

School of Education

**The Paradox of Education for Sustainability (EfS):
An Interpretive Inquiry into Teachers' Engagement with
Sustainability Policy Imperatives in a
Western Australian Primary School**

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Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made. This thesis contains no material that has been accepted for the award of any other degree or diploma in any university.

The research presented and reported in this thesis was conducted in accordance with the National Health and Medical Research Council National Statement on Ethical Conduct in Human Research (2007) – updated March 2014. The proposed research study received human research ethics approval from the Curtin University Human Research Ethics Committee (EC00262), Approval Number SMEC-87-11.

Signature:

Date:20 June 2019.....

Abstract

Education for sustainability (EfS) has emerged as a global focus for schools as a means of ameliorating unsustainable human actions. In Australia, this orientation to education has been evidenced by the development of national policies that have influenced the infusion of sustainability ideas within a new Australian Curriculum as well as the funding of initiatives and programs designed to support schools on their sustainability journey.

However, the research literature identified a gap between the thinking, the policies, the action required to move towards a more sustainable future, and the way schools currently operate in this domain. As such, the consensus amongst sustainability thinkers and practitioners is that education needs to be re-oriented toward a holistic, interdisciplinary, systems approach in order to bring about the profound changes in mindset required. Such change, suggested in much of the contemporary EfS literature, involves an understanding and development of the capacity for action of the interdependence of all four dimensions of sustainability – environmental, political, economic and social/cultural. However, despite support in policy documents and initiatives, sustainability education within the classroom in Australia remains non-mandatory. Rather, schools and teachers largely take up EfS voluntarily within the mandated and assessed components they are increasingly judged against. This research therefore explores this sense of tension between *required* and *desirable* directions for education in order to understand how the system of schooling in Australia affords EfS.

Specifically, this research investigated how teachers at a primary school in Western Australia (WA) engaged with EfS policies, initiatives and programs. The primary focus was on teachers' understanding and interpretation of the concept of sustainability as operationalised within the school context; firstly, by identifying the influences of these and secondly, by identifying how they served as a support for teachers' understanding and interpretation of EfS.

The research context, a pilot school commissioned by the state government, was built along ecological sustainable design principles such that the building reflected strong sustainable principles and incorporated recycled and environmentally friendly materials and functions. The school was intended as a showcase for sustainability

education, therefore had the most propitious conditions for developing a holistic Australian Curriculum focused on sustainability.

In utilising an interpretive ethnographic approach, I conveyed the complexity of the lifeworlds of teachers in relation to their engagement with sustainability. Data were generated through in-depth interviews, observations, reflective journaling and document analysis. Through the concepts of affordance and paradox I drew together understandings of how sustainability was constituted through macro and micro sustainability policy discourse. My findings identified 11 paradoxes that crystallised into three key themes – fragmentation and disorientation, dislocation of affordances, and deep inertia.

My findings show that teachers appeared to have only a partial, or fragmented, view of sustainability which privileged largely local, individual and environmental actions. Moreover, this fragmentation of the concept of sustainability disrupted and disoriented teachers from engaging in those principles and practices of EfS the research literature identifies as being crucial to effective, timely change in our unsustainable actions. These difficulties in adopting EfS – in a holistic, transformative sense – in the school was indicative of the malaise of both deep inertia and the hegemonic practices of schooling which plagues the educational system(s) in Australia. That is, the policies and programs shaping teacher and school practice appear to afford EfS yet, in effect, they work as, what I have termed, an active ‘counter affordance’. Thus, there are affordances in these policies and programs but these dislocate EfS, and instead usurp ‘education’ into narrow, reductionist, neoliberal ‘schooling’.

My findings contribute to a greater understanding of the need to interrogate and challenge the way sustainability is presented in the Australian Curriculum and the subsequent enactment of this as EfS in WA schools. These findings support the recommendation that EfS in our schools shift from a largely environmental, local approach with a focus on individual actions, to one that is representative of a holistic, transformative and systemic view of sustainability which draws upon the interdependent dimensions of environmental, economic, social/cultural and political issues and understandings.

Given the severity and urgency for a response to global social, economic, political, environmental and cultural issues, this research is timely as it offers an analysis that assists schools, policy makers and curriculum developers to re-view and re-calibrate the direction for education in WA.

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Finally, a most heartfelt thank you to Dr Paul Gardner for having confidence in my abilities, in the many times when I did not.

Dedication

I dedicate this thesis to my mother, Stella. A star that still burns brightly in all our lives, and will do so forever.

To my father, who always valued education, and whose own education, like my mother's, was interrupted by war. The words in this thesis are a symbol of the determination and hope that you both carried throughout your lives, and that I seek to pass on to the next generation.

Za moju dicu, Tanja, Jordan, Daniel i Matt, i za svi Mateljci!

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Glossary

ACARA	Australian Curriculum Assessment and Reporting Authority
AESA	Australian Education for Sustainability Alliance
AIR	Artist in residence
ARC	Australian Research Council
AuSSI	Australian Sustainable Schools Initiative
BMS	Building management system
CCP	Cross-curriculum priority
DEH	Department of Environment and Heritage
DETTWA	Department of Education in Western Australia
DEWHA	Department of the Environment, Water, Heritage and the Arts
EE	Environmental education
EfS	Education for sustainability
ESD	Education for sustainable development
GAP	Global Action Program
HaSS	Humanities and social sciences
MCEEDYA	Ministerial Council for Education, Early Childhood, Development and Youth Affairs
MCEETYA	Ministerial Council on Education, Employment, Training and Youth Affairs
OECD	Organisation for Economic Co-operation and Development
PCK	Pedagogical content knowledge
PL	Professional learning
PS	Primary school
SAKGP	Stephanie Alexander Kitchen Garden Program
SOI	Sustainability organising ideas
S&E	Society and environment
SS-WA	Sustainable Schools Western Australia
UK	United Kingdom
UN	United Nations
UNDESD	United Nations of a Decade for Education for Sustainable Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNHCR	United Nations High Commission for Refugees
USA	United States of America
WA	Western Australia/n
WAMSE	Western Australian Monitoring Standards in Education
WCED	World Commission on Environment and Development

Prologue

I begin this thesis by taking us back to 29 June 2000 when over 6000 organisations, including governments, agreed to what has become an international declaration – the Earth Charter (the Charter). Like the United Nation’s (UN) Universal Declaration of Human Rights, the Charter is not legally binding but serves as a ‘soft law’, ethical framework supporting the development of a “just, sustainable and peaceful global society in the 21st Century” (Earth Charter Initiative, n.d. para. 1).

The Charter framed global environmental, social and cultural, political and economic concerns and cited that the solution to these problems was to approach them holistically and systemically. These are the same concerns we now consider under the umbrella of sustainability.

Indeed, as the Charter shows, we have understood for many years now that the transition to a more sustainable way of living on this planet requires an acknowledgement of the interdependence and indivisibility of issues concerning ecology, poverty, equity, human rights, democracy and peace. The Charter’s preamble, replicated below, was a rallying cry to action for all the world’s people and their governments to effect change (Earth Charter Commission, 2000):

We stand at a critical moment in Earth’s history, a time when humanity must choose its future. As the world becomes increasingly interdependent and fragile, the future at once holds great peril and great promise. To move forward we must recognize that in the midst of a magnificent diversity of cultures and life forms we are one human family and one Earth community with a common destiny. We must join together to bring forth a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace. Towards this end, it is imperative that we, the peoples of Earth, declare our responsibility to one another, to the greater community of life, and to future generations.

Yet today, nearly 2 decades later, we find ourselves lamenting over more of the same concerns and, as I outline in Chapter One, these have escalated into global crises in many instances. Once again, we look to education to ameliorate the issues facing

humanity, as we did through the UN Decade of Sustainable Development (McKeown & Day, 2015), that was to reorient education towards sustainability. The fact that despite such a global imperative for education, we find ourselves still in the midst of such crises, should lead us to contemplate the kind of education that we may need. In this study, I suggest that we re-turn and re-view education and, in particular, what is done in schools in the name of an education that purportedly has the concept of sustainability at its centre.

Chapter One: Introduction

Overview

This chapter begins with an exploration of the reason sustainability has increasingly become a concept of great significance, not only to me personally, but to the world at large. I begin by outlining my rationale, through which I lay out the historical and philosophical groundwork for the discussion to follow across the thesis chapters. In this rationale I include an initial discussion of education as a means to achieving a sustainable society, as well as an outline of implementation of sustainability in both policy and practice. I then include my aims and research questions in order to further delineate my research. This is followed by a brief overview of the methodology used within the study, and an outline of the significance of the study. The chapter concludes with an overview of the structure of the thesis.

Rationale behind the study

There is no greater existential global threat than continuing our collective current course of action. A growing consensus of opinion considers these actions are not sustainable and require urgent systemic responses to prevent catastrophe for the world as we know it. Throughout 2018 this was evidenced by a number of alarming realisations that monumental shifts were occurring across the globe relating to a number of issues including the environment – specifically climate change and the rise of extinctions – and the interrelated social and cultural, political and economic crises that have resulted in conflict, widespread poverty and mass migration of refugees.

For example, the aid organisation the UN High Commission for Refugees (UNHCR) (2018) estimates that the world now has 68.5 million people who have been forcibly displaced. Of these, 25.4 million are refugees and over half of those are under the age of 18. An estimated 10 million are stateless and have no access to basic human rights, including education. The news headlines, as illustrated in Figure 1.1, shouted the issues loud and clear.

ABC NEWS AUSTRALIA
www.abc.net.au 30 October, 2018

More than half the world's vertebrates have disappeared since 1970; WWF sounds warning

“The number of vertebrate animals in the world has halved since 1970 and there are few signs we are slowing the trend, the World Wildlife Fund (WWF) has warned.

Populations of vertebrates — including African elephants, Sumatran tigers, and Australian species like the spotted-tailed quoll — have declined by an average of nearly 60 per cent globally in the past 40 years.

That's according to the WWF's latest Living Planet Report, published every two years as an update on the state of the environment.”

(ABC News Australia; 30 October, 2018; <https://www.abc.net.au/news/science/2018-10-30/wwf-species-loss-living-planet/10434956>)

REUTERS NEWS
www.reuters.com 12 September, 2018

World hunger levels rise for third year running: U.N.

“World hunger rose in 2017 for a third consecutive year, fuelled by conflict and climate change, the United Nations warned on Tuesday, jeopardising a global goal to end the scourge by 2030. In addition to conflict and violence in many parts of the world, the gains made in ending hunger and malnutrition are being eroded by climate variability and exposure to more complex, frequent and intense climate extremes.”

(Reuters News, 12 September, 2018; <https://www.reuters.com/article/us-global-un-hunger/world-hunger-levels-rise-for-third-year-running-u-n-idUSKCN1L50J5>)

THE INDEPENDENT
www.independent.co.uk 8 October, 2018

We have 12 years to act on climate change before the world as we know it is lost. How much more urgent can it get?

“Twelve years. According to climate scientists, that’s how long until we hit the 1.5C tipping point if we carry on as we are.

Such a shift in our planetary temperature will imperil not only low-lying areas because of the increased risk of floods, but will have consequences for all of us – not least due to the necessary migration of millions of people away from areas that become uninhabitable.

Coral reefs will vanish; many ancient trees will not survive; extreme weather events will become ever more common. The Intergovernmental Panel on Climate Change paints a bleak picture.”

(The Independent, 8 October, 2018; <https://www.independent.co.uk/voices/climate-change-ipcc-environment-paris-agreement-global-warming-a8573811.html>)

THE GUARDIAN
www.theguardian.com 4 March 2018

Why is the world at war?: Syria, the Democratic Republic of Congo, Yemen, Afghanistan, Ukraine – the globe is scarred by violence.

“We live in a world of trouble... We remain deeply anxious. We can blame terrorism and the fear it inspires despite the statistically unimportant number of casualties it inflicts, or the contemporary media and the breathless cycle of “breaking news”, but the truth remains that the wars that seem to inspire the fanatics or have produced so many headlines in recent years prompt deep anxiety. One reason is that these wars appear to have no end in sight.”

(The Guardian, 4 March 2018. <https://www.theguardian.com/world/2018/mar/04/why-is-world-at-war-syria-democratic-republic-congo-yemen-afghanistan-ukraine>)

Figure 1.1: News headlines from 2018

These issues – as well as others such as violence, racism, misogyny, modern slavery, corporate corruption, and governments bordering on fascism – appear to be escalating, not abating, with each progressive year. We are at the precipice of precarity in an epoch that has become known as the Anthropocene (Steffen, Crutzen, & McNeill, 2007). This means that for the first time in history, humans, more than any other factor on Earth, have affected gross and enduring destruction, thereby ensuing chaos across every sphere of the planet with little regard for either human or non-human elements. Indeed, the scale of our reach as humans is unprecedented in the history of humankind.

As such, it is very clear that our ways of being on the planet are increasingly unsustainable, and the need to act to stem these actions has never been more urgent. We therefore are impelled to search for ways to move towards a more sustainable mode of existence. A growing consensus of opinion is therefore calling for an urgent systemic and sustainable response to prevent a catastrophe for the world as we know it. In this study I will argue that one way to tackle these issues is through education.

Education as a means to achieving a sustainable society

As outlined above, in response to this maelstrom of crises, much attention turned to solutions that presented education as the locus of influence for the solution(s). A watershed moment for this new way of thinking internationally was the declaration by the UN of a Decade for Education for Sustainable Development (UNDESD) which aimed to firmly entwine education with sustainability on a global scale. It is important to note here that ‘education for sustainable development’ or ESD is the preferred term in many countries; however, Australia has adopted ‘education for sustainability’, EfS. The differences between the two are much debated and are discussed in greater detail in the review of literature in Chapter Two.

The UNDESD ran from 2005 to 2014 and was guided by the principle that the catalytic power of over 60 million teachers across the globe, at all levels of education – early years, primary, secondary and tertiary – would be able to reorient the education system. As such, teachers were envisaged to be the potential change agents utilising the multiplier effect of their influence on students (Chambers, 2009; Woolterton, 2003).

In addition, in 2018, UNESCO, the UN’s Educational, Scientific and Cultural Organization, declared education as their top priority “to build peace and drive sustainable development”. Similarly, the Organisation for Economic Co-operation and Development’s (OECD) *Future of education and skills: Education 2030* report again placed education as a central and essential factor to confront the growing array of compound societal problems (Organisation for Economic Co-operation and Development [OECD] 2018). The report offered a vision of the skills that those entering school in 2018 would need by 2030 due to a rapidly changing and “increasingly volatile, uncertain, complex and ambiguous world” (OECD, 2018, p. 3). Through these policy frameworks, teachers and schools have been positioned as central drivers to a more sustainable future.

Over the last few decades, there has also been a growing movement to address some of these global issues on a national level. Across the globe many whole-school educational programs have been developed to promote understanding and action in support of sustainable outcomes. For example, over 50 countries have become part of the Eco-Schools network (Boeve-de Pauw & Van Petegem, 2011). England has developed the National Framework for Sustainable Schools that is encouraging schools to become involved in a number of sustainability initiatives, including the Eco-Schools network (Department of Children, Families and Communities [DCFC], 2008). In Sweden there is the Green School Award program (Henderson & Tilbury, 2004), Canada has the Evergreen program (Evergreen, 2000), China involves their schools in the Green School Project (Williams, 2009) and the Enviroschools program runs in New Zealand (Enviroschools, 2018).

Australia also responded to these international calls, formulating a number of policy documents that not only affirmed the commitment of the Australian federal government to EfS (Department of the Environment, Water, Heritage and the Arts [DEWHA] 2009a, 2009b), but also provide funding for associated programs such as the Australian Sustainable Schools Initiative (AuSSI) and the Stephanie Alexander Kitchen Garden Program (SAKGP). Education in Australia appeared to be heralding a new progressive era of inclusion and success for all. In 2008 the nationwide Melbourne Declaration on Educational Goals for Young Australians (Ministerial Council on Education, Employment, Training and Youth Affairs [MCEETYA] 2008) set the agenda for schooling across Australia. From this impetus, in 2012 the first ever national Australian Curriculum was introduced. This demonstrated a willingness to support the ideals of sustainability through the weaving of a Sustainability cross-curriculum priority (CCP) across learning areas and year levels. However, despite its apparent support in policy documents and initiatives, sustainability education within the classroom in Australia remains non-mandatory. Schools and teachers largely take up EfS voluntarily, juggling its inclusion into their students' school lives and the professional 'lifeworlds' they inhabit alongside the mandated and assessed components they are increasingly judged against. There is this sense of a tension between *required* and *desirable* directions for education that I felt warranted further exploration and which was the initial catalyst for this research.

Indeed, despite the apparent flurry of globally-led action that accompanied the UNDESD, upon reflection it has become evident that the change anticipated as a result of education related to sustainability has not transpired (Huckle & Wals, 2015; Jickling & Sterling, 2017; Malone & Somerville, 2015; McKeown, 2015; Sterling, 2014). As a result, here have been subsequent efforts to scale up both EfS and ESD actions through UNESCO's Global Action Program (GAP) and more recently through UNESCO's 2030 Sustainable Development Agenda (UNESCO, 2018). For example, UNESCO's 17 sustainable development goals, of which education is identified as a central force, have been specifically designed as an accelerant to reorient education in support of a "sustainable and resilient world" (UNESCO, 2018, foreword).

This lack of real progress in EfS has brought to the forefront questions about whether the educational approach in Australia is the most efficacious one, and whether any progress now will be implemented in time to avert disaster. I hasten to add here that my belief is that education cannot, nor should it, tackle the issues related to sustainability alone. It would be foolhardy to believe that our only response to the crises facing us is to wait for the tranche of sustainability-conscious citizenry to graduate from schools and universities, and then enact the changes required. Sustainability, or more correctly 'unsustainability', is now recognised as a complex, "super wicked problem" (Peters, (2017, p. 388) that indicates it not only has multiple causes and requires multiple solutions on all fronts, as with the traditional understanding of "wicked problems" (Murphy, 2012), but also has additional characteristics. Peters (2017, p. 388) suggests the "super wicked problems" also have the defining characteristics of:

- The notion of 'time running out'. The idea that irreversible damage will occur unless significant action is taken now.
- Who to blame. That is, those that are causing the problem are charged with solving it. There is also the conundrum that the most educated are in fact the ones causing the most damage.
- A lack of mandated direction. There is no coherent approach or a very weak authority designated to manage the problem. Sustainability policy frameworks largely steer at a distance and do not have any real mandate for change.

- A focus on the short-term only. There is a realisation that short-term and/or ad hoc solutions are inadequate and are too small in scale. Change can only occur through comprehensive, large-scale and long-term actions.

As such, there has also been much discussion in the research literature that confirms it is not just education but education of a particular kind that will make the difference (Nolet, 2009; Orr, 2004; Sterling, 2011; Wals, 2010b). Over time, there has been a transition in understanding that what is needed is significantly more than what was previously conceptualised under the term of environmental education (EE). Sterling (2004, 2011) and others have categorised approaches to the inclusion of sustainability within education as either being education *about* sustainability, education *for* sustainability or education *as* sustainability. Education *for* sustainability has become widely known in the literature as EfS, and this is the term I have adopted throughout the thesis to reflect its common usage in Australia.

What EfS proponents suggest is that, as well as knowledge- and awareness-raising, such an approach reforms existing curricula and pedagogy. The need for change of the current situation is acknowledged but the assumption, as with the previous one, is that shifts to how we live can be achieved over time without changing underlying economic, social and political structures (Hopwood, Mellor, & O'Brien, 2005; Sterling, 2003). There is also some agreement that many of the dominant approaches to sustainability mirror this reformist, EfS approach (Clifton, 2010b; Robinson, 2004; Sterling, 2011).

However, the danger, as expressed in the literature, is that whilst a change in mindset and worldviews is espoused as necessary, there is a great deal of inertia bound with monolithic, traditional and hegemonic practices that needs to be overcome. Within this study this became evident as despite EfS policies and programs being an affordance to developing capacity and action competence, with a resulting change of both behaviour and practice, there were counter affordances that prevented its realisation. Teachers in this study, caught in the competing demands of the hegemonic neoliberal demands of the Australian education system and the desire to move towards new ways of thinking and being as espoused by EfS, were caught in paradoxical situations. To resolve this, Sterling (2003, 2014) proposed that we need to now think beyond EfS and move to a new phase of education *as* sustainability. This phase would see education undergo an

epistemic shift that would result in a total restructuring and design to reflect an ecological worldview. The goal of education would be to transform the world as we know it by “inspiring different sets of values and practices” (Sterling, 2011, p. 23).

What is evident here is that underlying each of these three approaches – education *about* sustainability, education *for* sustainability or education *as* sustainability – is a very different answer to the question ‘What is education for?’ It is this fundamental question that I believe needs to be reasserted in order to re-view (as in to look at anew with the intent to make changes) education and recalibrate the mechanisms of EfS that are guiding us. In this thesis I reason that we have lost sight of why we are engaged in ‘education’, but rather we seem to be too beguiled by the machinations of ‘schooling’ to even notice which direction we are headed and why. The way forward appears self-evident – what is required is a paradigm shift where current ways of thinking and existing mechanistic, reductionist, and instrumentalist worldviews are challenged and superseded with a holistic, transformative, systemic, ecological view (see Table 3.2).

EfS – the dichotomy between policy and practice

Ideas have percolated in the literature for some time about the kind of education that is actually required to make wholesale changes in society to ensure a sustainable future. It has been made clear that the kind of education proposed by EfS or ESD is markedly different to what schools traditionally have engaged in. But the evidence from schools shows there is still a fundamental uncertainty about what sustainability actually means and what it means to ‘do’ EfS as the policy frameworks commend them to. There has been a paucity of literature that has interrogated the basis of policy and curriculum frameworks that are designed to guide teachers. Sterling, Dawson and Warwick (2018) suggest more attention needs to be paid to examining not only discourses of sustainability education but the paradigmatic foundations of these in order to effect change. This is where I have positioned my study, following the trajectory from sustainability policy to practice, unearthing and re-turning, as in the Baradian (2007) sense, our assumptions and interpretations.

Indeed, the research literature I reviewed supported the idea that sustainability and EfS are not easy to grasp and operationalise in school context as they are complex and contested concepts. Nevertheless, whilst there are no agreed definitions, there are many commonalities expressed through general principles and philosophical stances

that epitomise the field (see Chapter Two, p.37-38 for elaborations of these). However, this kind of discussion is often beyond the reach of the average classroom teacher as it is discussed quite esoterically. Teachers in schools have busy, and increasingly pressured, professional roles and are required to make sense of, interpret and operationalise multiple, competing and often contradictory imperatives all at once. The lack of specificity of definitions leads to a wide variety of ways schools conceptualise sustainability and address in the school context.

The way sustainability is interpreted within a school context is of great significance as it is this which will undoubtedly impact student engagement with these ideas and the corresponding knowledge, values and dispositions they may develop. Yet, surprisingly, there have been very few studies that have addressed how sustainability as a concept is understood by teachers, nor how they interpreted such an understanding within the practices of their school. Furthermore, my examination of the literature has identified a very small number of studies – either internationally or in Australia – that focus specifically on primary schools (Lewis, 2012; Littledyke, Taylor, & Eames, 2009; Salter, 2013) and fewer still that focus on teachers' voices and ideas about sustainability (Chalmers, 2011; Evans, Whitehouse, & Gooch, 2012).

Furthermore, the literature that has considered what characteristics and aspects need to be considered in terms of sustainability has long held the idea that this can be broken down into three concurrent dimensions – the environmental, the social/cultural and the economic. However, there is an ever growing number of sustainability researchers that have drawn attention to the political as the fourth, integral dimension of sustainability (Ferreira, Ryan, & Tilbury, 2007a; Fien, 2001; Huckle, 2006; Taylor, Quinn, & Eames, 2015; UNESCO, 2005). What the research literature does indicate is that teachers, at all levels of education, do not have a holistic understanding of sustainability. Instead, the literature argues that teachers most frequent associate sustainability with just the environmental and social dimensions and, to a lesser extent, the economic dimensions of sustainability (Flogaitis, Daskolia, & Agelidou, 2005; Inoue, Gorman, & Davis, 2016; Siraj-Blatchford & Pramling-Samuelsson, 2016). Very few studies show teachers understand sustainability as representing an interconnected relationship of these dimensions. Fewer still indicate that teachers in schools are aware of, or

acknowledge, the political dimension of sustainability (Ärlemalm-Hagsér & Davis, 2014).

However, despite these findings, within such studies there appears to be an unquestioning assumption that policies and programs that have sustainability as their central principle are guiding teachers to a holistic understanding of sustainability where transformation of society is the goal. What I think is missing in these studies – and which has therefore resulted in a different outcome – is an interrogation of the policy influences themselves. I was cognisant that teachers in WA have no direct policy guidance that mandates their engagement with EfS. Teachers in schools can either refer to the ‘quasi policy’ that is the non-compulsory and non-assessed Sustainability CCP statements and sustainability organising ideas (SOI) embedded within the Australian Curriculum and/or the ‘suggested policy’ in the form of the information provided and gleaned from the school’s engagement with AuSSI’s national and WA programs (Sustainable Schools Western Australia, SS-WA) and with SAKGP.

