

Ecological Footprinting as a tool for engaging
sustainability in the workplace:
transforming adult resource-use perspectives in a
neoliberal university

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LIST OF ACRONYMS AND ABBREVIATIONS

EF	Ecological Footprint
TL	Transformational Learning
TSL	Transformative Sustainability Learning
MQ	Macquarie University
GFN	Global Footprint Network
PBL	Place-based Learning
pA	Participants A
pB	Participants B

Abstract

Humanity's use of global ecological resources is fast exceeding the earth's ability to replenish them. This thesis targeted organisations, as key consumers and waste producers, to examine adult neoliberal workplace resource-use perspectives. The thesis explores the potential for Ecological Footprinting (EF), as a measurement tool for organisational resource-use, to facilitate transformative learning. Utilising a feminist methodology – interviews with key practitioners and thinkers, and an applied EF workshop with Macquarie University staff, Sydney, Australia - the thesis examines the lived experiences of research participants.

Findings are presented at three interrelated scales: individual, organisational and societal. Individually, the thesis found that participants' connections within ecological systems were significantly influenced by their experiences, cultural connections and place(s). Participants were frustrated that organisational power dynamics limited the opportunities and support necessary to make and implement sustainable workplace resource decisions. At the societal scale, transformation of pedagogies and cultural values were considered by participants to be paramount for transforming resource-use perspectives leading to sustainability. The thesis highlights the benefits and challenges of EF as a component of dynamic transformations towards more ecological worldviews. In addition, finding that cultural shifts and workplace design play contributing roles towards longitudinal change in adult workplace resource-use perspectives.

AUTHOR STATEMENT

This thesis is my own work and contains no material published elsewhere or written by another person, except where due reference and attribution is made in the text.

The content of this thesis is a result of work which has been carried out since the official commencement date of the approved research program.

This thesis has not been submitted in whole or in part for the award of any other degree or diploma at any tertiary institution.

All research reported in this thesis received the approval of the Macquarie University Human Research Ethics Committee.

Protocol number: 5201500872

Signature:

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Chapter 1 Introduction

"[A]n ecozoic vision...a transformative perspective...a radical restructuring of all current educational directions...A full planetary consciousness opens us up into the awesome vision of a world that energizes our imagination well beyond a marketplace vision." O'Sullivan (1999a, 2-3)

This thesis takes inspiration from the above statement. Indeed, the need to move industrial societies towards sustainable resource use has been an increasingly urgent theme of public debate (United Nations 1987; O'Sullivan 1999a; Giroux 2002; Gendron 2014). Orr (1992) expresses that this move is "first and foremost a crisis of mind, perception, and values" (p. 27). In response to this crisis, this thesis explores individual perspectives of resource use in the workplace, with a strong focus on Transformational Learning (TL) (as expressed in Aim 2 below) within a neoliberal gestalt. Furthermore, within the context of Ecological Footprinting (EF) and connections within ecological systems, the role of place and culture in shaping individual perspectives is examined.

Orr (1992) further presents this crisis as a "challenge to those institutions presuming to shape minds, perceptions, and values" (p. 27). The pressures on universities, in particular, to conform to neoliberal expectations that require focus on financial performance, instrumental value and emphasizing training of particular professions (O'Sullivan 1999b; Giroux 2002; Couldry 2012), places the modern research university at a significant intersection of interests, pressures and opportunities. The research reported here explores this pressure to conform using a single case study of practice and experience at Macquarie University (MQ), Sydney, Australia. This chapter outlines the context and purpose, approach and scope, argument and aims, and finally the structure of this thesis.

Context and Purpose

This thesis explores the potential for EF to be utilised as a tool for adults in the workplace with the aim of facilitating TL: a form of learning that shifts an individual's worldview towards

more sustainable resource-use perspectives¹ (Mezirow, 1999). EF has emerged globally as a leading sustainability measurement tool, allowing an individual, organisation or community to ascertain their annual demand on ecological systems (Rees 1996; Wackernagel and Rees 1996). Current assessment of annual global biocapacity (supply of natural resources) is 12.2 billion global hectares, with current consumption estimated to be approximately 20.1 billion global hectares annually (Global Footprint Network (GFN) 2016a). Humanity is hence utilising biological resources and ecosystem services in quantities well beyond sustainable means, which many see as the heart of a global ecological crisis (Rockstrom 2009; Steffen et al. 2015; O'Sullivan, 1999a; GFN 2016b).

Adult perspectives are of particular importance within the context of this global ecological crisis, as adults form a significant proportion of society and can therefore play an important role in reducing ecological footprints towards sustainability - individually, collaboratively in organisations and within society in general. The term 'workplace' in this thesis is used to describe the physical and mental parameters that members within the organisation, in this case, Macquarie University, engage with in both personal and professional ways. This thesis helps to fill a gap in current research as to the perspectives of adults on sustainable workplace resource-use². There is significant research into management activities attempting to enable sustainable workplace behaviours and culture change (Linnenluecke & Griffiths 2010; Grant, Nyberg & Wright 2012; Stead & Stead 2013). However, Singtel (2015, Slide 1) identifies the following "skills and competencies needed to solve future sustainability challenges" as still lacking in current employees: ethics, external collaboration, integrity and abilities relating to the triple bottom line of sustainability (environment, society, economy), holistic future scenario planning, social innovation and shared value creation. This highlights the importance of research into tools and processes which facilitate employee

¹ Through understandings of TL (see Mezirow, 1997, 2000 and Kitchenham 2008), Indigenous knowledges (see Reid, Teamey & Dillon 2002; Bawaka Country et al. 2013, 2015, Wright et al. 2012, Williams 2013, Chinn 2015) and ecological commons governance (see Bollier 2012) I see perspectives as components within unique worldviews. An individual's neoliberal workplace resource-use perspective(s) relate specifically to resource use in the neoliberal workplace and yet are part of the dynamic between an individual's resource-use perspectives, neoliberal workplace perspectives and other, related broader cultural, ecological, political, social and economic perspectives. Worldviews can be described as a 'matrix of perspectives' since they influence and are influenced by these perspectives.

² I include several interpretations of neoliberal workplace resource-use perspectives - the concept of resource use (i.e. how an individual values and understands resource use: resource use as a noun) and the perception of individual and organisational resource-use (i.e. actual resource use and opportunities or abilities to change resource use: resource use as a verb).

learning for sustainability. This thesis starts to address this gap by examining resource-use perspectives within adult TL as TL shifts the perspective of learners to recontextualise and reinterpret their otherwise taken-for-granted and habitual settings.

The thesis examines the role of understandings and connections within place and culture on individual resource-use perspectives, and how these perspectives might influence organisational EF. Organisational EF is a measure³ of the organisational demand on ecological systems, both in providing resources for consumption and ecosystem services such as waste absorption. Chaudhary et al (2015) discuss discourses of ecosystem services, arguing that there remain ethical questions relating to the understanding of a concept based largely on ecological and economic perspectives. This thesis responds to their encouragement for broader, inter-disciplinary research that contributes to the evolving values, meanings and perspectives of ecological systems and their services in new and challenging ways.

Approach and Scope

This research drew on qualitative methods and developed an interactive, participatory workshop that enabled MQ employees to reflect on their perspectives and the consequences of various elements of their workplace in terms of resource use. Online interviews with experts in the fields of EF, TL and sustainable business learning and engagement (a total of 4 interviews) assisted in the development of the EF professional development workshop for MQ staff (4 staff members were involved in the MQ case study). The term professional development was used to entice individuals' interest in the course as an avenue to, and description of, the type of learning that was envisioned for the workshop, to expand their personal knowledge, skills and engagement within a professional workplace context. These expert interviews also contributed to understanding how this case study related to broader aspects of TL and the role of places and cultures in shaping workplace sustainability within neoliberal cultures. The MQ workshop allowed for a number of innovative and experimental pedagogies to be trialled, whilst maintaining a group workshop format. The pedagogy developed for the four-hour workshop combined instruction in general EF knowledge with components specific to the MQ workplace and utilised a variety

³ Used in this research as both a quantitative measure and a holistic concept of the connections within ecological systems, cultures, places and human and more-than-human elements.

of teaching methods, including storytelling, dialogue, place-based education and active participation. Drawing on questionnaires, interviews and participant observation with workshop participants, the thesis explores participants' understandings, perspectives, lived experiences and connections of self within the context of EF, ecological systems, organisational culture and the neoliberal workplace. Neoliberalism is acknowledged to be the major form of global governance that "prioritize[s] corporations and economic growth over considerations of social equity or environmental protection" (Tuck & McKenzie, 2015, p. 3). Neoliberal workplace in this context then, refers to a workplace based upon the underlying assumptions that free-market mechanisms and sustained growth are the key mechanisms through which human progress should be achieved. In particular, the neoliberal university has evolved to reflect these neoliberal cultural values as evidenced by the cultural practice of anchoring of learning and research outcomes with market driven forces, such that people and projects are seen as a representation of what they can contribute to the economy rather than as places for exploring knowledge, experiences and public discourse (Giroux, 2002; McKenzie 2012). It is the TL aim of emancipation of these individuals from within unequal neoliberal constructs that justified a feminist methodological approach for this research. Feminist methodologies are those methods of research and approaches of inquiry that are designed to challenge asymmetrical constructs, with a strong focus on generation of situated knowledges.

Due to the limited scope of the Master of Research, the thesis does not extend to evaluating the workshop or teaching methods nor does it measure the TL of participants, although the methods used could support such analyses. As discussed in the conclusion, the findings from this thesis can nevertheless inform further research in areas of cultural-political ecology and longer-term TL within organisations – responding to Taylor and Laros' (2014) identified need for pedagogical research that explores how the teaching of individuals, groups and organisations effects wider learning experiences.

Aims and Argument

This thesis explores a TL pedagogy, utilising the concept of EF with adult learners in the neoliberal workplace environment of MQ – a University which aims to promote 'a culture of

transformative learning in a research-enriched environment' (MQ, 2013). Drawing on expert interviews and the MQ case study, the thesis answers the question:

How can EF contribute to transformation in adult perspectives of sustainable resource use?

The following specific aims have underpinned the research design developed in the project:

Aim 1. To determine to what extent can engagement with EF tools can facilitate change in adult perspectives on sustainable resource use.

Aim 2. To explore how adults respond to TL orientated pedagogies in a workplace context.

Aim 3. To explore the role of place and culture in shaping adult resource-use perspectives.

While the limitations of the research reported here are acknowledged, the thesis argues:

1. EF can be a beneficial component of individual transformation towards more sustainable resource-use perspectives and this transformation can occur as part of a dynamic learning process at individual, organisational and societal scales.

2. EF can help employees bring the two sides of the human-nature dichotomy together in their thinking by increasing ecological awareness, including an appreciation of ecological systems in their workplace settings.

3. Learning, continual support, cultural shifts and the design of workplaces contribute to longitudinal transformative change in adult resource-use perspectives.

Thesis Structure

This thesis achieves these aims as follows. Chapter 2 examines the current setting for adult learning and EF within the neoliberal university context. Chapter 3 reviews the literature and key debates upon which the thesis is based, particularly conceptualisations of place, culture and TL within ecological systems. Feminist methodology is discussed in Chapter 4 as the approach through which power dynamics, individual lived experiences and voices of external experts and internal employees was explored. Chapters 5-7 present empirical

findings under the three main themes made evident by the research process: the potential for EF as a TL tool (Chapter 5), culture (Chapter 6) and place (Chapter 7). Finally, conclusions are drawn and implications for future research and wider society are considered in Chapter 8.

Chapter 2 Background - Linking Adult Learning to EF

This chapter describes the context for engaging adults with sustainable workplace resource-use issues. Key points considered are how adults learn (discussed in more depth through TL in Chapter 3) and how EF can be incorporated within the workplace, specifically the neoliberal university workplace.

Adult Learning

Adult learning, particularly in Western societies, is traditionally associated with knowledge acquisition, where transmission of content and individual learning is the primary intended outcome of many pedagogies. Hall's (1990) cultural context theory indicates, some Western societies also place a high value on learning through context - where meanings are communicated through the use of content combined with language use and body language. It is therefore not only the acquisition of knowledge that is important but how this knowledge, combined with different and more-than learning, enhances experiences, informing individual values and perspectives (Illeris, 2014).

These values and perspectives operate within a framework of individual and collective understandings, socially-constructed meanings and cultural norms. Ewing (2001, p.1) suggests that "(i)n learning to make meaning through language, we also learn to become members of a particular cultural group." In discussing how we culturally adapt to ecological systems (cultural ecology), Head (2010) suggests that we cannot assume that increasing knowledge results in behavioural change because there is a necessity to facilitate "cultural changes [that] will be extremely complex and occur at the intersection of individual, social and institutional behaviours and attitudes" (Head 2010, p. 238). In many Western cultures, the term 'Neoliberal' is often associated with free-market, high resource efficiency, economic growth and the privatisation of businesses/organisations (Giroux 2002; Couldry 2012). It is these neoliberal values - that focus on individualism and continual material and monetary growth - that have permeated university workplaces and are therefore at the intersection of adult learning and potential change in perspectives. Taylor and Laros (2014) agree, arguing that as technology and innovation enables far-reaching, instantaneous communication, it is critical that pedagogical research explores how the teaching of individuals, groups and organisations effects wider learning and cultural experiences. Indeed, Chen and Martin

(2015) argue the effectiveness of knowledge-based, environmental learning in producing sustainable behaviours continues to be significantly limited. Environmental learning is therefore an important aspect of sustainability education that explores how individuals and groups engage with learning about environmental issues such as resource-use (Rickinson, Lundholm and Hopwood 2009). This thesis contributes to this emerging literature by exploring the use of EF within TL to answer the research question by examining neoliberal workplace resource-use perspectives.

EF - A Demand and Supply Tool

As previously mentioned, EF has emerged globally as a leading sustainability measurement tool, allowing an individual, organisation or community to ascertain their annual demand on ecological systems (Rees 1996; Wackernagel & Rees 1996). This is achievable through the standardised metric - the global hectare (Chikoti 2012; GFN 2015) and demand is expressed by the number of planets required to sustain current levels of consumption per year, where values under one planet provide ecological surplus and values over, result in ecological deficit. Current assessment indicates global annual demand at 1.6 planets (GFN 2016b). To help achieve balance, EF can assist in quantifying and communicating biocapacity (i.e what the planet can provide) and demand to policy makers, organisations and individuals, contributing to the development and evaluation of responses and 'solutions'. Senbel, McDaniels & Dowlatabadi (2003) found that consumer consumption was the single most significant variable influencing EF, highlighting the importance of individual knowledge about the concept and application of strategies to reduce ecological footprints.

EF is undergoing constant evaluation and adjustment in order to overcome limitations and improve aspects such as accountability, transparency and applicability. EF's limitations include issues with incomplete data availability, accounting for indirect requirements, accounting variances and achieving flexibility to respond accurately to changes over time (Moffat 2000; Lenten and Murray 2003; Senbel et al. 2003). To overcome some of these limitations, various complimentary methods have been presented such as input-output analysis and land disturbance analyses (Lenzen and Murray 2003). Input-output analysis and the use of production trees, by establishing direct and indirect biocapacity requirements of single units of good and services, have gone some of the way to establishing the key areas

to target when designing for reduction in EFs and therefore, have arguably increased its robustness as a tool to aid in policy formulation (Lenzen and Murray 2003). Other key criticisms of EF are its inability to include, as yet, ecological risk factors and outcomes, such as “potential species loss, impairment of ecological services or ecosystem collapse” (Senbel et al 2003 p.93) or to provide indications of specific factors within categories that are responsible for unsustainable allocation of resources (Lenzen and Murray 2003 p.4). Lazarus et al (2015) suggest that by using the data available to cross tabulate biomass imports and exports, it is possible to gain some insight into the sustainable allocation of resources across and between nations as well as an indication of biodiversity. Indeed, as I argue and Moffat (2000) suggests, “some of these limitations can be overcome so as to make a useful contribution to the transformation of societies onto paths of equitable, ecologically sound and economically sensible sustainable development” (p. 359). EF evaluations of organisations such as child care centres (McNichol, Davis & O’Brien 2011), universities (Venetoulis 2001; Conway et al. 2008; Klein-Banai & Theis 2011; Bekmann, Noller & Rickards 2013; Flint 2001; Li et al. 2008; Gu et al. 2005), industrial sectors (Sonak 2004; TAFE NSW 2013; Rees 2009), companies (Lenzen et al. 2003; Sydney Water 2015) as well as cities (Anielski & Wilson 2005; Moore & Rees 2013) and nations (Galli et al. 2013; GFN 2016c, World Wildlife Fund 2014) has led to benchmarking, scenario evaluation and implementation of targets and initiatives to reduce resource consumption and waste production. This application of EF is increasing in pace as data becomes more readily available across many spatial scales (Moffat, 2000).

EF and the University Workplace

Universities have been increasingly recognised for their potential to be ‘living laboratories’, where social science research can combine learning, teaching and research through staff and student involvement (Howitt and Rickards, 2013; König, 2013). Globally, a range of universities have carried out some form of EF monitoring and reporting (Venetoulis 2001; Conway et al. 2008; Klein-Banai & Theis 2011; Flint 2001; Bekmann, Noller & Rickards 2013; Li et al. 2008; Gu et al. 2005). Others have incorporated EF into their curriculum within disciplines such as engineering, environmental studies, geography, architecture, business, arts, and education (Crompton, Roy, & Caird 2002; Allacker, Khan & Vandevyvere 2013; Howitt & Rickards 2013; Mcmillin & Dyball 2009). One course in the UK analysed changes in

behaviour, attitudes towards EF and socio-economic variables in relation to learning outcomes (Crompton, Roy, & Caird 2002). Importantly, this research found that environmental values did not determine positive behaviour change, indicating the outcomes were likely a result of TL during the course.

The Case Study: EF at MQ

Currently, MQ is embedding EF into their campus-wide sustainability policy, demonstrating their commitment to “developing a vibrant and sustainable campus” to “adhere firmly to our commitment to the principles of sustainability in all that we do” (MQ 2013). An important component of this process was the University’s engagement of The Footprint Company⁴ in 2011 to assess MQ’s EF, which was found to be 1.4 planets. Following this assessment, MQ proclaimed its goal to achieve approximately 25% reduction in resource use, or One Planet, by 2030 (MQ 2015c). While EF has become a component of some MQ courses⁵ and instrumental in property decision-making (MQ 2015a), it is not mentioned in the latest Learning and Teaching policy paper (MQ 2015b) or clearly expressed at the operational level in relation to staff, such as in policies and strategies⁶. As this thesis argues, this is a missed opportunity to utilise an engaging tool in the workplace.

Rethinking EF: a holistic approach

The individual impacts of teaching EF calculation have not been widely analysed. In this thesis I argue that a more holistic approach to EF (see Figure 1) which sees it taught within a pedagogy that facilitates opportunities for greater connection between people, place and self, may help individuals understand the interconnectedness of resource use and economic, social and environmental considerations⁷. This conceptual framework draws mainly on three bodies of literature, covering learning, nature and sense of self. Firstly, the ideas of culture/ social norms, sense of self, sense of place in place and frame of reference comes from research that focus on incorporating transformative sustainability learning into more informal learning environments including being embedded into workplace cultures and forming part

⁴ www.thefootprintcompany.net

⁵ For example: Measuring Sustainability - ACCG260; ENV118 - Environmental Management for a Changing World; ENV267 Australian Environmental Futures; GEOP340 - Resource Management

⁶ It has been reported in the MQ 2014 Annual Sustainability Report that a 2012 assessment indicated an MQ campus EF of “1.2 planets” (MQ, 2015a, p. 23).

⁷ Including political ecologies, politics of place and justice.

of successful processes of environmental initiatives. Examples of which include teaching tree-planting, respect and collaboration in Kenya (Bull, 2013) and David Orr's Oberlin project to transform a community towards sustainable ecology (The Oberlin Project n.d.). Secondly, the concepts apparent in Indigenous learning such as shared and active participation, linked to place, person and culture within a holistic learning framework and the idea that Indigenous or traditional knowledges are systems-based and "characterised as mixtures of knowledge, practice and belief" (Reid, Teamey & Dillon 2002, n.p.) were influential. These concepts highlighted frame of reference, place and sense of self as important areas for further pedagogical development, especially in exploring connections and agencies operating between the human-nature relationship and sustainability (Bawaka Country et al. 2013). Lastly, research into the Connectedness to Nature Scale (CNS) as a framework exploring individual connections to nature (Shultz, 2001, Shultz 2002; Franz and Mayer 2004; Orr, 2004; Shultz et al., 2012) was significant in identifying sense of self, ecological systems and frame of reference as key foci within this conceptual framework. The CNS explores 14 levels of varying connectedness, ultimately leading to different pro-environmental values, perspectives and behaviours (sustainability values and resource use in Figure 1). Frantz and Mayer (2004) summarised their support for the CNS as an "important predictor of ecological behaviour and subjective well-being" (p. 503). This highlights the importance of one of the key assumptions of the CNS: the inclusion of nature in one's self concept (Shultz, 2002). Figure 1 shows the focal elements of holistic EF and how I see them related. This diagram therefore provides a basis for which to conceptualise research findings.

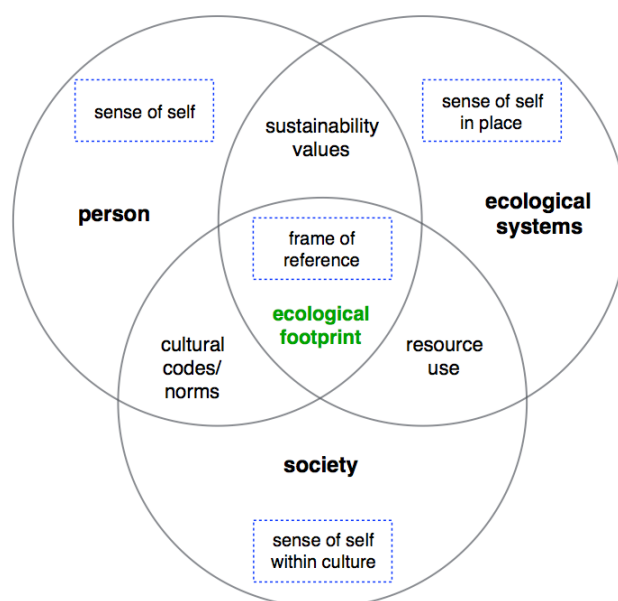


Figure 1: Conceptual diagram of the components within a more holistic understanding of EF⁸

This more holistic approach to EF would also provide greater clarity as to how and what values are attributed to ecological systems and how these influence resource-use perspectives (see Moffat 2000). In this case study, a more holistic pedagogical approach to EF facilitated exploration of how EF might stimulate transformation of resource-use perspectives.

