2012). Transforming transformative learning through sustainability and the new science. In E. W. Taylor, & Cranton, P. (Eds.), *The handbook of transformative learning: Theory, research, and practice* (pp. 195 – 211). San Francisco, CA: Jossey-Bass.

Lawrence, R. L. (2009). The other side of the mirror: Intuitive knowing, visual imagery and transformative learning. In C. Hoggan, Simpson, S. & Stuckey, H (Ed.), *Creative Expression in Transformative Learning*. Malabar, FL: Krieger.

Lawrence, R. L. (2012). Transformative learning through artistic expression: Getting out of our heads. In E. W. Taylor, & Cranton, P. (Eds.), *The handbook of transformative learning: Theory, research, and practice* (pp. 471-485). San Francisco, CA: Jossey-Bass.

Lawler, R. (1991). *Voices of the first day: Awakening in the Aboriginal dreamtime.* Rochester, Vermont: Inner Traditions International.

Misra, G. (1993). Psychology from a constructionist perspective: An interview with Kenneth J. Gergen. *New Ideas in Psychology*, 11, 399-414.

Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco, CA: Jossey-Bass.

Mezirow, J. (1997). Transformative learning: Theory to practice. *New Directions for Adult and Continuing Education, 1997*(74), 5-12.

Mezirow, J. (2003). Transformative learning as discourse. Journa of Transformative Education, 1(1), 58-63.

Mezirow, J. (2012). Learning to think like an adult: Core concepts of transformation theory. In E. W. Taylor, & Cranton, P. (Eds.), *The handbook of transformative learning: Theory, research, and practice*. San Francisco, CA: Jossey-Bass.

Morell, A., & O'Connor, M. A. (2002). Introduction. In E. O'Sullivan, A. Morrell & A. O'Conner (Eds.), *Expanding the boundaries of transformative learning* (pp. xv – xx). New York: Palgrave.

Muirhead, A & de Leeuw, S (2012) *Art and Wellness: The Importance of Art for Aboriginal Peoples' Health and Healing,* National Collaborating Centre for Aboriginal Health, Retrieved from: https://artshealthnetwork.ca/ahnc/art_wellness_en_web.pdf

Mumford, L. (1957). *The transformations of man*. London: Allen & Unwin.

Myers, F. (1986). *Pintupi country, Pintupi self*. Washington, DC: Smithsonian Institution Press.

Nightingale, D., & Neilands, T. (1997). Understanding and practicing critical psychology. In D. Fox, & I. Prilleltensky (Eds.)*, Critical psychology: An introduction.* (pp. 68—84). London: Sage Publications.

Nicolaides, A., Eschenbacher, S., Buergelt, P. T., Gilpin-Jackson, Y., Mitsunori, M., & Welch, M. (in press). *The Palgrave handbook on learning for transformation*. New York: Palgrave Macmillan.

Paton, D., Buergelt, P. T., & Campbell, A. (2015). Learning to co-exist with environmental hazards: Community and societal perspectives and strategies. In *Advances in Environmental Research, Volume 43*. New York, NY: Nova Publishers.

Plotkin, H. (1995). *Darwin machines and the nature of knowledge: Concerning adaptions, instincts and the evoluation of intelligence*. London: Penguin Books.

Posey D. (1999). Cultural and spiritual values of biodiversity: United Environment Programme. London: Intermediate Technology Publications.

Reber, A. S. (1995). *Dictionary of psychology*. (2nd ed.). New York: Penguin Books.

Rowe, S. (1990). *Home place*. Edmonton: New West.

Reason, P. (1995). A participatory world. *Resurgence, 186,* 42-44.

O'Sullivan, E. (2002). The project and vision of transformative education: Integral transformative learning. In E. O'Sullivan, A. Morrell & A. O'Conner (Eds.), *Expanding the boundaries of transformative learning* (pp. 1 – 12). New York: Palgrave.

O'Sullivan, E. (2012). Deep transformation: Forging a planetary worldview. In E. W. Taylor & P. Cranton (Eds.), *The handbook of transformative learning theory, research and practice* (pp. 162 – 177). San Francisco, CA: Jossey-Bass.

Sexton, T. L. (1997). Constructivist thinking within the history of ideas: The challenge of a new paradigm. In T. L. Sexton, & B. L. Griffin (Eds.), *Constructist thinking in counseling practice, research, and training* (pp. 3-18). London: Teachers College Press.

Sexton, T. L., & Griffin, B. L. (1997). The social and political nature of psychological science: The challenges, potentials, and future of constructivist thinking. In T. L. Sexton, & B. L. Griffin (Eds.), *Constructist thinking in counseling practice, research, and training* (pp. 249-262). London: Teachers College Press.

Stewart, M. (2012). Understanding learning: theories and critique. In D. Chalmers, & L. Hunt *(Eds.), University teaching in focus: A learning-centred approach (pp.* 3-20). Camberwell, Australia: ACER.

Stubington, J. (2007). *Singing the land: The power of performance in Aboriginal life*. Strawberry Hills, NSW: Currency House.

Sutton, P. (1989). Enviromental education: What can we teach? *Convergence, 22*(4), 5-12.

Taylor, E. W., & Cranton, P. (2012). *The handbook of transformative learning theory, research, and practice*. San Francisco, CA: Wiley.

Thompson, C. W., Aspinall, P., & Montazino, A. (2008). The childhood factor: Adult visits to green places and the significance of childhood experiences. *Environment and Behavior, 40*, 111-143.

Tyler, J. A., & Swartz, A. L. (2012). Storytelling and transformative learning. In E. W. Taylor & P. Cranton (Eds.), *The handbook of transformative learning theory, research and practice* (pp. 455 - 470 – 177). San Francisco, CA: Jossey-Bass.

Willis, P. (2012). An existential approach to transformative learning. In E. W. Taylor, & Cranton, P. (Ed.), *The handbook of transformative learning: Theory, research, and practice*. San Francisco, CA: Jossey-Bass.

Williams, J. P. (2008). Symbolic interactionism. In *The Sage encyclopaedia of qualitative research methods*. Retrieved from http://sage-ereference.com.ezproxy.massey.ac.nz/research/Article_n442.html

Wortham, S. (1996). Constructionism, personal construct psychology and narrative psychology: Comment. *Theory & Psychology*, 6(1), 79-84.

Yunkaporta, T. (2019). *Sand talk: How Indigenous thinking can safe the world.* Melbourne: Text Publishing.