Through this research I take up these ‘gaps’ by investigating the conceptualisation of sustainability that is actually presented to teachers through EfS policies and initiatives and how these support teachers in their understanding and interpretation of sustainability. Since teachers and schools have been identified as having the central and crucial role in promoting sustainability pedagogical content knowledge (PCK), understanding and action, research into their own understandings of sustainability is timely and paramount. These identified gaps in the research evidence have informed the aims and specific questions for this study. I wanted to know what teachers understood by sustainability and how this was reflected in their practice of EfS, and, in addition, how they arrived at such an understanding.

Context of the study

To investigate these interpretations and demonstrations of both sustainability, and of EfS, I chose as the site of my research a school that presents a unique combination of being the only school architecturally designed along ecological sustainable design principles in WA and of also having a strong foundational sustainability ethos. This school, Amity PS (a pseudonym), was the first of its kind in WA and remains the only one of its kind to this day. The state government commissioned the building of this

school as a pilot in 2004 as a showcase for sustainability education not only in building design but also in sustainability curriculum. It is purpose-designed and built to reflect strong sustainable principles incorporating such aspects as the orientation of the buildings to maximise solar passivity and the use of recycled and environmentally friendly materials. Another reason for such a school to be built is that it is on the edge of a natural wetland and is within one of the first Green Smart suburban residential developments in WA, meaning that the school design and ethos need to be sympathetic to the surrounding community. Part of the Green Smart requirements were expectations by the local council that all residents comply with their planning laws when building their homes to ensure buildings embody environmentally responsible principles. For example, they need to ensure greywater reuse facilities are installed and that they are designed according to solar passive principles to maximise energy efficiency and minimise environmental impact.

Amity PS has an enrolment of approximately 600 students ranging from Kindergarten (4-year-olds) to Year 6 (11-year-olds). It employs 48 teaching staff and, whilst the first staff appointees were not necessarily selected on the basis of their knowledge of sustainability, this soon became a requirement over time. The school is showcased as an exemplar of EfS on the Department of Education in Western Australia (DEW) website (website withheld to preserve anonymity of the school).

Aims and research questions

This thesis aimed to investigate the interpretations and narratives that were being shaped around this burgeoning concept of sustainability in a school context. In particular, I wanted to examine how schools were making sense of the various ‘policy’ imperatives intended to guide their implementation of EfS.

The intent of my questions was to come to a knowing of how teachers dwelt amongst/within the various EfS policies and how they wove these into the lifeworld of their schools and professional lives. In particular I wanted to journey through the narratives and discourses operating that shaped and formed how ‘sustainability’ was constructed and viewed by teachers.

My overall research aim was to understand how the current system of schooling in Australia affords EfS. Specifically, the research questions of the study were:

1. What do teachers understand by, and how do they interpret, sustainability?
2. What conceptualisation of sustainability is presented in EfS initiatives and policies?
3. How are teachers supported in their understanding and interpretation of EfS?

Methodology

As the goal of my research was to find out how teachers understood and interpreted EfS initiatives directed at them by policy makers, the interpretive paradigm was an appropriate lens to adopt. This approach recognises that it is through observation and interpretation that the social world can be understood. According to Denzin and Lincoln (1998, p. 194):

Interpretivism is the larger philosophical frame for the methodological tenets of constructivism... Constructivism is a philosophical perspective interested in the ways in which human beings individually and collectively interpret or construct the social and psychological world in specific linguistic, social and historical contexts.

My research sought to more fully understand the context of a purpose-built sustainable school and the people within it. In this way it was about making sense of the *situatedness* of about EfS. By speaking to the teachers and staff at the school and asking them to elaborate on their ideas, I sought to discover what ‘they’ thought rather than what the literature told me ‘should’ be the way to think about it. It is this aspect that is hardest to ascertain by means other than discussion, interview, relationship building, and observation, which are methods integral to ethnography. Lindlof and Taylor (2002) state that the researcher becomes the research instrument and as such must develop intimate familiarity within the group being studied, along with reflexivity, in order to, as accurately as possible, interpret the meanings of the group. My immersion in the school site for over 12 months was therefore critical as it enabled me to gain a sense of the staff’s shared beliefs and values of the school culture and its relationship to EfS.

In this ethnographic research I employed qualitative methods to gather data. These included naturalistic observation recorded in fieldwork journals, in-depth interviews and documentary analysis.

Significance of the study

This research is significant as it addresses the global priority of sustainability. EfS is signalled as a crucial priority by the UN to address the complex, intractable environmental, social and cultural, economic and political problems facing the world today. There is a growing sense of urgency in many countries for educators at all levels to engage with the ideas and principles of sustainability to enable and empower a new generation with the knowledge, skills and dispositions to ensure our futures.

Despite policy initiatives such as *Living sustainably: the Australian government's national action plan for education for sustainability* (Department for Environment, Water, Heritage and the Arts [DEWHA] 2009b), curriculum development in the form of the Sustainability Curriculum Framework (DEWHA, 2010c), and a Sustainability CCP, woven throughout the Australian Curriculum (Australian Curriculum Assessment and Reporting Authority [ACARA], 2010) as well as program initiatives such as AuSSI (DEWHA, 2010a) and SAKGP, the change is slow and incremental. This should be a cause for concern, yet there is a lethargy with regards to sustainability policies in our schools, or worse still, a denial. The time left to make the changes required to avoid imminent catastrophe, we are advised through successive environmental reports and media statements, is very limited. However, in Australia, the election of a conservative federal government in 2013 saw a shelving of those above mentioned government policies, and there has been no policy directive related to sustainability and education produced nationally since that date. Similarly, AuSSI is no longer funded nationally. You can almost hear the crickets chirping across Australia – it is a situation that is the antithesis of where we need to be right now.

Thus, it is a timely imperative for this research as a means to re-awaken discussion and debate about what is happening in schools in relation to sustainability. My research may be the impetus to start a national conversation through its examination of whether the conceptualisations that are promoted by Australian policies and programs are those that are indeed going to engender the rapid and comprehensive change that is required. This study will contribute to the field of EfS research as there is very little documented material to examine how teachers conceptualise sustainability within a primary school context. Although there have been previous studies examining particular programs,

such as AuSSI, in primary schools in WA, these studies have been largely about the effectiveness of the adoption of the formal outcomes of such programs.

Instead, this study is positioned beyond such ‘evaluations’ of programs and instead seeks to examine understandings of sustainability that teachers derive from various policy influences. By examining the key policy documents – from those that are ‘mandated’ such as the Australian Curriculum, to those that are ‘suggested’ such as the Sustainability CCP statements and SOI embedded within the Australian Curriculum, to the documentation associated with both AuSSI’s national and WA programs (SS-WA) and the SAKGP – my research in this thesis is able to critique how these contribute to teachers’ understanding of sustainability. Therefore, my findings are of potential interest to policy makers and curriculum developers worldwide who seek to adopt EfS within their education systems.

In particular, my research will be informative for the body charged with the development and renewal of the Australian Curriculum, ACARA. Their remit has been to develop a futures-focused Curriculum to prepare our students for the 21st century and beyond – my analysis of the Australian Curriculum may assist with the redesign and redevelopment of future iterations. I note that, as a response to the needs of the community and educators, ACARA has recently produced additional guidance and materials for one of their other CCPs – Aboriginal and Torres Strait Islander Histories and Cultures (ACARA, 2018). In much the same way, I would hope that my findings would form part of a re-view of how sustainability is dealt with within the Australian Curriculum.

This research also has particular significance because of the unique characteristics of the research site, Amity PS. The school represents a unique research context in that it was purpose-built according to ecological sustainable design principles and has a publicly espoused sustainability ethos that guides its practices. There is no other school that has these characteristics in WA and thus it provides an unparalleled opportunity to observe and analyse practices and understandings within a context that has been specifically constructed to embody EfS.

This study has personal significance for me. All my life I have had a close connection to the environment, as my parents, migrants from Croatia, were viticulturists and

farmers, and my father was also a fisherman. This was not only our source of livelihood – being close to, and caring for, the Earth was also our collective greatest joy. Through this research I have become very aware of how this upbringing has influenced my approach to education when I taught in primary schools and now as a teacher educator at university. Having first-hand visceral knowledge of the cycles of life, I grew into the understanding of the mutual reciprocity between all living and non-living beings. My childhood was filled with listening to stories of war, poverty, political persecution, displacement, immigration, racism, gender discrimination and exclusion. I saw my parents live much of this in reality in their new life in Australia but this was also countered by the warmth, generosity and kindness of others in their new community. Not only has this background engendered a respect for the environment, in the broadest sense of the word, but has additionally made me more aware of the injustices that many people face throughout the world and how the new world order of globalisation and neoliberalism has blinded us to our shared humanity.

I become saddened when I read educational policy documents whose primary focus is to reduce teaching and learning to a utilitarian, reductionist activity that denies the worth of not only the teacher as professional, but also denies the prospects of all that pass through such a system the opportunity to ‘flourish’ as human beings. Instead, the Curriculum is narrowed and we hurtle down the rigid, age ordered pathway of instruction to prepare ‘work-ready citizens’ who are there to serve the needs of the state. Humans are reduced to economic fodder and political pawns. As an educator, I have always believed in the wider enterprise of ‘education’ rather than ‘schooling’ that has come to dominate in Australia. By ‘education’, I mean this in the liberal, progressive sense, where it is of benefit to not only the individual but also the world at large. I am particularly taken with the definition proposed by Kemmis et al. (2014b, p. 26):

... education, properly speaking, is the process by which children, young people and adults are initiated into forms of understanding, modes of action, and ways of relating to one another and the world, that foster (respectively) individual and collective self-expression, individual and collective self-development and individual and collective self-determination, and that we are,

in these senses, oriented towards the good for each person and the good for humankind.

All of this is what has drawn me to research such a significant potentiality, sustainability in education. My work is premised on the unwavering belief and confidence in teachers' ability and commitment to pursuing education for the collective good by steadfastly and untiringly transmuting the neoliberal economic deterministic dominant paradigm.

This research has demonstrated the tensions and paradoxes faced by teachers every day in their professional lifeworlds. I decided that my work should speak out on behalf of teachers who are much put upon and bear the brunt of blame for things that are often well beyond their control. My desire is to be an advocate for all teachers who have been caught up in this well-meaning move to EfS but have been cut adrift by systems that are obsessed with accountability and compliance and offer limited curricular and pedagogical support. I would hope, as I have laid bare in this thesis, that within the limited and confusing policy and program support for EfS, there is a greater recognition of how teachers should be supported. Teachers, it must be remembered, are one of the 'many', not the 'only', groups responsible for the 'macro-shift' (Lazslo, 2001) that is required to move society in the direction of a sustainable future.

Limitations

Factors such as the scope of the study, sample size and research context can be considered as limitations. The study was focussed on a single school, and through rich description sought to present a multilayered account of that school context. Whilst twelve participants were interviewed, only one teacher agreed to classroom observations and therefore, this may not have provided a representative picture of what occurred across the school. However, it was through the inclusion of multiple sources of evidence, for example, my field journals noting my observations coupled with an analysis of school documents that provided a 'slice of life' at a certain point in time within that school. These findings were then compared and contrasted to the guidance provided by EfS policy documents to determine how well teachers and by extension, schools were supported in the interpretation of sustainability.

A feature of this study was the unique research context. Amity PS was a flagship school for the WA schooling system as it was the only school of its kind that exemplified sustainability principles in its design and structural features. As such, this school had characteristics that may not be found in other educational settings. Therefore, although the research examined how EfS was understood and enacted by teachers within this school, the findings may not represent what is possible in other primary schools. Yet, although this was a limitation, in some senses this was a benefit. For example, the argument could be made that if EfS policies and initiatives were to be exemplified anywhere, there would not be a more conducive environment than in such a specially built sustainable school. It is not the intention of this research to suggest that these findings may be extrapolated to other schools, however, some parallels may be found.

Structure of the thesis

This thesis is presented in seven chapters. This introductory chapter begins by outlining the rationale behind the study, including an initial discussion on how education should be used to achieve a sustainable society and how this can be implemented both in policy and in practice. It then identifies the context of the study, the aim and research questions that have guided my investigation, and the research methodology used. An explanation of the anticipated significance of this research is also included.

My review of the literature is presented in two chapters. Firstly, Chapter Two presents a review of the literature to set the historical and research context for the research and how it pertains to sustainability. Within this I clarify the key terms of sustainability and sustainable development from both a linguistic and historical perspective. I then present the visual and conceptual representations of sustainability and outline the principles and central ideas that have come to represent a contemporary understanding of the term. Following this, I provide a justification for the use of the term sustainability as a broader, inclusive concept and explain the associated conceptualisation that I have adopted throughout the thesis.

Chapter Three presents the literature examining the intersection between sustainability and education. Here I outline the three main models of education in relation to sustainability, identifying EfS as my focus for this thesis. An explanation of mindsets

and worldviews that are needed to support this model are then outlined. Following this, I describe the Australian educational policy context, also in relation to this model. The last section of the chapter provides a synthesis of the literature pertaining to both sustainability generally and in school contexts that informs the purpose and direction of the present study.

In Chapter Four I describe the philosophical background to the research and explain the rationale behind my chosen research methodology, including my positioning as a researcher and my selection of research methods. I also describe the research context, participants and the ecological sustainable design features of the school. An explanation of methods of data generation and a description of data analysis are outlined. The chapter concludes with ethical considerations and quality standards guiding the inquiry.

Chapter Five is the first of two findings chapters in which I present the results generated from my interviews, observations and reflective journals, as well as evidence from the analysis of official school-based and official external (state-based) documents. In this chapter I begin with an outline of my approach to both the interpretation and representation of the data across both Chapters Five and Six. In the second part of the chapter I present my findings in relation to, firstly, the policy infrastructure that is evident, and that acts upon, Amity PS. The final part of the chapter examines the findings in relation to the physical infrastructure of the school. I conclude the chapter with a summary of the key findings.

Chapter Six is the second of the two findings chapters. This chapter examines the findings in relation to the pedagogical and people (human) infrastructures. In the first section of the chapter I present the findings and my interpretations in relation to the educational practices, ways of thinking and allocation of resources that make up the pedagogical infrastructure at Amity PS. The second section of the chapter deals with the human element, the infrastructure created by people, which has enabled sustainability to be interpreted in the educational context. At the conclusion of the chapter I draw together the two sets of findings and interpretations into a summary.

In Chapter Seven I draw the findings and conclusions together in light of the research questions, and the overall research aim. I discuss the findings by revisiting the

literature to explain my enhanced understanding of issues generated throughout the thesis. In this chapter I weave the four threads of the findings together in relation to the policy, physical, pedagogy and people (human) infrastructures, which were presented in Chapters Five and Six, in a different way to develop a deeper thematic analysis and discussion. At the conclusion of this chapter I provide a set of recommendations for infusing sustainability ideas and concepts into our education system. The thesis concludes with personal final reflections on my learning and I also outline the limitations of the study.

Chapter summary

In this chapter I outlined the rationale behind and the context of the study, and stated the aims and research questions which have guided my investigation. I provided an overview of my research methodology and identified the significance of the research. I concluded the chapter by providing an outline of the structure of the thesis. In my next chapter, I traverse the literature to illustrate the historical and philosophical development of sustainability. In addition, I synthesise existing research on sustainability in schools in order to further identify the impetus for my study.

Chapter Two: Conceptualisations of sustainability

Introduction

This chapter outlines the way that sustainability has been conceptualised in the literature. I begin with an explanation of the distinction between the terms sustainability and sustainable development and offer a historical overview of these terms. Next, I present some visual and conceptual representations of sustainability and clarify my preference for the term sustainability, outlining the particular conceptualisation of the term that I draw on throughout the thesis. Following this, I offer an explanation of sustainability as a broader, more inclusive concept, and conclude with some central ideas and principles that have become associated with a contemporaneous view of the term.

Sustainability vs sustainable development

A variety of different conceptions of, and orientations to, sustainability and sustainable development are evident in the literature. As a result, there are a plethora of multiple and ambiguous definitions. The elasticity of their meanings is, on the one hand, very attractive, as they can mean all things to all people, but on the other hand their manifestation proves elusive as they cannot be readily operationalised. In addition, the two terms are defined through various interpretive lenses, making sometimes disparate and conflicting meanings.

One perspective posits that sustainability is interchangeable with sustainable development (Sartori, Latrónico, & Campos, 2014). The view here is that there is no difference in the history nor in the intent of the two, and thus they can function as one. This is evidenced in the literature where the terms are used interchangeably, imperceptibly gliding from the use of one term to the other. This, in my view, implies users are oblivious to the latent meaning within. An alternative view has the two terms arising from different philosophical bases. The position here is that whilst these two terms may currently coexist in modern discourse, they are in no way mutually interchangeable. That is, although they share some common ‘root stock’, they have deviated in meaning at a point in history. Therefore, when sustainability is used as a term it connotes a very different set of assumptions and parameters from that of sustainable development. A third orientation is that sustainability is the ultimate

destination or goal for society, whereas sustainable development is the process of change that needs to occur to reach such a destination (Atkisson, 2013; Waas, Hugé, Verbruggen, & Wright, 2011; Yanarella & Levine, 1992).

Hence, when educators and education systems are corralled by policy makers to embed sustainability or sustainable development into their curricula, they are understandably in a quandary. To assist educators there is therefore a need to lay bare the underlying assumptions and theoretical stances imbued within the use of the two terms. As a first step towards unravelling the semantic confusion, the following section forensically tracks the evolution of the terms and what they have come to represent.

Sustainability as a concept emerged first, with the idea of, and usage of the term sustainable development gaining prominence much later. It can be argued that now both terms are simply modern and recognisable nomenclature for concerns about humankind's impact on the Earth that can be traced back several centuries (Du Pisani, 2006; Waas et al., 2011). For example, there is evidence that concerns about deforestation, salinisation and poor soil fertility, which we would consider to be sustainability problems, plagued the ancient Egyptian, Mesopotamian, Greek and Roman civilisations (Mebratu, 1998). Whilst the term sustainability appeared in the English Oxford Dictionary only in the latter half of the 20th century, expressions akin to this term were evident for centuries prior to this in other languages, for example, in French (*durabilité* and *durable*), German (*Nachhaltigkeit*, meaning lastingness, and *nachhaltig*) and Dutch (*duurzamheid* and *duurzaam*) (Du Pisani, 2006). In more modern times, it has been suggested that the term sustainability was first used in Germany in 1713 by Hans Carl von Carlowitz in *Sylvicultura oeconomica* in relation to managing forests. However, it was not brought into common use until the 1980s (Bolis, Morioka, & Sznelwar, 2014). Hence, the term sustainability seems to have been coined to reflect a concern with the environmental impact of humans and the corresponding need to ensure the continuation of resources. It therefore resonated with the emerging developing conservation movement. Indeed, the conceptual basis of sustainability – of endurance, continuation, care and management of the environment, a symbiosis between Earth and humankind – was therefore, primarily, an ethos of concern about the environment.

The term sustainable development arose as humans became aware of, and concerned by, the impact on the environment by mass industrialisation. Industrialisation signalled a tipping point for the world, moving it beyond the largely localised agricultural practices of the Holocene to the first stage of the new epoch, the Anthropocene. According to Steffen, Crutzen and McNeill (2007), the Anthropocene describes a geological period that denotes the central role of humankind in precipitating massive and enduring geological and ecological changes beyond those that would naturally occur if the Earth were left to its own devices. A pivotal point of the first stage of this new epoch, one which signalled the need to think about development in a sustainable way, was the Industrial Revolution that began in the late 1700s. Along with this associated rapid industrialisation came greater stress on resources but also massive economic growth, generating wealth and thereby increasing consumption. The pace of development continued largely unabated until the economic lull during the wartime years. The post-war years of the early 1950s to 1960s ushered in another period of economic boom that “stimulated expectations of unlimited economic growth and ever-increasing affluence” (Du Pisani, 2006, p. 87). This growth, coupled with advances in science and technology, created the conditions that saw the world’s population tripling between 1800 and 1970, and alongside this came corresponding pollution, resource depletion and environmental damage. The period from post-WW2 to the present day has become known as the Great Acceleration and comprises stage two of the Anthropocene, denoting the rapid and sharp intensification of pressure on the global environment from human enterprise (Steffen et al., 2007). Progressively the world became growingly ever more aware of the increasing challenge to the environment posed by the pace of development, and concerns began to be expressed that humanity may “exceed the environmental limits of the Earth” (Waas et al., 2011, p. 1640)

In the wake of these changes to the environment, alarms started to be sounded. There was an increase in the publication of books such as Rachel Carson’s enormously influential observation *The silent spring* (1962), in which she traced the seeping of toxicity through the foodchain caused by the indiscriminate use of pesticides, to Paul Ehrlich’s *The population bomb* (1968), which extolled the curbing of population growth and Fritz Schumacher’s *Small is beautiful* (1973), which reminded the world that the modern economic system needed a values re-set to maximise human wellbeing. During this period, with the growing mood of fear and anxiety of possible

imminent ecological catastrophe, people began to rally together to form 'green' movements such as Greenpeace and Friends of the Earth. The first ever Earth Day was celebrated in 1970 (Du Pisani, 2006). The world was primed for a new way of thinking about progress and development, one that considered an alternative to unlimited growth. The environmental movement born of these times placed primacy on the quality of the environment over the quantity of resources (Kidd, 1992).

These burgeoning concerns about the impact of environmental issues – alongside a realisation that these could no longer be considered state- or nation-based but rather were to be acknowledged as global phenomena – triggered a series of international meetings and conferences in response. With each successive international gathering the field of environmental concerns was broadened. A notable event was the 1972 UN Stockholm Conference on the Human Environment where environmental problems, for the first time, captured those issues related to development, or lack of it, and made the link from these to social problems such as poverty. This event marked the beginning of a growing awareness that there was an interconnectedness between social and environmental events.

In April 1987, the former Norwegian Prime Minister and chair of the UN World Commission on Environment and Development (WCED), Gro Harlem Brundtland, launched what many consider to be the most pivotal and significant event in the timeline of the development of sustainability, the publication of *Our common future*, known as the Brundtland Report (WCED, 1987). The most widely quoted and enduring definition of sustainable development emanated from this – “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (p. 43). The report was released at a time where the public consciousness was raised and there was a greater willingness to coordinate political action and responsibility. This event therefore laid the foundations for the concept of sustainability to become a global agenda; however, this was through the promotion of the term sustainable development.

However, whilst the Brundtland definition has become a very pervasive, hegemonic conception of sustainable development, the elasticity of the definition is problematic and has attracted much critique. A central criticism of the Brundtland definition stated by many is that the term represents contradictory ideals – that of appearing to take care

of the environment but through an agenda of greater development (Connelly, 2007). Similarly, Lele (1991) states that although its appeal lies in its broad vagueness, “It allows people with hitherto irreconcilable positions in the environment-development debate to search from common ground without appearing to compromise their positions” (p. 607). Moreover, sustainable development is an oxymoron as sustainability implies lack of change, while development presupposes change (Jackson, 2011; Kopnina, 2014; Stables, 2013). Put simply, policy actors with disparate worldviews and goals abuse or hijack the term, appropriating it to suit their desired outcomes (Connelly, 2007).

Numerous critiques of the concept of sustainable development further claim that what has happened in practice, despite the potentially transformative appeal, has largely preserved the status quo. In effect it is ‘business as usual’ but ‘greener and fairer’ and not really addressing the causes of unsustainability (Huckle & Sterling, 1996; Webster, 2007). Instead, more emphasis has been placed on individual “atonement” (Braungart, cited in (Webster, 2007) – through recycling for example – which does not alleviate the problems of overconsumption but in fact encourages and legitimises it. Capitalism and the market economy and the subordination of nature to the economy are also unquestioned assumptions in the discourse of sustainable development (Ihlen & Roper, 2014), resulting in this largely isolating the term from the political and ethical context (Connelly, 2007). That is, there is no questioning of why we are engaged in such consumerist behaviours, what is driving it, and what effects this will have in the long-term. As such, it reinforces a largely uncritical view of the relations between economics and social and environmental issues, thereby condoning, rather than disrupting or redirecting, the current trajectory. Indeed, the concern is that sustainable development is seen as “innately reformist” in that it tinkers with minor reforms and does not offer a radical departure from current practices, thereby “mostly avoiding questions of power, exploitation, even redistribution” (Robinson, 2004) and perpetuating “the underlying disease by only treating the symptoms” (Robinson, 2004, p. 377). Hence, ultimately, anthropocentric views are clearly stronger and more privileged than eco-centric or bio-centric views (Du Pisani, 2006).

Additionally, because of this underlying economic bias in many conceptions of sustainable development, the solutions offered are therefore rooted in managerialism

and efficiency. This assumes we do not have to make wholesale socio-political changes, as all that is needed is greater efficiency and the belief is that advances in technology over time should make this readily achievable. However, these techno-economic fixes do not take into account the complexity of relationships between the three pillars of economy, environment and economy and the more comprehensive four pillars of economics, ecology, politics and culture proposed by UNESCO (UNESCO, 2010).

Thus the conceptual basis of sustainable development is one of endurance of the economy, business and profit. It is a continuation of humankind's dominion of the earth and growth by means of continued exploitation of resources. Primarily concerned with economic growth, sustainable development is thereby tainted with an underlying anthropocentric ethos where nature primarily exists for human use and does not have value in its own right. As a consequence of the reasons cited above, suggest Moore, Almeida and Barnes (2018), there has been a shift in thinking resulting in a preference for the term sustainability rather than sustainable development. Therefore, throughout this thesis I have also adopted the term sustainability to represent a broader, more inclusive ideal of what could be happening in our schools.