Conclusion

As highlighted in this chapter, there is potential for EF as a tool within the professional development learning process to expand the knowledge and experiences of individuals and their connection to ecological systems. The literature, reviewed next in Chapter 3, suggests this is a complex process with strong influences from lived experiences and power dynamics within places and cultures at individual, organisational and societal scales.

⁸ It is important to note this is a simplified diagram (yet arguably more dynamic than current figures representing EF as measurement - see http://www.footprintnetwork.org/en/index.php/GFN/page/footprint_basics_overview/) of a more holistic understanding of EF).

Chapter 3 Concepts for Consideration - Literature Review

"We are contemporarily within and outside nature. We are at the same time cosmic, physical, biological, cerebral and spiritual beings. We are children of the cosmos, but because of our own humanity, of our own culture, our own mind and consciousness, we have become foreign to this cosmos, from which we were born but which at the same time remains for us secretly intimate."

- Edgar Morin 2000 pp. 34–35

Worldviews form the lens through which individuals collect, interpret, analyse and communicate information and experiences and formulate perspectives (Mezirow 1997). Place provides the real or imagined biophysical context within which this process occurs (Ardoin 2006). Therefore, an individual's understanding of and connection to place; local, educational and workplace, provides a starting point from which to understand and explore their resource-use perspectives and values. Current literature suggests learning *in* place is critical for stimulating self-reflection and enhancing sustainability values and perspectives (Bowers 2005; Sipos et al. 2008; Lloyd & Gray 2014; Ardoin 2006). Several authors have also found culture to be of central importance to senses of self *and* (work)place and to play a significant role in facilitating change towards sustainability perspectives (or not) (Tuan 1977; Ingold 2000) and learning outcomes (Gruenewald & Smith 2008; Bowers 2005). This chapter briefly reviews the literature surrounding the interrelated role of place, culture and self within EF and TL⁹ to contribute to explorations of individual, organisational and societal resource-use perspectives. In doing so, it provides the basis for understanding how the feminist approach was utilised to explore and answer the research question and aims.

Two of the key words in the research question 'transformation' and 'adult' provided the basis for choosing the main body of literature to review - transformational learning (TL) - as this type of learning is acknowledged as one of, if not, the, main type of adult learning (Taylor 2007). In attempting to further relate this learning to the research question, transformative sustainability learning (TSL) literature was found to be of substantial influence due to the focus on sustainable resource-use perspectives (Sipos, Battisti & Grimm 2008). A developing

⁹ See above Figure 1.

understanding of the components of TL and TSL led to branching out the literature review to cover elements considered important in both such as sense of self, place and culture.

Place

Place is of central importance to humanity, for one cannot be, without being in some¹⁰ place (Aristotle in Casey 1997; Ardoin 2006). Cresswell (2004) suggests that current understandings and pedagogies of place elevate Western epistemology, promoting the human values attributed to places, often based on progressive or development goals. Manuel-Navarrete and Redclift (2009) argue that the concept of place requires further development, in particular, the phenomenological importance of place as 'lived' experience. Tuan (1977) finds that place is at the centre of human emotional attachment, where cultural meaning and awareness begin to be articulated. Furthermore, Bawaka Country et al. (2015) convey, through lived experiences, that place has active agency in the human and more-than-human ontological relational process. Importantly, place deserves significant consideration when exploring neoliberal workplace resource-use perspectives.

Place and Human-Nature Relationships

Kellert (2005), in researching the connections between nature and humanity, argues that due to biophilia: the innate human affinity for the natural world, an individual's experiences will help shape the values they attach to nature within contexts where there is sufficient experience of place(s) and learning and cultural support. More distinctly, Kellert (2005) believes development of the values humans attach to nature, can increase physical, emotional, intellectual, moral, creative and spiritual meanings and capabilities, particularly within places of Biophilic Design (Kellert & Calabrese 2015). Lamb (1996) attests that the values attributed to the natural world by an individual affect how they see their connection to nature. For example, Vinning, Merrick and Price (2008) state that if an individual values the human-nature relationship, they will see themselves as closer to nature, but if they place value on stewardship of natural environments, requiring separation of self and nature, they see themselves as separate to it. This is clearly evident in the results of the Greendex

¹⁰ Real or imagined biophysical setting.

survey¹¹, correlating the link between unsustainable consumers and low levels of guilt about personal environmental impacts (Greendex 2014; see also Shultz 2001, 2002). This low level of guilt may be due in part to emerging 'eco-phobia' (Sobel, 1995) or 'bio-phobia' (Orr, 1994), which is a person's fear or aversion to the natural world and ecological problems. Hensley (2012) suggests that this fear, or range from discomfort to scorn, for nature, is inherited from industrial cultures which promote the separation of humans and nature and is perpetuated by pedagogies that elevate technology and personal advancement above the well-being of the planet. Baumeitser (1987) argues that a sense of objective self, separate from nature, is the result of industrialisation when the self became more important than community. He finds that this also led to reduced connections with nature, places and others, leading to a superiority complex and the exploitive nature of Western cultures (White 1967; Frantz et al. 2005).

Hernández et al. (2010) assert that place attachment incorporates affective bonds between people and specific places. These relational bonds facilitate development of positive self-other perspectives, leading to empathy and desire to help places (Frantz et al. 2005). These bonds affect and are affected by cultural underpinnings. Indeed, culture is a central aspect of place attachment and hence individuals' resource-use perspectives. In combination with political, economic, historical and imaginary elements, culture comes together within a biophysical setting to determine an individual's 'sense of place' (Ardoin, 2006). Sense of place is not only made up of these relational components but can include the agency of non-humans, objects and places in on-going more-than-human relational processes (Massey 2005; Bawaka Country et al. 2013). These ideas are further explored below and form a central aspect of the findings and discussions within this thesis.

Sense of Place

Hummon (1992) describes sense of place as:

"... inevitably dual in nature, involving both an interpretive perspective on the environment and an emotional reaction to the environment ... Sense of place involves a personal orientation toward place, in which one's understandings of place and one's

¹¹ The Greendex survey (<http://environment.nationalgeographic.com.au/environment/greendex/>) is conducted annually. 17000 respondents in 17 countries answer questions - designed to 'measure and monitor consumer progress toward environmentally sustainable consumption'.

feelings about place become fused in the context of environmental meaning” (p. 262, emphasis in text).

This thesis expands the currently limited literature that examines connections between people and places as organisations (Kennelly and Shrivastava 2013), in particular, individual and community senses of place as workplaces (Thomas et al., 2008). The importance of sense of place is evident in the context of resource use, in particular natural resource management, where new ideas surrounding the ‘politics of place’ suggest place can be an organising principle for the values and articulations of individuals within place-based collaborations (Cheng, Kruger & Daniels 2003). While it is encouraging that place is given significance in providing individuals with environmental meanings, these ideas portray the humanistic epistemologies prevalent within many cultural ideologies surrounding resource use, polarising intended (human-human and human-more-than-human) collaborations through promoting individualism. Indigenous understandings identify place as important in the dynamic process of becoming; where place is not separate to oneself or community, but is an active presence, part of a network of relational beings which are constantly ‘co-becoming’ with each other (Bawaka Country et al., 2013). Human geographer, Doreen Massey (1998), agrees and advocates a “progressive sense of place” (p. 156). This means that an individual’s ‘sense of relations within place’ is undergoing transformation and is a central feature of relational processes of learning and practice. Ardoin (2006) supports a more “integrated, holistic view of place, particularly as it applies to environmental education” (p. 112).

Rich analysis of sense of place also reveals that imaginaries enable learning and consideration of sense of place that is not confined to a simple biophysical connection (Booth 2015). Instead, imaginaries allow exploration of how people see themselves in relation to, and in the context of, certain phenomena, becoming a significant aspect of how people create and live out their reality within places (Åsberg et al. 2015). Chinn (2015), arguing that “awareness of internal and external realities [is] a culturally-shaped habit of mind”, reiterates shared narratives as important in raising ecological mindfulness and greater sense of place. Ardoin (2006) also succinctly articulates the potential for pedagogies recognising and facilitating immediate or long-term sense of place “—whether rooted or mobile—[that] can relate these concepts and opportunities to real-world issues of environmental learning, involvement, action, and community-based conservation” (p. 119).

This idea shares a similar premise to place-based learning (PBL) theory that advocates learning within local communities can facilitate development of ecological literacy and a sense of self within ecological systems or 'ecological self' (Gruenewald & Smith 2008; Nettle 2014). Ardoin (2006) goes on further to reiterate the need for place-based adult environmental education as adults "can have deep, transformational relationships with place, while also having an inordinate impact on our world's resources" (p. 120), a common theme within TL towards sustainability and this thesis.

Transformational Learning (TL)

Mezirow's (1978) TL theory attributes transforming adult perspectives to self-reflection. As an adult educator, Mezirow based his theory on the premise that due to changes in the availability of information and lifestyles in a more modern world, adult learning should focus on developing an individual's ability to think, and therefore act, "as an autonomous and responsible agent" (Mezirow 1997, p. 7). Being critically self-reflective of the assumptions on which perspectives are formulated is central to TL. Mezirow sees these assumptions as embedded in the way individuals see the world, their 'frames of reference' or worldviews (1997, p. 5). Worldviews include points of view and "habits of mind" as "broad, abstract, orienting, habitual ways of thinking, feeling and acting influenced by assumptions that constitute a set of codes. These codes may be cultural, social, educational, economic, political, or psychological" (Mezirow 1997, p. 5-6). The articulation of these habits of mind leads to an individual's perspective. As learners engage in discourse, they are presented with other perspectives, validating or challenging their beliefs, which may lead them to amend their point of view accordingly. Mezirow notes habits of mind are much harder to change and worldviews are only transformed through "critical reflection on the assumptions upon which our interpretations, beliefs, and habits of mind or points of view are based" (Mezirow 1997 p. 7, see Appendix A). Certain experiences can provoke individuals to perform critical self-analysis, providing the catalyst for transformed worldviews.

Transformation of worldviews is an important concept within adult learning as worldviews are the outcome of individual and collective assumptions and experiences both reflecting and leading to specific values, perceptions and behaviours (Stubbs & Cocklin 2008).

Worldviews determine how and what information is received, how this is interpreted and

analysed, leading to cognitive, spiritual and physical outcomes and are therefore paramount to explorations of resource-use perspectives within workplaces.

Boyd (2003) suggests, the role of social settings and emotions on personal transformation, in particular facilitating more compassion and interdependence, is also important. Indeed, Illeris (2015) agrees, TL is about “personal development, deeper understanding, and increased tolerance and flexibility” (p. 50). Dirkx (2001) discusses a deeper TL process, involving substantive learning, where individuals have “emotional, imaginative connection with the self and with the broader social world” (Dirkx 2001, p. 64.). This highlights the importance of connections between self, place and culture and the role of the imagination and narratives within learning processes (McKenzie and Bieler 2016). Chen and Martin (2015) further suggest that TL is attractive, especially in environmental education, because it provides an avenue to turn personal transformations into social activism.

Bowers (2005) challenges TL theory, arguing that TL perpetuates individualism, technological solutions and heightened competitiveness: characteristics of neoliberalisation. Bowers’ (2005) argument considers that through emancipatory pedagogies (see Mezirow 1997; Fraire 1968; Gadotti 2003) individualism and breaking from cultures is encouraged, resulting in the breakdown of local cultures, and loss of Traditional knowledges that have been able to “sustain their commons” (p. 120). In this thesis ‘sense of self’ is examined not in isolation but always with respect to another element. In this way, I explore pedagogies that enhance the connections and interrelatedness of ontologies and epistemological elements of individual (unique) and collective, local and global, ecologies. This inclusion of ‘sense of self’ within an element is important as it influences how individuals perceive and act with respect to the element they self-identify with or to which they feel like they ‘belong’. For example, we feel that we are part of a particular culture if we use that specific cultural language (Ewing 2000). Furthermore, Liefländer et al. (2013) found that individuals who saw nature as part of self, exhibited strong pro-environmental behaviours in later life.

Facilitating TL

TL can be gradual, consisting of many small changes or ‘epochal’, involving dramatic or reorienting changes. Mah (2015) and Illeris (2015) found that how and when TL occurs is

dependent upon the individual's learning process, challenging pedagogies to be flexible enough to facilitate the disparate needs of individuals. Taylor (2007) found that important parameters for fostering TL were "providing direct and active learning experiences...the availability of varied medium...the importance of 'pedagogical entry points'...and the nature and importance of support" (p.182). Pedagogical entry points refer to the learners' readiness to enter the transformational process, such as disillusionment with the current paradigm, doubt of their current perspective or when they find the 'edge of meaning' (Berger 2004, p.339). It is crucial that teachers can identify learners 'entry points', create environments that are safe to express doubt and uncertainty, and facilitate questioning, self-reflection and understanding of individual meanings and roles (Illeris 2015).

Active research is also mentioned as a complimentary research method "providing a pedagogical framework for classroom teaching" (Taylor 2007, p.188), whereby opportunities for reflection and action are highlighted. Examples include participatory approaches and learning environments facilitating dialogue (discussed in Chapter 4). Furthermore, facilitators and institutions need to support adjustment to a new perspective and development of an individual's "skills to act on their new understanding" (Taylor 2007, p. 187) and guidance on practical implementation of new understandings (Gravett 2004) for sustained transformations. This literature informed my approach to the MQ EF professional development workshop, including how I facilitated the workshop and offered opportunities for active participation, dialogue and problem-solving within a supportive learning environment (Moore 2005). These were used in collaboration with consideration of continued support and how to implement workplace resource-use solutions after the workshop.

TL Pedagogies Towards Sustainable Resource Use

O'Sullivan (1999a) takes a more philosophical TL approach, believing the key to successful pedagogies is to establish "a radical restructuring of all current educational directions. To move towards a planetary education it will be necessary to have a functional cosmology that is in line with the vision of where this education will be leading us" (p. 2-3); see also Nelson & Coleman 2012). Further commenting that the "destructive and malignant forces of modernism" (p. 2) can be mitigated by reimagining futures through transformative

educational frameworks focused on integrating perspectives and creating global ecological identities. Indeed, the social context of TL¹² has been found to be significant for the integration and transformation towards more sustainable perspectives and identities as learners develop their understandings of sociopolitical and cultural systems more holistically when problem-solving real-world problems with others (Chen & Martin 2015). Hensley (2012) highlights the need for more TL pedagogies towards sustainability that engage learners in their physical and social surroundings, arguing that place-based, experiential learning provides a framework that allows learners to question and recreate their own realities. One TL framework, termed Transformative Sustainability Learning (TSL), that describes pedagogies aimed at sustainable perspectives was found by Sipos, Battisti and Grimm (2008) to be:

“a series of learning objectives corresponding to cognitive (head), psychomotor (hands) and affective (heart) domains of learning that facilitate personal experience for participants resulting in profound changes in knowledge, skills and attitudes related to enhancing ecological, social and economic justice” (p.68)

The TSL framework (Figure 2) facilitates pedagogies that give learners the best opportunity to enact sustainability through TL.

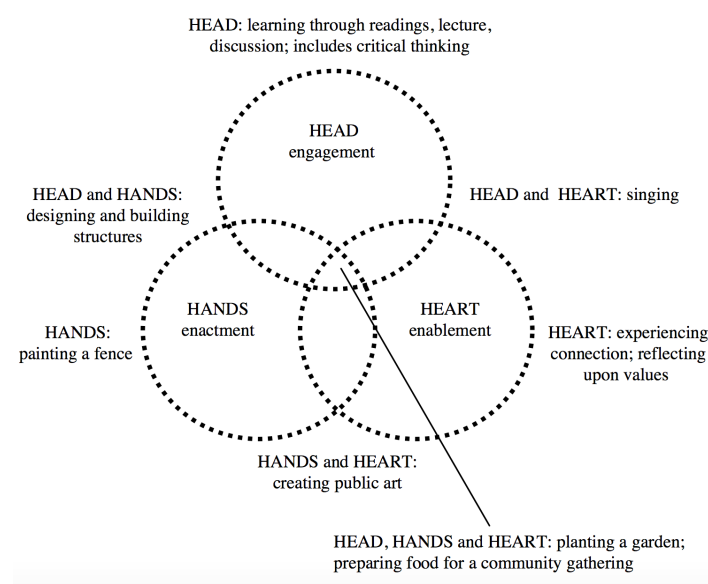


Figure 2: TSL framework from Battisti, Grimm and Sipos (2008) p. 75.

¹² In particular transformative sustainability learning (TSL). TSL is a type of TL (pedagogical framework) specifically aimed at transforming perspectives towards more ecological worldviews and sustainable behaviours. Sipos et al. (2008) describe the TSL framework as “a series of learning objectives corresponding to cognitive (head), psychomotor (hands) and affective (heart) domains of learning that facilitate personal experience for participants resulting in profound changes in knowledge, skills and attitudes related to enhancing ecological, social and economic justice” (p.68)

To this end, TSL combines an interdisciplinary, participatory and active type of learning within a holistic framework. Participatory, PBL facilitates understandings of the unique ecological and social parameters of surroundings, enhancing connection to place and sense of place in a holistic, dynamic way. These concepts were influential in the development of the content and context of the EF workshop intended to engage individuals to critically reflect on their own worldviews.

Culture

In understanding that culture is the “collective manifestation of everyday lives” (McKenzie and Bieler 2016, p. 11) then it becomes clear that the social constructs of cultures play a significant and interrelated role in EF and TL. As Arnold et al. (2002) found when researching learning in the neoliberal context “people constantly and actively construct meaning and understanding to associate their direct experience with their explanation and judgement of experience...an awareness and transformation of social reality becomes possible” (p. 71). Resource-use perspectives therefore influence ecological footprints and in turn, are influenced by lived cultural experiences, both in establishing resource-use ‘norms’ and ecological systems values (Sutton & Anderson 2010). McKenzie and Bieler (2016) discuss that it is these lived experiences as everyday habits that reproduce cultures and therefore “orients everyday ways of doing things to the dominant or institutionalized ways of life of a particular society” (p. 20). In emphasising the adaptation of these habits to specific places, such as home or work, even changes in feelings leading to subtle changes in habits can give rise to the possibility of social practices that operate counter to the dominant culture (McKenzie and Bieler 2016). Furthermore, subjective cultural parameters can enhance or inhibit transformation of individuals’ resource-use perspectives. The expressions, symbols, associations and meanings serving as the socially-constructed cultural parameters that mediate individual and organisational resource-use perspectives, are an therefore important parameters within this research (see Chapter 6) (Geertz 1973; Boyd & Myers 1988; Alexander 2003).

Neoliberal Culture Infiltrating Organisations

One of the key elements influencing individual perspectives within organisational culture is the dominant societal culture within which the organisation operates (Mezirow 1997; Giroux 2002). While there has been significant research on organisational culture within organisational theories, (Robbins & Barnwell 2002; Senge 2006; Hall 2014), Caldwell (2011) identifies a lack of exploration into elements such as lived experiences of individuals and power dynamics. Additionally, researchers highlight the burgeoning knowledge-action gap and an increasing skill deficit in neoliberal workplaces (Matthews 1999; Mezirow 1997; Boehnert 2010), prompting further research that explores these areas within the neoliberal organisational context. All external participants and the case study explored within this thesis are situated within a neoliberal cultural context.

Neoliberal Universities - Culture in Crisis?

Neoliberalism, the “defining political economic paradigm of our time” (McChesney quoted in Giroux 2002, p.425), promoting market mechanisms over collective, social justices, has infiltrated the most public of institutions – universities (Giroux 2002, Matthews 1999; O’Sullivan 1999b). This influences operational aspects, university workplace cultures, pedagogies and research directions. Brian O’Sullivan (1999b) identifies the neoliberal philosophy, whereby education is seen as promoting global competitiveness, focusing on subjects and curriculums that deliver continued ‘prosperity’. He argues that this industrialised nations trend reflects public opinion that prioritises strong links between education and work. This narrow utilitarian expectation of education, privileges preparing individuals for the workforce, leading towards a stronger economy and power on the world stage. Indeed, MQ’s current Learning and Teaching White Paper focuses on just how much “The needs of their [students’] future employers greatly influence their choices about what and where to study...Employability Matters” (MQ 2015b, p. 1). This is an example of how universities, operating within neoliberal democracies, are approaching strategic directions where “aims and substance are ‘closer’ to the needs of the economy” (Couldry 2012, p. 61). Reader (2011) argues that despite 40 years of critique, little pedagogical and societal transformation has occurred due to the cyclical continuation of “education in support of the status quo” (p. 2). Universities, as the dominant institutions educating adults within society, are experiencing new challenges as neoliberal policies and governance clash with academic research and teaching that challenges current paradigms. In their discussion of universities

implementing new policies towards more sustainable paradigms, Shriberg and Tallent (2003, p. 1) state “we are sorely missing guidance to move from often vague notions of sustainability into implementation practices that are applicable across organizational and cultural boundaries.” This thesis endeavours to provide a framework to challenge neoliberalism in the university workplace by using EF to bring human-nature relationships to the forefront of individuals’ minds, providing opportunities to create different ontologies and establish new pathways to ecological worldviews. Within this framework, the role of place within culture is significant and highlighted by Jones’s (2013) introduction of the concept of the ‘Biophilic University’. To Jones, a new narrative and heuristic can be built on principles that aim to restore:

“an emotional affinity with the natural environment...including the importance of organizational aesthetics around bio-cultural connection, the transdisciplinary input from non-instrumental disciplines such as the arts and the central role of the natural environment as a heterochrony in informing generative physical, virtual and social space of universities.” (Jones 2013, p. 148).