Visual and conceptual representations of sustainability

Sustainability is a complex and contested term that has defied precise operational definition. In order to understand how sustainability is to be taken up within the educational context, it is imperative that there be a clearer understanding of what is meant when we invoke sustainability. As outlined above, there is contestation in the literature between the terms sustainability and sustainable development. Yet I argue that common conceptualisations of sustainability tend to blur the boundaries between the two, and I demonstrate this with the examples provided in this section.

How sustainability has been presented in diagrammatic form has evolved over time. Some of the most common models that are used to represent the principles of sustainability are visual representations. Whilst Mann (2009) identifies no less than 255 diagrams representing sustainability in various configurations, the most common and most widely recognised largely revolve around three key elements – economy, environment and society. From the myriad of permutations, I have selected the most

common to illustrate the values and attitudes associated with each in order to contrast with more recent conceptions of sustainability.

Essentially there are two main distinct approaches to a sustainable world – a reformist or a transformative view. Reformist approaches accept the current dominant socio-economic system as largely immutable, and therefore, to effect changes in order to make the system more environmentally and socially responsible would only require a tinkering at the edges of the system. This view has been characterised by Clifton (2010a, p. 75), as “green and just” where an anthropocentric bias is maintained, through a focus on growth and development, resulting in increased consumption. In addition, this approach serves to maintain and preserve the status quo of the world. Conversely, the transformational approach sees the need for a fundamental rethinking of, and wholesale changes to, the current socio-economic system to achieve a sustainable world. Such transformative views have an ecocentric ethic, where growth is questioned and the Earths’ resources become the priority, rather than human satiation (Clifton, 2010a).

The first of the models, representing the reformist view, visualises sustainability as comprising of three overlapping circles, a Venn diagram, separately representing the economy, society and environment, where sustainability occurs at the intersection. This was reportedly developed at the International Centre for Local Environmental Initiatives in the early to mid 1990s and has been the most ubiquitous and enduring depiction (Connelly, 2007) (see Figure 2.1).

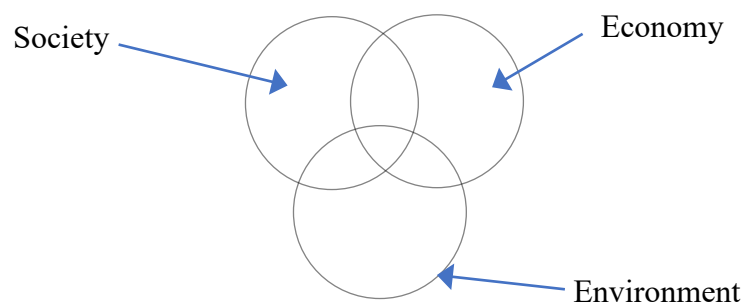


Figure 2.1: Representation of sustainability – Venn diagram

As it is in the form of a Venn diagram this model suggests that the three are interconnected but that sustainability occurs only within the points of intersection in the centre. The space where the three systems intersect is assumed to be where

integration is possible and solutions for sustainability are achieved, whereas the area outside of this interactive zone is considered an area of contradiction. A criticism of this model is that it reinforces linear thinking in that it suggests that all it would take to achieve ultimate achievement of sustainability is to create an integration of the natural, economic and environmental systems by simply aligning their objectives. This view belies the complexity and contestedness of each of the dimensions of sustainability and presents them as a largely homogenous 'text'. As Waas et al. (2011) state, these models are "simplifications of the complex reality" (p. 1650).

Further, in this model economy, society and environment are therefore not represented as enmeshed and integrated, rather only as presenting possibilities for problems and also solutions only at their boundaries. Moir and Carter (2012, p. 1481) contend that a fundamental flaw of it is that this depiction "can be interpreted as ignoring the intrinsic, immutable relationships existing between each of the dimensions". Huckle (2006, p. 21) further claims that, in doing so, this model "fosters reductionist rather than holistic or systemic thinking".

Another implication of such a model is that each of the three aspects remains intact, unchanged and unchallenged except for the overlapping intersections between. Such a model has gained much traction in business where the three circles have been recast as people, planet and profit. This has become known as the triple bottom line approach to financial accounting (Elkington, 2002), indicating that in determining impact and profits, businesses need to consider environmental and societal issues. This approach is based on the premise that, for environmental and societal problems to be resolved, a sound economy must take precedence over the other two aspects. Thus, any discourse associated with such a model is imbued with a latent economic bias. For this reason, it has been dubbed a 'business as usual' model as it is advocating that we continue as we are but that we also need to be more green and fairer.

Conversely, despite the fact that the three circles are generally depicted as being the same size, some sustainability proponents prioritise the environmental dimension when decisions need to be made about what needs to change (Moir & Carter, 2012). The reasons for this are twofold – one is that environmental performance is visible and more easily quantifiable (Moir & Carter, 2012), the other is that current economic systems are largely taken for granted. Through illustration of these characteristics of

the Venn diagram model of sustainability it can be seen that this is both congruent with the Brundtland definition of sustainable development and also confirms its inadequacy. This reformist approach to sustainability, that in effect maintains the status quo, is currently dominant and is consistent with the agenda promoted by the UN, most governments and the business sector (Sandhu, 2014; Purvis, Mao & Robinson, 2019).

However, whilst Figure 2.1 can be considered reformist in orientation, depictions of ‘nested models’, as shown in Figures 2.2, 2.3 and 2.4, can be considered more radical or transformative. As with the previous Venn diagram, these models came in various permutations that placed a different central focus and/or emphasis on the varying dimensions of sustainability. They consisted of two or three concentric circles representing a hierarchy with, most commonly, a rotational symmetry (Moir & Carter, 2012, p. 1480) (see Figure 2.2) or, as in some cases, an embeddedness represented by an elongated ellipse (Waas et al., 2011, p. 1653) (see Figure 2.3 with three circles and Figure 2.4 with two ellipses).

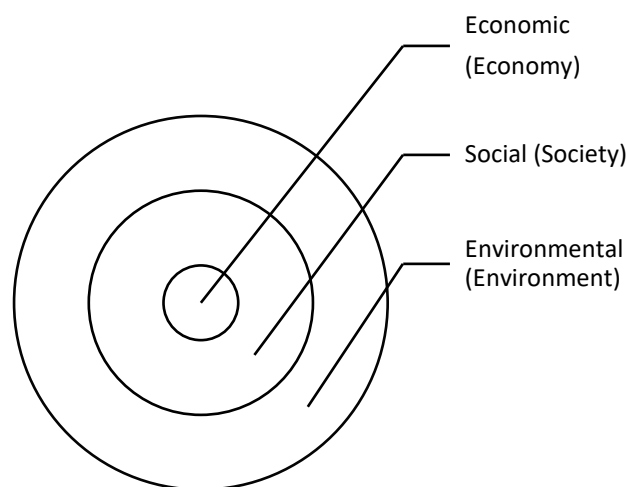


Figure 2.2: Representation of sustainability – Concentric circles with rotational symmetry

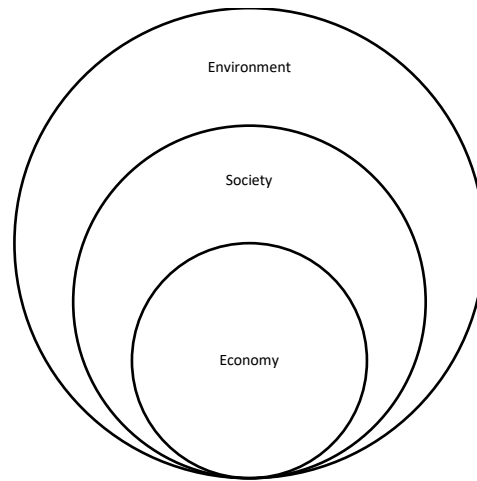


Figure 2.3: Representation of sustainability – Nested model with three circles

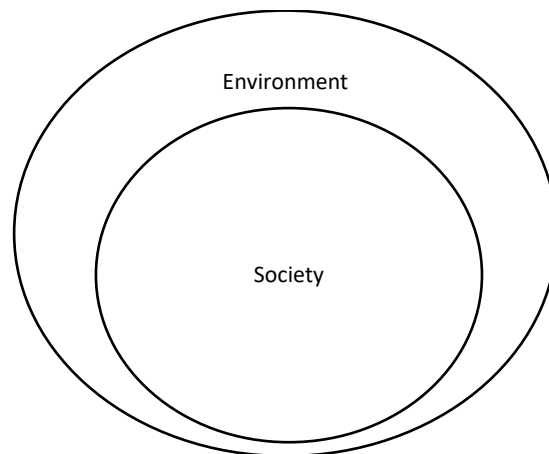


Figure 2.4: Representation of sustainability – Nested model with two circles (elongated ellipse)

Such models acknowledge that the root of unsustainability can be traced back to the current dominant socio-economic system (Sandhu, 2014) and that these modes of thinking and operating need complete transformation, not just a tinkering at the boundaries. These models therefore represent a more accurate depiction of material reality as the economy is nested within society that is bound by the environment. Nevertheless, Giddings, Hopwood and O’Brien (2002) note that the economy at the centre, as in Figure 2.2 and 2.3, should not be interpreted as the fulcrum of activity but rather that it is merely a subset that depends on society and environment. However, Mebratu (1998, p. 513) cautions that these models are based on a “cosmic (mis) perception” as they see the natural, economic and social systems as existing separately. Holmberg (1994, cited in Mebratu, 1998, p. 513) further suggests what these models may perpetuate is the view that the natural, economic and social systems as

independent systems that can be dealt with independently, and that they therefore appear to be aligned with a reductionist way of thinking.

Another example of a transformative conceptualisation of sustainability was the one proposed by UNESCO (2005). In this view, sustainability was thought of as resting on three pillars that were comprised of three interdependent systems – environmental, economic and social, with culture as an underlying dimension. The omission of the political system, in this view of sustainability, was challenged by authors such as Huckle (2006), Fien (2001) and Woolterton (2003), the latter of whom proposed sustainability as a “four legged stool”.

Subsequently, UNESCO (2010) began to place a much stronger emphasis on the integration of thinking and action around four dimensions or systems – natural, social, political and economic. Finally there was an acknowledgement of the importance of the political aspects and a new image began to be promoted within the educational materials offered to educators (UNESCO, 2010). The dimensions were presented as an image of four interlocking puzzle pieces (see Figure 2.5), underpinned by the principles of conservation, peace, equality and human rights, appropriate development, and democracy.

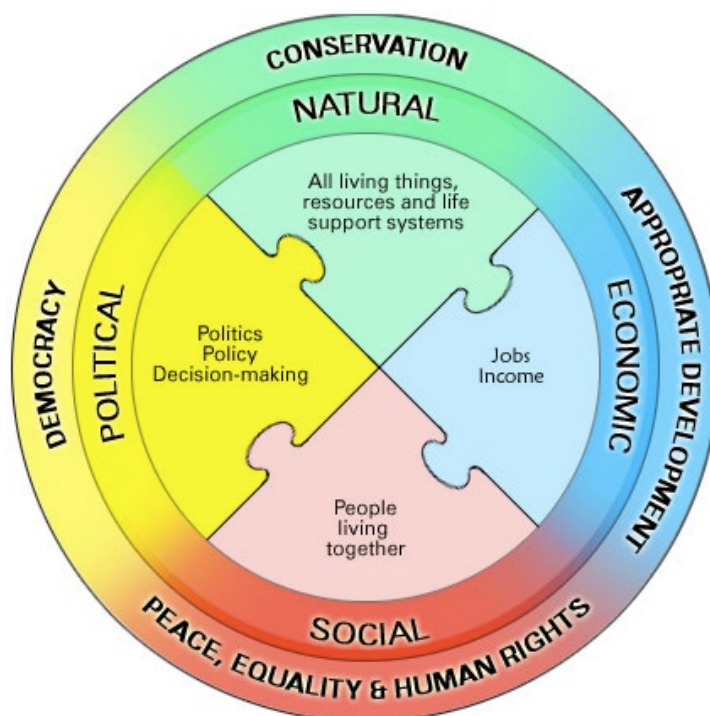


Figure 2.5: Representation of sustainability – UNESCO’s four dimensions

This more contemporary transformative model of sustainability has reflected a shift from seeking a single cause of the Earth's ills and remedying it, to a recognition of the interrelatedness and interdependency of multiple causes and effects. However, this view has taken decades to gain traction in any real sense. Yet, if we look back at the original premise of the Brundtland Report (WCED, 1987, p. 4), referred to earlier in this chapter, it can be seen that even then there was a sense of the importance of interconnectivity, as noted in this extract:

Until recently, the planet was a large world in which human activities and their effects were neatly compartmentalised within nations, within sectors, (energy, agriculture, trade), and within broad areas of concern (environmental, economic, social). These compartments have begun to dissolve. This applies in particular to the various global "crises" that have seized public concern, especially over the past decade. These are not separate crises: an environmental crisis, a developmental crisis, an energy crisis. They are all one.

This same thinking was later reiterated at the International Conference on Environment and Society that produced the Thessaloniki declaration (UNESCO, 1997, p. 2):

The concept of sustainability encompasses the environment but also poverty, population, health, food security, democracy, human rights and peace. Sustainability is, in the final analysis, a moral and ethical imperative in which cultural diversity and traditional knowledge need to be respected.

What has happened in the name of sustainability since these statements were made, however, has not necessarily represented these encompassing views. It has only been more recently that some contemporary understandings of sustainability have begun to recognise the importance of the interrelatedness of all four dimensions of sustainability and for the necessity of solutions to acknowledge this complexity. Rather than being four disparate elements, as portrayed in earlier depictions of sustainability, there is now a growing acknowledgement that the "Earth's environmental problems manifest from a complex interplay of environmental, as well as economic, social, cultural and political issues and any attempts to address these must be done in a systemic, holistic and integrated manner" (Ferreira, Ryan, & Tilbury, 2007b; Kuzich, 2011, p. 1). Indeed, more contemporary views of sustainability emerging since the depiction of the

UNESCO (2010) model of sustainability, shown in Figure 2.5, have continued to support this four dimensional model. An example of this was the view presented by Taylor, Quinn and Eames (2015) who saw the way forward to a sustainable future being dependant “on the interrelationships between four key areas – our ecological, economic, social and political systems. These systems are in a lockstep relationship, as the health of any one of them is influenced by, and in turn influences, the health of the other three” (p. 1).

My own view of sustainability throughout this thesis is consistent with the views expressed in the previous paragraph, namely the conceptualisation of sustainability represented by four interdependent pillars of environment, economy, politics and the social. As I believe the social and the cultural are deeply enmeshed, I refer to this pillar as the social/cultural. The elements of these pillars are identified in Appendix A which I draw upon in Chapters Three and Four. For me, what sustainability fundamentally asks are the deep questions “about the purpose and meaning of human life and its relationship to the natural world” Robinson (2004, p. 380). Thus, my belief is that sustainability cannot be nearly compartmentalised into silos of thought and activity but needs to be envisioned as an organic, responsive, inclusive and potentially transformative reaction to the web of concerns facing the planet today.

Sustainability as a broader, inclusive concept

If we go to the origins of the word sustainable we find that it is from the Latin ‘sustinere’ meaning to defend, maintain, assume or bear (Castiglioni and Mariotti, 1981, cited in (Bolis et al., 2014, p. 9) and ‘nourish and endure’ (Woolterton, 2003, p. 60). However, this then begs the questions of what is to be sustained and who decides? The various ways that sustainability is represented visually, as identified in Figures 2.1 through to 2.4, suggest different orientations to these questions.

The shift in language from sustainable development to sustainability, particularly in Australia, may be to remove the shackles of the problematic association with the term development. By removing the retrograde connotation that sustainability is concomitant with development – not least a particular kind of anthropocentric, economically biased development that privileges the status quo – a new mindset and ethic is enabled to flourish. As a concept, one thing that sustainability appears to offer is the possibility of a new relationship between humanity and nature. In addition, as

Brown (2016) also suggests, sustainability has a potential radicalism that in contrast to the hegemonic, narrower concept of sustainable development.

After conducting a review of the contemporary literature, Waas, Hoge, Verbruggen and Wright (Waas et al., 2011) concluded that, broadly speaking, the difference between sustainable development and sustainability is that “the former refers to ‘ameliorating’ economic growth taking into account the environment, whereas the latter is about ‘challenging’ economic growth, focussing on the ability of humanity to live within the environmental limits of the planet” (p. 1639).

From an educational perspective, the UNESCO (2012, p. 1) advice to teachers also noted this paradigm shift:

The sustainability paradigm is a major change from the previous paradigm of economic development with its damaging social and environmental consequences. Until recently, these consequences have been seen as inevitable and acceptable. However, we now realize that major damage or serious threats to the well-being of humans and the environment in the pursuit of economic development have no place within the sustainability paradigm.

For me, the use of the term sustainability increasingly speaks of the ability of human, cultural and social, economic and environmental systems to maintain themselves over time, indeed to persist over generations. An example of this kind of understanding of sustainability is the one offered by Meadows and Randers (1992) in the book *Beyond the limits: Global collapse or a sustainable future* where it states “A sustainable society is one that can persist over generations, one that is far-seeing enough, flexible enough, and wise enough not to undermine either its physical or social systems of support” (p. 209).

The stance taken by some is that by creating such an indeterminable space where strict definition is elusive, the concept of sustainability demonstrates a yet unrealised potential (Walker, 2006). Thus, a polysemic interpretation of sustainability, contends Robinson (cited in Bolis, Morioka & Sznclwar, 2013, p. 7), rather than being problematic, creates an opportunity for a conversation about what the future possibilities might be. This alternative lens displaces the deterministic discourse that sees sustainability as an end goal being reached when a certain set of conditions are

set in place in society, and challenges the view that we can identify a clear process that we need to move through to get to some imagined future state of nirvana (Bolis et al., 2014, p. 7). These kinds of views are problematic in that they suggest they are built on the mindset that we have all the tools and knowledge to reach this state at our disposal now and, moreover, that the future is knowable.

However, despite the patent appeal sustainability as a concept and term has, it has not been immune to the criticisms that have also been levelled against sustainable development. Indeed, many authors have lamented its vagueness, ambiguity and ambivalence (Walker, 2006), saying that it is still a very “immature notion” (Allen & Hoekstra, 1993, p. 98) as no one single definition has been able to be determined. As such, sustainability has suffered the fate of other aerosol words (Woolterton, 2003, p. 56) such as “excellence, quality and choice” and has become somewhat of a ‘buzzword’ that is ill defined, indiscriminately ascribed, but nevertheless sprayed around with regularity.

A productive way to view sustainability, suggests Owen (2003), is to draw on the work of philosopher John Rawls. In his seminal text, *A theory of justice* (1972), Rawls made the distinction between a concept, the broad meaning of the term, and a conception, which includes the principles required for implementation. Owen makes the analogy that, like justice, liberty and democracy, sustainability as a concept can be broadly consensual, that is we have a ‘sense’ of what it entails, but it is when we start making decisions about implementation that profound disputes are raised. One way that interpretation and implementation of sustainability has been made somewhat clearer is through a delineation of some commonly agreed principles. These principles are outlined in the following section.

Principles of sustainability

Over time a set of central ideas have crystallised to create a global common sustainability dialogue. As noted above, various authors and documents have added or omitted one or more of the elements and, as sustainability is considered an evolving concept, these continue to change. Further, given that sustainability has proven to be quite a difficult concept to grasp, it has become all the more necessary to pinpoint such ideas to guide all interested parties – not least educators – in their practice. I suggest

that an encompassing set of commonly recognisable ideas of sustainability that is useful to help orient practitioners is one developed by Nolet (2016).

Drawing upon the vast sustainability literature, Nolet (2016, p. 71) suggests there is a constellation of “big ideas” that we can draw upon to construct our sustainability worldview, with eight being the brightest stars. Amongst the myriad of stars in the sky these brightest stars, he explains, as they do in an actual constellation, stand out and form a recognisable pattern. In doing so, they form a reference point from which people can orient and therefore assist navigation through possibly very complex and lengthy journeys. Bearing in mind that other stars can assume importance from time to time, the list, he clarifies, is not exhaustive, but merely a starting point. According to Nolet (2009) the “brightest stars” that guide our sustainability journey need to be: 1) equity and justice; 2) peace and collaboration; 3) universal responsibility; 4) health and resiliency; 5) respect for limits; 6) connecting with nature; 7) local to global; and 8) interconnectedness – his ideas are adapted and elaborated on further in Table 2.1.

Table 2.1: Eight big ideas of sustainability

Big idea	Elaboration
1. Equity and justice	<ul style="list-style-type: none"> • The creation of a safe space now and in the future for humans and other species is central to a sustainability worldview. • This includes for example, social justice, economic justice, environmental justice, gender equity, food justice, intergenerational equity, intra generational equity, interspecies equity, etc. • The existence of an overarching ‘precautionary principle’ – if there is a possibility of harm to humans or the environment it is prudent to act even if all the scientific evidence has not yet confirmed cause and effect.
2. Peace and collaboration	<ul style="list-style-type: none"> • The notion of negative peace, the absence of violence among individuals, groups and governments. • The notion of positive peace, of social justice, fair distribution of power and resources, equitable opportunity, equal protection and impartial implementation of laws. These should not only be with human to human interactions but also with human–environment as this has positive effects on the health and preservation of natural systems.
3. Universal responsibility	<ul style="list-style-type: none"> • The premise that we are each responsible as individuals to creating a safe and just space for all. • The idea that the value of reciprocity is at the heart – this aligns with the ‘golden rule’ (e.g. do unto others...) at the core of numerous religions. • The promotion of active and collaborative engagement to find positive solutions (e.g. putting sustainability into practice).
4. Health and resiliency	<ul style="list-style-type: none"> • The promotion of human health, of individual habits and lifestyle choices or broader societal issues (e.g. HIV/AIDS). • The acknowledgement of the impact of environmental health, of poor air quality, climate change, agricultural and industrial impacts. • The idea that resiliency is now viewed as an essential element of sustainability, that change is a normal process in any complex system. Also noted is the amount of disturbance a system can withstand before changing state. • The notion of coping with constancy of change, impermanence, as embracing change as positive.

[Table continued overleaf]

Big idea	Elaboration
5. Respect for limits	<ul style="list-style-type: none"> • The idea that we respect the finite capacity of Earth’s resources, for example planetary boundaries. • The macro principles inherent in this idea are the laws of thermodynamics – 1) energy is neither created nor destroyed, merely converted from one form to another and that 2) energy tends to be more dispersed (disordered) until a state of equilibrium is reached. • This is counter to the dominant economic model, for example neoliberal economics based on assumptions of unlimited capacity and necessity of growth and consumption.
6. Connecting with nature	<ul style="list-style-type: none"> • The understanding that humans can learn from nature, for example biomimicry, and combinations of indigenous knowledge and Western scientific methods. • The development of an affinity with nature that disrupts dominant discourse that sees nature as human dominion, unlimited source of resources for human use or nature as recreational source. • The promotion of a more intimate, emotional response to, and affiliation with, nature, i.e. biophilia (Wilson, 1984). • The respect, curiosity and awe for nature. • The acknowledgement that nature is everywhere not only in pristine wilderness.
7. Local to global	<ul style="list-style-type: none"> • The notion of the term glocal to show an idea that there is interdependence between our local actions and decisions and the broader global political, economic and social systems • The idea that global and local concerns cross country and citizenship boundaries, that humans are citizens of the world. • The promotion of a global ethic, the respect for human rights and self-determination that transcend specific local, national or regional agendas. • An openness to diversity. • A tension between global markets and globalised consumerism reducing or replacing local customs and culture, and the potential of social media and technologies to communicate personalised, local concerns to the global community.
8. Interconnectedness	<ul style="list-style-type: none"> • An interwoven system of humans and nature, for example social-ecological systems. • A reference to the manner in which environment, society and economic systems are inextricably linked. • The idea that this can also apply to ideas, people, communities, issues and solutions. • The understanding that systems thinking can represent these complex interdependences and interrelationships.

Similar to these ideas presented by Nolet (2016), Waas et al. (2011, p. 1645) offer a “meta-perspective” that captures the elements embodied in the concept of sustainability within four fundamental principles – the normativity principle, the equity principle (see also Haughton, 1999), the integration principle and the dynamism principle. Moreover, they assert that these principles are of equal importance, as they not only define the ‘rules of action’ but also represent the crucial changes needed. These key elements of their sustainability principles are presented in Appendix F. As a concept therefore, it appears sustainability has a relatively stable set of defining characteristics that can be more or less agreed upon.

As such, distilling the central elements of sustainability provides some guidance to educators and other practitioners in determining what knowledge, skills, attitudes and values are to be included and valorised. What is evident from these collections of principles and perspectives is a confirmation of sustainability as a compelling force that appears to be marshalling the best of humankind in a positive, hopeful voyage to a more peaceful, socially just, and nurturing Earth.

Chapter summary

In this chapter, I have described the conceptualisations of sustainability evident from the literature. Following this, I examined and drew a distinction between the terms sustainability and sustainable development. In order to identify their relative orientations, I have also presented a historical overview of the development of these key terms. The visual representations and conceptualisations of sustainability were then outlined to indicate changes in understanding over time. In addition, I also set out my preference for the use of the term sustainability throughout this thesis and clarified my personal conceptualisation of what the term entails. I concluded the chapter with an explanation and critique of the concept of sustainability, followed by an overview of some key ideas and principles that increasingly represent a contemporary understanding of the term. Thus, this chapter has clarified that my conceptualisation of sustainability is represented by four interdependent pillars of environment, economy, politics, and as I believe the social and the cultural are deeply enmeshed, I refer to the fourth pillar as the social/cultural. In terms of principles and ideas underpinning sustainability, it is my belief that sustainability cannot be nearly compartmentalised into silos of thought and activity but needs to be envisioned as an

organic, responsive, inclusive and potentially transformative reaction to the web of concerns facing the planet today.