Chinn (2015) and Arnold et al. (2013) advocate that teachers should be taught in new ways that do not reemphasize current cultural norms but seek to develop more philosophical, real-world and local knowledges. Couldry (2012) believes the ignition of this counter-culture within neoliberal universities is important for encouraging critical debates and reimagining futures within larger society. This counter-culture is also necessary to disestablish current economic and political ontologies and epistemologies that suppress the voices that democracy was intended to acknowledge. As Gadotti (2008) states, “Each person is equally responsible for the Earth’s community as a whole, even if, individually, we have different roles and responsibilities” (p. 16).

Conclusion

This chapter highlighted the overarching themes significant to this thesis from the relevant literature. Namely that places, human-nature relationships and cultures are greatly affected by, and effect, worldviews. These worldviews are linked to individual workplace resource-use perspectives, important within TL processes. However, transformation should be examined with respect to ethical considerations such as those identified by Bowers (2005).

Opportunities for transformations towards more sustainable resource-use perspectives (and ecological worldviews) are greatly enhanced by learning conditions that include opportunities for engagement with places, participants, active participation, dialogue and

provisions for reflection and continued support. Transformation of individual and collective worldviews may influence the transformation of organisational culture, counter to current neoliberal trends, leading to more sustainable workplace resource-use perspectives.

Chapter 4 Methodology: Breaking the Habit

This thesis explores TL towards sustainable workplace resource-use perspectives with a case study at MQ. The thesis draws on a feminist methodological approach in its focus on places and cultures (Aim 3), EF and their concurrent dynamic integration within a transformational framework (Aims 1 and 2). The research involved online interviews of experts in TL, EF and business engagement external to MQ (Participants A) and the lived experiences of MQ staff who participated in an intensive EF Professional Development Workshop (Participants B). This approach utilised interviews, questionnaires, participant observation and reflexive techniques. In analysing the research data, feminist methodologies facilitated a targeted frame of analysis on lived experiences, power dynamics and social constructs.

Cresswell (2013) demands that feminist geography, both in theory and practice, breaks through current neoliberal barriers by challenging researchers to explore the “way we think about the geographical world and the ways in which we study it” (p.165). Haraway (1988) advocates for acknowledgment of the subjectivity of situated knowledges and the dimensions of power apparent in feminist research. This research responds to these challenges in two ways. Firstly, through the exploration of individual lived experiences and perspectives within physical and socially-constructed neoliberal workplace structures. Secondly, through applying TL methods which aim to let individual voices be heard and the careful examination of social, cultural and environmental assumptions upon which individual perspectives are based. Through this examination of epistemologies and ontologies, this thesis hopes to contribute to a break with current neoliberal perspectives and indeed, contribute to more equitable power dynamics and knowledge making processes (Whatmore 2002).

Feminists, such as Warren (1996), Tong (2009) and Gaard (1996; 2011) discuss the role of power relationships within feminist theory, linking the masculine-feminine connection with the geographic concept of the human/culture-nature dichotomy (see also Cresswell 2013). They explore these ideas further by suggesting the possibility that through bringing any dualism into closer proximity, the other responds in parallel. To build on this link between feminist theory and feminist geography, the methodology for this thesis also draws on new

ecofeminist approaches and their critique of current social systems and constructs and their ability to marginalise not just women and other sectors of society but also non-human agents within ecological systems (Alaimo & Hekman (Eds.) 2007; Gaard & Gruen 1993; Mack-Canty 2004; Seager 1993). New ecofeminists interrogate Western human-nature dichotomies by identifying dominant narratives and discourses (Gaard 2011). This thesis draws on these approaches to further understand how individuals within the workplace are affected by cultures, places and human-nature relationships, leading to unique perspectives of ecological systems and resource use. Although challenging within the small scope of this thesis: places, cultures, and human-nature relationships are dynamically interrelated, and examination of individual components would not be robust enough to adequately address the research question.

Research Design

As is common in feminist approaches, the research for this thesis was non-linear and iterative as it explored the complexity of experiences and perspectives in everyday work life (Naples 2007¹³). The research was designed to be flexible, adaptive, dynamic and fluid - as

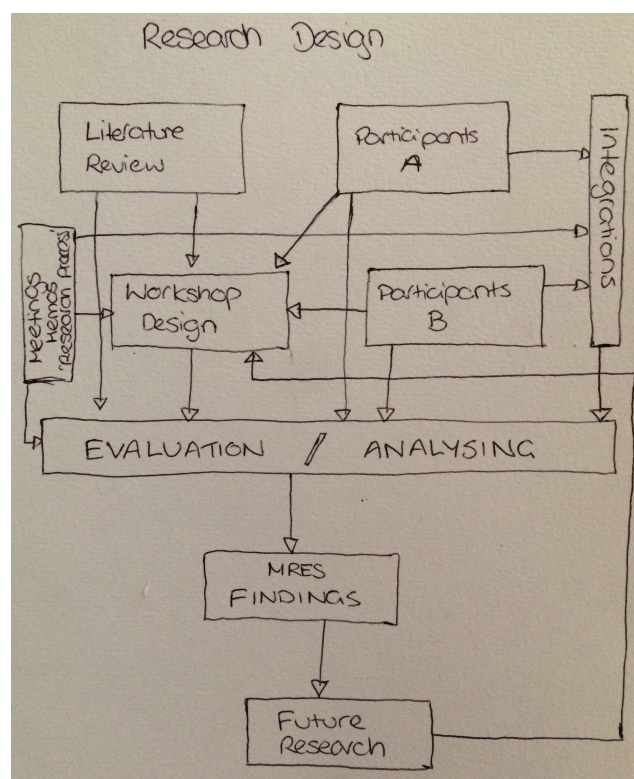


Figure 3: MRes Research Design - Iterative and Cyclical. (Participants A, Participants B, Research Process and Integrations discussed in more detail below).

¹³ see also Sipos, Battisti & Grimm 2008 in relation to TSL

information and experiences were received they helped in understanding, exploring, refining and transforming past and future research components (see Figure 3¹⁴). For instance, interviews with external participants contributed to understanding how this case study related to broader aspects of sustainability within neoliberal cultures.

MQ as a Case Study

As Corcoran, Walker & Wals (2004) note, universities have an important role to play in developing understandings and uptake of sustainability in adults. As such they are an excellent medium for researching pedagogies as a form of transforming adult perspectives. Corcoran, Walker & Wals (2004) also suggest case studies are “useful to look for contextual studies of practice that have transformative value both for local practice and practices elsewhere” (p. 9). Kenny and Grotelueschen (1980) suggest the case study is the best way to “develop a better understanding of the dynamics...[and] to convey a holistic and dynamically rich account of an educational program” (p.5). Therefore a case study within the university framework was deemed appropriate as it provided the depth and richness of research required to explore the thesis question and aims and pave the way for future research.

MQ was chosen as the case study due to the University’s sustainability initiatives and efforts to actualise a living laboratory as well as the ease of which contacts and logistics could be arranged, an important factor in a constrained 8 month research project. Although MQ incorporated EF into its campus-wide sustainability policy (MQ 2013), there is insufficient data detailing staff engagement or office uptake of the concept. A professional development workshop was considered the most appropriate method for obtaining data on the transformative potential of EF in the neoliberal workplace for two main reasons. Firstly, the logistical ability to recruit and deliver to available staff on campus within the timeframe. Secondly, the workshop environment allowed for qualitative techniques to examine the “depth, richness and uniqueness” (Corcoran, Walker & Wals 2004, p.16) of the lived experiences of participants. The professional development workshop was informed by and complemented with online expert interviews.

¹⁴ This figure has been included as hand-written, reflecting the personal, ‘giving of voice’ and creative elements of post ecofeminist and sustainability research, encouraged by several interview respondents (pA discussed below) and influenced by the work of Dr Kurt Grimm (2015; see drkurtgrimm.com).

Participants A (pA)

A review of literature and relevant current local and international projects (business engagement sustainability initiatives), highlighted individuals who appeared to be viewed by their peers to be experts in their fields: EF, TL and business engagement. These experts (all over the age of 18) from neoliberal, English-speaking countries were recruited via email and invited to answer online interview questions. Those who accepted the invitation were interviewed via email and their responses used to develop the workshop, analyse the workshop data and answer the research question and aims. In total, 9 individuals were invited to participate, 4 of whom completed email interviews. pA all wished to remain anonymous and are referred to via pseudonyms (Table 1).

Table 1: Participants A - Basic Information

Participant A (pA) Pseudonym	Field	Engagement	Country
Steve	Ecological Footprinting	Accounting	America
Kate	Sustainable Business	Sustainable Change Engagement/Consulting	Australia
Rita	Transformative Sustainability Learning and Place	Teaching and Research	America
Maria	Sustainability Learning	Teaching Individuals and Business	Canada

Participants B (pB)

MQ staff who participated in the research were classified as Participants B. Current MQ staff were invited to participate in the workshop via an invitation email (Appendix B) to the Sustainability Representative Network - a group of volunteers on campus who champion sustainability issues in their department/area - and also forwarded to other MQ employees whom network members thought might be interested. The initial invitation email was sent from the Sustainability Project Manager (Learning and Teaching), who then forwarded on any responses to the researcher. Respondents were offered three options for workshop

involvement - a four hour afternoon, a weekend session, or several 2 hour sessions over two weeks. The majority of respondents chose the four hour afternoon workshop. Those that could not attend the workshop were invited to still take part in the questionnaire and/or interview. There were no exclusions on the basis of any other criteria. Invitees were informed that they could accept or decline to participate in any part of the research, exit the workshop and withdraw from the research at any point without fear of personal or professional repercussions. pB were invited to complete pre- and post- workshop questionnaires, attend the workshop and participate in a post-workshop interview. 70 individuals were invited to participate in the workshop. 9 responded that they were interested, 2 attended the workshop and 7 were unable to attend the workshop due to time constraints or prior engagements. The 2 pB who attended the workshop did not complete the pre-workshop questionnaire but both completed the post-workshop questionnaire and attended a one-on-one post-workshop interview. pB were kept anonymous to allow them the freedom to participate in the research without any pressure (i.e. employees talking about workplace issues), and were allocated pseudonyms (Table 2). 2 other pB contributed to the research – although neither could attend the workshop, both completed pre-workshop questionnaires. 1 pB further received the workshop slides and then completed a one-to-one interview.

Table 2: Participants B - Basic Information

Participant B (pB) pseudonym	Role	Uni Area	Contributing Data
Jane	Academic	PACE	Participant observation, post-workshop questionnaire and Interview
David	Academic - Senior Lecturer	Business and Economics	Participant observation, post-workshop questionnaire and Interview
Jessica	Advisor	Student Support	Pre-workshop Questionnaire and Interview
Jack	Academic - Tutor	Business and Economics	Pre-workshop Questionnaire

Workshop Design

The workshop was designed as an opportunity to engage MQ staff with simple EF content whilst utilising varying methods of TL to explore resource-use perspectives. 5 modules, each

designed to engage individuals at varying scales with ecological systems and EF, were: 1. Getting in Touch - The Individual; 2. Individual Ecological Footprint; 3. Organisation/Office Ecological Footprint; 4. Ecological Footprint Stakeholder Dialogue; and 5. The Bigger Picture (see Appendix C). EF was chosen as the content and contextual focus of the workshop for its flexibility, relate-ability, measurability and scalability. It was hoped that in exploring EF through TL, current resource-use perspectives would be challenged. Although using the EF tool may seem counterproductive, in that it measures exploitation of ecological systems, it provides a conceptual avenue that highlights the connections that humans and cultures have on both non-human and human elements of ecological systems. As noted by Rita, Maria and Kate (online interviews) - although change in behaviour can be brought about by other means (i.e. regulations/systems/policies), change in perspective requires first understanding these connections. Individuals can then question assumptions and assess how their perceptions are engaged in their lived workplace experiences, potentially enhancing connections within ecological systems. Engaging in real-world, resource-use issues with EF, was seen as the most appropriate way to explore EF and sustainability perspectives on the neoliberal campus¹⁵ (Davis & O’Gorman 2013).

During the workshop, action research - “the process of reflection and action...a means for members of...any community, to improve their own practice, to help them acquire knowledge and personal empowerment, and to adjust organizational policies and institutional arrangements to make improvements” (Corcoran, Walker & Wals 2004 p.15), was encouraged. Workshop participants were asked to reflect on their own resource use/sustainability perspectives and practices and how these might relate to organisational policies and operations. On several occasions, they were also invited to enter into discussions on how their perspectives and practices might change moving forward, personally and professionally, within the systems currently operating at MQ.

Applying TL Teaching Methods

TL leading to sustainability learning outcomes has been enacted through a variety of teaching methods. Studies discuss the use of activities such as community gardening, preparing food for community members, experimental field work and group reflection

¹⁵ see Nelson & Coleman 2012 for similar success using EF to engage adults with sustainability

(Sipos, Battisti & Grimm 2008; Illeris 2015). Emergent directions in TL explore the use of creative arts and new forms of expression as well as informal learning such as role-play and sharing narratives (Reader 2011; Bull 2013; Chen & Martin 2015). While including all of these activities would have been ideal for this type of exploration, the budget, scope, time and participants available for this research was insufficient for such a workshop to be delivered. However, TL methods highlighted by the literature as effective in sustainability learning appropriate within research parameters were incorporated into the workshop content and context. Explanation of, and justification for, the specific methods utilised in this pilot workshop are outlined below.

Place-Based Learning (PBL)

As mentioned, PBL is a prominent method utilised in sustainability education (Sipos, Battisti & Grimm 2008). The linking of place to worldview through PBL was an integral part of workshop delivery and involved participants learning within the workplace context and surrounding geophysical areas within MQ campus. Module 3 included a walk around a section of the campus that comprised of built up areas, offices, paved and eating areas, trees, grass, roads, native plants and landscaped gardens (Figure 4). Participants were asked

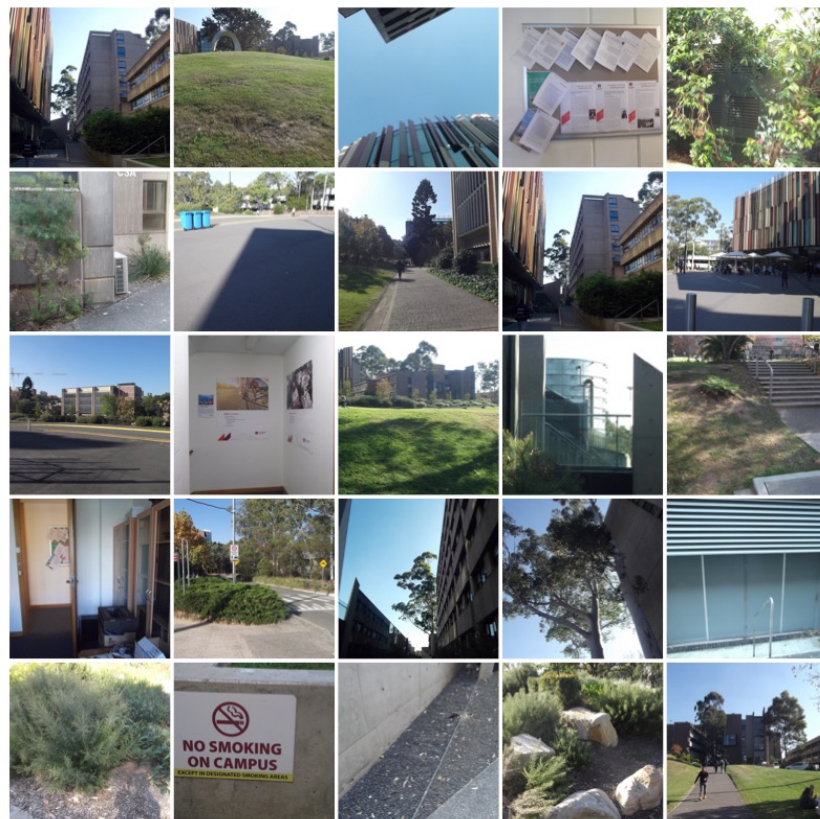


Figure 4: Workplace walk imagery

to engage in discussion and thought about their connections within place and understanding of EF in relation to their workplace.

Narratives

Narratives are a burgeoning methodology, particularly when intergenerational and cross-cultural communication surrounding ecological systems is of paramount importance to learning and collaborative outcomes (Chinn 2015; Kendall & Kendall 2012; Wright et al. 2012; McKenzie and Bieler 2016). McKenzie and Bieler (2016) suggest that narration is important as “[w]e collectively engage with structures of feeling through a range of forms of narration...also in the stories we informally share and repeat together” (p. 29) and that this is important for exploring “relationships to the expression of norms in popular narratives, and these relationships are central to the ways in which structures of feeling are maintained or shifted” (p. 29). An example of which can be found in Bull (2013), whose research in Western Kenya, highlighted the importance of ‘storytelling’ in overcoming preconceived cultural concepts relating to resource use. Winchester and Rofe (2010) also advocate the expansion of geography by giving voice to the voiceless, whereby all individuals are included and given the chance to be heard. In the workshop, participants were encouraged to share and reflect on narratives during Module 1 (personal story) and Module 5 (their imagined future office). There was also scope for informal sharing of individual narratives during every module.

Stakeholder Dialogue

The support and exploration of stakeholder dialogue across the plethora of environmental issues is well-established and this can be mirrored in pedagogies dedicated to transformation towards collaborative, sustainable resource-use perspectives (Chen & Martin 2015). This is because stakeholder dialogue can result in participants understanding a diverse set of resource-use perspectives if limitations (such as power differences and equal representation) are mitigated (Halpin 2008; Holley 2011). Indeed, Furtak et al. (2012) found that activities involving procedural, societal and epistemic domains requiring collaboration, analysis and communication had a high positive impact on student learning. Pickerill’s (2008) study of Indigenous and non-Indigenous negotiations around place and environment also found that opportunities for dialogue and changing working practices encouraged

acknowledgment of commonalities across differences and the creation of shared values. Accordingly, a mock stakeholder dialogue in Module 4 focused on discussing university resource-use strategies.

Qualitative Data Collection

When researching a case study, widely accepted qualitative techniques include interviews, participant observation, focus groups and open-ended survey questions (Robbins 2010). These were al

I incorporated into the research design, except for focus groups, due to the small number of participants. Human Ethics approval was given by the MQ Human Research Ethics Committee prior to the commencement of data collection (for information and consent forms see Appendix E). No ethical issues arose during the research.

Expert Interviews

Questions were tailored to each interviewee. Material covered included both personal and professional thoughts and experiences of the concepts of EF, TL, TSL and workplace/employee engagement. In particular, discussions entered around EF and/or TL and the role of place and culture in change in resource-use perspectives.

Pre- and post-workshop questionnaires

A pre-workshop questionnaire (Appendix D) was emailed to pB with a request to return to the researcher prior to commencement of the workshop. This questionnaire identified demographic characteristics of participants such as age, gender, employment, education, motivation for workshop interest. This was combined with 6 questions focussed on more general personal connections to ecological systems and 6 questions focussed on workplace perspectives of resource use. Questions were modelled from sense of place and connection to nature concepts from Reid, Teamey and Dillon (2002), Ardoin (2012; 2014), Shultz (2001; 2002) and Shultz et al. (2012). These answers were then used to explore participant's ecological systems values, connection to place, understanding of sustainability and EF and resource-use/consumption perspectives. As Secor (2010) cautions that asking respondents their level of agreement or disagreement tends to result in preference towards the

agreeable responses, scaled (1-10) responses were requested¹⁶. Other questions asked for simple word responses or a choice of yes, no, not sure. Several responses asked for further clarification. Jessica and Jack returned the questionnaire but could not attend the workshop. Jane and David, who attended the workshop, did not complete the pre-workshop questionnaire (see Table 2).

A post-workshop questionnaire was emailed to Jane and David the morning after the workshop. The questionnaire contained all the questions from the pre-workshop questionnaire with the addition of reflective questions (Appendix D). These reflective questions encouraged participants to evaluate and understand their experience, particularly in reference to any changes in perspectives that may have occurred due to their involvement in the workshop. This was used to evaluate engagement with the content and context of the workshop and was designed to make it possible to explore possible transformation in perspective(s)¹⁷. Both Jane and David completed this questionnaire. Questionnaires were used in conjunction with interviews.

Post-workshop Interviews

Secor (2010) states that interviews are an appropriate method of qualitative research when the goal is to “answer questions about the ways in which certain events, practices or knowledges are constructed or enacted within particular contexts” (p. 199). Interviews are therefore especially relevant to the study of TL in a neoliberal university workplace context. To allow time for participant reflection, interviews with willing participants commenced at least one week after the course. Jane and David attended post-workshop interviews (see Table 2). Merriam (1998) suggests that the ability of the researcher to be intuitive while collecting data would allow them to “change direction in search of meaning” (p. 20-21). Interviews were therefore quasi-structured making them flexible enough to engage participants in detailed responses. Interviews focused on: engagement during the course,

¹⁶ Where scaled questionnaire responses are discussed in this thesis, numerical values are given in brackets. Two 1-10 scales were used. When asking how someone felt, 1 = not at all and 10 = absolutely. When asking about the occurrence of something, 1 = never and 10 = every time.

¹⁷ As the workshop attendees David and Jane did not complete the pre-workshop questionnaire they were sent, I was unable to determine the extent to which perspectives transformed (or not). However, I was able to analyse their self-reflective answers in their post-workshop questionnaire and follow up with them re transformation in their interviews (held 2-3 weeks after the workshop). This is discussed further in Chapter 5 under the heading: EF TL Opportunities)

exploration of more detailed descriptions of questionnaire answers, and overall experiences within ecological systems and the workplace. I consciously aimed at being a good communicator and being able to empathise with participants to encourage responses. Secor (2010) suggests interviews create a setting whereby participants can make critical self-reflections and express more in-depth thoughts and feelings, which, in comparison to the workshop, was the case. Jessica was not able to attend the workshop, but completed the pre-workshop questionnaire, was sent the workshop slides and then interviewed, during which aspects of the workshop (i.e. EF, sense of workplace and cultural influences), personal motivations and transformation were explored.

Participant Observation

Winchester and Rofo (2010) suggest that participant observation, through immersion in certain environments, is a research method that can aid in recognition and further understanding of how individuals experience a particular event or place. As I was facilitating the workshop, a research assistant was employed to take participant observations during the workshop. This enhanced the depth of data collected, as quality of detail was increased, and also helped to overcome some of the researcher bias by including another perspective.

Analysing Data

Data collected from pA and pB was analysed and three distinct yet interrelated categories emerged: 1. The Potential for EF as a Tool within TL, 2. Culture and 3. Place (Chapters 5-7). These emerged through the following process: findings from expert online interviews were incorporated into the workshop, both through the activities carried out and the way in which dialogue was approached by the facilitator (the researcher) to facilitate active participation - allowing for participants to share their 'voice' and feel like they had power through acknowledging their personal agency (Boehnert, 2010). pA interview responses were analysed then applied to the workshop design and content. pA data was also coded after the workshop using Eclectic coding - a combination of first-cycle coding methods useful for beginner qualitative researchers and when exploring a variety of elements (Saldaña 2013). For example: Worldview - values, - ideas, - environments, and Bigger Picture - coalesce shifts, - movements, - dialogues. This was then re-visited after pA had been coded to explore recurring themes. pB data was then first-cycle coded using Affective (examining

subjective aspects from participants such as Transformation - longevity, - outcomes, - inhibitors, - reflections) and Elemental (basic, focused filtering) methods, while also looking for broader narrative (understanding participants experiences through narratives) codes that may have become apparent (Saldaña 2013). Narrative codes for place were extensive. An example of which was Place Engagement - love nature through previous experience in natural places, - writing reflections in places, - meanings of places, - challenges faced in places, - imagining natural places, - technology-mediated experiences of nature - activities in places. In this way, it was possible for 'reduction, or abstracting' (p. 284) themes and useful content 'along the lines of similarity or relationship' (p. 284) from the large and varied amount of data (Hay 2010). Second-cycle coding involved Pattern coding into major themes, relationships, processes and constructs (Saldaña 2013). A self-reflection journal, researcher photos and other data obtained during the research process, was analysed after pA and pB data was coded, using Eclectic coding and then Pattern coding matching the pB codes (Kitchin & Tate 2000).

Reflections - Limitations, Biases and Positionality

A key limitation of this study was the small number of participants (pA = 4 and pB = 4). Due to the small participant number, non-random source of recruitment and availability of participants, findings present a slice of the whole and are not representative. Although names were changed to keep participants anonymous, the small size of participants infers the ethical issue of anonymity, as participants could identify other participants through reading about personal experiences shared during this research. This was unavoidable due to the small number of participants who attended the workshop. In respect to anonymity within the wider MQ community, I endeavoured to keep experiences quite general and/or include experiences that have likely been shared by others within such a large organisation to ensure individuals could not be identified.

Merriam (1998) suggests good interviewing is only established through practice and my interviewing experience was previously limited to a human resource capacity. My inexperience in the interview process resulted in some data collection that was not as relevant or as large in quantity. Qualitative studies are also subject to the biases and perceptions of both researcher and participants (LeCompte & Prieissle 1993) and therefore

geographers are increasingly considering how methodologies can successfully explore connections of people participating within place (Kinden, Pain & Kesby 2007). I kept a reflection journal and analytical notes in order to be critically reflexive (Dowling 2010), drawing on these as data sources for analysis.

I grew up in Sydney, attended Christian private schools and several Sydney universities, gaining a double undergraduate degree in biotechnology and business and a masters in environmental law. This has given me an undeniably Western worldview due to my upbringing, education and professional career in neoliberal organisations. Science, business and law are also traditionally focused on positivist, essentialist 'truths'. Therefore, my initial approach with this research was quite positivist. I believed that in educating adults in 'scientific truths' of environment and biological systems, they would understand and change their perspectives on the ecological dilemma facing our society. This research challenged the assumptions on which my original perspectives were built realigning my worldview to new ecofeminist viewpoint: each individual has their own, constantly changing, perception of the world. Learning is about knowledge, skills and personal experiences and questioning prior knowledge and assumptions that are based on the structures present within personal, social and wider environments. I also developed an interest in the agency of place, more-than-human and Indigenous ideas, thoughts, cultures and ways of being/knowing/becoming¹⁸. Although these interests could not be adequately explored in this short research project, they affected my research, particularly the lens through which I analysed and interpreted data.

¹⁸ see also Bawaka Country et al. (2013); Lloyd et al. (2012) and Whatmore (2002).

Exploring the Empirical

Chapters 5-7 integrate the empirical findings with relevant discussions from the literature to address the thesis question and aims. The key finding is that a holistic idea of transformation within the neoliberal workplace is necessary when exploring resource-use perspectives. This finding is discussed under the three broad themes that emerged through data analysis:

Chapter 5: The Potential for EF

Chapter 6: Culture

Chapter 7: Place.

These themes are explored within the context of power dynamics, lived experiences, giving individuals a voice and social constructs. As one of the respondents coloured the text of their emailed interview responses, I felt that I would be neutralising their 'voice' by removing the colour they had chosen to give their narrative. Therefore, to highlight the individualised responses of participants and to enable the reader to get a sense of the participant's particular 'narrative', all direct quotes are colour-coded (Table 3¹⁹).

Table 3: Participant quotation colours

Participant A (pA) Pseudonym	Participant B (pB) Pseudonym
Steve	Jane
Kate	David
Rita	Jessica
Maria	Jack

¹⁹ See also Table 1: pA Basic Information and Table 2 : pB Basic Information

Chapter 5: Exploring the Empirical - The Potential for EF

This chapter focuses on the potential for EF to be a TL tool which stimulates sustainable neoliberal workplace resource-use perspectives. This examination is achieved by analysing the professional and personal insights of pA, and the lived experiences of pB, with the relevant literature. In particular, the role of narratives in creating and sharing messages of sustainable resource use and reimagining sustainable futures through scenario building is considered. This chapter also explores factors that may pose challenges in using EF as a TL tool, including the ability to gather, calculate and disseminate EF data and the current cultural paradigms that may inhibit robust understandings and use of EF. Finally, the need is conveyed for on-going cultural, leadership, resource and systems support for longitudinal transformations.

EF Enhancing Sense of Self within Ecological Systems, Culture and Workplace

All pA, in their personal and professional capacity, discussed the importance of increasing an awareness of self within cultural-ecological systems for establishing sustainable values and perspectives. As an experienced adult sustainability educator Maria stated “If we have a connection with nature (environmental responsibility) and people in other cultures (social responsibility) then we will care about saving those things.” Rita, a geography academic, suggested that individually and culturally “We lack a basic understanding of the natural systems we rely on, much less the negative impacts of our choices”. Steve stated that through his own experience with EF: “I have learned a great deal about the interconnectivity of global systems...both ecological and societal”. pB: Jess, David and Jane also indicated that EF provided insight into how individuals understood human-nature connections. This was well articulated in their questionnaires. When asked to describe the term ‘ecological footprint’, Jess responded “The measure of how resource-demanding your lifestyle is on the planet”, David responded “the amount of productive land it takes to produce the ecological services consumed over a particular period” and Jane responded “the extent to which an individual interacts with its environments and the amount of impact that one creates in terms of using resources”.

Each pA also agreed on the potential for EF to increase this awareness at organisational levels through its capacity to provide evidence of the interconnectivity of human-nature-culture at interrelated scales. In the workshop and interviews, pB advocated that EF had the ability to connect MQ's consumption to its use of ecological resources and services. In their interviews, David and Jane also encouraged using EF to engage employees in real-world workplace resource-use issues. Steve noted organisations use EF as they find it to be relevant, robust and simple in reflecting their resource use. Indeed, David talked of the robustness of EF and its ability to “make a difference” (workshop). pA also discussed how EF created a sense of place (discussed in Chapter 7): EF had the ability to enhance sense of place through facilitating understanding local area productivity, EF attributed a value system in respect to ecological resources, EF could be used in scenario building (i.e. sense of future place) and EF allowed reporting and reflection on resource-use practices and initiatives within places.

EF TL Opportunities

All pA were particularly supportive of any tool or activity that evidenced the reliance of humans on ecological and social systems, allowing opportunities for experiencing new ways of knowing and being, and perhaps transforming perspectives (and behaviours) towards sustainability. Maria advocated “We need to enable people with a bunch of different tools. Let them use some, measure their success and then help them get to the next level”. When asked if EF could be a successful tool in facilitating change in resource-use perspectives, Kate commented “Yes. It directly reflects the impact that each person or action has which makes it easy to measure.”. The research findings hint at the potential for the lived experiences of calculating and engaging with EF to initiate reflection on assumptions of resource use (i.e. perceptions of supply/demand and ecological system values) and develop new points of view and habits of mind - counter to current neoliberal cultures (in response to Aim 1). This is also supported by Kellert's (2005) theory on 'biophilia' that highlights the lived experiences of an individual, within a process involving learning within place and culture, as being a determinant of the values they place on nature. Boehnert (2010) describes this as the necessity to unlearn damaging values, aspirations and resulting behaviour patterns within complex social processes so that new epistemologies and ontologies can be established leading to sustainability.

During the workshop, David and Jane agreed that individual/department access to organisational (and component parts thereof) EF could be useful in designing and implementing new policies and strategies, increasing accountability and transparency, integrating EF into teaching, learning and workplace decision-making and in on-going reporting/measuring and evaluation. Jess supported these views during her interview, and further stated that if utilised in informed ways, EF could provide both rational, external motivators whereby employees see the monetary/efficiency value of initiatives and more-than-rational, internal responses - *"feel good about doing something"*. As predicted by the literature (Matthews 1999; Hummon 1992; Booth 2015), Maria cautioned that when emphasising understanding of ecological systems (through rational/systems approach such as EF), consideration should also be given to the emotional side of TL regarding sustainable resource use: *"the biggest challenge is creating awareness about the ecological and social challenges we face, without creating a huge weight of guilt about not getting it all correct"*.

As David and Jane (pB) did not complete both pre and post workshop questionnaires, it is difficult to present findings on the ability of an EF workshop to transform neoliberal workplace resource-use perspectives. Indeed, as discussed below, David and Jane both indicated that they had significant knowledge of the concept of EF before attending the workshop, although this knowledge was not specifically linked to MQ EF. As the literature predicts, TL requires clear pedagogical entry points, such as doubt or disillusionment of current perspectives and although David and Jane both appeared to exhibit some disillusionment with the current neoliberal paradigm (i.e. they expressed desire for new, ecological pedagogies, initiatives and workplaces), they did not confirm any significant change in perspectives when asked in their post-workshop questionnaire or interview (Taylor 2007)(in response to Aim 2). However, in exploring EF as an engaging TL tool, Jane commented that it was a *"good opportunity to share perspectives and be challenged in my thinking"* (questionnaire) and David that *"there were some interesting discussions"* (questionnaire). For David, the EF calculator was the most engaging workshop activity.

Rita, Maria and Kate agree that through providing several engaging formats in relation to EF, EF workshops have the potential to facilitate TL in neoliberal workplaces (linking Aim 1 and Aim 2). Furthermore, the literature supports this research finding - advocating using EF

for a transitional process because it “gives a clear, unambiguous message often in an easily digested form” (Moffat, 2000, p.359). David also discussed the flexibility of EF in engaging varied perspectives within MQ, giving the example of using the numbers from EF reporting to engage members of the Business and Economics faculty. Interestingly, David thought that in a “rational society” (interview), the EF results should be understood by most people. David also believed that EF could be used to strategise how transformed perspectives could be enacted by individuals or groups by examining resource-use “trade-offs” (David, workshop). For example, after understanding organisational resource-use connections within ecological systems, EF could provide a tool to prioritise resource-use changes based on contributing factors such as cost-benefit, will power, achievability, values etc. This is an interesting concept, whereby understanding the resource-use connections and concepts involved in EF (rather than arbitrary numbers), can facilitate dialogue and the creation of shared values through common understandings and common goals, yet also the ability to explore different ways to achieve these goals based on different values and perspectives.

Narratives and Scenario Building with EF

The connection between human resource use and ecological systems across scales was seen by pA as the critical message that EF can deliver as part of a larger movement coalescing shifts towards sustainability. Steve indicated EF was successful at the national and global scale as part of a political message and advocated its use “in discussing a global need for resource conservation and smart growth” as EF results are “an excellent way to support a broader message of resource over-use”. For individuals, Kate stated “giving them [adults] clear data about their ecological footprint is an important step to start change”. David and Jane also discussed the versatility of EF: to understand resource-use connections at various scales, yet also to link diets to EF and practical resource use on campus:

The Footprint would identify it, if it was looking at it more holistically...

It's only one piece of the puzzle and unfortunately it's all interconnected and you've got to give people an understanding of how those connections work, that takes a while actually, for people to come to that realisation”

Identifying organisational priorities is of course a useful thing to do, I'm not saying an analysis of the EF at the university level isn't useful, I think that there's a difference between...a general footprint message versus a message which is more important for the people who are dealing with, you know, cleaning and waste services...How often should offices be cleaned, well, that's helpful to know the amount of impact it is.

- David and Jane, workshop

The engagement of individuals within organisational EF assessment and scenario building is a critical element within TL - as Maria reiterates “We learn from doing; we understand our underlying perspectives only by realizing we operate within a constructed reality.” Narratives can be useful in exploring these realities through spreading resource-use messages that encourage TL by enhancing understanding of the connections between current and future resource use and ecological systems. Indeed, these findings indicate that EF can provide a narrative that can be useful in scenario building (creating a future narrative), for varying time frames at different scales. Findings from pA and pB strongly highlighted narratives as important in spreading resource-use messages, learning and scenario building towards transformation of workplace resources-use perspectives. Maria stated “learning for me is always about getting people to talk about their experiences, their learning and what they will do next.” and Rita commented “Stories allow for alternative endings”.

Expanding on emerging EF literature, EF was found to be useful to snapshot future scenarios (Senbel, McDaniels, & Dowlatabadi 2003; GFN 2016d). It was suggested that modelling future EF scenarios could be beneficial in many ways: operational, cost/benefit analysis, to create narratives of over-consumption, explore how demand decisions connect to ecological systems and enhance shared values and meanings associated with resources uses (see above dialogue). By providing a snapshot of the future that includes sustainable resource-use strategies, individual and organisational pathways to sustainability can be made clearer, including how attainable they are in reality, even when they are counter to current cultures (Moore & Rees 2013). Utilising EF to contribute to sustainability initiatives and prioritisation through scenario building has also been successfully exhibited in emerging research at the national scale in the UAE, through the development of lower footprint scenarios that can further be supported by policies (Laila et al. 2010). Furthermore, Senbel, McDaniels, & Dowlatabadi (2003) used EF calculations to model different scenarios for North America over the 21st Century and found that the only scenarios providing no net deficit of ecological resources were those in which simplicity lifestyles were enacted by all individuals, reducing per capita consumption. Although it is often stated that technological innovation and production efficiencies will help balance the resources we require for production and waste absorption (Gendron 2014), Senbel, McDaniels & Dowlatabadi's (2003) findings challenged this perspective. In modelling scenarios of this nature, they found these innovation and efficiency-dependent scenarios resulted in North Americans still living

beyond the means of their region to support their current lifestyles. This is highly relevant as it illuminates how EF scenarios can instigate doubt and/or disillusionment with the validity of current neoliberal technological/innovative-based 'solutions'.

As a component linking directly to the exploration of Aim 1, I argue that future EF narratives can engender hope towards a reimagined future and that has the potential to overcome the fear (or guilt) that can lead to paralysis of action. This was found to be extremely relevant when establishing new perspectives on workplace resource-use through TL processes. This is supported by TL, TSL and EF literature that urges the way forward from within the current cultural climate is to 'redefine', 'imagine', 'envision' and 'dream' new realities in order that humanity can shift towards sustainable pedagogies and cultures (O'Sullivan 1999a; Sterling 2008; Gray 2010; Grimm 2015). Rita agreed, reflecting on the motivations influencing employee perspectives on their ability to act on their resource-use values and beliefs in the workplace, she asserts "Your Ecological Footprint Training would be perfect for this latter motivation. Having people understand their personal (and organizational footprint) would go a long way to establishing an internal motivation to adopt new practices.". Jess conveys this concept in her previous experience with carbon footprinting, whereby she engaged in tasks that reduced her carbon footprint (part of EF) when she was presented with ways in which she could adapt her behaviours that would reduce her carbon emissions. Overall, the literature and thesis findings point to the potential for EF within TL as a scenario building tool.

Control and Power

Although this case study had few participants, and while not directly aligned with answering the aims of this thesis, it is interesting that the findings hint at power dynamics that currently control access to information, decision-making capabilities, opportunities to collaborate and the make-up of resources devoted to the future sustainability of resource use within MQ. As discussed significantly by David and Jane, and briefly by Steve, Rita, Maria and Jess, giving individuals access to EF potentially displaces hierarchical power dynamics of control over information relevant to resource use within organisations. Maria strongly advocates employees taking control through using EF as a tool to embed sustainability in the workplace. This increases employees' ability to assess their lived experiences, allowing them

to use the data to facilitate new resources-use perspectives, and to assert their voice, such as through new initiatives. pB perceptions of a lack of resource-use control in the workplace is alluded to in the questionnaire data. This is expressed in the relatively low values (on a scale of 1-10) given by pB to the questions referring to opportunities for resource-use decision-making and resources-use solutions to be implemented in their workplace²⁰ (see Table 4).

Table 4: pB Questionnaire responses for workplace questions surrounding opportunities and support in the workplace for resource use decisions and solutions.

Questions (1, not at all - 10, absolutely, scale answers)	Jane	David	Jessica	Jack
Workplace Questions				
Do you feel that you have opportunities in the workplace to make resource decisions?	5	3	7	6
How supported are you in the workplace to implement resource management solutions?	6	3	5	5

David and Jane discuss their frustration at the lack of access to EF (and other resource-use) information and lack of pressure to, and perception that they could, successfully implement resource-use initiatives. Indeed, David and Jane stated their desire to have access to more EF data, the MQ EF calculator and information on the University's One Planet 2030 goal for both personal and professional (pedagogy inclusion and department initiatives) applications. Holley (2011), in discussing environmental governance mechanisms, explains that power influences who can participate in dialogue surrounding resource use²¹. Through engaging in EF dialogue, greater expertise can be achieved, dislodging traditional power dynamics. Expertise in this sense refers to the knowledge and experience gained from engaging with EF and understandings of diverse perspectives, improving the skills necessary for critical self-reflection. For instance, David discusses that by combining EF within a TL process, enhanced expertise may allow for greater opportunities to participate in resource-use decision-making, thereby reducing power inequalities. However, this is a complex process, as Taylor (2007) cautions “transformative learning does not adequately account for

²⁰ Jessica's higher value for 'opportunities to make resource-use decisions' may be influenced by her experience of having managers who have ecological worldviews (discussed in Chapter 6: Culture - Leadership).

²¹ See also Brisboisa & de Loëa (2015) for a greater analysis of power in water governance. They also discuss how understanding power dynamics can aid in collaborations.

the enormous interpersonal and socio-cultural challenges associated with confronting the effects of power” (p. 395) (challenges explored in Chapter 6 and 7).

Issues Posing a Challenge for Maximising EF Potential

Research findings highlight challenges to using EF in the TL workplace process successfully (linking Aim 1 and Aim 2). As David mentioned in his interview, issues that should be considered in using EF within the workplace are the realities involved in any initiative that is entered into the calculation, for instance, the timeframe, costs, support structures, availability and accuracy of data, the ultimate decision-makers, other options available and how the initiative might be successfully framed to employees. Other issues included: the ability to undertake the necessary calculations needed to scale EF to smaller (e.g. organisational or departmental) levels; the consistency of on-going support that is fundamental to long-term change (at all scales); and barriers, such as systems and culture, that might inhibit actual usage of EF despite initial and/or on-going support. David, Jane and Jess also stated that although EF may enhance understanding of current, and options for future initiatives to reduce, resource use; certain systems and cultural elements could inhibit not only transformations to more ecological worldviews but also the ability of individuals and organisations to act on sustainable resource-use perspectives (examined in Chapter 6). An example highlighted in this research are the planning systems and cultural lifestyle values that inhibit thinking about and practising sustainable transportation. They also acknowledged therefore, that EF by itself was not necessarily a determinant of long-term perspective transformation, yet was certainly beneficial within the TL process²². Jess, David and Jane also stressed that EF wasn't completely holistic in regards to sustainability learning due to its limitations in examining externalities, capturing different 'values' (not just money/productivity outputs) and taking into account other species and biodiversity. Moore (2005) also argues that resource-use mechanisms must be inclusive of all 'voices', including

²² Although not directly related to perspectives, it should be noted that Kate reflected on her experience with engaging businesses in sustainability initiatives:

“I actually don't think it's critical that people understand everything about ecological systems to influence change. Some people will change because they care (they're the ones who understand) and some people will change because they have to, either following the norm or a trend, or if they are forced to with legislations and rules (and that's the majority of people).”

This is an interesting point - and while it cannot be adequately examined within the parameters of this thesis, as I am only examining perspectives, it does indicate two areas for future research. Firstly, the importance of the knowledge-value-action nexus, how EF knowledge may or may not lead to stronger ecological systems values or be enacted, and how actions may or may not influence knowledge or values. Secondly, exploring how sustainability initiatives engage with diverse epistemologies, values and behaviours.

those of 'nature' and future generations. Indeed, Gendron (2014) and Moore and Rees (2013) argue that there are significant challenges in integrating the social and cultural domains with ecological and economic paradigms within the neoliberal context.