Chapter Three: Sustainability and education

Introduction

The overall intention of this chapter is to examine the literature that links sustainability and education and to establish the focus of this research. The chapter has two main parts – this first part considers the literature that identifies sustainability as part of the education system more broadly, and the second focuses more specifically on teachers and schools.

I begin the first part by establishing the intersection between sustainability and education. I then set out the three main models of education in relation to sustainability – education *about*, *for* and *as* sustainability – and identify EfS as the central focus for this thesis. From this I explain the kinds of mindsets, worldviews and ways of thinking that support EfS. Using this ideological research as a base, I then examine EfS in the current, practical context of wider Australian education policy-making, focusing on how sustainability forms part of the Australian Curriculum, and present the notions of achievability and accountability as defining educational discourse in this country.

The following section then identifies the prevalence of EfS in school contexts, beginning with a justification of the importance of teachers' understanding of sustainability and then examining the associated literature, both from an international and Australian perspective. I then examine what teachers understand by sustainability across different classroom settings, including early childhood, secondary and, lastly, primary as this is most closely relevant to my own study's context. I conclude by presenting key research regarding teachers' understanding and enactment of sustainability in sites of exemplary EfS practice in the primary setting, culminating with an explanation of the positioning of this research.

Part one: The intersection between sustainability and education

It is no less than a paradigm shift that many call for a disruption of the unsustainable trajectory we find ourselves in on Earth. What many propose is a transformative change to address the issues of sustainability, and this change is increasingly positioned as emanating from education. In one such appeal, David Orr, in the foreword to Stephen Sterling's book *Sustainable education* (2001, p. 8) states:

The disorder we see all around us reflects a prior disorder grounded in the paradigm of human domination that has nearly conquered the entire world. That paradigm must be replaced by one that places us in the web of life as citizens of a biotic community. We must come to see ourselves as implicated in the world, not simply isolated, self-maximising individuals. The battle will be won or lost in the schools, colleges, and universities around the world.

This mobilising of educational systems in response to the disorder evident in the world has seen the rise of the concept of EfS as I have identified in Chapter Two. There have been a number of landmark events and documents that have marked this accession of education to the forefront of endeavours towards sustainability. An early study, the Brundtland report entitled *Our common future* (WCED, 1987), certainly saw education as being relevant in dealing with environmental issues, yet education only really became the central core to the sustainability campaign at the 1992 Earth Summit on environment and development in Rio de Janeiro. What was produced at this summit was a pivotal international agreement – to which Australia was also a signatory – codified in a document titled *Agenda 21*. In Chapter 36 of this Agenda the link between education and sustainability was unequivocally articulated for the first time, claiming “Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues” (UN, 1992, section 36.3).

This was a watershed moment and set the trajectory for future discussions and deliberations. It outlined an ambitious agenda to make education an “integral lever for the kind of systemic change in thought and action required” (Kuzich, 2011, p. 1). Education, it was acknowledged, had the capacity to precipitate a “profound change in mindset” (Furnass, Goldie, & Douglas, 2005, p. 3) and, in doing so, could prevent future catastrophe. However, the potential momentum of *Agenda 21* never materialised into action, and it was not until nearly a decade later, at the UN’s World Summit on Sustainable Development in Johannesburg, the third international gathering of its kind, that a greater commitment to action was garnered. As a result of this summit, UNESCO declared that a decade of change regarding sustainable development, the UNDESD, would run from 2005-2014. The mandate for this time period was to completely re-orient the education system, utilising the leverage and

catalytic power of 60 million teachers across the world. The premise of this approach was that teachers, at all levels of education – early years, primary, secondary and tertiary – are potential change agents through the multiplier effect of their influence on students (Chambers, 2009; Woolterton, 2003).

Indeed, this idea of wholesale reorientation of both formal and informal traditional education systems promoted by the UNDESSED certainly looked promising. According to Nolet, the way this was to occur was to encourage governments across the world to imbue their education systems with these following ideals (2009, p. 417):

- Interdisciplinary and holistic learning – EfS should be embedded in the whole Curriculum, not as a separate subject.
- Values-driven learning – the assumed norms (the shared values and principles underpinning sustainable development) must be made explicit so that they can be examined, debated, tested and applied.
- Critical thinking and problem-solving – this should lead to confidence in addressing the dilemmas and challenges of sustainable development.
- Multi-method approaches – different pedagogies that model an environmental process such as word, art, drama and debate should be encouraged. Teaching that is geared simply to passing on knowledge should be recast into an approach in which teachers and learners become co-learners and play a role in shaping the environment of their educational institutions.
- Participatory decision-making – learners should participate in decisions on how they are to learn.
- Locally relevant information – this should address local as well as global issues, and use the language(s) that the learners most commonly use.

However, the irony of this appeal was not lost on those who were cognisant that it was the most highly educated nations that inflicted the deepest ecological scars and have contributed most to unsustainable practices (UNESCO, 2002). Indeed, the current education system was itself responsible for the manifestation and maintenance of unsustainable practices through shaping what we think and influencing our capacity to do so (Nolet, 2009; Orr, 2004). As Sterling (2003, p. 46) explains:

Most mainstream education sustains sustainability – through uncritically reproducing norm, by fragmenting understanding, by sieving winners and losers, by recognising only a narrow part of the spectrum of human ability and need, by an inability to explore alternatives, by rewarding dependency and conformity, and by serving the consumerist machine.

It is therefore understood that it is not just more education that is required, but education of a different kind if we are to avert the impending catastrophe. The assemblage of assumptions and beliefs that course vehemently through our current educational system, it is argued, are based on an “epistemological error” (Bateson, 1972). This error, according to Bateson and many others since, is that our worldview that frames the way we think and interact within the world is founded on a belief of dualistic separation of humans from the world. This in turn perpetuates this separateness and fragmentation from our environment even further (Sterling, 2009b, p. 108). Donella Meadows (1982), an educator and systems thinker, explains the crux of the problem, saying “The world is a complex, interconnected, finite, ecological-social-psychological-economic system. We treat it as if it were divisible, separate, simple and infinite. Our persistent, intractable, global problems arise directly from this mismatch” (p. 101).

Such a belief in the dissociation of human actions and ensuing effect on the planet has inevitably given rise to a blinkered anthropocentric worldview. In this view we deny the material reality of the impact of human actions on the whole biosphere, and concomitantly continue to view nature as merely being a resource to serve our ever growing needs (Sterling, 2003). Instead, we need to move our world – and particularly our educational focus – towards a more sustainable orientation, one that is reflexive and responsive and lays bare the dominant root metaphors (for example anthropocentrism) encoded in our cultural narrative (Bowers, 2002). If we do not change how our education system works, Mueller (2009) cautions, we “may inadvertently perpetuate the ways in which students frame their relationships with other people and the Earth’s natural places” (p. 1034).

The UNDESD certainly assisted with a greater understanding that education needed to be designed so students can understand and have action–competence with the intertwined and interdependent social, economic, political and environmental elements

that have given rise to unsustainable actions on the planet. However, at the conclusion of the UNDESD, even though there was some evidence that the ideas of sustainability were permeating through educational systems worldwide, the overriding concern was that progress was very slow (Huckle & Wals, 2015). As such, renewed efforts after the UNDESD to promote the importance of education as a mechanism to promote sustainability has been evidenced through a number of studies. For example, the UNESCO report *Planet: Education for environmental sustainability and green growth* states “Living sustainably requires a huge shift in mindset. Education has to be part of that change” (UNESCO, 2016, p. 1).

In addition, in a reinterpretation of the UNDESD’s initial ideals, Huckle and Sterling (1996) developed a set of characteristics they suggested should form the basis of a more applicable approach to sustainability in education, namely the aforementioned EfS. I have adapted the original from Huckle and Sterling (1996, p. 22-24) and present a summary in Table 3.1.

From this it appeared that educating with sustainability in mind should now involve a broader range of concerns, a shift from the previous singular emphasis on the environment and, in addition, reflect a more critical, transformative and reflexive slant (Tilbury & Cooke 2005). That is, the implication was that the focus of school curricula needed to shift from educating ‘about’ the environment to educating ‘for’ sustainability (UNESCO 2005; Henderson & Tilbury 2004). However, whilst the sustainability in education impetus is still evident currently, the issue that appears to need resolution is the bridging of the gap between the kind of thinking and action that is required to move to a more sustainable future, and the kind of education currently privileged in our schools. In the following section I outline the three main models of education that address sustainability as evident from the literature.

Table 3.1: Summary of the characteristics of Efs

Ideals	Characteristics of Efs
Contextual	Understands and engages in addressing the crises caused by modernity. Is grounded in and simultaneously pays attention to local, regional, national, international and global economic, social and ecological – and, I would argue, political – contexts.
Innovative and constructive	Draws on the paradigm of post-modern thinking to offer insights and ways forward to a safe, humane and environmentally sustainable future, moving away from ideas of chaotic, threatening and ‘gloom and doom’ ways of thinking.
Focused and inclusive	Offers a holistic, multidimensional approach but is primarily grounded in, but not limited to, social development and human ecology, equity and futures.
Holistic and human in scale	Recognises that all education dimensions – such as curriculum, pedagogy, structures, organisation and ethos – are mutually interdependent and need to be seen as a consistent whole. Needs to be both learner-centred (development of the whole person) and socially oriented (reconstructionist).
Integrative	Places a greater emphasis on interdisciplinary and transdisciplinary enquiry.
Process oriented and empowering	Is engaged and participative rather than passive. Emphasises learning rather than teaching – critical reflection and democratic ownership of change are inherent to Efs.
Critical	Is ideologically aware and socially critical – no educational values are politically neutral. Needs to draw on body of theory that challenges modernist hegemony in a continuous cycle of reappraisal.
Balancing	Seeks to rebalance correlated pairs that are dissociated and distorted in the dualistic dominant paradigm, for example cognitive and affective learning, knowledge and values, material and spiritual etc.
Systemic and connective	Puts emphasis on relationship and pattern, offers a participative systemic awareness.
Ethical	Clarifies ethical issues but also nurtures normative ethical sensibility that transcends personal and collective boundaries. Promotes solidarity with others, distant people, environments, species and future generations.
Purposive	Explores, tests, criticises and nurtures sustainability values and alternatives, with an explicit intention to assist change.
Inclusive and lifelong	Is not selective, but is accessible for all persons in all areas of life, and extending throughout their lifetime.

Models of education in relation to sustainability

In the preceding section of this literature review I outlined the key characteristics associated with the kind of education that is designed to support the creation of a sustainable society (see Table 3.1). In this section I examine how this kind of education may be conceived within formal schooling contexts, focusing on three main models of education.

Education is held to be central to sustainability. Indeed, education and sustainability are inextricably linked, yet the distinction between education as we know it and EfS remains enigmatic for many (UNESCO, 2005). What reverberates through the sustainability literature is the idea that creating sustainable societies will take more than the kind of basic education that is currently taught in many countries. Indeed, the necessity to move beyond once dominant tendencies of *transmissive* education, where facts, skills and values are merely transferred from teacher to pupil, to a conceptualisation of education as a *transformational* force, where knowledge is co-created, learning is critically engaging and participative (Jickling & Wals, 2008), is evident if we are to achieve a sustainable society. Further, when considering what kind of education is necessary, we need to acknowledge the aforementioned sobering idea that the deepest ecological footprints have been created by the most educated nations (UNESCO, 2002, 2005). Therefore, as Orr (2004, p. 8) cautions, “It is not education that will save us, but education of a certain kind”.

This consideration of how to, or even whether to, marry education and sustainability gives cause for us all to step back and take a moment to think about the fundamental questions – What is education? and What is it for? How governments, policy makers, educators and curriculum theorists respond to such questions shapes and forms the ways sustainability is conceptualised within the educational enterprise, which in turn reflects implicit assumptions and underlying worldviews that guides their thinking and actions. However, this enmeshing of education and sustainability is an inherently complex process that bears no claim to neutrality, and therefore it is important for all educators to have a way to expose and ‘lay bare’ such assumptions and worldviews. For, if we do not, we risk being trammelled along a pathway that leads in a completely different direction than one we think we are espousing or supporting.

Yet the response to sustainability in schools varies. As typified by Sterling (2014), engagement can range from the simplest level, where there is a raising of consciousness and passive reception of information about sustainability issues, the aforementioned transmissive approach, through to a more complex transformative level that encourages critical appraisal, capacity and willingness for action and alteration of worldview. As such, he claims there are three levels of engagement evident in terms of how we approach sustainability in our schools:

- Level 1: Accommodation – education *about* sustainability
- Level 2: Reformation – education *for* sustainability or EfS
- Level 3: Transformation – education *as* sustainability or sustainable education.

These three levels indicate the degree of integration and responsiveness to sustainability principles and ideas within existing frameworks. For example, when considering how sustainability is imbued into educational curricula and practices, Level 1 indicates a response that accommodates sustainability within an already existing curriculum and pedagogical practices – nothing really changes, it is an add-on to what is already being taught and the orientation and purpose of education remain unchanged. Level 2 suggests that existing curricula and pedagogy may be altered, thus experiencing a ‘reform’, perhaps leading to pedagogical practices being imbued with the principles and ideas of sustainability. However, again, there is no challenge to the existing status quo. Sterling (2014) and (Butler, 2007) view Level 3 as the stage that can affect the kind of paradigmatic shift that results in societal change required. In this, transformation of existing paradigms and ways of knowing and being are suggested as being the only way that society can change its unsustainable trajectory. Education is not merely imbued with sustainability, instead sustainability becomes the *raison d’être* of education. In doing so, it precipitates wholesale shifts in the way the world works and what we value as humans. So, in effect, whilst Levels 1 and 2 represent stepping stones that some educational enterprises are progressing through to reach Level 3, Sterling does not seem to advocate them as necessary pre-requisites. He argues that by being aware of the static nature and inertness of action bound within Levels 1 and 2, we are freed of the notion of being compelled to traverse these in sequence and instead it opens our horizons to understand that little prevents us, except volition, in aiming

for Level 3 and the transformation of education as we currently know it. The difference between the three levels is elaborated next.

Education about sustainability

Education about sustainability suggests a sense of a discrete set of knowable content and skills that can be gained with the intended effect of developing an understanding and awareness. Sterling (2014, p. 98) equates this to the Bateson's (1972) "first order learning/cognition" where information is simply gained by the learner in a one way transmissive process. Underpinning this approach is a belief that gaining knowledge will precipitate behaviour change in the individual (Tilbury & Cooke, 2005). The downfall of this thinking, assert Orr (2004) and Sterling (2004), is that there is little or no relationship between knowledge of issues, nor even an awareness of unsustainable actions or any resulting changes in behaviours.

In Vare and Scott's (2007) typology of three approaches to learning and change, education about sustainability is consistent with what they identify as a Type 1 approach. The Type 1 approach reflects an understanding that the source of problems facing humanity are largely environmental and that these will be resolved by a scientific, technical response that is waiting to be developed. Inherent in this approach is the lack of agency and resourcefulness of the learner – the learner is merely a recipient of knowledge and facts that are predetermined by more knowledgeable others, the 'experts'. In summary, engaging in education about sustainability has at its core a belief that, simply with knowledge and information about sustainability, individuals will action change.

Further, as the thinking associated with education about sustainability merely requires an 'add-on' to existing curricula and practices in schools, it follows that no structural change within the prevalent education system is required. A practical illustration of would be where a classroom teacher may focus on knowledge in relation to climate change, biodiversity, energy production and not engage students with the corresponding ethical considerations and underlying values. In this way education about sustainability is considered as an objective, relatively value free lens to impart content and declarative knowledge (Tan & Okamoto, 2018) associated with these topics within the existing, for example, science subject area of the Australian curriculum. Sterling (2003) characterises this way of thinking about sustainability as

an adaptive response that preserves the status quo of the dominant paradigm and values governing the education system. For example, he explains that there may be piecemeal attempts to include sustainability concepts within some subjects within the Curriculum; however, there may be conflicting messages supporting or reflecting unsustainability in other subject areas.

Education for sustainability (EfS)

EfS has been interpreted as being premised on the idea that a future pathway to achieve sustainability can be determined with the current knowledge we have. That is, the future is knowable and we have enough information at present to determine what the correct course of action may be. Vare and Scott (2007) identify this thinking as being consistent with their Type 2 approach, with the point of difference from Type 1 being that environmental problems are symptoms of the malaise, with the cause being social and/or political issues. However, with both the Type 1 and Type 2 approaches – as well as with both education *about* and education *for* sustainability – there is a similar understanding that the learner is largely non-agential and relies on the expert knowledge of others. Learning of this kind, say Vare and Scott (2007, p. 197), is merely useful as a “tool to facilitate choice between alternative futures which can be specified on the basis of what is known at present”.

In this approach, posits Sterling (2014), learners take a reflexive approach, adopting a critical questioning of existing assumptions, beliefs and values and engaging in a deeper affective learning. As such, Sterling suggests, there is a metacognitive element and thus it is considered “second order learning” (2014, p. 98) according to Bateson’s typology (1972). That is, the kind of learning encouraged here may promote a sense of engagement that engenders a greater sense of responsibility for our fellow humans. An example of this in Australia is the definition offered within the Department of Environment and Heritage (DEH) report *Educating for a sustainable future: A national environmental education statement for Australian schools* (DEH, 2005, p. 25):

Education for sustainability includes many of the founding principles of environmental education but with a stronger human focus, recognising that fundamental human rights and social justice are just as essential to sustainable development as environmental sustainability.

Another key feature of EfS is that action, not merely understanding and awareness, is required to improve our quality of life now and for future generations. The Australian Curriculum offers an extensive explanation of the approach embodied within EfS (ACARA, 2017):

Education for sustainability develops the knowledge, skills, values and worldviews necessary for people to act in ways that contribute to more sustainable patterns of living. It enables individuals and communities to reflect on ways of interpreting and engaging with the world. Sustainability education is futures-oriented, focusing on protecting environments and creating a more ecologically and socially just world through informed action. Actions that support more sustainable patterns of living require consideration of environmental, social, cultural and economic systems and their interdependence.

EfS is therefore seen as an action oriented, transformative approach as it focuses on not only changing individual but also social practices to more sustainable ones, as well as addressing the underlying structures that perpetuate these unsustainable practices (Kemmis & Mutton, 2012). In summary, EfS moves from a passive transmissive model of learning – as espoused by education about sustainability – to a transformational, constructivist model (Jenkins, 2015). Here the emphasis is on ‘learning how to learn’ rather than accumulating knowledge as there is now a great deal of evidence to suggest that this alone does not create change (Taylor et al., 2015). In classrooms education for sustainability may be evidenced by students critically examining the causes of unsustainability, reflecting on their own personal but also collective societal values. This approach also promotes competencies to create positive change in that students are empowered to take remedial actions such as saving power and water, recycling, composting, as well as advocating for and supporting marginalised groups (Rieckmann, 2018). Strategies teachers use in classrooms to achieve these aims may include the teaching of critical, and systems thinking, collaborative practices, and problem solving skills

This approach can be considered reformist – in that there is certainly an acknowledgement that the current situation does need to change and move towards sustainability – but its proponents posit that shifts in policy, lifestyle and actions can

be achieved over time without changing existing social and economic structures (Hopwood et al., 2005; Sterling, 2003). Indeed, a number of authors concur that the current dominant approach to EfS is a reformist one (Clifton, 2010b; Robinson, 2004; Sterling, 2011).

However, criticisms levelled at EfS centre around the idea that it is in fact a kind of indoctrination to educate *for* something, with Jickling (1992, 2005) being the main proponent. Jickling's objection is that educating *for* is inherently deterministic in that it implies the content and ideology to be infused into the education system is determined a priori by a segment of society making the decision on behalf of the rest of us. Using education for such instrumental predetermined ends, Jickling argues, defies how many people view the role of education. Foster (2001) also challenges the idea that you can educate *for* sustainability, arguing that it implies that humans can direct the whole educational enterprise to realise a state of sustainability. His view is that education cannot be used instrumentally to operationalise sustainability as it is up to all of us to incrementally and fluidly determine in a "collectively intelligent way what is to *count* as... sustainability" (p. 159). However, others, such as Fien (2000), counter these concerns, reminding us that no education is value free and neutral.

Other concerns are that both education *about* and *for* sustainability are just another addition to an already overburdened Curriculum and do not represent any cultural or mindset shift. Sterling (2004, p. 50) stridently says that sustainability should be about:

... a change of fundamental epistemology in our culture and hence also in our educational thinking and practice. Seen in this light, sustainability is not just another issue to be added to an overcrowded curriculum, but a gateway to a different curriculum, of pedagogy, of organisational change, of policy and particularly of ethos.

On examining studies that detail EfS in school contexts, I noted that, whilst the broader sustainability literature defines EfS in the way I have described here, as I explain later in this chapter, this interpretation is not necessarily consistently applied in the various school contexts.

Education as sustainability

So, while education about sustainability is about knowledge and awareness, and remains largely theoretical in nature, and EfS suggests education can develop capacity and action–competence, resulting in a change of both behaviour and practice (Cutting & Summers, 2016), education *as* sustainability is perhaps the next logical phase. Sterling (2014) visually explains this thinking, showing the development of change strategies, associated pedagogies and resultant outcomes in Figure 3.1 (adapted from Sterling, 2014, p. 100).

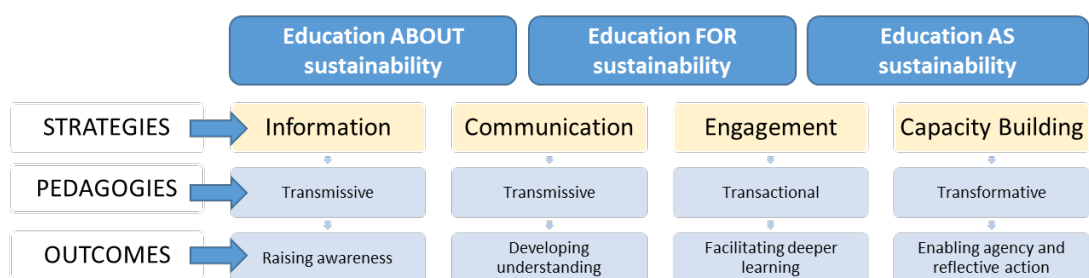


Figure 3.1: A continuum of change strategies

The shift to education *as* sustainability therefore opens up the interpretation of sustainability and recognises that it is not a fixed, pre-determined entity nor end point but rather an emergent and negotiated journey. That is, education undergoes an epistemic shift with a total restructuring and redesign, reflecting an ecological worldview and transformative educational practices (Sterling, 2003). Sterling, in his later work (2014, p. 98), elaborates:

There is an emphasis on capacity building, empowerment and action competence, stressing the ability to engage creatively, to manage successfully in conditions of uncertainty, complexity and ambiguity, to reflect critically and learn iteratively over time...

What makes education *as* sustainability a significant departure from education *about* and *for* sustainability is that what is under discussion here is not just cognition, nor behaviour alone. If marrying this to Bateson’s (1972) typology it could be categorised as “third order learning” and, as such, claim Tosey, Langley and Mathison (2010, p. 8), Bateson would envisage that this kind of education or learning involves “embodied,

enacted change... embodied knowing”. To achieve this kind of learning, suggest Tosey et al. (2010), would entail a transcendence and potentially a subversion of the basis of our perception and understanding of the world.

Yet some authors suggest that we do not have the time to patiently wait for learning of the kind suggested in both education *about* and education *for* sustainability to make incremental changes to the world (Wals, 2010b). Instead, we need to act now – and urgently – to change our ways of thinking, perceiving and doing and to transform our old, existing paradigms that support current unsustainable actions. This shift in epistemology is at the heart of this third level of learning. Sterling (2011) identifies that the crux of education *as* sustainability is the reconceptualisation of education so as to be able to see – that is, make apparent – our worldview rather than see *with* our worldview. In other words, education takes a transformative reflexive turn, “enabling a paradigmatic reconstruction” and causing “an expansion of consciousness and a more relational or ecological way of seeing... inspiring different sets of values and practices” (Sterling, 2011, p. 23). In this way, through this kind of education, the metadiscourses that form our existing worldviews are laid bare and are thus able to be directly challenged.

Nevertheless, this kind of transformative learning is challenging and uncomfortable, and can be resisted by both the learner and systems of education. That is, it is a difficult kind of education, Sterling (2011) points out, firstly to facilitate or design and, secondly, as it may present a lengthy traumatic experience over time for the learner as their mental models are reconstructed and recalibrated. However, Sterling counters this warning by noting that at the same time such a transformation has the potential to be an energising and a positive experience for learners. He argues that to shift to a new way of being and operating in the world requires no less than a wholesale shift in consciousness and that this can only be achieved through a new mindset and values that are clearly not evident within the dominant educational paradigms, policy practices and structures. In this next section I will examine these shifts in mindset and values that are thought to be a concomitant requirement for sustainability, and therefore are thought to support the shift from the current modes of education, that are still, in the Australian context, largely ‘education about’ and ‘education for’ sustainability, to a future model of education *as* sustainability.