Conclusion

In responding to the research question, these findings highlight that EF has significant potential to be a tool that can be utilised as part of a long-term transformation towards sustainable resource-use perspectives, at the individual, organisational and societal levels. In particular, it can be a catalyst for recognising connections within ecological systems and it can provide a format for challenging resource-use assumptions and creating new constructed realities.

Chapter 6 Culture

This chapter explores in more depth the strong influential element of cultural life experiences on resource-use perspectives (Aim 3). pA and pB acknowledged these cultural experiences played a major role in their understandings and practices of EF. These influences included socially-constructed values attributed to, meanings of, and connections within, ecological systems which were reflected in their resource-use perspectives. pB also discussed lived experiences and resulting perspectives from personal standpoints within cultural and ecological parameters. This chapter therefore explores the cultural lived experiences of individuals as they engaged at various scales with EF, including 'gradual shifts' and/or 'epochal' moments, that contributed to the broader individual and organisational TL processes. In this discussion, the neoliberal culture in which the university operates, in combination with organisational culture and sub-cultures, was found to place limitations on an individual's perception of how they could enact ecological worldviews when making resource-use decisions. The importance of leadership and on-going support through shifts in individual and organisational cultures were also emphasised by both pA and pB, and the relevant literature.

Perspectives - A Component of Worldviews

Maria and Rita felt that perspectives, as part of worldviews that form the medium through which individuals engage with their socio-cultural and biophysical environments, should be further explored for their role in the learning process. Indeed, this thesis shows that neoliberal resource-use perspectives are heavily influenced by the values and meanings of ecological systems communicated through knowledges and experiences of individuals and groups. These findings are supported by the literature which argues that the understandings and values of place, culture and human-nature relationships are socially-constructed (i.e based on previous and dynamic human-placed values and meanings) (Stubbs & Cocklin 2008). For instance, pB all highlighted the role of lived experiences in establishing their current perspectives, especially in relation to ecological systems. Jack recognised the influence his Latin American upbringing had on his relationship to the 'natural' environment, stating "[the way I was raised. As a child, I was always taught to respect our environment](#)", this learned 'respect' appeared to be reflected in the questionnaire value he attributed to ecological systems (9). During her interview, Jess reflected that her relationship with

ecological systems was greatly influenced by childhood experiences in 'natural' settings. She described ecological systems as "different levels of the natural environment - flora and fauna, the air, the earth, water etc" (questionnaire), and places a high value on ecological systems (10), which she says has been life-long. She also discusses her latent ecological systems values being re-ignited through the activity of planting trees at MQ and enhanced through her interactions with individuals who have, and represented, strong ecological worldviews and exhibit strong sustainability behaviours. Jane understood ecological systems to be the "inter-connections and interactions with all aspects of our many environments." and reflected on the link between her experiences and sense of ecological-self:

"I have always had an affinity with natural systems believing that we should live as simply as possible. I spent many years either living without electricity or on solar power, growing my own food, recycling and re-using wherever possible. I like to view the interaction and interconnectedness of systems and to reflect on how my input affects these systems and sub-systems."

- Jane, questionnaire

David defined ecological systems as "systems that sustain life on Earth". In his interview, David clarifies that as an individual he cannot be outside ecological systems as humans operate within ecological systems. He further discusses his worldview has been dynamically adapted as he discovers new ideas, knowledge and experiences with ecological systems through evaluating information in relation to the evolving assumptions on which his worldview are established. David attributes, in part, his ethical decision to become vegetarian on realising the large impact eating meat has on ecological systems. Each pB also stated they felt ecological systems were valuable to them, defined as important, having a positive effect and having extrinsic and intrinsic qualities, with Jess noting one value of ecological systems was for her 'own enjoyment' (questionnaire). As Stedman (2002) and Pereira and Forster (2015) suggest, the higher the valued attributes of a setting, the more likely an individual is to want to protect/conservate it. In response to Aim 3, these findings indicate connections within, and values attributed to, ecological systems have emerged through interactions between individuals, cultures and biophysical settings, leading to and reflecting nuanced and dynamic worldviews²³.

²³ Cameron (2014) discusses this as "admit[ting] a degree of epistemic anthropocentrism" in acknowledging that the values we attribute to things are mediating by our sense of the world; based upon our own unique experiences.

Transforming Sense of Self within Culture

Worldviews then, as the lens through which individuals see, interpret and analyse the world, are important in exploring transforming resource-use perspectives. Indeed, Maria supported this notion, stating, “If worldviews are ‘how we see the world’, then different information, beliefs, values, can change our worldview”. Rita, Kate, David, Jane and Jess discussed the benefit of shifting current neoliberal worldviews through single or multiple disruptions. Kate and Jane asserted that often “planting a seed” starts the process of shifting perspectives, as individuals relate their own acquisition of knowledge and experiences to a certain piece of information acquired previously, the ‘seed’. While this information may not initially cause a change in values or perspective, through gradual shifts and reflection, it can become a precursor to change - a change more likely to be permanent if the individual feels like it aligns with their core values (Kate, interview; Jane, workshop). During his interview, David indicated that the main source of his gradual shifts came from personal learning and professional reflection on environmental paradigms, leading to changes in his ‘habits of mind’ (see Costa & Kallick (Eds.) 2009; Hall 2014). Jane said her participation in sharing narratives in this project challenged her own perspectives, stating ‘sharing thoughts’ and ‘sharing stories’ (interview) allowed for greater reflection: “It [the workshop] reminded me that I am not doing enough to be mindful of times when I could be influential in the workplace” (questionnaire).

As supported in the literature, Rita felt a more holistic understanding of cultural influences on individual resource-use perspectives and underlying assumptions should be part of any learning or engagement process towards more ecological worldviews (Reid, Teamey & Dillon 2002; Reader 2011). With that aim, Table 5 outlines and highlights potential associations between pBs’ definitions of sustainability, their reflection on which cultures they felt had influenced their understanding of ecological systems and experiences that were further elaborated on by David, Jess and Jane in their interviews (Table 5).

Table 5: pB's definitions of sustainability, cultural and upbringing influences and lived experiences discussed (questionnaire, workshop and interviews).

Participant	Description of Term 'Sustainability'	Cultural Influences (<i>Living Influences</i>)	Experiences Discussed
David	"MAXIMISING HUMAN AND NON-HUMAN OPPORTUNITIES WITHIN PHYSICAL, INTELLECTUAL AND CULTURAL LIMITS"	Academic, business, <i>Sub-urban living</i>	Using rational thought and analytical mind to understand environmental paradigms, walking on campus, understanding EF (meat, highest impact), previous sustainability initiatives on campus (link to health and safety), objective teaching, office plants.
Jane	"TAKEN LITERALLY IT REFERS TO THE ABILITY OF TO SUSTAIN ANY GIVEN SYSTEM OR PROCESS. I DO HAVE TROUBLE WITH THE TERM IN THAT ALL SYSTEMS EBB AND FLOW SO I SEE IT AS A CYCLICAL PROCESS THAT NECESSARILY MUST ALSO CONSIDER THE CONTEXT AND THE CONSISTENCY OF CHANGE."	Organic, permaculture <i>Rural</i>	Walking in Spain, plants, organic food markets, walking on campus, having to drive to work in a city, farming, community gardens (on and off campus), meditation, previous sustainability initiatives on campus (not continued support), project-based education.
Jess	"AWARENESS OF YOUR PERSONAL IMPACT ON THE ENVIRONMENT AS WELL AS THE IMPACT OF THOSE AROUND YOU, TO PROTECT RESOURCES AND THE PLANET FOR FUTURE GENERATIONS"	Fitness, active, health, university, NSW public school system, eco <i>Sub-urban living</i>	Tree-planting on campus, bush/garden growing up, nature on campus, studying on campus, involved in groups for environment and social benefit through MQ, family engagement with sustainability, projects with, and narratives and support of, people with ecological worldviews
Jack	"ENDURANCE OF OUR ECOSYSTEM SO FUTURE GENERATIONS CAN USE IT AS WELL"	Upbringing <i>Urban city</i>	Taught to respect environment

Jess thought her Australian, organic, green, NSW education/university, health and fitness cultures had each played a part in guiding her towards her current social-ecological worldview, advising that "The combination of these different influences means I am very conscious of my impact on the environment and try to minimise it (I also try to help others to do the same)". Jane, in identifying with rural, organic and permaculture cultures, hints at the

impact urban cultures can have on preventing or stifling activities more congruent with an individual's ecological worldview. She writes "I am probably less ideological now than when I was younger, but I also think I live less responsibly now that I am in a city, as opposed to a rural environment, where the reality is with you constantly." David also referenced the impact urban cultures can have on shaping worldviews when he discussed the influences of academic/business cultures, "My relationship is probably more analytic than experiential - I am familiar with many of the ecological paradigms but I'm generally a city/office-dweller".

Personal TL Processes

The lived experiences within this case study support the literature that suggests more ecologically-centred worldviews can be created through participatory approaches that facilitate greater understanding of, and connections between, humans, non-humans and more-than-humans within ecological systems (Merchant 2005; Hensley 2012). Indigenous cultures are a good example of how participatory learning within (and sometimes as) place, culture and ecological systems can contribute to more ecological worldviews (Reid, Teamey & Dillon 2002; Taaliu 2012; Lloyd et al. 2012; Bawaka et al. 2013; Chinn 2015; Burns 2015). Indeed, as Ritchie (2012) points out, the paramount importance placed on the wellbeing of the collective, and the respect and stewardship of the natural world due to its significance in providing resources to survive within Māori cosmology and lifestyles, could form part of a new narrative towards sustainability. Jones (2013) agrees, asserting that through creating 'biophilic' universities that allow for greater connections and affinity with nature, a new narrative can be created counter to the current neoliberal culture. Indeed, Boehnert (2010), in researching innovative values-based design for sustainability, advocates that through designing for future ways of living rather than material artefacts (i.e. buildings), universities can become sites of more robust learning towards living sustainably. This was reiterated in the workshop by David and Jane who conversed about linking the design of the university to increasing opportunities for enhancing awareness of ecological-self and enactment of ecological worldviews (see Chapter 7). The literature also predicted that by providing opportunities for individuals with unique worldviews to collaboratively solve real-world problems, sense of ecological self within culture could be enhanced, leading to TL (Sipos, Battisti & Grimm 2008; Chen & Martin 2015) (linking Aims 2 and 3).

Organisational Culture

As expected, organisational culture was also found to be heavily influenced by the dominant societal culture within which it operated, as individuals and groups create meaning and attribute values to places with each resource-use decision (Giroux, 2002). Both pA and pB emphasised that the policies, strategies, everyday experiences, design and operation of a neoliberal workplace mirrored the values, meanings and perspectives of resource use prioritised by the neoliberal paradigm (O'Sullivan 1999b; Giroux 2002, McKenzie and Bieler 2016). David termed this "cultural overlay", and discussed this as the filter through which individuals acquire and understand knowledge. These social constructs are the "default" (David, interview) and the "ways of thinking [we are] locked into" (Jane, interview). Consequently, shared neoliberal organisational and societal cultural values were found to act as a potential barrier to utilising and applying EF, in particular, in relation to alternative resource-use options, and enacting sustainability more broadly. David commented on the challenges he faces in wanting to "move away from [cultural] 'default' significantly" and that he agreed "to some extent" with the statement that it is easy for people to "get swept along with society to a degree" (David, interview). In linking Aim 2 and Aim 3, Maria affirms this idea in her description of the way in which culture can restrict resources-use perspectives "Many do not even realize there are more sustainable alternatives. TSL can expose the reality behind these assumptions".

While this research aimed at exploring perspectives it is interesting to note that in further exploring the cultural aspect of Aim 3, participants, in narrating lived experiences and power dynamics, discussed limitations on how their ecological resource-use perspectives could be utilised and were supported within the neoliberal organisational culture. Jane felt that her office design had taken away the ability for her to control her own environment as she would have preferred to be able to turn off lights and the air conditioning systems. Indeed, Sterling (2001) warns that the acquisition of environmental knowledge without the ability to engage in a "deeper and broadening learning process" can actually be "disempowering" (p.19). Without the ability to 'act' on their perspectives, participants suggested there was a 'forgetfulness' or 'disconnect' of values, meanings and perspectives as a result of everyday lack of control and power to change systems and norms. Several types of inhibitors were mentioned by David, Jane, Jess, Rita, Maria and Kate, namely,

systems, planning and design, cultural norms, identity, status symbols and the preservation of personal rights (see Gendron 2014). Restrictive cultural values, the importance of lived experiences and the opportunities for sharing narratives to challenge perspectives is illuminated in this workshop dialogue:

"So if you really wanted to reduce your [organisational EF] impact, you could say, ok, all of the travel that we do is going to be offset...That doesn't require the education of 1000 people to get onboard...say this is what we're doing, end of story.

Do you think that that's long-term the way forward if we keep externalising...is that then promoting a culture of if you offset something, then...

Yeah it takes away the responsibility and it's the same with using recycled plastic bags which have very little effect but people think they're doing something useful. It depends partly on how robust the offsetting process is...

Right.

But I think that, obviously there's levels of intervention...as a long-term solution, probably not.

Realistically, the fact is, the rich are getting richer and the poorer are getting poorer, but we are using more and more, we're already using 1.6 planets, if we continue to do what we're doing and offsetting, it's not counter balancing the resource use that's climbing, it's not sustainable, that's the big problem. I think we're very comfortable and we like what we've got.

But if you can say something's better than what we've got and has less of an impact, then you've got a long-term solution

Unfortunately that's not the situation we've got, we're getting pushed further and further to the brink, we're in danger of really hitting a crisis.

But it's quite different if you look at the difference between academic and corporate travel...I mean, in corporate travel, when you're travelling to a meeting, that is incredibly replaceable. When I was working in the US...they took travelling on an airline like travelling on a bus...I was like, dude let's just do it [a meeting] over the phone."

You don't need to travel, but you see, they'd see that as a perk.

There is that whole thing about frequent flyer points.

There's all of that."

- David, Jane and workshop facilitator

Maria expressed particular concern about systems, saying "We may want to change our ecological footprint and our habits but sometimes the 'systems' we live within stand in the way". For example, Maria would prefer not to own a car yet had little choice as she lived in a rural area. Moreover, Rita discussed cars as part of wider cultural perspectives on design and planning, including land-use decisions, reflecting "Travel by private automobile is culturally prioritized over other modes". Similarly, in the organisational context, Jane, David and Jess explained the limitations in their choice of work transport (infrastructure, cost, convenience, number of car spaces etc), making the decision to drive to work more about cultural necessity rather than personal desire. This points to the structure-agency dilemma,

where resource-use decisions and ability to implement resource-use solutions was found to be limited within the current organisational systems, in direct opposition to high individual values of ecological systems (Dunlap et al. 2002; Haluza-DeLay 2006; Block 2013). Moore and Rees (2013) describe this as the reflection of “policy paralysis” within broader society. Indeed, Boehnert (2010) found that without a system designed to support transformation, even individuals with sustainable ‘values’ felt they lacked the agency to put them into practice. This was evidenced by the values attained for questionnaire responses of personal values attributed to ecological systems (9-10) in contrast to those responses related to perception of ability to enact these values in the workplace (3-7)(Table 6).

Table 6: pB questionnaire response to questions on the value of ecological systems and perceived ability to make resource-use decisions and implement solutions in the workplace.

Questions (1-10 scale answers, where 1 = not at all and 10 = absolutely)	Jane	David	Jessica	Jack
Workplace Questions				
Do you feel that you have opportunities in the workplace to make resource decisions?	5	3	7	6
How supported are you in the workplace to implement resource management solutions?	6	3	5	5
Personal Questions				
how valuable are ecological systems to you?	9	9	10	9

Transformation Towards a Culture of Sustainability within the Neoliberal Organisation

In response to Aim 3, this thesis provides evidence for the complex role culture plays within individual, organisational and society transformations towards sustainability. MQ Council recently acknowledged:

“The public insists that universities are competitive – even profitable. But to be sustainable, we must also nurture the institution by encouraging our students, researchers, academics, professional staff and partners in industry, community and government to actively engage in and seek solutions to the complex issues that will define the future of humanity and the planet.” (Howitt, 2015a)

Importantly, David found that linking sustainability initiatives to health and safety appeared to engage employees most successfully, further hinting at the prioritisation of certain cultural values (i.e. individual health) over others (i.e. future generations). Maria also highlighted the

propensity of cultures to prioritise certain values, both individual (i.e. status, convenience) and/or collective (i.e. decreased air quality, future generations). Rita and Kate agreed TSL could further challenge these ingrained political, social and cultural norms within a neoliberal university. Rita added that “such a transition needs long term support”. Kate reflected long-term support is required as:

“while most people care about the environment if you give them the tools to do it, it definitely challenges their norms, and mainly also their habits, which are hard to break...People tend to do what they've always been doing or what they see the others do...if sustainability isn't part of their cultures (such as recycling their waste for example), it is a very new and complicated habit to get”.

Shared narratives may also help to break ‘habits of mind’ (McKenzie and Bieler 2016), indeed, this is a point of entry for both Maria and Kate when engaging adults in embedding sustainability in the workplace. The power of narratives in realisation of one’s ‘sense of ecological self’ and how to create shared meanings counter to the present cultural norms is also supported in the literature (Colucci-Gray et al. 2006). Through content and context of the narrative, individuals can reflect on their values, meanings and perspectives in relation to others, creating shared, socially-constructed values, meanings and perspectives within culture (Lloyd et al. 2012; Bull 2013). Building on this literature, this research highlights the role of narratives in transforming neoliberal/unsustainable resource-use perspectives. Rita explains “It is through stories that we develop and pass on community and personal values” and suggested further that the intensity of the disruption to current perspectives is determined by the ability to be “effective in countering dominant [cultural/societal] narratives”. As Howitt articulates in a presentation to the MQ Council:

“I worry that our narrative of being a university of service and engagement is at risk of being reduced narrative from sustained moral compass to ephemeral marketing slogan and is mobilised in ways that undermine rather than supports our academic mission.”(Howitt, 2015b)

This presentation points to the power of narratives to provide opportunities for employees to engage in creating and restoring shared values, meanings and perspectives, redefining culture(s) within organisational transformation (Colucci-Gray et al. 2006; McKenzie and Bieler 2016). For instance, in sharing his story about why he became a vegetarian, David challenged EF as a tool in prioritising resource-use impacts, by explaining that food and drinks were not indicated as a large component of the university’s EF, yet in his experience, he felt the largest impact individuals could have in reducing EFs was to switch to a vegetarian diet. He and Jane debated that while MQ had the power to implement solely

offering vegetarian food on campus, this would be unlikely as it would be considered strongly counter to the dominant narratives of food consumption (i.e. current lifestyles/diet) and individualism (i.e. freedom of choice vs. collective wellbeing) promoted in the neoliberal paradigm (see dialogue below).

“Organisations say when it comes to diet, we’re dealing with habit, we’re dealing with vested interest, we’re dealing with the idea that, well, does the organisation have a right to tell me what to do?”

It’s all in how you frame it, and how it’s sold.

That’s right...a plant-based diet is healthier, it’s better for you, it’s better for the environment, and it’s cheaper.

Or are we in the habit of saying, ‘Yes, but it takes me time, I can’t do it and I don’t like it as much, there is a whole range of arguments against it.

Yeah.”

- David and Jane, workshop

Moreover, Maria found that organisations use workshops to facilitate a culture change, because “Companies are “stuck” on how to get employees to embrace and embed sustainability and CSR within their companies...no-one wants to take the time, effort or money to find out what is important to their staff”. To counter these issues, all participants were adamant that TL could occur by linking sustainability (including EF as a tool) to all organisational objectives (i.e. teaching, learning, research and operational at MQ). During the workshop and interviews, pB strongly emphasised the importance of policies, access to resources, control of information and resources, clarity of outcomes and goals, communication, on-going support and leadership for achieving transformation towards more sustainable organisations.

Leadership

pA and pB (excluding Jack) believed long-term organisational culture change was more effective if there was leadership on resource-use issues, indicating that leadership can influence both individual and collective/shared perspectives. David, Jess and Jane highlighted the need for leadership at MQ to provide vision, accountability and support through processes of individual and organisational transformation, including initiating redistribution of power through increasing access to information, resources and opportunities to participate in and apply resources-use solutions. Their examples included participation in resource-use dialogue, the design of workplace(s) and creating sustainability initiatives. Jess in her personal experience, and Kate in her professional experience, agreed

that the support of bosses who are ecologically mindful is an important factor in influencing sustainability values and enabling opportunities to undertake sustainability initiatives. Mezirow (1991) suggests that in TL “personal meanings we attribute to our experiences are acquired and validated through human interaction and communication” (p.XIV). In a neoliberal workplace culture, this communication comes not only in the form of information but also from the way the behaviour of others, in particular direct management, is perceived. This type of long-term leadership supporting TL within the organisational context is encouraged by Gravett (2004), who advocates engaging individuals whose ideas and/or behaviours may inspire transformed perspectives. Rita and Maria commented on the importance of individuals who express ideas counter to current cultural narratives through embodying resource-use solutions. As Kate explains “You need a leader or champion in a business who is interested and motivated to implement change and will help motivate others”. This links to emerging TSL studies that expand the term leadership from the parameters of position, status and power - to include each individual within an organisation promoting change (Mah, 2015).

Conclusion

While the workshop in this case study did not facilitate any epochal transformations, the research findings highlight that processes of TL are dynamic and influenced heavily by previous experiences, culture and place. The lived experiences of individuals within ecological systems, in particular relationships with and influences of place and culture, are therefore of paramount importance to their resources-use perspectives within their unique worldview (Aim 3). This worldview aids individuals in navigating their way through organisational cultures and is part of a dynamic process at the nexus of organisational culture and individual experience, and the power dynamics that control the ability to understand epistemologies and enact ontologies. Personal and organisational narratives were identified as a key element in ascribing values, meanings and perspectives to ecological systems and resource-use issues within organisational TL processes. Additionally, professional development opportunities and on-going support mechanisms, such as resources, access to information and tools, and leadership provided mediums through which individuals and groups continued the TL process towards sustainable workplace resource-use (Aim 2).

Chapter 7 Place

As chapter 6 discussed, an individual's understanding and enactment of sustainable resource use is mediated by their workplace and influenced by their lived experiences within ecological systems, including places and cultures (Aim 3). This chapter focuses in more depth on how sense of place within the workplace is influenced by, and in turn influences, an individual's resource-use perspective. The possibility that the strength of these connections positively correlates to the values attributed to each 'place', leading to sustainable resource-use perspectives, is also considered. Finally, this examination turns to the role of lived experiences and power dynamics within places and TL (or not) of neoliberal workplace resource-use perspectives.

Sense of Place

pA each highlighted the ability of enhancing connections and sense of place through engagement with the built environment and cultural, social and geophysical surroundings when learning EF and sustainability more broadly. Steve commented "There is a real possibility to use the EF to create a sense of place" and further, that reflecting on EF can also help create a global sense of place, an important step towards individuals realising they are part of a planet where resource use is unsustainable and unequal (Massey 1998) - a key component of this exploration of the research question. Rita reflected on the ability for 'latent' sense of place to become acknowledged through processes that saw residents "engaged in planning for their communities in order to preserve the sense of place qualities that were threatened". This is similar to Jess's experience of tree-planting on campus that restored her commitment to enacting the "latent" high-value she attributed to ecological systems. Kate also felt that sense of place influenced workplace resource-use perspectives, especially that "people tend to care much more if they have a sense of belonging". Rita agreed, stating "Individuals with a sense of place – a connection to a place built through the accretion of memory and a sensory experience of the natural resources and built features—are motivated to protect elements they value". Indeed, Frantz et al. (2005) and Gosling and Williams (2010) found that individuals who were established to have greater place identity and place attachment (i.e. connections to place through lived experiences) were more likely to exhibit protective/conservation behaviours. However, Stedman (2002) and Hinds and Sparks (2011) caution there are also other factors to consider in assessing the links between

place identity, place attachment, sense of place and pro-environmental behaviours (discussed below as part of a deeper exploration of Aim 3). These factors include personality, lifestyle, lifecycle, systems and power dynamics.

Sense of Self within Workplace

This case study also linked to the literature in support of the idea that people's lived experiences in place(s) contribute to the socio-physiological influences on individual and broader organisational workplace resource-use perspectives (Stedman 2002; Kellert & Calabrese 2015). For example, Jane grew up in a rural setting and Jess talks of having a backyard that backed directly onto bushland, with both indicating medium to strong connections to ecological systems (see Table 7). Similarly, some findings in the literature suggest spending time directly within nature is linked to increased connectedness, love and care for nature (Kaplan & Kaplan 1989) and increasing connectedness to nature increases willingness to protect it (Mayer & Franz 2004). Additionally, childhood experiences also appeared to influence perspectives as those that have spent more time in 'nature'/rural settings growing up, have stronger environmental identities (Hinds & Sparks 2011).

Table 7: pB connections to, and resource-use perspectives within, the workplace, and values attributed to ecological systems (questionnaire)

Questions (1-10 scale answers, where 1 = not at all and 10 = absolutely)	Jane	David	Jessica	Jack
Workplace - home away from home	7	5	10	7
Do you feel that you have opportunities in the workplace to make resource decisions?	5	3	7	6
Do you feel pressure in the workplace to use resources efficiently?	5	3	6	7
How supported are you in the workplace to implement resource management solutions?	6	3	5	5
How connected do you feel to ecological systems?	7	6	10	6

David and Jack indicate they do not feel significantly connected to ecological systems, yet David's sense of self within ecological systems was strong, believing that as humans, "we can't be outside ES". In contrast, Jack felt the same strength of connection yet described ecological systems as "nature that has not been touched by human beings". Connections to ecological systems did not appear to correlate to connections to workplace or determine

sustainable workplace resource-use perspectives (Table 7). These findings hint that connections to ecological systems on a broad scale may not necessarily be reflected in connections to workplace ecological systems resource use. This builds on current literature suggesting that the systems and processes involved in making meanings within cultural upbringings and/or sub-cultures within the university (i.e. Latin American upbringing, Business and Economics faculty) may significantly influence sense of workplace, yet in complex ways, leading to extraordinarily unique workplace resource-use perspectives (Lewicka 2011). It also shows potential to broaden current sense of place literature, such as that of Ardoin (2014) who found that there could be a positive correlation to the scale of sense of place and conservation behaviours (or possible behaviours to be taken) at the same scale.

Maria, David and Rita identified places as something representing individual and collective meanings and values. They discussed how these values and meanings were derived from the individual or collective use of the built environment and 'natural' components within places. Rita discussed the transience of workplaces as a possible reason there is a lack of current research into the theory of place in organisations. She commented "work places are more transient in our lives; that the activities there are less personal" therefore individuals attribute less personal value to them. Although Kelly and Hosing (2008) suggest place identity and place attachment deepens the longer a person spends in a place, Hernandez et al. (2010) argue that there is inconclusive evidence that suggests the strength of these bonds determines pro-environmental behaviours. In this research strong connections to workplace did not seem to correlate in any way with the length of time individuals had been part of the organisation (student or employee). However, pBs' senses of self within workplaces appeared as a casual relationship with the proximity/transience of experience and activities within workplaces. pB discussed the activities they carried out on campus (see Table 8), their connections to workplace and consideration of ecological systems when using workplace resources. Their responses suggest that increasing activities with personal value within workplaces may increase connection to workplace. This relates to examining the role of place within the broader context of the research question - by suggesting that how (work) place is used may effect workplace connections and in turn, conservative workplace resource-use perspectives.

Table 8: pB questionnaire responses to connection to workplace and considering ecological systems when using workplace resources and individual and collective activities on campus (from workshop and interviews).

Questions (1-10 scale answers, where 1 = not at all and 10 = absolutely)	Jane	David	Jessica
Workplace - home away from home	7	5	10
Consider ecological systems when making use of workplace resources	8	7	9
Activities on Campus	Tried Community Garden, Meditation classes	Student, Gym	Student, met up with friends, exercised outdoors, environmental and social volunteering/activities

Rita agreed: “Sense of place can be both individual and collective and involves human perception, interaction, and interpretation”. These findings support Stedman’s (2002) suggestion that sense of place involves the meanings, attachments and contentment attributed to a special setting by an individual or group. Researchers also highlight the importance of addressing the current lack of consideration of these ‘social aspects’ when integrating social-ecological systems (Mascia et al. 2003; Gendron 2014). Through exploring more ‘social aspects’, this research highlights the importance of individuals belonging to a social/cultural group within a place, and the place identities they associate with the geophysical place itself, as instrumental in mediating resource-use perspectives (Stevenson 2011). Indeed, Jess’s questionnaire answers indicated she felt she had the strongest connection to workplace (10) and greatest connection to ecological systems (10) and had undertaken a significant amount of environmental and social initiatives in personal and professional capacities on campus. This builds on Ardoin’s (2014) research into the effects sense of place across different scales can have on the everyday experiences of individuals, illustrating how sense of belonging to a certain area influences an individual’s conservation behaviours and/or intention to carry out future conservation behaviours. These findings suggest that in exploring Aim 3, the unique interconnectedness of processes and agency within place, together with social factors such as sense of self and cohesion within the workplace, affects an individual’s emotional reaction to, and interpretive perspectives of, the environment (Stedman 2002; Hummon 1992; Lewicka 2011).

This research indicated that individuals hold different meanings, values and perspectives in relation to ecological systems. This supports Hinds and Spark (2011) findings that individuals' affective responses were varied towards different environments, influencing their learning within place. Jane, in particular, felt the effects of place and culture on her sense of self within workplace and ecological systems, stating that she lived less responsibly now due to her current urban lifestyle because she felt more removed from the realities of the human-nature relationship. pB interviewed discussed the influential agency of the built environment and 'natural' elements within the workplace in relation to resource-use perspectives. David and Jane commented that often they chose their pathway through the University based upon the amount of greenery or 'nature' available. As the literature forecasted, these natural elements (within place) were described as making them feel 'refreshed', 'happy', 'relaxed' and 'more productive' (Hartig et al. (Eds.) 2011; Kellert 2002, 2005; Kahn 1999; Hinds & Sparks 2011). Jane reflected that this may have a positive effect on her resource-use perspectives during the day. This was also evidenced during the workplace walk where participants were asked to describe one aspect of ecological systems that stood out for them while walking. David indicated the 'built environment' made a significant impression on him, and this is also noted in the participant observations where David's viewpoint on ecological systems involves "buildings as part of ecology" (participant observations). Recent PBL literature states "The built environment thereby can enhance or detract from our perceptions of our natural surroundings or local contexts in the same conceptual ways as the psychosocial environment we experience" (Zandvliet 2014, p. 19), and this research extends this concept to TL in the workplace (Figure 5: Workplace walk built environment).



Figure 5: Workplace walk built environment

Additionally, Rita highlighted the importance of a more holistic PBL experience, stating “TSL is about engaging all of our human senses in order to explore issues of sustainability”.

Indeed, Jane stated the “lack of trees and all the cement” was what she had noticed most (Figure 6: Workplace walk cement) and rated the workplace walk as the most engaging of the workshop activities, stating “I always enjoy the walking and talking involved in interaction”.



Figure 6: Workplace walk cement

These findings maintain the current ideas endorsed in the literature - that providing learning activities within local communities and environments can facilitate transformation of perspectives (Sipos, Battisti & Grimm 2008, Gruenewald & Smith 2008; Chinn 2015; Illeris 2015). Indeed, this research expresses how Aims 1, 2 and 3 link into the research question by pointing to the unique engagement individuals experience with the geo/bio-physical and socio-cultural elements within place, as the main stimulant of critical self-reflection. This critical self-reflection on the connections within ecological systems enhances TL opportunities towards deepening the human-nature relationship (Ardoin, Schuh & Gould 2012).

Rita and Maria both commented on the agency of place in learning (linking Aim 2 and 3). A good example of this is Maria's students completing an activity within a reclaimed brick pit, reflecting on the different challenges faced by humanity, including themselves, in the past, present and future. Maria illustrated the ability of the rehabilitated site to encourage learners to explore their ideas and assumptions about the world, explaining that learning in place can "be a great reflection on the challenges they [learners] face today and their role in creating a more environmentally and socially responsible world". She achieved this by asking learners to "do a written reflection on what this place means to them, what it tells them about nature, progress and human kind". This also exemplifies how imagining history within sense of place might enhance reflection on current perspectives. Jane also supported the role of imagination in facilitating sense of place through meditation on campus and David emphasised the power of imagination and environment in learning about the connections of self within ecological systems. Kate also highlighted the role of imagination in developing sustainable ideas within the individual, saying "It's also about 'planting a seed' about sustainability in their mind...they are much more likely to change if they think the idea came from them". Although the importance of imagination in the development of new ontologies and epistemologies necessary for sustainable pedagogies has been emphasised in the literature (O'Sullivan 1999a; Huggan & Tiffin, 2007, 2010; Nelson & Coleman 2012), this research supports the broadening of this concept to include the idea that individual imagination may be stimulated through workplace PBL. It also argues that these opportunities for imagination can contribute significantly to processes of TL that counter current workplace neoliberal paradigms.

Examination of participants' senses of self within the workplace highlighted how individuals perceived a lack of power to make, and/or difficulty in evaluating options in order to make, 'ethical' or 'responsible' resource-use choices. Indeed, Lewicka (2005) refers to determining variables, such as cultural identities, and structural barriers that can influence an individual's perspective on how they can enact certain values linked to their sense of place. This was evident in pB questionnaires where participants perceived that their ability to implement workplace resource-use solutions was 6 or below (on a scale of 1-10), yet their connection to workplace spanned (5-10).

During the workshop, and suggested by Rita, was the idea that the design of place: MQ as a workplace and council planning more broadly, had the propensity to limit individuals' values, meanings and perspectives on what places were and how they, and the resources therein, could be used. This included what, where and how land (and other resource) uses were designed and implemented, resulting in spaces within place that could only be used for the things intended by management, for example car parks and smoking areas. The design of spaces also determined how they were used, for example Jane believed the inconvenience of the distance from central campus to the community garden meant that it was not being used to maximum benefit. David thought that campus walking tracks may not be used due to online maps being difficult to follow (in his experience). As Rita suggested *"Most of our lived experience is mediated by a built element or technology."* As discussed previously, this is particularly important as the ability to carry out personal and professional activities within different workplace spaces (buildings, lawn, bushland, carparks, gym etc) plays an important role in the dynamic relationships of place attachment, place identity and the facilitation of an individual's understanding of resource uses, issues and collaborative efforts in the workplace (Hernández et al. 2010; Stedman 2002; Tuan 1977; Ingold 2000; Massey 2005). The ways culture and place design can challenge and support neoliberal resource-use perspectives within MQ is exemplified in this section of workshop dialogue which took place after the workplace walk.

"So in terms of the other interaction with the built environment, for me the main non-work interaction is when I go and buy lunch. A big step forward has been that whole food shop...and some varied vegetarian options on the menu but...where is the vegan option, why is there only one vegetarian option? why is the default still that

we have all of these different things, if we were serious about this, it would be the reverse, you would have to get a special...
Or if there were enough people that wanted that...
You see that's the issue, isn't it, should it be a demand-driven thing?
Whether or not it should be, that's the way the world operates, that's the economic model."
- David and Jane, workshop

Another example of the influence of culture on design and use of places - the workplace - and the areas participants lived, was conveyed by Rita, Maria, David, Jane and Jess through their reflection on their ability to make sustainable choices, such as using public transport vs. cars. Even though there are cultural norms associated with cars, such as status, prestige and convenience, each participant indicated their reluctance to purchase or use a car, with each saying it was more of a necessity in upholding their lifestyle within neoliberal society. This suggests that despite the best intentioned ethical positions, a range of complex issues including design of places (e.g. convenience of car infrastructure on campus and surrounds) can compromise people's ability to action their intentions. This type of effect is supported in current cultural studies literature. For instance, Chinn (2015) suggests the unsustainable consumer behaviours in America are evidence of the lived experiences and "cultural construction of a competitive, acquisitive" (p. 122) 'mindlessness' towards ecology. She quotes prominent euphemisms used in this construction; "Keeping up with the Joneses" and "He who dies with the most toys wins" (p. 122) that place emphasis on competition and construction. This neoliberal competitive workplace design (Figure 7: Wall of Inspiration)

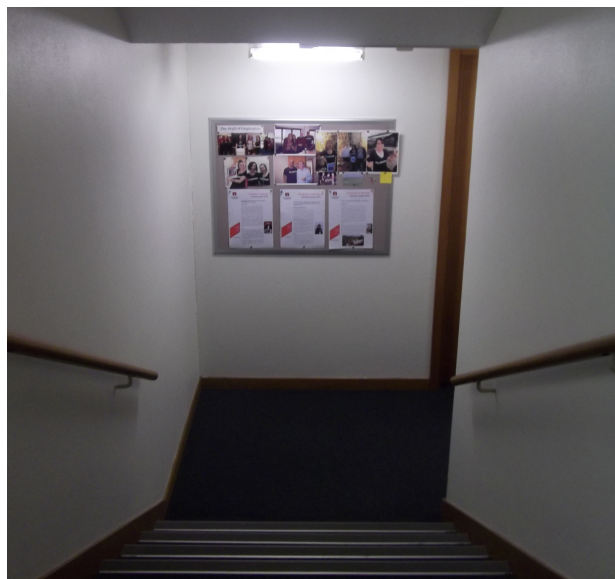


Figure 7: Workplace walk Wall of Inspiration

is also reflected in workshop dialogue:

"I guess to me the...big issue isn't paper. Look at what's being promoted on the wall down there, the thing that I took the photo of, was the Wall of Inspiration. So what's on the wall of inspiration - PhD completions.

Hmmm

Having been through that process, It's a big milestone, I certainly think that deserves recognition.

That's what they're here for.

Yeah but that's really where the university's agenda is.

Overrides everything.

So we haven't got a wall of inspiration that shows what people have done from an EF point of view.

No.

And if we did it wouldn't be about recycling paper, it would be about things like diet."

- David and Jane, workshop

This research therefore conveys the importance of shared narratives and inclusion of employees in the design of workplaces as on-going support for transformed resource-use perspectives counter to current neoliberal cultural activities.

Redistributing Workplace Power through EF

David, Jane, Jess, Rita, Steve, Kate and Maria suggested that having access to EF provides information on workplace land uses and therefore allows individuals and groups to feel connected to the workplace ecological systems in new ways. This finding helps to consider the complexity of the link between Aim 1 and Aim 3 and aids in answering the research question. Indeed, Steve commented that smaller scale EF can aid in learning about the productivity of certain areas, for instance the strengths of a smaller, local area. David noted in his interview that although EF does have some "profound limitations" (as mentioned in Chapter 2) it can aid in ecological awareness as it "points to interconnectedness" within ecological systems. Indeed, Bowers (2005) advocates it is the priority of ecological pedagogies to enhance awareness of the limits of ecological systems within place, including how current technological and economic paradigms result in resource uses that restrict the capacity of ecological systems to sustain life. EF was also discussed as providing individuals (and groups) with more control by providing opportunities to suggest initiatives that aimed at land use improvements as well as enhancing dynamic sense of place as EF presents land uses changes. However, it was also noted that EF does lack the ability to measure the personally derived benefits/weaknesses from use of places i.e. enjoyment/

uncomfortableness. Workplace examples of this included the enjoyment derived from the natural elements i.e. walking/running through certain areas to/at work and discomfort derived from enforced parameters such as constant artificial lighting/air control.

The Places of TL

As McKenzie (2008) and McKenzie and Bieler (2016) discuss, and in reference to Aim 3, in particular, the place of pedagogies is also important. This may not be a specific biophysical setting per se but rather how the learner engages with the learning process, as a range of intersubjective experiences that can enhance connections to place within evolving cultures. Rita advocated the strengths of TSL in informal settings, describing a major challenge for TL towards sustainability in a formal workplace setting, as “formal settings tend to shy away from directly dealing with “heart” (or values) aspects of our world understanding”. Informal settings, such as ‘workplace walks’ were also attributed to provide opportunities to be less threatening, dislodging power dynamics and therefore allowing more freedom for true expression and explorations of meanings, facilitating TL. These findings show how TL within the workplace, delivered in place and utilising different mediums, could encourage opportunities for self-reflection on human-nature relations at the individual and organisational level. Indeed, Goldstein et al. (2013) and McKenzie and Bieler (2016) found that members of a community not only enhance their own sense of self with a community (ES and culture) through narratives, but also that sharing narratives, in particular those regarding alternative futures, promotes critical learning and collaboration between individuals with unique perspectives about shared places. This was clearly emphasised in Jane’s rekindled commitment to try and include more nature (i.e. plants) in the workplace in the future after sharing narratives about sustainability initiatives during the workshop. Bliss and Fisher (2008) elaborate further on this concept in suggesting the case for digital narratives within organisations. Kate also mentions that in her professional experience with business sustainability engagement, where she found that “Watching case study videos, and hearing about positive results really engage businesses.”. Furthermore, Jess felt that learning online could provide an engaging learning medium in respect to disseminating knowledge and creating a community for further sustainability engagement, such as sharing their own workplace sustainability narratives.

Conclusion

Participants in this research each discussed the lived experiences of their human-nature relationship and connections to place, including values and meanings, and how these linked to resource-use perspectives in relation to places and more specifically, neoliberal workplaces. This case study also highlighted how sense of place, imaginaries, controls and power dynamics can influence individual and organisational TL. Overall, when considering the components that link the aims of this thesis to the research question, this research made a case for the use of a variety of learning activities, including walking, tree-planting, workplace initiatives, dialogue, narratives and online engagement, within the workplace. It was found that these learning mediums facilitated opportunities to develop deeper human-nature relationships through TL, enhancing connections to place within cultures, enabling shifts in individual and shared values, meanings and perspectives, counter to those exhibited in the current neoliberal workplace.

Chapter 8 “How do you prioritise what you’re going to change?” (David, workshop)

In a world with finite ecological resources and services, the question is not if human demand of ecological systems needs to change but “How do you prioritise what you’re going to change?” (David, workshop, emphasis added) to reduce human consumption and waste production. Reducing organisational resource use through TL towards sustainability poses significant challenges due to the socially-constructed worldviews and structures present within neoliberal workplaces. This thesis adds to EF, TL, place and culture literature by integrating these concepts in the context of the MQ neoliberal workplace. Using feminist methodology, it begins to shed light on the interplay of neoliberal constructs and lived experiences at varying scales. In concluding, this chapter highlights how the research design allowed participants’ engagement within different geophysical and socio-cultural settings, facilitating exploration of the interrelationships between EF, culture and place within TL towards sustainable resource-use perspectives.

Summary of Argument

The thesis argues that EF has the potential to be of significant benefit as a component of individual transformation towards a more sustainable resource-use perspective(s). TL of this nature can occur as part of a dynamic learning process at the individual, organisational and societal scales. In particular, the thesis argues that EF has the potential to enhance human-nature connections, increasing ecological awareness, including an appreciation of ecological systems in the workplace. It also argues that learning, continual support, cultural shifts and the design of workplaces play contributing roles towards longitudinal transformative change in adult resource-use perspectives.