Sustainability mindsets and worldviews

The way we think affects the actions we take. According to Robert Pirsig in *Zen and the art of motorcycle maintenance* (2014, p. 92):

If a factory is torn down but the rationality which produced it is left standing, then that rationality will simply produce another factory. If a revolution destroys a government, but the systematic patterns of thought that produced that government are left intact, then those patterns will repeat themselves... There's so much talk about the system. And so little understanding.

Modern education systems are based on a model, on a way of thinking, developed at the turn of the century to cope with rapid industrialisation, and have changed little in character and intent despite the passage of time. What is important to realise, stress a number of authors, is that education expresses, reflects and enacts the beliefs and values of the wider cultural milieu (see Sterling, 2003 as a leading proponent of this). These beliefs and values form the dominant paradigm that exert influence on the practices, provisions and policies of educational systems. Indeed, the dominant paradigm can be said to be hegemonic in that the ideas are so pervasive that they are rendered invisible and therefore imperceptible and, as such, it is this that constructs our mindsets and worldviews. Hence, when there is a need for change to occur within education, what most often occurs is that the solutions are sought within the same umbrella of paradigmatic thinking that caused the problems in the first instance, creating a tautological cycle.

Nevertheless, changing these mindsets that have contributed to our current global problems, advocate Nolet (2009), Orr (2004), Sterling (2003, 2010b) and numerous other authors, requires a change, in particular a change in our educational systems. Yet this is radically more than just a tinkering around the edges. In fact, as systems theorist and philosopher Ervin Laszlo (2001) posits, change needs to be in the magnitude of a “macro-shift”. That is, there are changes of such magnitude that they entail a change in civilisation as we know it. Laszlo warns that the world we have created is based on “established values, vision and behaviour (*that*) have become useless and even dangerous. We must update the way we perceive our world and the way we value it so that we would change the way we act in it. This in the final count, is the crux of the matter” (2001, p. preface).

However, change is not always straightforward, and there are a number of factors identified by various authors that in effect paralyse our current education system, rendering it less responsive in embracing a more sustainable future. At the core is an epistemological and ontological framing of our ideas that form our mindsets and values and thereby manifest in our actions – or inactions. Indeed, there have been many who have suggested that the root of the problem of our current crises is the way we perceive the world (Bateson, 1972; Capra, 1996; Capra, 2003; Lazslo, 2001; Sterling, 2009a).

As a first step, implementing an EfS model of education can change this. As elucidated in the earlier sections of this chapter, EfS is a rallying cry railing against these now outdated and incoherent models of the world. Such worldviews, mindsets and mental models are described variously as mechanical/mechanistic, reductionist and/or instrumentalist, whose function is to disaggregate the real world into composite parts in an attempt to understand how it works. The failure of this approach, however, is that the oversimplification incurred through such disaggregation is dismissed and the models of the real world created became a defacto reality. Sterling (2010b) gives the example that even the division of sustainability into the dimensions of economic, the social, the environment (and, I would add, the political) are “merely mental constructs. A glance out of the window at the real world will not indicate where any of these categories stops and another starts: the boundaries are in our heads” (p. 215). He argues that these models therefore create a boundary for our thinking, which I would refer to as ‘cognitive parameters’, delimiting the range of thought and opportunity for interconnectedness. Moreover, Selby (2007, p. 166) concludes this “straightjackets” our responses to the crises that arise as a result of such mechanistic, reductionist thinking as we cannot conceive of a resolution without applying a mechanistic solution.

This mechanistic worldview that has permeated Western thought has engendered an epistemological disposition of reductionism (Selby, 2007). To summarise the arguments made elsewhere for the evidence of domination of this worldview, I have compiled a list of the characteristics of such a worldview and how these impact on our Western education system (see Table 3.2, adapted from Sterling 2001, p. 47, 58-5). The table also includes a list of the characteristics of a more ecological worldview, an approach outlined in more detail next.

Table 3.2: Differences between mechanistic and ecological worldviews

Mechanistic worldview	Ecological worldview
Level 1: Educational paradigm – core values	
Preparation of individuals to contribute to the economy	Preparation of individuals to participate in all dimensions of society and contribute to sustainability transition
Selection or exclusion	Inclusion and valuing of all people
Formal education	Learning throughout life and informal learning valued
Effective learning	Transformative learning
Competition	Cooperation and collaboration
Development of institutional profiles (branding)	Developing learning communities – sharing knowledge
Standardisation	Diversity
Accountability	Responsibility
Level 2: Organisation and management of the learning environment	
A prescriptive and detailed curriculum	A curriculum which is open, negotiated and representative of diverse views, knowledge bases
Fixed knowledge and ‘truth’	Provisional knowledge recognising uncertainty and approximation
Disciplines and defence of borders – silos	Greater transdisciplinarity and domains of interest
External inspection	Self-evaluation, plus critical support
External indicators, narrowly prescribed	Self-generated indicators, broadly drawn
Quantitative measures	Qualitative as well as quantitative measures
Architecture, energy and resource use, and institutional grounds which are neither managed ecologically nor seen as part of the educational experience	Ecological management which is linked to educational curriculum and experience – the school environment is a ‘third teacher’
Top down control	Democratic and participative ideals
Planning	Design
Problem solving	Problem reframing and situation improvement
Few links with community	Acceptance of the local community as increasingly part of the learning community
Level 3: Learning and pedagogy	
View of teaching and learning as transmission and passive instruction	View of teaching and learning as transformation and active learning
Product oriented	Process, development and action oriented
Emphasis on teaching	Integrative view – teachers also learners, learners also teachers
Primarily for functional skills	Education is for functional as well as critical and creative inquiry and skills
View of learner as a cognitive being	As a whole person with full range of needs and capacities
Deficiency model	Existing knowledge, beliefs and feelings valued
Teachers as technicians	Teachers as reflective practitioners and change agents
Meaning is given	Meaning is primary and is constructed and negotiated

Examining Table 3.2, the conclusion can be drawn that the current education system in a number of countries, including Australia, is still largely rooted in a mechanistic worldview (Huckle & Wals, 2015; Sterling, 2010a); Sterling (2011); (Wals, 2010a; Wals, 2010b). Indeed, the shift in thinking to a more ecological worldview, as represented in Table 3.2, has taken place slowly across the globe over the past century, reflecting an ongoing, progressive recalibration of our basic assumptions of how the world works, and our place as humans within it. New scientific discoveries have relegated the dominant reductionist paradigm of Bacon, Newton and Descartes as an incomplete rendering that does not adequately, nor wholly, explain reality. What is emerging is a new paradigm that is blending ancient worldviews – for example Indigenous knowledge and Eastern philosophy – with more modern ideas of ecology and quantum physics that more comprehensively explain living systems and sub atomic physics (Du Plessis & Brandon, 2015).

This new ecological worldview is rooted in the ontological metaphor of *ecology* and contrasts with the Newtonian metaphor of mechanistic, reductionist and linear thinking (Sterling, 2009a). The tension between the two ways of viewing the world is captured by Capra (1996) when he states “The basic tension is one between the parts and the whole. The emphasis on the parts has been called mechanistic, reductionist or atomistic; the emphasis on the whole, organismic, or ecological” (p. 17). Sterling (2009a), a very strident advocate of the ecological worldview, also concludes that everything is inevitably drawn up into a relational vortex, contributing to the dynamism and future condition of the “whole” because everything is part of the “whole” (p. 67). Others, expressing similar views, use the terms “participative” (Reason & Bradbury, 2006), “co-evolutionary” (Norgaard, 1994); (Kallis & Norgaard, 2010), “living systems” (Elgin, 2015) or “postmodern ecological worldview” (Zweers, 2000) to describe these ideas. What is important to note, however, is that this new worldview does not replace the previous worldviews but instead builds upon them, adding deeper and clearer insights and creating a more comprehensive picture of reality (Wilber, 1996, 2000).

Du Plessis and Brandon (2015) identify three key narratives associated with the ecological worldview – integral, relational and non-linear. The first is that the world needs to be considered as a whole, where humans are considered as an integral part of

nature. Just like any other organism, they act upon and are acted upon within the biosphere, that is, they are participative co-creators of the world around them. In contrast, our system of education reflects a collective consciousness which views humans as disconnected elements coexisting with nature rather than intrinsically part of the whole. Returning to the work of Bateson (1972), this worldview is a result of an “epistemological error” which he explains by saying “I believe that (the) massive aggregation of threats to man and his ecological systems arises out of errors in our habits of thought at deep and partly unconscious levels” (1972, p. 463). By this, Bateson means that the core of the modern worldview is based on an erroneous perception of Cartesian dualism where we dissociate mind and body, people and nature. Moreover, it can be argued that our current worldview is a largely anthropocentric one where humans are not considered as being in an integral, symbiotic relationship with nature but as apart from, and of supreme importance to, above all other life forms. In effect, we humans have a predatory view of the world, adopting a mindset that all its resources are at our disposal with little regard for consequences of their depletion (Bonnett, 2002; Capra, 1982, 1996; Selby, 2007). It is this sense of separateness and utilitarian view of nature that has permeated our collective consciousness and has become the *modus operandi* of the Western world (Handa, 2017; Louv, 2005; Malone, Truong, & Gray, 2017; Taylor, 2017; Ward, 2017). Our Western education systems, argues Handa (2017), are also based on this mindset that has at its core a mechanism for controlling or conquering nature.

The second key narrative is that this worldview is relational. This is broader than traditional ideas of ecology, and encompasses the idea that the world is “constantly regenerated through interactions within systems at all scales and levels of existence (physical, intellectual, emotional, social and spiritual)” (Du Plessis & Brandon, 2015, p. 56) that engenders adaptation, self-organisation and evolution. Importantly, there is a sense of ‘becoming’, where phenomena are not seen as existing independently but are brought into being through their relationships.

The third narrative is that the world is in constant change and flux, is non-linear, where small-scale changes can lead to macro level changes through perturbation and critical bifurcation points. There is also a recognition that the world is complex, uncertain and unpredictable and, therefore, all knowledge is subjective and dependent upon the

viewpoint of the observer. These narratives are represented in the sustainability literature as systems thinking.

Systems thinking, first encountered in the 1930s (Capra, 1996; Senge, 2006; Sterling, 2003), has come to represent such a new way of thinking in relation to creating a sustainable world, one that creates a new perception of reality, a new worldview. Systems thinking is the one concept most frequently mentioned in the literature as being an essential aspect of sustainability education, with Sterling (2003), Capra (2003), Senge (2004), Wals (2007), Huckle (2006), Lewis (2013), Wright and Meadows (2012) and Davis (2010) being key proponents of this view.

The emphasis of systems thinking is to think about the whole – as an example of holistic thinking. It is derived from the Greek *holos* meaning the whole. Wholes are not to be thought of as ‘things’ according to Bertalanffy (1968), a Viennese biologist who was an early proponent of systems thinking, but rather as networks of relationships or interactive, interconnected patterns of organisation. Relationships and interconnectivity are the central tenets of systems thinking – or whole systems thinking – and are considered to be the organising principles that govern the universe (Capra, 1996; Senge, 2004). Evitts, Seale and Skybrook (2010, p. 1) posit that by becoming more aware and in tune with these hidden, invisible relationships, a “tightly interconnected web of existence” is revealed to us.

Thus, systems thinking is a way of seeing and perceiving that simultaneously sees all the disparate elements (the parts) and also how they are connected to comprise the entire picture or context (the wholes). Within this resides the idea of ‘emergence’, where what is generated cannot be predicted from the properties of their constituent parts. An illustration of this principle, suggests Stone (2010, p. 39), is “the wetness of water cannot be predicted by adding together the properties of hydrogen and oxygen or the tensile strength of steel exceeds the combined strengths of iron and nickel”. The whole, therefore, is greater than the sum of its parts. The complexity of the world becomes apparent when you understand that there is not a singular whole but rather a world that is made up of “hierarchies of systems nested within systems, wholes nested within wholes” (Evitts et al., 2010, p. 17). Hence, a central principle of systems thinking is that the ‘whole’ or ‘system’ is irreducible, it must be considered in its entirety. As such, in terms of this study, these ideas support the conceptualisation of

sustainability I have adopted, one that is aligned to the holistic UNESCO model (see Figure 2.5) that requires all four dimensions of sustainability – the environmental (ecological), social/cultural, economic and political – to be considered as interdependent.

In summary, this section has identified that if the world is to continue with its current predilection for mechanistic ways of thinking, the ability to respond to change in a timely and appropriate manner is severely constrained. Indeed, continuing in this way can only perpetuate further unsustainability. The rapid rate of change in multiple and intersecting societal, environmental and economic systems across the world therefore necessitates a more flexible and responsive system. The literature strongly supports that greater sustainability is best supported by moving to a way of working based an ecological worldview where interdependence and interconnectedness are acknowledged. An essential feature of this shift to an ecological worldview is the ability think in ‘systems’. Whilst in this preceding section I have examined the ‘idealised’ educational contexts regarding sustainability in schools, in the following section I examine the actual Australian context, where the expression of sustainability in policy documents is largely termed as EfS.

EfS in the Australian policy context

In this section I map out a brief historical overview of Australia’s policy responses to EfS, with a focus on how sustainability forms part of the Australian Curriculum and how the notions of achievability and accountability are defining discourse in this country. The conclusion of this section outlines the current policy environment relevant to the overall aim of this research as evidence for ways the current system of schooling in Australia affords EfS in a practical setting. A number of official policies, statements and developments have mapped the journey towards sustainability in education in Australia (see Table 3.3), and three pivotal documents amongst these milestones are outlined below. Of the list identified in Table 3.3, in this study I focus on the three sustainability policy initiatives that featured at my research site, Amity PS – the AuSSI schools program (which became SS-WA in WA), SAKGP, and the Australian Curriculum. As such, in the next section of this chapter I outline how sustainability is evidenced within the Australian Curriculum, and address the SS-WA and SAKGP in Chapter Four.

The beginning of a national approach to EE in Australia started with the document *Environmental education for a sustainable future: A national action plan* (DEH, 2000). Whilst still privileging the environment as a focus for education, the report nevertheless promoted the view that EE is critical in leading to changed behaviours for an ecologically sustainable environment and explicitly framed such education as encouraging people to “think broadly and understand systems, connections, patterns and causes” and to understand that the “challenges... have social, scientific, cultural, economic and ethical aspects, all of which must be considered... a holistic appreciation of the context of environmental problems is essential” (DEH, 2000, p. 4).

In 2005 another report, *Educating for a sustainable future: A national environmental education statement for Australian schools* (DEH, 2005), promoted the kind of education that dealt with 21st century issues, embodying “sustainability in the broadest sense, with an emphasis on transformational change in values and behaviour from the individual to a global scale” (p. 6). Moreover, this document stressed the importance of taking into consideration UNESCO’s aforementioned four dimensions of representations of sustainability – environmental/ecological, social/cultural, political and economic (Figure 2.5) – the key concepts and themes of which are consistent with those I have constructed for my study as I have outlined in Appendix A. This report therefore aligned Australian policy views with the more current conceptualisation of sustainability I discussed earlier in this chapter.

Whilst this document still primarily focused on EE, the next document, *Living sustainably: The Australian government’s national action plan for education for sustainability* (DEWHA, 2009b) catapulted sustainability front and centre. Rather than being organised around purely environmental issues, *Living sustainably* used EfS as an organising framework. Additionally, a very strong alignment with the UNDESD focus on reorienting education systems to sustainability was present throughout the document and was particularly evidenced in the EfS “principles of transformation and change; education for all and lifelong learning; systems thinking; envisioning a better future; critical thinking and reflection; participation and partnerships for change” (DEWHA, 2009b, p. 9).

By now there was an understanding that EfS in Australia meant more than just providing information about the environment, that instead it rested on a number of

interconnected needs and understandings, namely the importance of an interconnectedness of environmental, economic, social and political systems, a shared vision of the future, partnerships and cooperative approaches, and a critical engagement with the world in order to challenge current thinking. As such, this report provided a clear rationale for the importance of EfS and precipitated its inclusion in the new Australian Curriculum that was being mooted.

This understanding also brought about a shift in the language used in government policy documents – from ‘environment’ or ‘environmental’ to that of ‘sustainable development’ and now, more commonly, ‘sustainability’ or the preferred terminology of EfS (DEWHA, 2009a). The shift was also apparent in the renaming of government bodies such as the National Environmental Education Council (NEEC) to the National Council on Education for Sustainability (Chambers, 2011; DEWHA, 2009b). The Australian Curriculum was a strong example of a policy document that championed the terms sustainability and EfS, heralding a greater awareness these in schools. I discuss this in greater depth in the following sections of this chapter. This new national Curriculum was the impetus for the development of a Sustainability Curriculum Framework (DEWHA, 2010c) document designed to provide information and guidance for curriculum developers and policy makers on the way sustainability could be structured from Kindergarten to Year 10 (see Chapter Five).

Table 3.3: Development of key EfS policies, statements and developments in Australian education

Key policy papers / statements / developments	Addenda
1992 <i>Agenda 21</i> endorsed by the Australian government <i>National strategy for ecologically sustainable development</i> (Commonwealth of Australia)	Limited the role of education to processes of information and awareness raising. Provided the framework for each state and territory to create their own response.
1999 <i>The Adelaide Declaration on national goals for schooling in the 21st century</i> (Ministerial Council for Education, Early Childhood, Development and Youth Affairs [MCEEDYA])	Provided broad direction to guide schools and education authorities.
<i>Today shapes tomorrow: Environmental education for a sustainable future: A discussion paper</i>	Responded to inaction with <i>Agenda 21</i> ; EE became top of sustainability agenda.
2000 <i>Environmental education for a sustainable future: National action plan</i> (Department of Environment and Heritage [DEH])	Provided leadership and point of coordination for EE in Australia.
National Environmental Education Council (NEEC) established	Established advisory expert groups across school, tertiary and industry sectors. Was formed as an outcome of the national action plan.
2003 Australian Research Institute in Education for Sustainability (ARIES) established	Conducted research to identify whole-school approaches for EfS.
2003 Hope for the Future (WA)	Established a state sustainability policy strategy which focused sustainability education on awareness raising and the need to modify behaviour.
2004 Australian Sustainable Schools Initiative [AuSSI] launched	Established a voluntary federal government-funded initiative that sought to create a whole-school approach to EfS.
2004 <i>Environmental education strategy and action plan</i> (WA)	Still based on traditional models of EE, this raised awareness and encouraged responsible environmental behaviour.

[Table continued overleaf]

Key policy papers / statements / developments	Addenda
2005 <i>Initiating the UNDESD in Australia: Report of a national symposium</i> (July 2005)	Offered advice from the Australian community to the government about how they should proceed with the UNDESD.
2005 <i>Our environment, our future</i> (Victoria)	Focused education on the provision of information in order to precipitate change. Followed a traditional model of EE.
2005 <i>Educating for a sustainable future: A national environmental education statement for Australian schools</i>	Defined sustainability in the “broadest sense, with an emphasis on transformational change in values and behaviour from the individual to a global scale” (p. 6).
2007 <i>Caring for our future: The Australian government strategy for the UN’s education for sustainable development</i>	Pledged commitment to embed EfS in formal schooling.
2008 <i>Melbourne declaration of educational goals for young people</i>	Informed the development of the Australian Curriculum in order to meet the needs of 21st century learners. Acknowledged sustainability as an important issue for students.
2008 Stephanie Alexander Kitchen Garden Program [SAKGP]	Initiated a federal government-funded rollout of a voluntary program to build kitchen and garden infrastructure in government primary schools.
2009 <i>Living sustainably: The Australian government’s national action plan for education for sustainability</i>	Placed education at the core of creating a sustainable future. Offered a broad understanding of sustainability, including social, economic and environmental dimensions.
2010 <i>Sustainability curriculum framework: A guide for curriculum developers and policy makers</i> (DEWHA)	Futures oriented. Provided advice for curriculum developers to embed sustainability into a formal curriculum.
2012 Australian Curriculum CCP – sustainability	Offered a multidimensional approach. EfS was interpreted as “beyond the ‘environmental’ domain, extending richly into the domains of systems thinking, worldviews, futures and ethic of care” (Dyment & Hill, 2015).

However, while this shift – not to mention the seemingly extensive list of documents outlined in Table 3.3 – looks impressive, it is notable that the most recent significant government policy or initiative in terms of EfS was in 2012. According to Lasen, Skamp and Simoncini (2017), this gap in EfS policy between 2012 and the present day can be attributed to the election of a Conservative federal government in 2013. They note the effects of this government in terms of EfS included the cessation of funding and the decommissioning at the national level of not only AuSSI – which then became individual states’ and territories’ responsibility (Smith & Watson, 2019) – but also of the two aforementioned reports, *Living sustainably* (DEWHA, 2009b) and *Educating for a sustainable future* (DEH, 2005). Indeed, these two documents, alongside others related to sustainability, were then even removed from public access from Australian government websites (Evans, Stevenson, Lasen, Ferreira, & Davis, 2017; Smith & Stevenson, 2017).

If, therefore, as Moore, Almeida and Barnes (2018, p. 107) suggest, “policy is about change”, it would appear that the dismantling and disappearance of sustainability policy and initiatives, as evidenced in Australia, indicates the change came to an abrupt halt in 2013. The causes for this disruption in the momentum towards sustainability are discussed in the next section.

Sustainability within a discourse of achievement and accountability in Australia

Schools in Australia are sites of multiple and contested, often competing, policies. Teachers are faced with the task of responding, either overtly or covertly, to these policy imperatives and finding a navigable way to meet their official obligations whilst still pursuing personal and professional passions. In addition, the current trajectory of the policy suite impacting Australian education from a sustainability perspective entreats educators to be responsive to such diverse matters as global social and environmental concerns and social justice and equity, whilst simultaneously ensuring the economic global ascendance of our nation. Such policy directives result in teachers in schools being required to reconcile sometimes conflicting and contradictory policy aims.

For example, even the policy discourses influencing education have their origins in two major – and in some ways opposing – fields of thought. One of these is the development over the last 2 decades of a globalisation agenda that has co-opted

education as a strategic tool in the nation's arsenal in order to achieve economic growth. This has spawned a greater sense of the need for accountability and standards, and can be directly linked to the spread of the neoliberal policy formulations of governments not only in Australia but also in England, the United States (USA) and Canada. The other, arising somewhat simultaneously since the 1980s, is the emphasis on EfS resulting from a growing realisation of the need to do something to halt the decline of the planet. Paradoxically, achieving the former is predicated on the narrowing of attention to improving student scores in their basic literacy and numeracy skills, whilst the latter is said to require a broad, holistic integrated style of education.

The discourse of achievement and accountability in education has gained momentum since the 1980s in countries such as England, the USA, Canada, New Zealand as well as Australia. This has arisen because these governments are moving away from a socially-centred Keynesian model of economics with a sense of care for the common good to a more highly individualistic, competitive, deregulated market approach that has come to represent a neoliberal orientation to policy (Lakes & Carter, 2011; Lingard, 2010). In particular, the link between education and the economy has assumed an increasing importance over this time and has slowly shifted the purposes and intent of schooling (Davies & Bansel, 2007). This has also resulted in a move from ideals that are more progressive to those that embrace the utilitarian value of the individual in service to the state.

This impact of neoliberalism on education systems has produced a similar landscape wherever it has penetrated. For example, in England, Ball (1999, pp. 196-197) suggests that neoliberalism in education policies are manifested in three inter-relating principles – choice and competition, resulting in the commodification and consumerisation of education; autonomy and performativity, which causes the managerialisation and commercialisation of education; and centralisation and prescription, resulting in the imposition of centrally determined assessments, schemes of work and classroom methods. Similarly, in Canada, neoliberalism has translated into major policy shifts since the 1980s that privilege competition, individualism and entrepreneurship. This is evidenced in the decentralisation of provincial responsibilities to municipalities, increased privatisation within and of schooling, mandated standardised curriculum, and province-wide standardised testing of students and greater teacher accountability

measures (Carpenter, Weber, & Schugurensky, 2012). Across the border in the USA most school reforms have at their basis the same neoliberal ideals (Apple, 2006), the most infamous example of this being the No Child Left Behind (NCLB) policy that focused on tightening standards and increasing testing and accountability measures and consequences (Gruenewald & Manteaw, 2007). These kinds of policy shifts have come to be collectively known as a discourse of achievement and accountability. This movement has also become known as the Global Education Reform Movement (GERM) and has created a hegemonic discourse of standardisation, achievement, competition and accountability (Sahlberg, 2015).

In Australia the effects of a regime of achievement and accountability mirrors that experienced in other countries. We have ‘borrowed’ policies from these Anglophone counterparts (Lingard & Sellar, 2013), and have has taken on the language, rhetoric and policy directions consistent with this discourse of achievement and accountability. These neoliberal trends have permeated Australia such that quality education is now synonymous with reporting, a standardised Curriculum and assessment metrics (Lingard, 2010; Lingard & Sellar, 2013). This in turn has caused the proliferation of policies and bureaucratic processes that focus on school performance and literacy standards (Comber & Nixon, 2009). In such a policy climate this overt neoliberal education agenda can act as a constraint to a broad interpretation of curriculum, thwarting sustainability education from flourishing (Smith & Stevenson, 2017).

Therefore, while it can be argued that the effects on Australian pedagogy are manifold, a central one pertaining to EfS is a narrowing of the Curriculum, particularly in favour of literacy and numeracy (Lingard & Sellar, 2013). This has created a somewhat ironic situation in education in Australia – as well as other Anglophile countries – where, at the same time as there is a worldwide call for a move toward sustainability, there is a paradoxical reform of achievability being promoted, couched in terms of the need for global economic competitiveness, which is gained through increased student achievement success rates primarily in the narrow measures of literacy and numeracy.

As such, a particular view, and purpose, of education arises as the result of such emphases and creates a hegemonic mindset that becomes hard to resist. As a result, the link between success in literacy and numeracy and economic ascendancy has therefore become firmly entrenched in the Australian psyche. After all, who does not

want their country to prosper and for their children to reap the rewards of a strong economic global position? However, quietly, the need for a broader style of education that works for the common social good has thus given way to a belief that a narrower focus on particular learnings will provide a more efficient way of ensuring Australia's educational success. The economy then becomes the primary goal of education and the technologies employed to ensure its ascendancy, in policy circles, are primarily ones of surveillance and accountability.

Additionally, in its desire to be a competitive economy, Australia has centralised – that is, nationalised – its educational policy with the ultimate aim of concentrating efforts to improve teacher and student outcomes and performance. It is of note that this has occurred despite Australia's federal political structure with constitutional responsibilities for education residing with the state governments. One key feature in Australia's education policy landscape that exemplifies this discourse of achievement and accountability are the national standardised tests designed to measure students' literacy and numeracy skills. These tests form the National Assessment Program – Literacy and Numeracy (NAPLAN).

Indeed, it can be argued that NAPLAN purely arose out of the perceived need to improve achievement and accountability. Policy makers formed the view that to ensure Australia's global competitiveness and economic ascendancy, education standards needed to be raised – they argued that the best way to achieve this was to ensure that all of Australia's students had adequate knowledge of basic skills in literacy and numeracy. Thus, annually since 2008, each student is tested on these reading, writing, language conventions (spelling, grammar and punctuation) and numeracy skills in Years 3, 5, 7 and 9. By standardising the tests, it became possible for schools to be ranked through a publicly available metric that enables poorly – and strongly – performing schools to be identified (Au, 2008). Parents and the community are then able to make judgements and may select schools that rank highly, thus promoting choice and competition.

However, one of the arguments against standardised tests such as NAPLAN is that they exert control over “pedagogic discourse” (Au, 2008, p. 640). Research from the USA (Au 2007, cited in Au, 2008) shows that they affect three areas of education – content knowledge, form of content knowledge, and teacher pedagogies. Firstly, such

tests were shown to delimit what is counted as legitimate school content knowledge, that is what is considered worthy to be included in the enacted curriculum and what is actually taught in the classroom as opposed to what is intended. In other words, knowledge that is not being tested risks being excluded from the students' learning experiences. The effect that this may therefore have is that knowledge, skills and strategies in literacy and numeracy that are not tested in NAPLAN are given peripheral status or, in fact, may be omitted entirely. Similarly, whole subject domains such as art, science and social studies may be marginalised or, in some cases, ignored (Au, 2008). Secondly, these tests changed the way content was presented by classroom teachers. For example, knowledge is presented as "isolated facts, as bits and pieces of datum that students need to memorize for the tests alone" (Au, 2008, p. 640). Thirdly, teacher pedagogies become increasingly teacher-centred with a corresponding "decrease in student-centred activities, field trips and opportunities for independent learning" (Au, 2008, p. 640) in the belief that this type of direct teaching is more time efficient and will enable effective coverage of content needed for the tests.

So how does this affect the teaching of sustainability and sustainable practices in the school environment? Evidence of the impact of standardised and high stakes testing and assessment practices on the implementation of EfS in schools was a noticeable trend across the literature. Indeed, a large number of studies showed the demands of these testing practices – in particular the focus on literacy and numeracy – have prevented teachers and schools from fully engaging with EfS (See for example: Eames, Cowie, & Bolstad, 2008; Evans et al., 2012; Gruenewald & Manteaw, 2007; Hodgkinson, 2011; Kennelly, Taylor, & Serow, 2012; Lasen et al., 2017; Malone & Somerville, 2015; McNaughton, 2012; Puk & Behm, 2003; Raso, 2014; Redman, 2013; Simkin, 2014; Stevenson, 2007b; Warner & Elser, 2015). This is therefore a strong and pervasive thread of concern warranting further investigation.

Sustainability and the Australian Curriculum

In this section of the chapter I identify the impetus for the inclusion of sustainability in the Australian Curriculum. In addition, I elaborate on the way that sustainability is presented within the Curriculum text through the notion of both SOI in the Sustainability CCP and the Sustainability CCP statements. It is important to note that, unlike the previous state-based curriculum documents which were available as a hard

copy or paper version, the Australian Curriculum has only ever been able to be accessed by teachers online via the ACARA website. By going to the ACARA website and locating the online Curriculum, teachers can identify the appropriate Curriculum goals – expressed as content descriptors – as well as the scope and sequence of Curriculum content for each learning area for their particular year level. They can also access some additional pointers – Curriculum guidance in the form of elaborations – that sit alongside the content descriptors.

In the development of the new Australian Curriculum, the goals of the *Melbourne Declaration of Educational Goals for Young Australians* (MCEETYA, 2008) were a strong influence, as evidenced in ACARA's May 2009 shaping paper (ACARA, 2009b, p. 5). This paper expounded that new approaches to education were now needed in response to the changes occurring in the world, a time of "Complex environmental, social and economic pressures such as climate change, that extend beyond national borders pose unprecedented challenges..." which heralded a "need to nurture an appreciation and respect for social, cultural and religious diversity, and a sense of global citizenship" (ACARA, 2009b, p. 5).

As part of this way of thinking about education, the Australian government, right from the outset, flagged their intention to create three cross curriculum perspectives – Aboriginal and Torres Strait Islander Histories and Cultures, Asia and Australia's Engagement with Asia, and Sustainability. Sustainability was to be "a commitment to sustainable patterns of living... reflected, where appropriate, in national curriculum documents" (ACARA, 2009b, p. 13). Over time, a sense of urgency became evident with the growing recognition of the need for the Australian Curriculum to "be both relevant to the lives of students and address the contemporary issues they face..." resulting in a change of language for these cross curriculum areas from the more passive term 'perspective' (ACARA, 2009a), to the more active 'priorities' (ACARA, 2010, p. 20). In December 2010 the sustainability cross curriculum priorities (CCP) were formally endorsed by the council of federal, state and territory ministers of education (ACARA, 2015). This increasingly active and engaged rhetoric around sustainability was also reflected in subsequent ACARA documentation regarding these sustainability CPP (ACARA, 2012, p. 18):

The sustainability priority will allow young Australians to develop the knowledge, skills, values and worldviews necessary for them to act in ways that contribute to more sustainable patterns of living. It will enable individuals and communities to reflect on ways of interpreting and engaging with the world.

The Australian Curriculum therefore needed to enable students to act in favour of greater sustainability as well as to ensure students develop the capacity to reflect on the world as it currently was, and how they engaged with it. The discourse in the Curriculum guidance documents also began to move beyond just the environmental concerns with the inclusion of considerations for the future (ACARA, 2012, p. 18):

Sustainability addresses the ongoing capacity of Earth to maintain all life. Sustainable patterns of living meet the needs of the present without compromising the ability of future generations to meet their needs. Actions to improve sustainability are individual and collective endeavours shared across local and global communities. They necessitate a renewed and balanced approach to the way humans interact with each other and the environment.


The Sustainability priority is futures-oriented, focusing on protecting environments and creating a more ecologically and socially just world through informed action. Actions that support more sustainable patterns of living require consideration of environmental, social, cultural and economic systems and their interdependence.

Sustainability was therefore clearly an important espoused feature of the new Australian Curriculum. Its claimed intent was for all students, at all levels of education, to comprehend the complexity of making change through an understanding of the interdependence of not only the environmental, but also the social, cultural and economic systems. This understanding of interdependence was intended to be translated into an integration of sustainability across all learning areas, in every Australian school (Hill & Dymont, 2016). To this end, sustainability was designed as a CCP to ensure that teachers remained aware that it was not just a discrete set of skills and knowledge, but that it should become a way of thinking and doing that should transcend subject boundaries (ACARA 2012).

In particular, this commitment to sustainability has been expressed in the Australian Curriculum in two main ways. Firstly, ACARA developed a set of nine ideas organised into the three conceptual groupings – systems, worldviews and futures – which are known as SOI (Table 3.4). These are designed to represent the intent of the Sustainability CCP, give teachers a coherent picture of concepts associated with sustainability, and identify the necessary skills, knowledge and ways of viewing and thinking about the world that would be required of students. The SOI have remained consistent in their wording from their inception to the most recent Australian Curriculum v8.3 (ACARA, 2014).

Table 3.4: SOI within the Australian Curriculum

Code	SOI
Systems	
OI.1	The biosphere is a dynamic system providing conditions that sustain life on Earth.
OI.2	All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing and survival.
OI.3	Sustainable patterns of living rely on the interdependence of healthy social, economic and ecological systems.
Worldviews	
OI.4	Worldviews that recognise the dependence of living things on healthy ecosystems, and value diversity and social justice are essential for achieving sustainability.
OI.5	Worldviews are formed by experiences at personal, local, national and global levels, and are linked to individual and community actions for sustainability.
Futures	
OI.6	The sustainability of ecological, social and economic systems is achieved through informed individual and community action that values local and global equity and fairness across generations into the future.
OI.7	Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments.
OI.8	Designing action for sustainability requires an evaluation of past practices, the assessment of scientific and technological developments and balanced judgements based on projected future economic, social and environmental impacts.
OI.9	Sustainable futures result from actions designed to preserve and/or restore the quality and uniqueness of environments.

Secondly, sustainability has been identified by the ACARA Curriculum design paper 3.1 (2013) as being integral to aspects of the Curriculum text through the use of a three-pointed leaf visual icon or tag . The use of this icon is to alert teachers to the need

and opportunity to address the Sustainability CCP in relevant learning areas. The icon is placed next to either Curriculum content statements or, in some instances, the elaborations of these statements. These tagged elements of Curriculum text have become known as the Sustainability CCP statements. As the Australian Curriculum took many years to develop, initially teachers could only work with the tags evident within the first four learning areas developed and implemented by 2012, namely English, mathematics, science and history. In WA, as with the rest of the country, the remainder of the Curriculum learning areas were implemented in a piecemeal manner, with the final learning areas only becoming available to teachers in 2016. Thus, through the inclusion of sustainability in the Australian Curriculum, teachers are provided with some policy guidance in terms of what to teach. The Australian Curriculum is clear that it provides guidance with Curriculum content and not pedagogy (Brennan, 2011), thus teachers have latitude with how they interpret and implement these ideas into their teaching. The enactment of the skills, knowledge and actions, that arise from these sustainability ideas in the Australian Curriculum, form part of the landscape of what can be considered EfS in schools.

In the following sections of the chapter I examine the literature that examines how sustainability is addressed within the context of schools, and in particular primary schools.

Part two: Sustainability in a school context

In this section of the chapter I turn to the literature that goes beyond theories and policies and instead examines sustainability in the more practical, day-to-day context of schools. In light of my first research question – outlined in more detail in Chapters One and Four – my study focuses on two aspects. The first is the importance of teachers' understanding of sustainability as a concept. The second is their interpretation of the concept through their collective practices in schools, both internationally and in Australia, that is considered as EfS. Therefore, in this review I purvey literature that addresses both of those aspects. I begin this section by setting out the arguments for the importance of teachers understanding the concept of sustainability. I then examine the literature that details teacher awareness and understanding of EfS policy, and follow this with a discussion of how research in school contexts, at times, blurs the concepts and boundaries around sustainability and

EfS. Following this, I provide a broad overview of the literature that looks at EfS in schools, both internationally and in Australia. I then examine what teachers understand by sustainability across early childhood, secondary, and lastly primary, as this is the context of this study. I conclude by presenting key research regarding teachers' understanding and enactment of sustainability in sites of exemplary EfS practice in the primary setting, culminating with an explanation of the positioning of this research.

The importance of teachers' understanding of sustainability

Despite the patchy policy trends in Australia which I have discussed previously in this chapter, there is still a growing trend around the world, as I identified in Chapter One, to include sustainability in curricula. Teachers are considered, perhaps now more than ever, as change agents. An expectation has been thrust upon them that, through their teaching practices and influence, they will reorient the education system towards sustainability and thereby turn the careering 'world ship' towards a more sustainable destination. It has been argued that, whilst, clearly, schools and teachers are not the sole source of sustainable knowledge and behavioural changes, they certainly have a great impact on students' learning (Hattie, 2009).

Further, given teachers have been given the mantle of professional responsibility to educate their students in a complex understanding of sustainability, it would therefore seem imperative that teachers also have such understanding. As such, Loughran, Berry and Mulhall (2012) argue that effective teachers should not only have a rich conceptual understanding about what they are teaching, that is, the content, but also the knowledge and skills to meet the learning needs of their students through appropriate pedagogy. This amalgam of conceptual understanding and pedagogical expertise is known as pedagogical content knowledge or PCK (Shulman, 1987). If educators are to take up the call by UNESCO to move towards a more sustainable future through education, it seems imperative to examine how understanding the term sustainability guides their PCK.

It is not difficult to argue that if teachers have a poor understanding of sustainability, this will unquestionably affect their teaching of it, and this will, not surprisingly, impact student understanding of, engagement with, and actions in relation to sustainability. Indeed, teachers' understanding of sustainability as a concept is likely to determine which of the three models of sustainability in education described

previously in this chapter they are likely to enact in their classroom. For example, in a large-scale Swedish study of 2,413 adolescent students, Boeve-de Pauw, Gericke, Olssonm and Berglund (2015) examined learner perceptions of how well Swedish teachers taught a holistic and pluralistic conception of ESD. In the typology of educational models of sustainability, presented previously in this chapter, this was most aligned with EfS. Nevertheless, their findings, although demonstrating some effect on student knowledge, attitude and behaviour in relation to sustainability, question whether Swedish teachers had comprehensive understanding of sustainability. In addition, they note that despite the strong policy direction this appeared to have little effect on teacher practice (Boeve-de Pauw et al., 2015). Indeed, evidence of teachers' lack of confidence in understanding and putting sustainability into practice has been identified as one of the key barriers to its implementation (Evans et al., 2012; Green & Somerville, 2015; Kennelly et al., 2012; McKeown, 2013; Nolet, 2009).

It is interesting here to note that studies of students' conceptions of sustainability evidence a variety of understandings of sustainability. For example, a 3-year longitudinal study of students in the United Kingdom (UK) during 2005-2008 showed that whilst most students had heard of the word sustainability it was largely only associated with the environment, and these students were unable to articulate anything more than a simple personal concept (Gayford, 2009). Similarly, another UK study showed that 12-13-year-old geography students appeared to 'know' the different dimensions of sustainability – economic, environmental and social – but they did not have a detailed enough understanding of their interconnectivity (Walshe, 2008). This was a surprising and concerning finding given that these were geography students and that a holistic view of sustainability was strongly represented within geography in the English Curriculum. However, the concept of sustainability is a complex one – students need to be equipped to grapple with the idea of interconnectedness and exploration of tensions between the natural environment, the social dimensions, economics and questions of power / politics and it can be argued that they need knowledgeable teachers to assist them with this (Walshe, 2008).

These studies therefore bring into question what kind of education is being provided in relation to sustainability in schools and, furthermore, what teachers know and

understand by the concept. It also alerts us to the need for a clear connection between a strong policy framework and support for teachers' understanding of, and capacity to, educate for sustainability. It is by following these lines of inquiry that has led me to the focus of my own research.

Teacher awareness and understanding of EfS policy

Despite decades of policy directed at sustainability in education across the globe, the mid-decade global review of the UNDESD confirmed there was limited awareness and understanding regarding this in a wider context and at all levels of education (UNESCO, 2009). There is also evidence to suggest that this is also the case in Australia. That is, in addition to EfS being poorly understood by teachers, their work is also not being guided by an awareness of sustainability policies, either national- or state-based (Smith, 2014; Taylor et al., 2015). In addition, a number of Australian studies have made commentary about the conceptual fuzziness of EfS for teachers due to the lack of clarity in Curriculum documents about the difference between EE and EfS which made it difficult for teachers to interpret into practice (Skamp, 2009). Indeed, in Australian schools, EfS is still “finding itself” in terms of how it is understood and established in practice (Kemmis & Mutton, 2012, p. 188). Disturbingly, evidence from Smith's (2014) study of primary and science teachers in NSW attests to this apathy towards sustainability implementation, noting that none of the teachers were aware of the UNDESD, nor were they cognisant that sustainability was a CCP underpinning the legislated Australian Curriculum. A cause for this, suggest Malone and Somerville (2015), is that education systems – that is, the states and territories, and particularly the national system – have been piecemeal in their ongoing commitment to EfS. Reflecting the previous discourse on achievement and accountability discussed in this chapter, evidence from some school systems has also identified another cause – the reluctance to include EfS is due to the fear it may dilute or interfere with the current narrow focus on improving test scores. The change in federal government, in the same year as that report was written, brought with it a retraction from the emphasis on sustainability and, therefore, a dilution as a cross-curricular thread, posing a threat to its continuation.

Other evidence also supports a lack of teacher awareness and understanding of EfS in Australia. The results of a large-scale quantitative study of almost 5000 educators across Australia conducted by the sustainability action group the Australian Education

for Sustainability Alliance (AESA, 2014) showed that despite very positive initiatives and a few exemplary examples of EfS practice, these were quite isolated – in reality, 91% of teachers still had not made any headway into integrating sustainability into their teaching practice. Interestingly, this was not due to a lack of belief in the importance of sustainability – the same study showed that 92% of the teachers surveyed believed in the importance of sustainability, saw it as a valuable aspect that students should be engaged with, and supported its integration into the Australian Curriculum (Taylor et al., 2015). Instead, Taylor et al. (2015) surmise reasons for this are due to a lack of confidence in teaching EfS caused by “a poor conceptual understanding of environmental and sustainability issues, and the social, cultural, economic and political dimensions of them” (p. 7). Supporting statistics from AESA (2014) research confirm that 39.5% of teachers are not aware that sustainability is a CCP in the Australian Curriculum and a further 40% have an awareness of EfS but do not fully understand its meaning nor importance. Indeed, these statistics suggest that only approximately 2% of teachers are engaging with EfS teaching practices in their classrooms. Thus, teacher awareness of the concept of EfS, and how to teach it, appears in quite a precarious state in Australia. This mirrors the paradox that is evident in the findings of the AESA (2014) study which suggests a disconnect between the policy rhetoric and teachers’ actual practice, a recurrent theme throughout the literature and, as such, is one which forms the nexus of inquiry at the heart of this investigation.

Blurring of concepts and boundaries

In examining the research literature on sustainability in schools it was evident that there were multiple, and sometimes blurred or conflicting, interpretations of what the concept meant and how it manifested in practice, particularly in regard to EfS. For example, some of the research in schools saw EfS as being, in many cases, conflated with the terms ‘EE’ or ‘sustainable development’ (Bolstad, Eames, Cowie, Edwards, & Rogers, 2004; Edwards, 2011, 2016; Kennelly, Taylor, & Jenkins, 2008; Lee, Wong, & Lo, 2000; Weeks, 2010). I, therefore, cautiously surveyed, and included, those studies that extrapolated the more restrictive term of EE to one congruent with EfS. In addition, understanding that in nations such as the USA and the UK, the preferred term for EfS is education for sustainable development (ESD), I also incorporated these studies into my literature search.

Indeed, a reason for these conflicted findings may be due to a lack distinction made by teachers between the kinds of things that they may have taught in previous years under the banner of EE and this newer concept of EfS. Indeed, there appears to be some consternation in the literature about the relationship between EE and EfS or ESD as the case may be (Kopnina, 2012; Pavlova, 2013). The varying views of this relationship in the literature, that in turn may impact the way EfS is considered in schools, can be categorised into four key approaches.

The first suggests there has been a natural growth and progression of ideas which has resulted in environmental education (EE) morphing into ESD/EfS (Fien & Tilbury, 2002; Leal Filho, 2009; McKeown & Hopkins, 2003; Smyth, 2006; Tilbury, 1995). The second identifies the two have distinct epistemological differences, and therefore trajectories, for what the required human response should be, that is deep ecology or market environmentalism (Cutter-Mackenzie, 2011). The third considers EE as just one of the many thematic or adjectival educations that belong to the ESD/EfS stable, including global education, social justice education etc (Sterling, 2010b), whilst the fourth posits that the two are in fact synonymous and EE has just been renamed or rebranded as ESD/EfS (Gough, 2006). These different stances have resulted in a conceptual blurring in a number of studies where EfS/ESD was identified as the key focus. Thus, even though the researchers, and the participants in these studies, may have identified as being engaged in EfS/ESD, their interpretation reflected predominantly only environmental concerns rather than a broader sustainability approach.

An example that illustrated this blurring of concepts was a study by Chatzifotiou (2006). This found that, even though the curriculum in England and Wales had moved from EE to ESD, teachers were still largely unaware of what the former meant. The study showed that since the curriculum emphasis was on literacy and numeracy in these two countries – coupled with the fact that there was no clear, specific curriculum guidance to help teachers incorporate EE (and then subsequently ESD) – teachers remained largely oblivious to these imperatives. The consequence of the teachers' lack of awareness of the difference between EE and sustainability consequently jeopardised their conception and enactment of ESD. These findings have particular relevance to

the research questions of this study as it raises questions about how the system of schooling affords EfS.

Of particular concern was the finding that in a number of studies researchers themselves appeared to have the understanding that EfS was synonymous with EE. It is beyond the scope of this review of literature to elaborate on the distinctions between the two; however, suffice to say that I have reached the view that they have fundamental differences, with EfS being a broader more encompassing term. In my view, EE is one strand of EfS that needs to be considered in light of the broader context of socio-cultural factors and socio-political issues of equity, poverty, democracy and quality of life for all inhabitants of the Earth. I find this statement by Bolstad, Joyce and Hipkins offers a useful demarcation between the two terms (2015, p. 2):

EE can connote a broad range of student learning activities in, about, and for “the environment”, often with an emphasis on students’ interactions with and understanding of the biophysical environment. Education for sustainability tends to signal a more integrative, critical educational approach that additionally focuses on the social, economic, cultural, and political patterns and contexts that shape human interactions with the biophysical environment, and foregrounds the goal of critically informed action as an outcome of EfS.

A further example of this conflation of EE and EfS was a Greek study that examined in-service primary teachers’ environmental literacy and attitudes to EfS (Spiropoulou, Antonakaki, Kontaxaki, & Bouras, 2007). As the wording of the teacher questionnaire was centred largely on environmental issues, teachers in this study only referred to the environmental aspects of their teaching. In addition, the findings also showed that many teachers held misunderstandings or misconceptions of the conceptual meaning of the term sustainability and many were even unaware of the term sustainable development. Whilst some of these studies do draw connections between EE and sustainability in its broader sense, their lens is nevertheless primarily on environmental knowledge and attitudes (Flogaitis et al., 2005), thus representing only one dimension of sustainability.

This emphasis on the environment was not just confined to Greece. The UN report reviewing the progress of ESD/EfS across the globe over the UNDES concluded that

whilst environmental dimensions of sustainability were more readily addressed by the education systems of many countries, the social, economic and cultural dimensions of sustainability were less evident (UNESCO, 2009). Indeed, there appeared to be very few examples of implementation of sustainability in schools that focused on all four dimensions of sustainability as outlined by UNESCO (2012).

Throughout this chapter I have also identified the research that specifically addresses teacher conceptions, understandings and interpretations of sustainability within school contexts. My goal in this study was not, however, to influence teachers' definitions of sustainability in the school through any means, therefore I took great pains to avoid asking leading questions that may have caused teachers to construe a particular viewpoint and understanding of sustainability and, in turn, EfS. In this way, this study differed from a great number that I reviewed. For example, there were very few examples of studies that examine teacher conceptions, understandings or interpretations of sustainability (Walshe, 2008). Of those I did find, I identified four main clusters or types of research:

- Those in which research tools and questions are devised and results are analysed according to the researcher's pre-defined conception of sustainability.
- Those which investigate the impact of a particular program, for example Waste Wise, or a particular approach, for example AuSSI.
- Those which seek to consider teachers' engagement in prior professional development in order to develop their conceptual understanding of sustainability.
- Those in which sustainability is not pre-defined by the researcher and the focus of the research is on teachers' understanding and interpretations.

These can be further expanded upon. In the first and second examples, sustainability has been investigated within a school context either via how the researcher's definition of sustainability has been applied within the school (Hagevik, Jordan, & Wimert, 2015; Higgs & McMillan, 2006; Ireland, 2007; Jaspar, 2008; Laumann, 2007) or via the impact of a particular sustainability program or approach (Armstrong, Sharpley, & Malcolm, 2004; Cutter-Mackenzie, 2010; Goldman, Baum, Ayalon, & Weiss, 2018; Henderson & Tilbury, 2004; Lewis, 2012, 2013; Salter, 2013; Warner & Elser, 2015). In the third example, the investigation within the school context occurred after teachers

participated in some professional development that presented teachers with a particular definition of sustainability (Birdsall, 2011; Johnston, 2017; McNaughton, 2012; Summers, Corney, & Childs, 2003; Summers & Kruger, 2003). However, studies that seek to identify teacher conceptions and understandings of sustainability are mainly within the secondary education context (Borg, Gericke, Höglund, & Bergman, 2014; Elshof, 2005). There are only a very small number of studies in primary school contexts, either internationally or in Australia, where teachers' understanding and interpretation of sustainability did not reflect the researchers' views of sustainability, was not an investigation of the impact of a particular sustainability program, nor was a result of professional development as per the fourth example above. My study, therefore, reflects a more, grounded, interpretive approach where teachers' own voices are enabled and valued within the discourse of sustainability within a particular school context.