Findings and Contributions

The thesis found that EF provided opportunities for individual exploration and enhancement of sense of self within ecological systems and therefore that EF could be a beneficial component within a broader TL process. Through qualitative data collection, it was found

that engagement with MQ EF initiated self-reflection within a dynamic TL process, facilitating realignment of, and/or change in, values, meanings and perspectives surrounding neoliberal workplace resource use. The thesis could not fully determine the extent to which EF could facilitate *change* in adult's perspectives of sustainable resource use due to limitations stemming from the sustainability focus of participants as well as incomplete pre- workshop questionnaire data from workshop attendees. However, this research contributes to organisations', and universities' in particular, learning and teaching endeavours, by illuminating an avenue through which individuals can be engaged with sustainability. Contributions were also made to the broader discussion on practical and successful EF applications by expanding on research into EF limitations and inhibitors in relation to a specific neoliberal university context. Universities could also utilise these findings to expand professional development for employees, including teachers, as well as incorporating elements into operations, research and/or the content and teaching context of units offered. More specifically, this thesis contributes to the MQ community by deepening the understanding of how individuals within the community engage with its physical and non-physical elements of the organisation such as workplaces, communities, narratives, social contexts, processes and policies (McKenzie and Bieler 2016). This understanding provides a basis upon which management could derive future research/activities, such as more accessible and tailored EF workshops and online material, to further explore engaging individuals in workplace sustainability. This research has also contributed to the MQ community narrative, opening up the opportunity for individuals and groups to explore and build on shared resource use values and scenario building.

This thesis explored the practice of TL pedagogies in the workplace. Specifically it utilised questionnaires, interviews and participant observations to explore the elements involved in transforming adult perspectives at MQ: a neoliberal workplace. By drawing out patterns and narratives through two cycles of coding, the thesis determined firstly that individuals who do not exhibit clear pedagogical entry points for TL may still experience 'restorative' learning and secondly, that longitudinal transformations need on-going support. Indeed, this thesis found that varied mediums, supported by top-down policies, processes and on-going support, in combination with bottom-up initiatives, engagement and participatory design of workplaces are key features of a successful holistic TL process. The informal research design also provided a safe and inclusive learning environment allowing MQ participants the

freedom to consider the structures, systems, cultures, designs and power dynamics that inhibited TL at MQ. Through analysing the lived experiences of four MQ employees, the thesis found that TL was a holistic, dynamic process occurring in parallel at various scales: individual, organisational and societal.

This thesis also explored the influence of place and culture in shaping resource-use perspectives. By utilising input from TL and organisational engagement experts in creating an informal workshop design, individuals were encouraged to actively participate in the research. This allowed individuals to express how their enhanced understandings of 'ecological selves' influenced personal and professional resource-use perspectives, in particular, through sharing narratives of lived experiences of places and cultures (McKenzie and Bieler 2016). As Mezirow (1998) predicts, individuals coming together were able to "participat[e] in discourse that validates beliefs, intentions, values and feelings" (p. 197) and the creation of new shared meanings (Bull 2013). The thesis examined neoliberal cultural influences (as a component of Aim 3) and found that knowledge, systems, controls, design and social factors were significantly defined by individuals through the neoliberal cultural lens. Additionally, sense of place was found to be influenced by experiences of historical, socio-cultural, biophysical, political-economic, imaginary and more-than-human agency within places and was therefore influential in transforming resource-use perspectives. Individual connections to, and identities within, culture and places were found to operate within neoliberal ontological and epistemological constructs, creating nuanced and dynamic resource-use perspectives.

Significance and Limitations

In this case study adult resource-use perspectives are the integration of lived experiences within ecological systems, including cultures and places. Resource-use perspectives in the workplace varied not only due to lived experiences influencing worldviews, but also power dynamics within the organisation that controlled information, resources, policies and systems individuals perceived to be relevant to individual and broader organisational resource use. This is highly significant as it emphasises the need for both top-down and bottom-up approaches in TL processes in neoliberal organisations, in particular the need for on-going support mechanisms designed to facilitate long-term individual and organisational

TL. This research finds that EF as a TL tool can contribute significantly to trans-disciplinary projects and employee skill-building, especially those skills that are currently lacking in the workforce yet necessary for sustainability, such as collaboration, holistic future scenario planning and shared value creation. This thesis, therefore, contributes to conversations on how EF may enhance exploration of the interconnectedness of a sense of self within the workplace, ecological systems and culture in the format of professional development workshops. In doing so, the thesis further highlights the complexity of individual and organisational shifts towards sustainability, counter to the current neoliberal paradigm, and offers ideas on areas of significance for future research (discussed below).

The main limitation of this study was the small number of pB, affecting not only the ability to identify significant relationships, correlations and draw representational conclusions, but also the opportunities for significant dialogue during the workshop. As Maria advocated “*more people increases dialogue necessary for TL*”. However, having only four pB allowed for greater exploration of participants’ lived experiences, voices and narratives and for these to become the methodological foci of the thesis. Another limitation was that the MQ staff invited to take part in the research were already interested in and motivated by sustainability and therefore it was less likely that their perspectives would significantly change. Finally, while the expert interviews and TL literature encouraged creative methods for reflection and longitudinal learning processes, the participants did not use reflection journals or photography and did not pick the workshop option for delivery over several weeks. Therefore, greater, more critical self-reflection most likely did not occur although Jane, David and Jess indicated that the experience allowed for identification, articulation and restoration of sustainable resource-use perspectives.

Recommendations

This thesis recommends that neoliberal organisations, many of which rhetorically acknowledge the importance of sustainability, engage employees with sustainability by implementing processes, systems and resources which enable more holistic TL. By integrating sustainability principles into workplaces, including pedagogies, policies, processes, activities, design and their *raison d’être*, neoliberal organisations could begin to facilitate transformation of individual and organisational resource-use perspectives towards a

more holistic, ecological paradigm, counter to the current neoliberal culture. Facilitating transformation requires continuous commitment to encouraging opportunities for new sustainable perspectives to be enacted, such that initiatives should allocate resources supporting sustainability learning, practices and habits, especially skills building in creativity, collaboration and self-reflection. Organisations should explore how to actively engage those individuals that are in places of power, either due to structure, expertise or other social reasons, and support their role as 'local sustainability leaders' while also empowering each employee to become a change agent. Indeed, Maria asserted "We need to create change makers, who, when then (sic) come up against a barrier find a way to change it...We need to activate more citizens to find the win-win scenarios". Lastly, as communication with management, these change agents and other individuals within the organisation appeared to be a key element in facilitating opportunities for TL, the sharing of stories and creation of shared narratives should feature predominantly in any transformational process (Aim 2).

Further Research

Sub-cultures, the cultures present within a larger organisational culture, are identified in this research and mentioned in the literature (see Taylor 2007) as playing an important role in TL, but this has not been extensively explored in relation to large neoliberal organisations. Some of the influential sub-cultures within this case study appeared to be departmental (i.e. business and economics), activity-based (i.e. community garden) and dependent on education and organisational position (i.e. academic, administrative). While having only four pB not allow any clear indications of the effects of sub-cultures within the university workplace, it hinted that they appeared to impact resources use perspectives. For example, Jane felt the exclusive nature of the community garden sub-culture prevented her from utilising this resource and non-sustainability centred people were discussed by David, Jane and Jess as having more health, safety and tokenism-based perspectives of resource-use initiatives. Future studies could therefore explore the effects workplace sub-cultures have on sustainability perspectives and behaviours in the neoliberal workplace.

As this thesis highlights, the experiences of professional and personal activities within the workplace play an important role in enhancing sense of self within ecological systems (culture and place) and influencing resource-use values and perspectives. Therefore, future research could explore activities on a much broader scale. Research participants suggested

activities including: expanded EF professional development workshops, collaborative designing of workspaces, trans-disciplinary projects (with students, staff and wider community) and interactive initiatives (i.e. encourage more social and environmental projects on campus with both staff and students and online engagement). Meditation was also strongly emphasised throughout the workshop as a potentially beneficial individual and collective workplace activity that could increase awareness of one's ecological self, connection to ecological systems, connection to place and engagement within workplace culture. Although not within the parameters of this thesis, findings also suggested that application of workplace EF could provide individuals with the skills and initiatives that would allow them to enact transformed workplace resource-use perspectives. Any further research into such activities should consider engaging the unique worldviews of individuals, opportunities to create shared values and meanings, and impacts on the wider organisation and society.

Conclusion

Inspired by O'Sullivan's (1999a) call for an "an ecozoic vision" (p. 2), this thesis suggests that EF can be a catalyst for TL in the workplace, in which epistemologies and ontologies can be reimagined and structures, systems, places and processes redesigned to align with more holistic, ecological worldviews. Moreover, facilitating exploration of connections within ecological systems, culture and place through engaging with EF at the professional level, has the potential to stimulate sustainable neoliberal workplace resources-use perspectives. Organisational support of these sustainable resource-use perspectives, through leadership, resources, opportunities to participate in dialogue and design of workspaces, also has the potential to encourage skill and narrative-building towards sustainable futures. At the broadest level, answering the research question, EF as a TL tool has the potential to initiate critical dialogue and culture change within neoliberal universities and beyond. Indeed, as Moore and Rees (2013) advocate, EF can aid in social and cultural transformations for "a new social contract that recognizes humanity's collective interest in designing a better form of prosperity for a world in which ecological limits are all too apparent and the growing gap between rich and poor is morally unconscionable." (p. 49).

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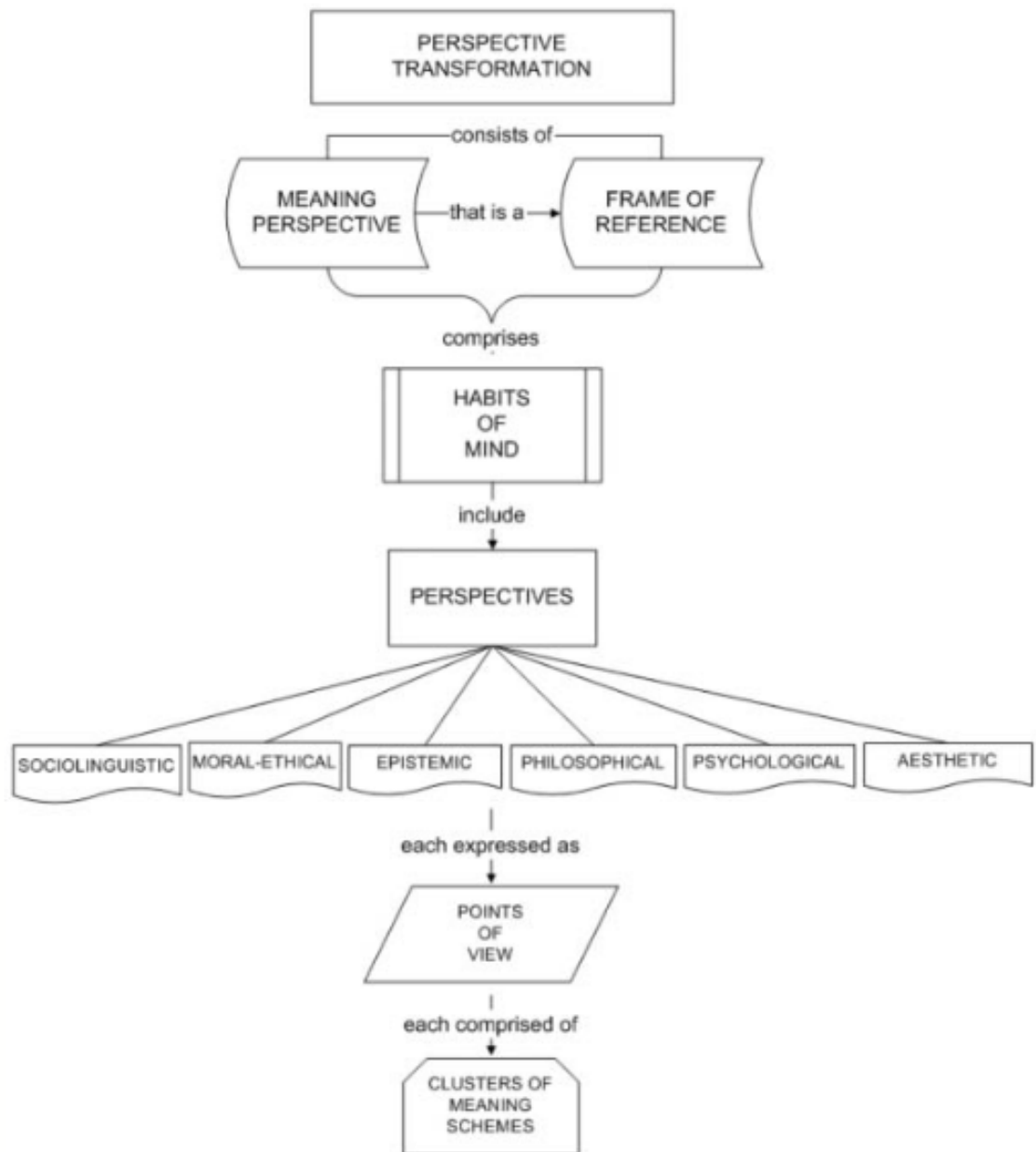
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Steffen, W., Katherine Richardson³, Johan Rockström¹, Sarah E. Cornell¹, Ingo Fetzer¹, Elena M. Bennett⁴, Reinette Biggs^{1,5}, Stephen R. Carpenter⁶, Wim de Vries^{7,8}, Cynthia A. de Wit⁹, Carl Folke^{1,10}, Dieter Gerten¹¹, Jens Heinke¹¹, Mace, G.M., Persson, L.M., Ramanathan, V., Reyers, B., Sverker Sörlin (2015). Planetary boundaries: Guiding human development on a changing planet. *Science* 347(6223) 1259855-1-1259855-10.

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Source: Kitchenham (2008) p. 119, Figure 4: Diagrammatic Representation of Mezirow's (2000) Revised Transformative Learning Theory.

Appendix B: EF Workshop Invitation Email to MQ Staff - This invitation to a professional development EF workshop was sent out to Sustainability Representative Network (for staff) via email.

Dear SRN member,

I am writing to you on behalf of Associate Professor Dr Sandie Sauchet-Pearson and Master of Research student Sarah Prebble, both from the Department of Geography and Planning, Macquarie University, Australia. They are investigating a pilot project entitled 'Ecological footprinting as a tool for facilitating individual change: the effectiveness of transformative sustainability learning for adult education'.

Due to your interest in sustainability, I thought you might be interested in participating in a professional development course they are running as part of this research. This short course focuses on sustainable resource use in the workplace. Participants will be involved in a 6 hour course (morning tea and lunch provided) where they will learn about fun and collaborative ways of using ecological footprinting towards more sustainable resource use in the workplace.

This research is part of a Masters of Research and with your informed consent may include questionnaires, interviews and observation. Your participation is entirely voluntary, you may withdraw at any stage of this research and participation will not have any effect on your employment at Macquarie University, Australia. Please see the information and consent form attached for further information.

If you are interested in participating, I will let the researchers know and they will be in contact via email to answer any questions you may have and discuss the course should you wish to participate.

Please let me know if you do not wish to receive any more communication about this research.

Kind regards,

Sara Rickards
Sustainability Project Manager (Learning and Teaching)
sara.rickards@mq.edu.au
Macquarie Sustainability
9850 4231

Macquarie University
Think before you print.
Please consider the environment before printing this email.

Appendix C: Workshop Outline - Module Objectives and Slides

Introductions - 15-20 mins 1-1.20

Outcomes

- Participants will understand the research aims
- Participants will understand their role in the research
- Participants and facilitator will get to know each other
- Participants will understand the role of ecological footprint within the research

Module 1 - Getting in Touch - 20 mins 1.20-1.40

Outcomes:

- Participants should feel relaxed
- Participants will start building a trusting relationship with each other and the facilitator
- Participants will engage with narratives

Module 2 - Personal EF - 30 mins 1.40-2.10

Outcomes:

- Participants will be able to explain the concept of ecological footprint and it's role in sustainability
- Participants will be able to identify how and what things are measured in EF
- Participants will be able to identify target areas of consumption
- Participants will understand how the EF can be used on different scales
- Participants will understand how to use EF for scenario building and strategy evaluation
- Participants will understand their own EF

Module 3 - Office/Organisation EF - 80 minutes 2.05-3.25

Outcomes:

- Participants will understand their office/organisation ecological footprint
- Participants should feel a deeper connection to their workplace and ecological systems
- Participants will be able to identify major target areas of their office/organisation ecological footprint
- Participants will understand how to use EF for workplace scenario building and strategy evaluation
- Participants will be able to recall successful strategies for EF reduction
- Participants will be able to identify barriers/inhibitors to implementing successful EF strategies

Module 4: Stakeholder Dialogue - 40 mins 3.45-4.25 (small break for a tea/coffee if needed, stretch legs)

Outcomes

- Participants will be able to identify different perspectives and motivators for stakeholders
- Participants develop an understanding of different ways to communicate during dialogue
- Participants will be able to identify social, economic, environmental and temporal considerations of EF reduction strategies
- Participants will be able to discuss different outcomes of implementing EF reduction strategies
- Participants will be able to identify how EF reduction strategies contribute to overall sustainability

Module 5 - The Future Picture - 40 mins - 4.25-5.00pm

Outcomes:

- Participants can imagine and share ideas/images for future scenarios
- Participants understand how their ideas translate into everyday life/habits/routines
- Participants can identify key drivers for change within their workplace
- Participants understand what structures and facilities are available for support in implementing their idea of a more sustainable workplace
- Participants have a variety of ways in which they can engage others in their strategies

Workshop Slides - Footprint calculator images are still and the calculator was interactive.

Slide 1



Slide 2

Introduction

This Research


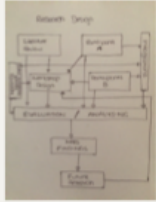
Workshop

- Activities - learning, video, walk
- Journal - writing/drawing
- Photos - phone/ipad
- Info and Consent

Why Ecological Footprinting?

Introductions

- Desired outcomes



Bendley, P. (2017). Could Self-Perception Be Useful in Reframing Learning Priorities for a Post-Carbon World? *Ecological and Community Science Conference of the American Educational Research Association, New Orleans, USA.*

Slide 3



Slide 4




Slide 5



Slide 6

Module Two: Ecological Footprint (EF) - Personal



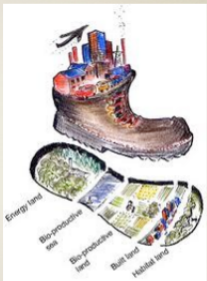
The Ecological Footprint
How fast we consume resources and generate waste

Measures: Energy, Deforestation, Timber & paper, Food & fiber, Footprint

How fast nature can absorb our waste and generate new resources

Components: Carbon footprint, Building land, Forest, Cropland & pasture, Fisheries

Image source: Global Footprint Network



Energy land, Bio-productive soil, Bio-productive land, Built land, Habitat land

Image source: <https://kloontjens.wordpress.com/>

Ecological Overshoot: When humanity's annual demand on ecological systems is greater than the earth's annual capacity to meet that demand.

Module 2

Slide 7

YouTube Video - Mathias Wackernagel (EF creator)

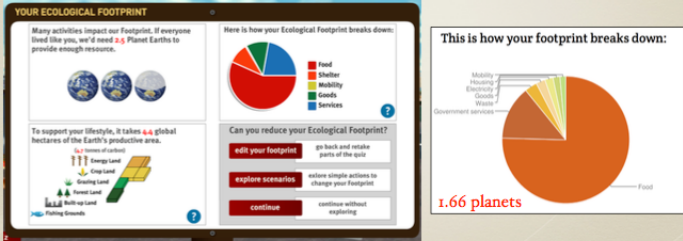
<https://www.youtube.com/watch?v=3M29BY86bP4>

Global: 1.6 planets
Overshoot day 2000-Oct then by 2011-Aug
Australia: 6.25 gha per capita

Slide 8

Calculating Your EF

Global Footprint Network Greencredme



What are your **Target Areas**?

Slide 9

Module Three: Organisation/Office EF

Macquarie University's Sustainability Strategy

One Planet: 2030



Target by 2030: 25% reduction in consumption

- The Footprint Company - actual expenditure and consumption and travel survey data
- Global Hectares: **gha**
- Global Meters Squared / Equivalent Full-Time Occupant: **gm2/EFT**
- Software aims to aid in evaluating, recommending and monitoring sustainability strategies by allowing for future projections and calculating impacts of various scenarios
- Engagement at 3 levels to ensure BAU reductions and future growth and developments do not increase the institution's ecological consumption

Buildings → Faculties → Campus

<http://mq.edu.au/business-and-community/property-and-facilities/office-planet-ecological-footprint/>

Slide 10



Slide 11

EF Calculator Demonstration

Science Faculty and Business and Economics Faculty

Discuss
What is measured?
How can the tool be used?

Slide 12

General Info

> Go to your draft assessments

☐ Incomplete section
☒ Completed section

General Information ✓
Biological Capacity ✓
Energy ✓
Water ✓
Buildings ✓
Non building items ✓
Operational items ✓
Transport ✓
View Results
View Map

General Information
The information you provide in this section is critical to your overall result. It is very important that the information on this page accurately reflects the assessment period. If you get unusual results - check the accuracy of this data first.
The first field has been filled in for you.
You must complete ALL fields on the page prior to clicking NEXT or SAVE for the entered data to be saved.

Project: Business & Economics Faculty STUDENT
Version: B & E 2016 Demonstration
Location: NSW/Non-CBD
Usable Floor Area: 5878 m²
Site Area (in Hectares): 0.6 ha
Academic & support population (FTE): 275
Student population: 10732
Commercial occupant population: 0

< Previous Next > Save

Slide 13

Biocapacity

> Go to your draft assessments

☐ Incomplete section
☒ Completed section

General Information ☒

Biological Capacity ☒

Energy ☒

Water ☒

Buildings ☒

Non building items ☒

Operational items ☒

Transport ☒

View Results

View Map

Biological Capacity

In this section, the net bio-capacity impact associated with your use of land is calculated. It takes into consideration both your on and off-site activities.

Bio-capacity is the capacity of ecosystems to produce useful materials, support organisms and to absorb waste (e.g. carbon dioxide). Bio-capacity is removed through the creation of a building directly but can be lessened through measures on site or "off-set" through additional activities off-site.

You need to have an estimate of your site by activity type (in terms of percentage of the overall site) to complete this section. You will also require the area in Hectares of any off-site activity by type. Refer to the "help" button for further information.