EfS in schools

As outlined previously in this chapter, there are a great many models and theories evident in the literature, both in Australia and internationally, of what EfS may, and should, entail. However, the evidence of what actually transpires in schools is lacking. For example, while one such review looked at national and international programs across kindergarten, primary and secondary settings (Henderson & Tilbury, 2004) – including Enviroschools (NZ), the Green School Award (Sweden), the Green School Project (China), the Foundation for Environmental Education (FEE International), OECD's ENSI, Eco-Schools, Learning Through Landscapes (UK), Learnsapes, and Evergreen (Canada) – interviewing teachers, those actually implementing the schemes, was outside the scope of the project. Nevertheless, what makes this review very useful is that it examines programs that identify more than a single sustainability issue – i.e. not just litter campaigns – thus adopting a broader, holistic perspective on sustainability that includes the social, environmental and economic. Indeed, an important area of research worldwide has been that of examining whole-school approaches to sustainability. Two key findings that also emerged from this review were the need for schools to be more responsive to international and national sustainability agendas to shift understanding and practice from a purely environmental perspective to one which embraces sustainability, as well as a recognition that few

teachers have the knowledge and capacity to develop the resulting EfS pedagogies in schools effectively.

As such, this kind of research can paint a broad brush picture; however, more detailed research is required as to how practising teachers are positioned in relation to actually implementing EfS in their schools. Indeed, a plethora of studies instead focus on examining how student or pre-service teachers of particular subject disciplines, for example geography or science, have understood sustainable development (Birdsall, 2013; Jonsson, 2008; Summers & Childs, 2007; Summers, Childs, & Corney, 2005; Summers, Corney, & Childs, 2004; Winter & Firth, 2007). There are also a number of studies about how schools adopt and enact certain subjects, for example EE (Bolstad et al., 2004; Edwards, 2011, 2016; Kennelly et al., 2008; Lee et al., 2000; Weeks, 2010) or outdoor education (Beames, 2012; Hill, 2012; Irwin & Straker, 2014; Prince, 2017; Wattoo, 2011; Zink & Boyes, 2006), yet, again, these do not reflect understandings of sustainability, nor the practical implementation of EfS in schools. Whilst this is useful – in that we may be able to ascertain how those particular subject teachers’ understanding of sustainability may impact on education and student learning in the future – it does not give us an indication of what is currently transpiring from a whole-school perspective.

Similarly, other studies examine the impact of school leadership (Pepper & Wildy, 2008) on the implementation of sustainability practices rather than focusing on the teachers. Yet others are interested in detailing the process of change management at the school level to move schools to a more a more sustainable ethos (Delaloye, 2017; Henderson, 2014; Hodgkinson, 2011; Lichau, 2015). However, it is noted that Hodgkinson’s research intersects with this study regarding the importance of identifying causes for negative responses to sustainability in order to promote research that seeks to develop a greater understanding of participant realities and how they conceptualise sustainability. In addition, Hodgkinson’s documentation of the challenges of trying to implement sustainability where the prevailing educational norms of evaluation and accountability govern the education system in the USA is reminiscent of the situation in Australia, as I have identified previously in this chapter.

Additionally, other studies focus primarily only on student voices and understandings of sustainability, again ignoring that of teachers (Armstrong et al., 2004; Goldman et

al., 2018; Salter, 2013). Indeed, it is interesting here to note that studies of students' conceptions of sustainability also evidence a variety of understandings of sustainability. For example, a 3-year longitudinal study of students in the UK during 2005-2008 showed that whilst most students had heard of the word sustainability it was largely only associated with the environment – an aforementioned common theme throughout the literature – and these students were unable to articulate anything more than a simple personal concept (Gayford, 2009). Similarly, another UK study showed that 12-13-year-old geography students appeared to 'know' the different dimensions of sustainability – economic, environmental and social – but they did not have a detailed enough understanding of their interconnectivity (Walshe, 2008). This was a surprising and concerning finding given that these were geography students and that a holistic view of sustainability was strongly represented within geography in the English Curriculum. However, the concept of sustainability is a complex one – students need to be equipped to grapple with the idea of interconnectedness and exploration of tensions between the natural environment, the social dimensions, economics and questions of power / politics and it can be argued that they need knowledgeable teachers to assist them with this (Walshe, 2008).

Other research has a focus not on the teachers nor the students, but on the school curriculum. For instance, in Iceland there is very little explicit mention of sustainability within the curriculum which prompted researchers Jóhannesson, Norðdahl, Óskarsdóttir, Pálsdóttir, and Pétursdóttir (2011) to devise a key to assess whether EfS was “given space” in the pedagogical practices across early childhood, compulsory (primary and secondary) and upper secondary schools. In contrast, the Australian Curriculum does mention sustainability and EfS explicitly; however, Somerville and Green (2012) challenge the idea that schools are the hub of innovative sustainability education, and instead suggest the action is strongest outside of schools, in the community. However, their research did not examine what was occurring in schools directly, only the potential afforded to sustainability within curriculum documents.

Similarly, Laumann (2007) investigated the role of sustainable development in secondary education (ages 13-16) in Norwegian schools. The study examined curriculum documents and textbooks through the lens of the Brundtland definition of sustainable development, and concluded that sustainable development has only a

peripheral role in both. Environmental and developmental issues appeared infrequently and, even when they did appear, only a very weak relationship with social, economic and cultural consequences was demonstrated. In addition, the study showed that sustainability issues are not foregrounded nor integral to neither the curriculum, nor the textbooks used by 70-80% of students and, as such, present a failed opportunity for Norwegian students to link societal patterns with global concerns. Indeed, textbooks are disturbingly silent on challenging the dominant growth and development oriented status quo. As such, Laumann concludes that sustainable development is a “missing story” in the narrative of Norwegian education.

In light of the aims of this study I found Laumann’s (2007) notion of a narrative of sustainability a useful point for contemplation as it caused me to become more curious about what stories or narratives operated within school contexts and how teachers reacted and contributed to them. Following this line of thinking, I considered Reid and Nikel’s (2007) suggestion that my inquiries into teacher perceptions of sustainability are really an attempt to identify how the narratives work. From this line of questioning I also wanted to know the following: who or what narrates meanings of sustainability in schools and how teachers understand these; what is or is not signified in sustainability narratives, for example “in terms of nature, class, gender, race, agency, power, structure, worldview; and how sustainability narratives are constituted, layered, legitimated and circulated in educational settings”, for example in discipline areas and curriculum documents (Reid & Nikel, 2007, p. 89). Ultimately, by examining teachers’ understanding and conceptions of sustainability, at this point in time it would be possible to gauge which narratives are favoured, discredited, told or silenced through EfS in the micro context of school and the macro context of society more widely (Reid & Nikel, 2007). In doing so, in conjunction with the aforementioned analysis of curriculum and policy documents as well as the literature review that follows, I argue that a mirror would be held up to the Australian education system to ascertain this thesis’ underlying aim, namely how the current system of schooling in Australia affords EfS.

As outlined above it can be seen that, internationally, there are only a few studies that focus on teachers’ understanding of sustainability in schools, and these are largely in the secondary context. In the Australian context there has also been very little

investigation into how sustainability has manifested in schools, particularly primary schools. The exceptions to this are studies by Salter (2013), Green and Somerville (2015), Lewis (2013), Lasen, Skamp and Simoncini (2017), Kemmis and Mutton (2012), Flowers and Chodkiewicz (2009), Cutter-McKenzie (2010), and (Evans et al., 2012) which I will explicate in next section, in particular with regard to their relevance to this study.

Teachers' understanding of sustainability in a classroom setting

In this section of the chapter I draw together the findings from the small number of studies conducted in specific classroom settings – early childhood, secondary and primary educational contexts – that identify teachers' understanding of sustainability. Where relevant, I note which of the four categories of research I have identified in the opening section of this chapter and outline the key findings in each setting. Two key patterns could be discerned from these studies. One was that the vast majority interpreted sustainability as being largely, if not exclusively, about the environment. The second was that there were few, if any, studies where the teachers expressed an understanding of sustainability as comprising of UNESCO's aforementioned four interdependent dimensions – environment, social-cultural, economic and political.

Early childhood context

This lack of understanding of a more holistic approach to sustainability has been evidenced by a number of studies in the early childhood setting. For example, in a comprehensive literature review of sustainability research published from 1996-2013 by Hedefalk, Almqvist and Östman (2015) the researchers themselves had two different definitions of ESD. One view adopted in the research was ESD as being education 'about', 'in' and 'for' the environment, and the other that it concerned three interrelated dimensions, namely social, economic and environmental. This highlights that, as understanding about sustainability has grown and developed, so have the kinds of research foci. For example, Hedefalk, Almqvist and Östman noted there was a demonstrable shift – from researchers examining ESD as just about teaching environmental facts and sustainability issues to children, to a more action oriented approach where children were educated to act for change. Moreover, in the early childhood setting, Siraj-Blatchford and Pramling-Samuelsson (2016) noted social and cultural concerns of ESD – including social justice, racial equality and bias, multiculturalism and multilingualism and gender education – were also being

addressed. However, they identified that the least developed understanding was the economic dimension of sustainability, whilst Årlemalm-Hagsér and Davis (2014) also identified the same issue for the political dimension. Thus, such commentary by these researchers indicated an understanding of sustainability consistent with a transformative view of sustainability, as outlined earlier in this chapter that appeared to be emerging in the literature over time.

Notably, of the 87 articles of the literature review by Hedefalk, Almqvist and Östman (2015) focusing on children up to 5 years of age, only eight focused on teachers' understandings of ESD. From these, three ways of understanding ESD were identified – teaching children facts about the environment (Flogaitis & Agelidou, 2003; Flogaitis et al., 2005; Lee, 2001; Sandberg & Arlemalm-Hagser, 2011), changing students' environmental behaviour (Kennelly et al., 2008), and developing children's critical thinking skills (Årlemalm-Hagsér & Sandberg, 2011; Dymont et al., 2014; Johan, 2011; Kennelly et al., 2008; McNaughton, 2012; Öhman, 2011). In another study conducted after the 2015 Hedefalk, Almqvist and Östman literature review, Inoue, Gorman and Davis (2015; 2016) conducted a survey of early childhood educators working across a number of centres of one Queensland early childhood provider. This work built upon a previous study investigating early childhood teachers' understandings and practices of EfS conducted in Japan. They found that, like their Japanese counterparts, these educators did not have a well-developed knowledge and understanding of sustainability. Only 40% knew about and practised ESD and EfS, with only one respondent able to articulate the multidimensional nature of sustainability, namely the social, economic and environmental. Thus, the prevalent understanding in the early childhood context was only EE, with majority of educators practising traditional nature-based activities such as playing outdoors, gardening and teaching about resource conservation.

As identified in the previous section, one category of research was where teachers engaged in professional development in order to develop their conceptual understanding of sustainability. An example of this in the early childhood context was an Australian study by Dymont et al. (2014). In these professional development sessions, the researchers' viewpoints and understandings of sustainability were embedded in the learning materials presented. Thus, not unexpectedly, the educators'

views of sustainability shifted after the professional development. From an initial understanding of sustainability largely being about the natural environment, particularly aspects such as recycling and composting, the early childhood educators expressed a broader conceptualisation of sustainability that included environment, social–cultural and economic dimensions. Unlike this example, this study consciously avoided influencing teachers’ understanding of sustainability.

Secondary context

Secondary school teachers have expressed similar views on sustainability to those in early childhood and primary. For example, in Pepper’s study (Pepper, 2013; Pepper & Wildy, 2008, 2009) across three secondary schools, even those teachers who were considered ‘leaders’ of EfS in their schools did not necessarily have a holistic conceptualisation of sustainability. The concept of EfS, with its balance of the three pillars, was not extensively embraced and, instead, with the exception of one participant, again only the environmental aspects of sustainability became a focus. Furthermore, their focus narrowed to education *on* and *about* the environment, consistent with the more historical emphasis of EE and, as with traditional EE, the locus of interest in all things sustainable was largely contained with the social sciences and sciences only. Conclusions drawn from the research were that despite personal enthusiasm for the environment, the use and understanding of sustainability across the three schools was therefore very superficial.

This lack of understanding of the interconnectedness of the four dimensions of sustainability was also identified in a Swedish study in which a nationwide survey of 3229 upper secondary teachers was conducted to ascertain the conceptual understanding of sustainable development according to their subject discipline (Borg et al., 2014). It was clear that teachers from different disciplines viewed sustainable development differently – science teachers emphasised ecological dimensions, social science teachers emphasised social dimensions. However, none of the subject disciplines had a clear understanding of the economic dimension. Overall, all the teachers had an awareness of the relevance of social, economic and ecological/environmental dimensions but not a clear holistic understanding of their interconnectedness. Similarly, Elshof’s (2005) research of 45 design and technology teachers found that they had very little understanding of the connection between

science, technology, society and environment. Elshof therefore concluded that the technology curriculum, and subject disciplines per se, are riddled with “blind spots”, thus working against sustainability succeeding. I would suggest that as secondary teachers largely work in their own subject silos, unlike primary teachers who teach across all the learning subjects/areas, this issue may only be resolved by ensuring sustainability is embedded in each learning area across a curriculum.

Primary context

Internationally, there has been very limited research in how sustainability is implemented or understood by teachers in primary schools. Evidence from Australian and New Zealand primary schools also suggests that, despite their personal high level of concern for the environment, teachers do not have a strong conceptual understanding of sustainability issues especially in relation to the social, cultural, economic and political dimensions and thus feel very underprepared in teaching such matters (Cutter-Mackenzie, 2011; Cutter-MacKenzie & Smith, 2001; Ferreira et al., 2007a; Littledyke et al., 2009; Taylor et al., 2015).

An example of my aforementioned category of research where teachers’ understanding is influenced by the researchers own interpretation of sustainability is evidenced in Green and Somerville’s (2015) study of primary teachers in eight Australian rural and regional schools in Victoria. Sustainability was defined through the lens of place, with place being the metaphorical meeting point of the three pillars of sustainability – economic, ecological and social/cultural community. Thus, whilst teacher conceptions of sustainability appeared to reflect a broader understanding than just the environment, the way the study was constructed did not enable teachers to draw upon their own conception of sustainability entirely.

Nevertheless, this association of sustainability with primarily environmental or ecological concerns by primary teachers is, however, a strong recurring idea in the literature. An example of one such study across five primary schools in New Zealand by Chalmers (2011) revealed that neither the primary teachers nor students had a good understanding of the terms environment, EE / EfS or sustainability. Instead, teachers’ understanding of the similarities and differences between EE and EfS was blurred, a common issue I have identified in the previous sections. Indeed, whilst these teachers’ personal passion and enthusiasm for EE/EfS was evident, their lack of conceptual

understanding prevented them from understanding, for example, the wider issues or underlying causes of waste issues. This poor conceptual knowledge and understanding was also reflected in the interviews with their students. Such findings reinforce the nexus between teacher knowledge of sustainability, coupled with appropriate pedagogical practices - for example PCK which I have identified as being of great importance previously in this chapter- and student learning and achievement in sustainability knowledge and practices.

The emphasis on environment as being synonymous with sustainability was also identified in two studies specifically based in WA. Both studies were examples of the aforementioned category of research that examined the impact of a particular program, in this case SS-WA. Salter (2013) examined the impact of whole-school EfS on upper primary students and their families, but focused on purely environmental knowledge and behaviours and, as such, teachers' understandings of sustainability were largely framed only in these terms. Additionally, Lewis' (Lewis, 2012, 2013; Lewis, Baudains, & Mansfield, 2009) longitudinal case study investigated students' understandings and teachers' perceptions of EfS, and the study was primarily concerned with the effects of school involvement in the program. As such, both Salter and Lewis' research investigated EfS through the lens of a particular program occurring within their school sites, and in doing so they adhered to a definition of sustainability circumscribed within the parameters of the program. In contrast, my own research interest was not in this kind of program evaluation but rather in examining the wider range of influences that have culminated in individual teacher conceptualisations and understanding of sustainability. I wanted to know what teachers meant when they used the term sustainability.

Explanation of the positioning and relevance of this research

As my research was centred on a primary school that was identified as embodying exemplary practice in EfS, I was particularly interested in the studies conducted by Kemmis and Mutton (2012), Flowers and Chodkiewicz (2009), Evans et al. (2012), and Lichau (2015). Two of the studies, Flowers and Chodkiewicz (2009) and Lichau (2015), were looking at whole-school change in terms of the AuSSI schools program and the design process for change towards transformative sustainability education, respectively. Flowers and Chodkiewicz (2009) focused on sites of exemplary practice

examining 30 'outstanding schools'. However, there were two major differences to this study. One was that teachers' conceptions, understandings and enactments of sustainability within individual school contexts was not the primary focus of their research, and the other was that their primary focus was on the environmental dimension of sustainability.

Likewise, Lichau's (2015) study did not set out to identify teachers' understanding of EfS, However, this had had resonance with my study in that the data showed there was a great deal of anxiety and confusion in the school community about what sustainability actually meant. Upon examination, however, it appeared that the principal and many staff members reflected the new ecological paradigm of sustainability. That is, these staff members expressed awareness of, frustration with, and a resolve to move beyond the existing mechanistic mindsets that they saw as barriers to sustainability. Lichau identifies that there is a paucity of literature that examines in-depth how schools understand and define sustainability. In addition, she concluded that more research is needed to show how schools build an understanding of sustainability within their community context as well as contribute to a greater understanding of its meaning in respect to the old (mechanistic) and new (ecological) educational paradigm. My research seeks to pursue this line of inquiry and, moreover, to discern what kind of educational culture and system of education needs to exist to enable sustainability to flourish.

However, whilst the two aforementioned studies were indeed conducted within an exemplary site of practice in EfS, their intentions did not match my own. The two studies that I discerned from all the literature, particularly in primary education, that were similar to this study were those of Kemmis and Mutton (2012) and Evans et al. (2012). The similarities were that my own research site was considered an exemplary school in terms of building design and in engagement with EfS, and that the definition of sustainability was not imposed by the researcher.

In the first of these, Kemmis and Mutton (2012) investigated the educational practice of 10 sites – both formal and informal – of exemplary practice in EfS. These sites were located in the rural/regional Murray Darling Basin of New South Wales. Four of these were schools (three secondary, one primary), two were in tertiary settings, and four were community initiatives. As with my own research interests, this study identified

sustainability as more than simply the three pillars. Instead, they examined the representation and enactment of five dimensions – environmental–ecological, material–economic, cultural–discursive, social–political and personological – amongst the participants. Whilst sustainability was conceived broadly, the findings indicated the ‘practices’ of sustainability at the schools were largely centred on the visible, environmental aspects such as growing seeds and revegetation projects, increasing biodiversity through putting up roosting boxes for micro-bats, removing weeds, and planting vegetables and flowers.

In the second study investigating a site of exemplary practice, Evans et al. (2012) explored the barriers, successes and enabling practices of EfS in two primary schools in far north Queensland. A common set of issues was revealed by all the participants – the lack of funding, the social unacceptability of being a ‘greenie’ in these regional areas of Queensland, the resistance by other school staff/members to adopt a whole-school sustainability approach that involves change, the lack of teachers’ conceptual understanding of environmental and sustainability education, and the necessity of leadership and trust (Evans et al., 2012, p. 128). These findings of poor teacher conceptual understanding certainly present as a dissonance given that both schools had exhibited exemplary practices in terms of sustainability. What they found instead was that a large proportion of actions and projects related to sustainability, particularly within one of the schools, were directed at education *about* environmental topics, omitting the action. Ironically, the action component was explicitly written into the unit planning documents, yet this was often omitted in their teaching practices. Furthermore, the professional development on sustainability education provided for teachers neglected to include the theory, presenting a more holistic, transformative understanding of sustainability and thereby disabling teachers from fully comprehending the principles and concepts underpinning this concept.

From this it can be seen that even in so-called ‘exemplary’ sustainable schools a paradox can exist where, despite all the pre-conditions appearing to exist, the end outcome in terms of a broad, inclusive and transformative education does not manifest. However, it is important to note that the study by Evans et al. (2012) was in a regional area where access to professional development may have been more difficult, whereas

my research site was in metropolitan area and this may impact the type and quality of professional development accessed by teachers.

Nevertheless, in identifying comparable studies in terms of methodology and research intent, these two aforementioned studies are most similar to this study. Kemmis and Mutton (2012) conducted fieldwork over 2 years with four to six visits per site, resulting in a brief case study being created that reflected the findings from each site. They employed case study methods that included observation, interviews and document analysis. Evans et al. (2012) conducted their research through interviews with the principals and key staff with a responsibility for sustainability over three site visits. This approach to methodology compares to my study as I also used the research methods of observation, interview and document analysis but also contrasts, as I conducted an, ethnographic, interpretive inquiry. This involved long-term participant observation engagement, over a period of 1 year, in addition to in-depth interviews and extensive observational field notes, as well as reflective journals that documented how teachers conceptualised and interpreted sustainability. Thus, whilst the studies by Kemmis and Mutton and Evans et al. were similar in some ways to this study, my study appears quite unique in the literature on sustainability in primary school contexts in relation to methodology and research aims.

Summary of the literature

Overall, the literature reviewed supports the idea that sustainability and EfS are complex, contested concepts. There are no unitary, agreed definitions, nor parameters; however, there are general principles and philosophical stances that epitomise the field. This lack of specificity can present challenges to how these are approached, interpreted and practised. What is noted from the research literature is the wide variety of ways schools have addressed EfS and the wide variety of conceptualisations of sustainability.

A summary of this research literature indicates that teachers, at all levels of education, do not necessarily have a holistic understanding of sustainability. Many indicate awareness of the environmental, economic and social dimensions, but there are very few studies that show teachers understand the nature of sustainability as being an interconnectedness of these. Fewer still indicate an awareness and understanding of the political dimension of sustainability. Yet this socio-political context that governs

the ‘grammar of schooling’ has been shown throughout the literature to play a part in teachers’ understanding and enactment of sustainability. Given that teachers have been given the remit to advance the progress of sustainability thinking and action, they have a central and crucial role in student understanding. Indeed, how sustainability is interpreted by teachers within a school context has great ramifications for the kinds of engagement students will have, and the kind of knowledge, values and dispositions that students may develop. These findings indicate the gaps in the research evidence and consequently have informed the research intentions and questions of my present study.

The importance of this study is evidenced in the gaps in terms of aims, research context and methodology I identified in the existing literature. Firstly, there are very few studies that focus on sustainability in primary schools, with no studies identified that on teacher interpretations of the concept within a site of exemplary practice where the definition of sustainability is not imposed by the researcher. In addition, I sought to identify how teachers were supported in their interpretation of sustainability by policy documents and initiatives. Thus, my research aims were unique in that they combined teacher interpretation, a purpose built sustainable school site and the influence of EfS policy documents on practice. Secondly, my research has contributed to a deeper understanding of how EfS has been conceptualised and interpreted by teachers in schools through the examination of a school context by means of an in-depth ethnographic, interpretive inquiry, as well as the analysis of policy documents purporting to advance EfS.

Chapter summary

In this chapter I have clarified the relationship between education and sustainability. I began by presenting the three main models of education in relation to sustainability and identified EfS as the central focus for this thesis. In addition, I outlined the mindsets and worldviews associated with EfS. Australian educational policies with regards to EfS were also described. An examination of the rationale for the importance of teachers’ understanding of sustainability and EfS, the associated literature, as well as what teachers understand by sustainability across early childhood, primary and secondary school contexts was then presented. The chapter concluded with an examination of key research regarding teachers’ understanding and enactment of

sustainability in sites of exemplary practice in the primary setting, and an explanation of the positioning and relevance of this research.

In the following chapter I outline the methodological approach that has guided my inquiry. The chapter sets out the philosophical orientation to the research along with a justification for my qualitative interpretive stance. I outline the features of this methodology, including the context, phases and procedural elements of the research. Ethical considerations and quality standards are also addressed.

Chapter Four: Research methodology

Introduction

In this chapter I outline the research process, beginning with the philosophical background of the research. Within this I explain both the constructivist epistemological and relativist ontological contexts for my theoretical perspective and then elaborate on my choice of an interpretative ethnographic methodology. I then identify the research context, including the unique location and demographic of the school as well as the selection of research participants. I also discuss both the ecological sustainable design features and sustainability initiatives present in the school. I then consider the three main research methods I used to generate data – interviews, fieldwork observations and documents – and discuss the process of data analysis, outlining my conceptual framework. To conclude the chapter I discuss the ethical requirements and consider appropriate research quality standards.

The research process emerged from my interest in ascertaining how EfS is understood and enacted by teachers in a primary school setting. In particular, I wanted to examine how schools were making sense of the various sustainability ‘policy’ imperatives intended to guide their implementation of EfS. Using the pseudonym Amity PS as the site for this research study, my intent was to learn – or come to understand – how teachers dwelt amongst, and within, various EfS policies, and how they wove these into the lifeworld of their school and professional lives. My overall research aim was to understand how the current system of schooling in Australia affords EfS. In order to achieve this aim, I constructed three research questions to guide my study:

1. What do teachers understand by, and how do they interpret, sustainability?
2. What conceptualisation of sustainability is presented in EfS initiatives and policies?
3. How are teachers supported in their understanding and interpretation of EfS?