Can't find what you're looking for? Send us an email on: help@footprintcompany.com.au

Development / Protection Activities

The land-use type of the site in %

%

The area (in Hectares) of any off-site, "off-set" activity by type.

ha

Slide 14

Energy

> Go to your draft assessments

☐ Incomplete section
☒ Completed section

General Information ☒

Biological Capacity ☒

Energy ☒

Water ☒

Buildings ☒

Non building items ☒

Operational items ☒

Transport ☒

View Results

View Map

Energy

In this section the ecological footprint associated with your annual energy consumption is calculated. It takes into consideration both the impact and the benefit associated with any embedded generation or 3rd party purchased "off-sets".

Operational energy consumption is a strong focus of many sustainability assessments but it is important to remember that there is a "leakage" effect to your embodied footprint as you increase your operational energy efficiency. This should be a point of focus for your design considerations.

You need to enter your total annual consumption of electricity, gas and other fuels used for stationary energy generation.

Ensure you have your actual or target energy consumption before you start.

Can't find what you're looking for? Send us an email on: help@footprintcompany.com.au

Annual Energy Consumption (Enter 0 if no value)

Total annual grid electricity consumption. kWh / yr

Total annual embedded photovoltaic electricity. kWh / yr

Total annual embedded wind electricity. kWh / yr

Total annual grid or stored gas consumption. MJ / yr

Total electricity exported. kWh / yr

Total Diesel. L

Total LPG. L

Total Bioethanol (sugar). L

Slide 15

Water

> Go to your draft assessments

☐ Incomplete section
☒ Completed section

General Information ☒

Biological Capacity ☒

Energy ☒

Water ☒

Buildings ☒

Non building items ☒

Operational items ☒

Transport ☒

View Results

View Map

Water

In this section the ecological footprint of your annual water consumption is calculated. It takes into consideration both the total amount of water as well as the sources of water from grid or on-site generation.

Operational water conservation is a strong focus in Australia due to the nature of our climate. However, it is important to consider that the ecological impact of water recycling systems is substantially larger than that of many municipal systems. Your priority should be to conservation and avoid use to maximise the ecological and economic efficiency of operational water.

You need to enter your total annual water consumption in kilolitres. Ensure you have your actual or target water consumption before you start.

Can't find what you're looking for? Send us an email on: help@footprintcompany.com.au

Water Consumption

The total annual water demand in kilolitres (kL).

kL/yr

Water Sources

Annual water consumption by source

%

Slide 16

Buildings

> Go to your draft assessments

☐ Incomplete section

☒ Completed section

General Information

Biological Capacity

Energy

Water

Buildings

Non building Items

Operational Items

Transport

View Results

View Map

Buildings

In this section the ecological footprint of all materials required to create your buildings is calculated from the information you provide.

Use the Buildings Approximate section where you do not have an accurate individual assessment. It provides an approximate impact based on benchmark averages.

The Buildings Actual section allows you to input the actual impact of each building which can be obtained from a detailed assessment within one of the base building calculators.

Once a actual assessment has been done for a building, that building needs to be removed from the approximate section to avoid double ups.

Can't find what you're looking for? Send us an email on: help@footprintcompany.com.au

Buildings (By Approximate Estimate Only)

NOTE - to generate entries, click the EDIT button.

Select the building type which best describes your building. Enter the Gross Building Area and the age.

ID#	Description	Impact (Gm ² /m ²)	Reference	Area (m ²)	Age
E4A	Office 8-9 storey rein. conc. w/ curtain wall	148		4443	<25 years
E4B	Office 3 storey conc. OR conc. & block	31		1435	<25 years
	Commercial Office Average fitout (excluding tenant energy)	282		5878	<25 years

Edit

Slide 17

Non-Building Items

> Go to your draft assessments

☐ Incomplete section

☒ Completed section

General Information

Biological Capacity

Energy

Water

Buildings

Non building Items

Operational Items

Transport

View Results

View Map

Non building Items

The ecological footprint of external works, other non-building elements as well as operational capital expenditure will be calculated. This allows you to account for the impact of operational maintenance works. Note that the input units vary so check to make sure you know which one is required.

Refer to the "Input Requirements and Information Sheet" for the information required for each option.

If you do not have an option you must enter "0".

Can't find what you're looking for? Send us an email on: help@footprintcompany.com.au

Other Items

Items by number

N/A or NONE

0

Qty

Add Another

Maintenance and operational capital expenditure

Not applicable or None

0

\$

Add Another

External Works

In this section the impact of civil and inground services capital expenditure and depreciation will be calculated.

Annual depreciation allowance for buildings and infrastructure

0

\$

External capital infrastructure items

Not applicable OR included in FEASIBILITY above

0

m²

Add Another

< Previous

Next >

Save

Slide 18

Operational Items

> Go to your draft assessments

☐ Incomplete section

☒ Completed section

General Information

Biological Capacity

Energy

Water

Buildings

Non building Items

Operational Items

Transport

View Results

View Map

Operational Items

In this section the ecological footprint of your operational consumption will be calculated from the information you provide. It is important that you provide accurate cost information to ensure a useful result.

Can't find what you're looking for? Send us an email on: help@footprintcompany.com.au

IT, Electronic & Scientific Equipment & Appliances

Telephones (incl. mobiles)

10750

\$

Add Another

Paper, Print Services, Publishing & Advertising

Purchased Printed Material

26258

\$

Stationery

95367

\$

Advertising, marketing, promotions

131170

\$

Add Another

Food & Drink

Not applicable

0

\$

Add Another

General consumable items

Furniture - non specific

41044

\$

Pens, pencils, etc.

20291

\$

Add Another

Cleaning & Waste Services

Cleaning services

1095086

\$

General Waste disposal

211885

\$

Add Another

Other

Other operational expenditure

2682153

\$

Postage

28949

\$

Rent hire, leasing fees

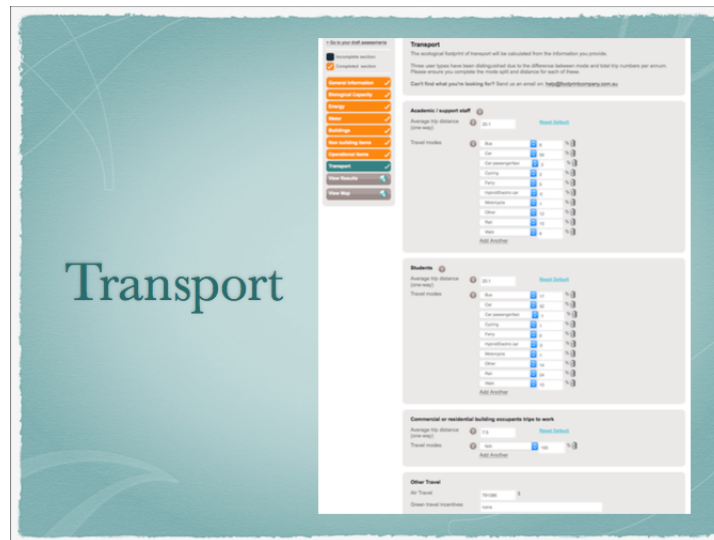
2789590

\$

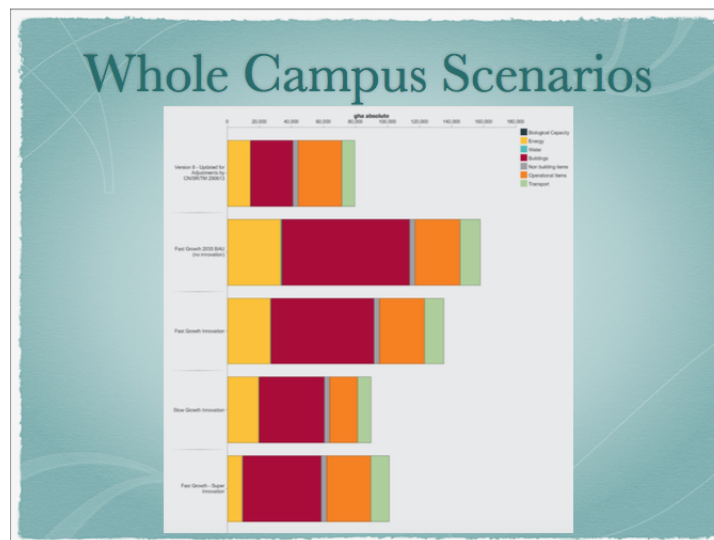
Add Another

101

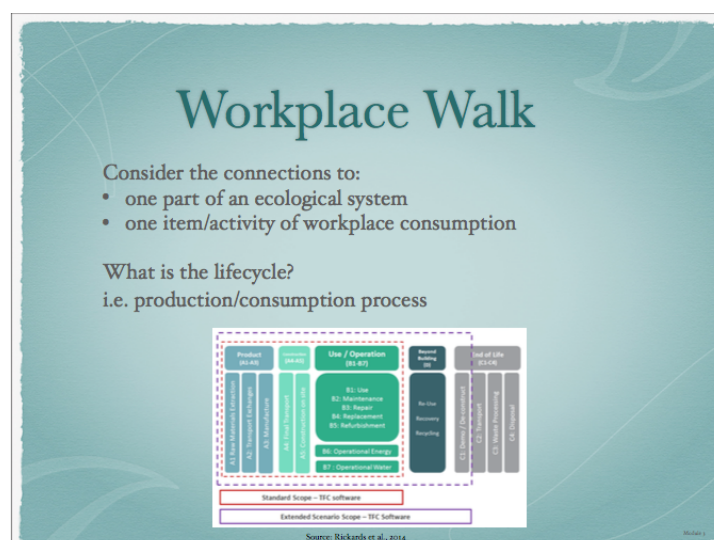
Slide 19



Slide 20



Slide 21



For your own workplace

- Maximum decreased EF (overall)
- Maximum decreased impact of targeted categories (Energy, Water etc)
- Socially Acceptable
- Economically viable
- Functionally viable
- Realistic targets
- Super innovation - considers all of the above

Can also use workplace calculators - e.g. Green office

Your annual Footprint is reported in both Global Acres, a unit of land with average biological productivity, and tons of CO₂, the leading cause of climate change. This allows you to compare your impact against Earth's capacity for renewal and to neutralize your carbon emissions. The best way to diminish your Footprint is through resource conservation, green purchasing, and carbon neutralization.

Your Footprint			
Global Acres	CO ₂	Electrical %	Neutralize Now
58.9 acres	5.1 tons	12% Non-Electricity 88% Electricity	\$127.50

Module Four: Stakeholder Dialogue



Ecological Footprint Representative Committee

Tasked with developing new sustainability strategies to reduce overall EF

- Target areas: transport, operational items, energy
- Organisational goals: education, research, operations
- Groups: academic, operational, administration, students, teachers, volunteers, local community
- Considerations: social, economic, temporal, environmental
- Strategy: outcomes, implementation, monitoring

Small campus, 2 big buildings, 2 small buildings, mostly paved area, parking lot next to uni, trains station 10 mins walk.
Have not tried to implement any strategies yet, assume similar figures to B & E faculty

Image Source: <http://www.carbonfootprint.org/india.php?id=5>

Arts Department - Well-established University

Samantha - Researcher, field work and a hot desk, advocates innovative technologies to enhance research methods, part of book club on campus

Derek - Operations Manager, works 8-6pm from uni but would like to work one day from home, believes in measuring productivity and costs, loves cooking

Charlotte - Undergraduate arts student, major in Interactivity and Games, on campus for access to technologies, loves coffee, fast food

Rafique - Planning Lecturer, works 3 days from uni, 1 at home doing research, loves gardening and playing tennis, working on a new design app

Jasmine - Accounting Assistant, works 4 days a week and volunteers on Saturdays at the uni taking people on guided tours, loves outdoors, doesn't like change

Brandon - member of local business community council, charged with finding ways to engage organisations and build consumer base for local businesses, suspicious of large organisations taking advantages of small business partnerships

Slide 25



Slide 26



Appendix D: Pre- and Post- Workshop Questionnaire

Pre- and Post-workshop questions (same questions)

Personal Questions

1. What is your age?
2. What is your gender?
3. In what geographic area/s did you mainly grow up?
4. What is your educational background (eg Bachelor of Science, Masters of Education, high school, professional development courses etc)?
5. Would you say there is a particular culture (set of beliefs/attitudes/behaviours) that influences you (eg surfer, Australian, Mediterranean, organic lifestyles etc)?
6. If yes, please discuss how you think it influences your relationships with ecological systems?
7. How long have you worked at Macquarie University?
8. What is your current role at Macquarie University?
9. Do you understand the term sustainability?

If answer to 9 was 'yes' - Please describe what sustainability means to you.
10. Do you understand the term ecological footprint?

If answer to 10 was 'yes' - Please share your definition of ecological footprint.
11. On a scale from 0-10, how much do you want to learn more about human-nature connections?
12. On a scale from 0-10, how much would you like to think more about your own connections with ecological systems?
13. On a scale from 0-10, how much do you consider ecological systems when you make personal purchases?
14. On a scale from 0-10, how valuable are ecological systems to you?
15. Please describe (even just a few words) what you feel 'valuable' means.
16. On a scale from 0-10, how connected do you feel to ecological systems?
17. How would you describe ecological systems?

18. How much time do you spend interacting with ecological systems per week (on average)?

19. Would you say you are concerned about the future of ecological systems?

If answer to 19 was 'yes' or 'not sure' - For what reasons are you (potentially) concerned about the future of ecological systems? Please tick all that apply.

For their own value

For the needs of future generations

To be able to meet current human needs (resources and ecosystem services)

Other - please comment in box

These questions relate to your workplace.

20. On a scale from 0-10, how much do you feel like your workplace is a second home (home away from home)?

21. On a scale from 0-10, how much would you say you consider ecological systems when making workplace purchases (incl. items you buy for use at work)?

22. On a scale from 0-10, how much would you say you consider ecological systems when making use of workplace resources?

23. On a scale from 0-10, how much would you say you feel pressure in the workplace to use resources efficiently?

24. On a scale from 0-10, do you feel that you have opportunities in the workplace to make resource decisions?

25. On a scale from 0-10, how supported are you in the workplace to implement resource management solutions?

Post-Workshop Reflection Questions

26. Did you enjoy this workshop. Why or why not?

27. Did this workshop meet your expectations? Why or why not?

28. Please rank the workshop activities in terms of ability to be engaging. 1 being the most engaging, 6 being the least engaging.

Storytelling

Workplace Walk

Stakeholder Dialogue

Photography

Reflective Journal

Ecological Footprint Faculty Calculator

29. Could you please elaborate on your rankings (i.e. photos was engaging as taking photos made me feel even more in touch with ecological systems etc or put don't know if you're not sure).

30. Did any of your views/ideas about ecological systems and/or the use of workplace resources change during the workshop?

Appendix E: Participants A and Participants B Information and Consent Forms

Participants A (experts - theorists and practitioners in the fields of EF, TSL and business/employee engagement) Information and Consent Form



Department of Geography and Planning
Faculty of Arts
MACQUARIE UNIVERSITY NSW 2109

Phone: +61 (02) 9850 8393

Fax: +61 (02) 9850 6053

Email: sandie.suchet@mq.edu.au

**Associate Professor
Sandie Suchet-Pearson**

Participant Information and Consent Form

Ecological footprinting as a tool for facilitating individual change: the effectiveness of transformative sustainability learning for adult education

You are invited to participate in a study of the pedagogy (teaching) of ecological footprinting. Ecological footprinting is a leading measurement tool, allowing an individual, organisation or geographic area to ascertain their demand on nature. The purpose of the study is to explore the teaching of ecological footprinting in order to develop effective pedagogy that facilitates positive life-long resource use behaviour change in individuals in the workplace. A pilot workshop conducted with employees of Macquarie University will be the focus case study of this project.

This research is being conducted by Sarah Prebble (0431 219 787, sarah.prebble@mq.edu.au) to meet the requirements of a Master of Research Geography and Planning, under the supervision of Sandie Suchet-Pearson of the Department of Geography and Planning (02 9850 8393, sandie.suchet@mq.edu.au).

If you decide to participate, you will be asked to answer interview questions via email, or via phone if you should prefer, to collect information on your knowledge and experience in the use of and/or teaching of the ecological footprint or transformational learning. You will have the option to allow/disallow further contact beyond this point. If you choose to allow further contact, you may be invited to attend another interview to expand on your initial responses. At any point you can choose not to answer a question should it make you uncomfortable. No remuneration will be provided for your participation.

Any information or personal details gathered in the course of the study are confidential, except as required by law. No individual will be identified in any publication of the results, unless they wish to be named (see below). The data will be accessible only to the chief researchers listed above and their research assistant. A summary of the results of the data can be made available to you on request by emailing sarah.prebble@mq.edu.au.

Participation in this study is entirely voluntary: you are not obliged to participate and if you decide to participate, you are free to withdraw at any time without having to give a reason and without consequence.

I, *(participant's name)* have read *(or, where appropriate, have had read to me)* and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this research, knowing that I can withdraw from further participation in the research at any time without consequence.

Please only fill out the section below **if you wish to be named** as the interviewee in respect to data collected from your interview, or leave this section blank if you wish to remain anonymous.

I, *(participant's name)* wish to be named as a participant (*participants A*) in this research.

I have been given a copy of this form to keep.

Participant's Name: (Block letters)

Participant's Signature: _____

Date:

Investigator's Name: (Block letters)

Investigator's Signature: _____

Date:

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics (telephone (02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

(INVESTIGATOR'S [OR PARTICIPANT'S] COPY)



**Associate Professor
Sandie Suchet-Pearson**

Department of Geography and Planning
of Arts
MACQUARIE UNIVERSITY NSW 2109

Phone: +61 (02) 9850 8393
Fax: +61 (02) 9850 6053
Email: sandie.suchet@mq.edu.au

Participant Information and Consent Form

Ecological footprinting as a tool for facilitating individual change: the effectiveness of transformative sustainability learning for adult education

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This research is being conducted by Sarah Prebble (0431 219 787, sarah.prebble@mq.edu.au) to meet the requirements of a Master of Research Geography and Planning, under the supervision of Sandie Suchet-Pearson of the Department of Geography and Planning (02 9850 8393, sandie.suchet@mq.edu.au).

If you decide to participate, you will be asked to take part in a workshop at Macquarie University and answer brief pre and post-workshop questionnaires. During the workshop, you will be encouraged to feel free to take photos of your experiences and/or write down thoughts and feelings in a journal. These aspects are entirely voluntary. Your photos and writing can be kept private, can be used to help recall memories during subsequent interviews or can be made partly or wholly available to the researchers at your discretion. During the workshop, the researcher will be making observations of participants specific to this research. There will also be a research assistant present during the workshop making participant observations. Please indicate below whether you consent to these observations being included in the research. After the workshop, you will be asked if you will allow/disallow further contact. If you choose to allow further contact, you may be invited to attend an interview to expand on your responses.

Interviews will take approximately 1 hour and will be audio-recorded to ensure information is correct and used in context for this research. At any point during the interview you can

choose not to answer a question should it make you uncomfortable. No remuneration will be provided for your participation.

Any information or personal details gathered in the course of the study are confidential, except as required by law. No individual will be identified in any publication of the results. The data will be accessible only to the chief researchers listed above and their research assistant. A summary of the results of the data can be made available to you on request by emailing sarah.prebble@mq.edu.au.

Participation in this study is entirely voluntary: you are not obliged to participate and if you decide to participate, you are free to withdraw at any time without having to give a reason and without consequence. Taking part in this research will have no bearing on your employment at Macquarie University. Participation is for the sole purpose of data collection in ensure the research can be successfully utilised to develop a more effective pedagogy of ecological footprinting for adults in the workplace.

I agree to participate in (please tick one or more of the following):

- ☐ pre and post workshop questionnaires
- ☐ participant observation during the workshop
- ☐ personal interview
- ☐ further contact after any one of the above

I, *(participant's name)* have read *(or, where appropriate, have had read to me)* and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this research, knowing that I can withdraw from further participation in the research at any time without consequence.

I have been given a copy of this form to keep.

Participant's Name:
(Block letters)

Participant's Signature: _____

Date:

Investigator's Name:
(Block letters)

Investigator's Signature: _____

Date:

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics (telephone (02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

(INVESTIGATOR'S [OR PARTICIPANT'S] COPY)



MACQUARIE
University

Faculty of Arts Research Office <artsro@mq.edu.au> Wed, Nov 18, 2015 at 3:04 PM

To: Associate Professor Sandie Suchet-Pearson <sandie.suchet@mq.edu.au>

Cc: Faculty of Arts Research Office <artsro@mq.edu.au>, Miss Sarah Prebble <sarah.prebble@students.mq.edu.au>

Ethics Application Ref: (5201500872) - Final Approval

Dear Associate Professor Suchet-Pearson,

Re: ('Ecological footprinting as a tool for facilitating individual change: the effectiveness of transformative sustainability learning for adult education')

Thank you for your recent correspondence. Your response has addressed the issues raised by the Faculty of Arts Human Research Ethics Committee. Approval of the above application has been granted, effective 18th November 2015). This email constitutes ethical approval only.

If you intend to conduct research out of Australia you may require extra insurance and/or local ethics approval. Please contact Maggie Feng, Tax and Insurance Officer from OFS Business Services, on x1683 to advise further.

This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at the following web site:

http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72.pdf.

The following personnel are authorised to conduct this research:

Associate Professor Sandie Suchet-Pearson
Miss Sarah Prebble

NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL EMAIL TO SUBMIT WITH YOUR THESIS.

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).
2. Approval will be for a period of five (5) years subject to the provision of annual reports.

Progress Report 1 Due: 18th November 2016

Progress Report 2 Due: 18th November 2017

Progress Report 3 Due: 18th November 2018

Progress Report 4 Due: 18th November 2019

Final Report Due: 18th November 2020

NB: If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

4. All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University.

This information is available at the following websites:

<http://www.mq.edu.au/policy/>

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will not be informed that you have approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this email.

If you need to provide a hard copy letter of approval to an external organisation as evidence that you have approval, please do not hesitate to contact the Faculty of Arts Research Office at ArtsRO@mq.edu.au

Please retain a copy of this email as this is your official notification of ethics approval.

Yours sincerely

Dr Mianna Lotz
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