My first research question focuses on teachers’ understanding and interpretation, the second focuses on the effect of policy on teachers’ practice and the final question seeks to explore how teachers are supported by the surrounding constructs of policy and EfS

programs. My overall research aim was to understand how the current system of schooling in Australia affords EfS.

Having established the aim and associated questions – the ‘what’ of the research – the focus of this chapter is on the ‘how’, the methodological considerations. My choice of an interpretative ethnographic methodology is guided by the need to understand the construction of meanings and perceptions of the subjective experiences of teachers within the context of their worldview and in their social and cultural settings. An exploration and justification of interpretive ethnography as a methodology for this study therefore follows. It begins with an explanation of constructivist epistemology and relativist ontology that inform this theoretical paradigm (Mackenzie & Knipe, 2006 n.p.).

Philosophical background of the research

The goal of my research was to learn how teachers understood and interpreted EfS initiatives directed at them by policy makers. This concerns a social reality rather than a ‘natural’ reality where the laws of science prevail (Gray, 2018, p. 23) and therefore sits well within an interpretive paradigm. Interpretivism holds that it is through observation and interpretation that the social world can be understood.

Since the theoretical position or paradigm – and its associated methodology and methods – are informed by both the researcher’s epistemological perspective and their ontological position (Crotty, 1998; Easterby-Smith et al., 2002; Gray, 2018), I describe in the following sections the constructivist epistemology and relativist ontology that underpin my theoretical paradigm. An illustration of my theoretical paradigm, the methodology I have chosen and the methods I have employed are set out in Figure 4.1.

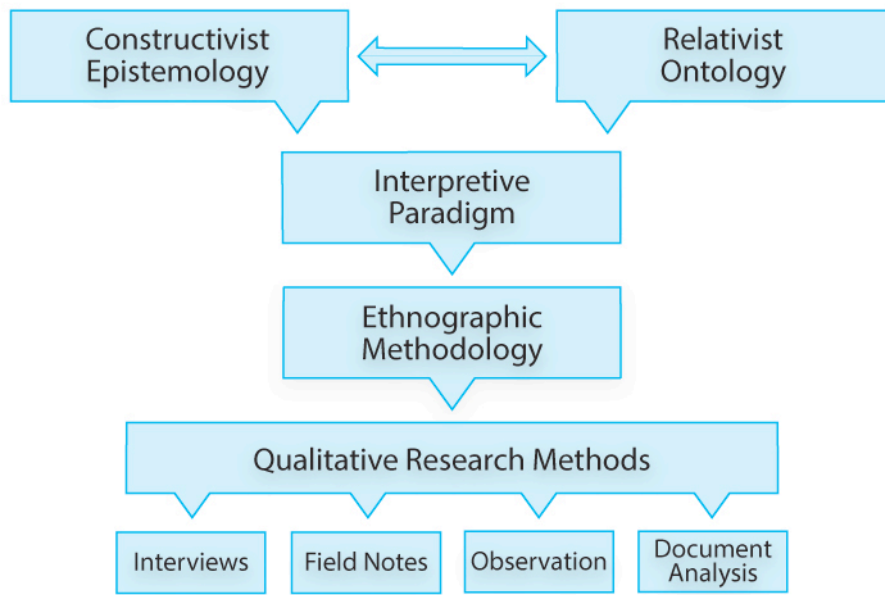


Figure 4.1: Methodological approach guiding the research design of this study

Constructivist epistemology

Constructivism sees reality as socially constructed. Whereas an objectivist epistemology holds that truth is a fixed reality ‘out there’ that exists independent of conscious thought, constructivism regards truth and meaning as constructed by the subject’s interactions with the world (Gray, 2018, p. 20). Constructivism understands “the complex world of lived experience from the point of view of those who live it” (Schwandt (1994, pp. 221-222). Adding to this, Denzin and Lincoln (1998, p. 194) observe that:

Constructivism is a philosophical perspective interested in the ways in which human beings individually and collectively interpret or construct the social and psychological world in specific linguistic, social and historical contexts.

While objectivism does not reject subjectivity nor peoples’ values and beliefs, it holds that these must be studied objectively and that researchers should work towards excluding their own beliefs and values (Gray, 2018, p. 20). Constructivism, by contrast, recognises the interdependence of the relationship between the researcher and the researched (Lincoln, Lynham, & Guba, 2011). In this view, the researcher, what is

being researched, and the participants, become one entity and the findings are, therefore, a co-construction resulting from the interaction between them.

I therefore considered constructivism to be the most appropriate alignment for my research as I was interested in understanding teachers' conceptions of sustainability within the school context. My goal for the research process was not to unearth a set of truths that were the one and only 'real and true answer' for what sustainability might mean; indeed, within constructivism there is an understanding that there is no finite, objective 'truth'. Instead, constructivism acknowledges multiple constructions of sustainability where all constructions are taken as meaningful, and conflicting versions of truth are unproblematic (Guba & Lincoln, 1985).

Relativist ontology

A relativist ontology holds that reality is a subjective perception of reality and knowledge based on experience and social engagement (Guba & Lincoln, (1994, p. 110). Knowledge is a mental and intangible cultural construction held by individuals and shared across groups that is contextual in that it is created and influenced by cultural, historical and political factors. In this view it is acknowledged that there is no objective truth out there waiting to be discovered (Crotty, 1998) and that this truth, reality and meaning is actively constructed through engaging with the world. Therefore, to understand a phenomenon it is necessary to view it from an individual's perspective, that is, from the inside (Crotty, 1998). By framing my research within relativist ontology I am aware that I am not merely mirroring "what is there" (Crotty, 1998, p. 64) but instead am reporting how the concept of sustainability is constructed by the staff within the context of Amity PS.

In summary, my theoretical perspective is informed by both the ontological orientation of relativism and a corresponding constructivist epistemology that guides me to develop my research design in alignment with interpretivist principles.

Interpretative ethnography as a research methodology

Interpretivism is a theoretical perspective that involves researchers interpreting elements of the study. It holds to the view that reality is accessed through social constructions such as language and shared meanings, and that truth, reality and meaning are actively constructed through engaging with the world. A researcher within

the interpretivist paradigm seeks to “understand, explain, and demystify social reality through the eyes of different participants” (Cohen, Manion, & Morrison, 2011, p. 19) and, as such, is consistent with the epistemological perspective and ontological positions outlined above. In my inquiry I sought to understand the meanings made by teachers about sustainability and EfS in the context of a purpose-built sustainable school. This process of understanding meaning is the process of interpretation.

Within this, awareness of, and the effect of the researcher’s own subjectivity throughout the research, is essential. Reflexivity is the term given to the researcher’s awareness of the invisible, but deeply rooted, framework that reflects the “cultural, political, social, linguistic and ideological origins of one’s own perspective and voice as well as the perspective and voice of those one interviews and to whom one reports” (Patton, 2002, p. 65). Conducting inquiry through interpretivist methods, aligns me, as a researcher, with the Weberian tradition of *verstehen* that privileges understanding, empathic introspection, researcher self-reflection, deep listening, interest and caring and maintaining a non-judgemental stance (Patton, 2002, p. 52). Schwandt (1994) further acknowledges the common central goal of constructivism and interpretivism as “understanding the complex world of lived experience from the point of view of those who live it” (p. 221-222). He elaborates further, saying that to understand this world of meaning it must be interpreted, and this interpretation requires the researcher to construct a reading of these meanings which, in effect, is the researcher constructing the constructions of the research participants.

I have therefore situated this research within the paradigm of interpretivism, and have adopted ethnography as the methodology for which naturalistic, qualitative methods are suited. This approach was appropriate as it is premised on extended fieldwork observation, interaction and dialogue with the participants – in this case teachers – to develop such deep understandings. Furthermore, interpretive ethnography embraces the use of thick description as a means of holistic representation (Geertz, 1973). According to Denzin (1989), thick descriptions are deep, dense, detailed accounts whose purpose, as suggested by Cresswell and Miller (2000, p. 129), is to create “verisimilitude, statements that produce for the readers the feeling they have experienced or could experience, the events being described in a study”.

Interpretive ethnography, as conceptualised by Denzin (1997, 2000), is a qualitative methodology that “seeks to understand how people enact and construct meaning in their daily lives” (p. 401). Interpretive ethnography is grounded in the central aspects of traditional ethnography, where the latter is defined as a “qualitative design in which the researcher described and interprets the shared and learned patterns of values, behaviours, beliefs and language of a culture-sharing group” (Cresswell, 2013, p. 90).

Interpretive ethnography adheres to the central principles of traditional ethnography. LeCompte and Schensul (2010, p. 9) identify seven characteristics that mark a study as ethnographic:

- It is carried out in a natural setting, not in a laboratory.
- It involves intimate, face-to-face interaction with participants.
- It presents an accurate reflection of participant perspectives and behaviours.
- It uses inductive, interactive and recursive data collection where there is a continuous interaction between data (induction) and hunches or hypotheses (deduction) and analytic strategies to build local cultural theories.
- It uses multiple data sources, including both quantitative and qualitative data.
- It frames all human behaviour and belief within a socio-political and historical context.
- It uses the concept of culture through which to interpret results.

In the case of this inquiry this ethnographic approach was evident through my immersion in the situated cultural context of the school site for over 12 months. Through speaking with, listening to, and observing teachers and staff at the school, as well as gathering documents, I gained a sense of how sustainability and EfS were conceptualised. In doing so, I was able to reflect more accurately their thoughts, behaviours and actions in relation to sustainability. This approach to my research necessitated close communication and understanding between myself as the researcher and the participants through discussion, interview, relationship building and observation, all of which are methods integral to ethnography.

Interpretive ethnography also aligned with my goal to highlight the voices of multiple participants, including that of my own as a researcher, in a full and holistic exploration of the research context. Moreover, ethnography enabled me to highlight the

complexity of the school site and to situate the practices of the research participants in the historical and temporal political, social, environmental and economic milieu. I have used ethnographic ways of seeing to “make the familiar strange” (Erickson, 2010, p. 322) and to render visible the hidden actions and lines of connection both within the local socially and culturally constructed research setting and beyond to the wider societal influences.

In this research, I have conceptualised ethnography as both a process and a product. Through engaging in this process of interpretive ethnography, I have been conscious that this written text, the product of my inquiry, is sensitive to, and has valued the perspectives of the teachers, and the way they viewed their own actions, interactions and context (Fetterman, 1998; Punch, 2009). However, a central understanding of interpretive ethnography is that there are many ways a text could be written and multiple meanings that can be presented. What I have written here has been recorded at this point in time but, in reality, according to Mantzoukas (2012, p. 428), “this type of research text is never finalised, is always in the process of becoming or being undone...this process is never completed” (p. 428).

However, Denzin (1997) distinguishes interpretive ethnography from the traditional methods of ethnography in the way it brings myself as a researcher more clearly to the foreground. A key way this is achieved is through my own reflexivity as a researcher. In this inquiry my role was to be mindful that reflexivity is required at different points in the research process all the way from design, collection and analysis of data, and reporting through to the dissemination of findings (Gilgun, 2006). Reflexivity “is a continuous process of self-reflection that researchers engage in to generate awareness about their actions” (Darawsheh, 2014, p. 561). By including entries from my fieldwork journal in my writing, I became “human as instrument”, demonstrating reflexivity by interrogating myself critically. Reflexivity is to be, as Gayatri Spivak (cited in Pillow, 2003, p. 178) states, “vigilant about our practices”. Rather than viewing myself as a possible contaminant, reflexivity encourages the location of oneself within the research text. In this conceptualisation I therefore do not merely reflect the experiences, values and beliefs of the participants but, with full awareness, co-create meaning.

According to Patton (2002, p. 65) there are two primary ways to communicate reflexivity throughout the research, that of “finding voice” and “owning one’s own voice and perspective”. Following Patton’s (2002) suggestion, finding voice in my research meant that I write in the first person, with an active voice in order to engage the reader. Furthermore, my use of an active voice seeks to persuade the reader to join me in the search for meaning through the use of thick description, thoughtful sequencing that enables the reader to follow the ‘storyline’, selective and appropriate use of quotes, as well as via clarity about the context. In this way, what I communicated about the research could be deemed to be “credible, authoritative, authentic and trustworthy” (Patton, 2002, p. 65). Secondly, by owning my own voice and perspective, Patton’s (2002) other aspect of reflexivity was evident throughout the thesis in reporting the process and findings of my research in an avowedly self-reflective manner, acknowledging biases and limitations and honouring multiple perspectives. I present this voice in the form of authorial vignettes drawn from my reflective journal, throughout the thesis. I alert the reader to this by presenting the vignettes in a box and using a font that distinguishes these journal entries from the remainder of the body text.

In the next section of this chapter I outline the process for the selection of the research participants and provide an overview of the research context. Following this I present the research methods of this inquiry, and identify their relationship to the research questions.

Research context: Amity PS

In this section I provide information on Amity PS and identify the reason for the selection of this as the site of my research. Firstly I outline the demographics of the school, introduce the staff that participated in the research and identify their roles in the school. I also consider its location in terms of the natural environmental and ecological sustainable design features, including key aspects of the school grounds and buildings that contribute to the school’s educational focus on sustainability. In addition, I provide a summary of two key programs that are central features of engagement with sustainability at the school, AuSSI and SAKGP.

Of all the schools that engage with sustainability in WA there is only one where sustainability is represented in both the physical design and the school ethos. Amity

PS in suburban Perth was the first of its kind, and to this day remains the only one of its kind in WA. What made it a unique research site were two things. Firstly, it was a pilot school commissioned by the state government in 2004 to feature ecological sustainable design principles as an integral element of its built environment. As such, it was purpose-designed and built to reflect strong sustainable principles such as incorporating recycled and environmentally friendly materials and functions. Secondly, DETWA intended the school to be a showcase for sustainability education. Therefore, this school had the most propitious conditions for developing a holistic curriculum focused on sustainability initiatives.

Amity PS has about 600 students enrolled from Kindergarten (4-year-olds) to Year 6 (11-year-olds). There are 48 teaching staff, with four of these being the administration team comprising of the principal and the three deputy principals. It is located on the edge of a natural wetland within one of the first Green Smart suburban residential developments in WA. This initiative required its residents to comply with local council planning laws that governed grey water reuse, recycling, passive solar building design and orientation to maximise energy efficiency and minimise environmental impact.

Participants

The research participants were selected through purposive, convenience sampling. Teachers at Amity PS already known to me through the associated Australian Research Council (ARC) project Socially Responsible Science (2009-2011) were approached to participate in the research. Associate Professor Peter Taylor, Dr Lily Taylor and Professor David Fisher were the principal investigators of the ARC project and already had connections with the school. Due to my connection with the lead researchers, I had convenient access to the participants.

As this inquiry examined how school(s) interpret EfS policy initiatives, I considered it important to select a school where such initiatives were being implemented. Such a method of non-random participant selection is known as purposive sampling (Bryman, 2012). This approach was appropriate, as Merriam (1998) notes, because it is “based on the assumption that the investigator wants to discover, understand and gain insight and therefore must select a sample from which the most can be learned” (p. 61). Therefore, I selected a research context and research participants that were aligned to the principles of sustainability and would feasibly be able to address the research

questions. The names, which are pseudonyms, and role of all 12 staff members who became participants in the research are listed in Table 4.1.

Table 4.1: Research participants (all pseudonyms)

Participant name	Role
Annette	Principal
Margaret	Deputy principal
Janine	Deputy principal
Robert	Year 6 teacher
Anne	Year 4 teacher and science coordinator
Adam	Year 4 teacher and sustainability coordinator
Mary	Year 4 teacher
Tarryn	Year 2 teacher
Nancy	Kindergarten teacher
Christine	Art teacher
Susan	Music teacher
Audrey	Kitchen garden chef

Ecological sustainable design features

The school was built along ecological sustainable design principles (Taylor Robinson Architects, n.d.), resulting in an impressive physical infrastructure. It was constructed as WA’s first ‘green school’ in an outer suburb of Perth, the new housing development of Prairie Lakes (also a pseudonym), and is situated on the periphery of a natural wetland and adjoining council land. The development is situated close to a major local groundwater catchment area that provides much of the potable drinking water for the metropolitan residential area of Perth. To ensure the continued integrity of this precious water resource, both residential housing and the new school needed to comply with environmental building regulations that encompassed grey water reuse, passive solar building materials design and orientation to minimise environmental impact.

The construction brief of the school (Taylor Robinson Architects, n.d.) was to ensure a sympathetic and complementary approach to the surrounding ‘sustainable community’. According to DETWA (2011), the school was designed as a demonstration school for sustainability – the entire physical infrastructure, including the materials used in the buildings and layout of the school grounds, integrate environmentally sensitive and efficient features. Indeed, written objectives for Amity

PS explicitly incorporate EfS and community partnerships as core elements of the school's ethos. Amity PS' ethos statement on their webpage (reference website withheld to preserve anonymity) states:

Students graduating from Amity Primary School should have a love of learning and a commitment to the achievement of potential, social skills and competencies that encourage social and civic responsibility, a strong self-belief, respect and concern for others and their rights and environmental responsibility.

Amity's building and learning inclusive social skills (BLISS) code (reference website withheld to preserve anonymity) is another core feature of the school in which the rights and responsibilities of all students, staff and parents are emphasised. Within this, contributing to a cooperative school community is outlined as a major goal – "The whole school community has become increasingly more committed to sustainability and EfS. Ethically, it would be hard to justify promoting sustainable practices to our students without that commitment" (from the 'Amity PS' page of the DETWA website):

Hopefulness is a key ethic when sharing issues of sustainability with our students as it empowers them to face problems and find solutions, and provides the impetus for becoming more knowledgeable and competent in dealing with their social and environmental future.

Sustainability initiatives

The school took part in two key programs, the AuSSI schools program and SAKGP.

Amity PS participated, along with over 2000 other schools across Australia, in a voluntary program established in 2003 called AuSSI (DEWHA, 2010a). The aims of AuSSI were to promote a whole-school approach to EfS through the coordination of the previously disparate efforts in teaching Environment education (EE) and EfS in schools into a coherent and supported framework. In WA, the state branch of AuSSI, was rebranded as Sustainable Schools WA (SS-WA).

The stated purpose of SS-WA was to actively promote the espoused goals of the Melbourne Declaration of Educational Goals for Young Australians (MCEETYA,

2008) and, to support the implementation of the WA Curriculum, a state-based derivative of the national Australian Curriculum, within which sustainability is a CCP. The premise of SS-WA was that sustainability is a key context for teaching and learning and not simply an ‘add on’ guided by “the protection and replenishment of our natural environment, and the development of just, diverse societies supported by effective economies” (Sustainable Schools WA [SS-WA], p. 1). Concepts that SS-WA focused on as part of a whole-school approach were to reflect the three pillars of economic, environmental and social sustainability. This was to be done respectively through the efficient use of school resources (for example energy, water, products and materials); the sustainable management of schools grounds (for example biodiversity, waste, landscape design and vehicular traffic); and the promotion of concepts such as “social justice, participation, fair trade, human rights and cultural diversity and respect, consistent with an integrated, holistic model of sustainability” (SS-WA, p. 1). Amity PS was part of the AuSSI/SS-WA Alliance of Schools and was showcased as one of the exemplary EfS case studies within the SS-WA website.

As a SS-WA school, Amity PS could display and refer to the organisation’s ecological footprint and social handprint (DETTWA, 2016) (see Figure 4.2), as a shorthand visual metaphor for the key aspects of sustainability that schools needed to pay attention to through their curriculum and daily practices. The elements to be paid attention to are printed on the toes and fingers of the images.



Figure 4.2: SS-WA's social and ecological handprint

The school was also voluntarily a part of SAKGP, an Australian federal government-funded program aimed at Years 3-6 (approximately 8-11 years of age). Its intention is to teach students to “grow, harvest, prepare and share fresh nutritious food” (<http://www.healthyactive.gov.au/kitchengarden>). An initiative of an Australian celebrity chef, Stephanie Alexander, the program is designed to change young children's attitudes towards food in order to combat childhood obesity and improve nutrition in school children. Amity PS was able to access start-up funding from the SAKGP for aspects of their physical infrastructure such as the kitchen, a pen for chickens and the vegetable gardens (DETTWA 2011).

In summary, conducting my research at Amity PS provided me with a unique opportunity to examine the conceptualisation of sustainability in a most conducive environment. The school is the only school of its kind – in that it is purpose-built and located according to ecological sustainable design principles and boasts embedded sustainability features – and, as such, would seem to fully support the notion of EfS. This is further complemented by a strong sustainability ethos and by sustainability programs such as SS-WA and SAKGP.

Research methods

In the following sections of this chapter I outline the research methods I selected. These align with my stated philosophical stance of interpretive ethnography and also seek to address my research questions as outlined at the beginning of this chapter.

Crotty (1998) defines research methods as “the techniques or procedures used to gather or analyse data related to some research question or hypothesis” (p. 3). The methods used for this particular research belong to a tradition of inquiry known as qualitative research which Denzin and Lincoln (1994, p. 2) describe as:

Multimethod in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them.

Conducting research using both a qualitative research focus and an interpretive ethnographic approach therefore suggests data generation techniques that enable understanding where I, as the researcher, am able to build “a complex, holistic picture” (Cresswell, 1998, p. 15). Denzin and Lincoln (2013) further explain that qualitative research is a “set of interpretive, material practices that make the world visible” (p. 6). In the case of this inquiry, I sought to make the world become visible through the creation of representations via a number of different research methods. For example, I documented what I had seen and heard via three key sources – interviews, fieldwork (teacher) observations, and documents. These included naturalistic observation captured in field notes, in-depth interviews, conversations, observations, photographs, recordings and memos to the self (Denzin & Lincoln, 2013), as well as via the collection and analysis of documents (Brewer, 2000). Table 4.2 shows the relationship between the research questions, summarises the research methods I used to generate data, and outlines the methods I used to analyse these data.

Table 4.2: Relationship between research questions, research method and data analysis methodologies

Research question	Research methods	Data analysis methods
1. What do teachers understand by, and how do they interpret, sustainability?	Interviews (Q 1, 3,6,7,9,10,11,12,13)	Thematic analysis/ grounded theory
	Fieldwork observation	Thematic analysis/ grounded theory
2. What conceptualisation of sustainability is presented in EfS initiatives and policies?	Interviews (Q 2,4,5,8,14)	Thematic analysis/ grounded theory
	Fieldwork observation	Thematic analysis/ grounded theory
	Documents (school-based and external)	Content analysis
3. How are teachers supported in their understanding and interpretation of EfS?	Interviews (Q 3, 4,8,10,14)	Thematic analysis/ grounded theory

Data generation

In this section I outline in more detail the research methods used in this inquiry to generate data. I use the term ‘data generation’ in line with my interpretivist research paradigm in preference to ‘data collection’ to recognise that data do not exist a priori, but rather are constructed through the interaction of myself as the researcher and the research context using qualitative research methods.

Interviews

Interviews were considered a useful and effective way of garnering data because they assisted me to better explore the depth and complexity of the context (Silverman, 2014). Interviews allow insights into social worlds that are created and not directly observable, for example what teachers understand by EfS. As Jones (1985, p. 46) claims:

In order to understand other person’s constructions of reality, we would do well to ask them... and to ask them in such a way that they can tell us in their terms (rather than those imposed rigidly and a priori by ourselves) and in a depth which addresses the rich context that is the substance of their meanings.

I adopted the style of in-depth and semi-structured interviews in this inquiry. The design was deliberate in that this form of interview has a loosely prepared set of broad questions that do not presuppose any answers, therefore allowing associations to be made by the interviewee. In this way the interview becomes more of a ‘conversation’, as in its original Latin denotation, and through this conversation both the interviewee, and I as the researcher, would “wander” together (Heyl, 2001, p. 371). My intention was to be, as in Kvale’s (1996) metaphor of the research interviewer, a traveller who goes on a journey and returns with stories to tell.

In addition, interviews, whilst not offering a direct transfer of experiences of the interviewee, offer representations mediated by the choice of language and selection of elements to share with me as the interviewer. Byrne (2004) rejects the notion that through interviews it is possible to “get inside someone’s head” (p. 182). This is further supported by (Kitzinger, 2004, p. 128) who claims that any experience described within an interview is “never ‘raw’, but is embedded in a social web of interpretation and re-interpretation”. For example, as Charmaz and Bryant (2011) put it, “an interview is a performance, whether stories tumble out or are strategically calculated and enacted, but that does not disqualify interviews from providing rich data and sparking analytic insights” (p. 299). Indeed, the interview is an active process through which knowledge is co-constructed via the interaction and connection between the interviewer and the interviewee and is therefore “intersubjective and social” (Kvale & Brinkmann, 2009, p. 18). My aim was to conduct interviews so as to “communicate genuinely, in both subtle and direct ways that, “I want to know what you know *in the way that you know it...* will you become my teacher and help me understand?” (Spradley, cited in Heyl, 2001, p. 369). Hence, I recognise that the interview is a collaborative production where the interviewee has agency too and is not a passive “vessel to be tapped” (Gubrium & Holstein, cited in Silverman, 2014, p. 168).

The use of semi-structured interviews as a research technique straddles that space between an open everyday conversation and a closed questionnaire in that it provides some structure and direction around certain themes (Kvale & Brinkmann, 2009). As Kvale (1996) asserts, “an interview is literally an *inter view*, an interchange of views between two persons conversing about a theme of mutual interest” (p. 14). This interview approach has less formality, both parties interact as relative equals. This

resonated with me as, as I taught within higher education for the duration of my research I was conscious of being erroneously perceived as the ‘university expert’ on sustainability by the school staff. With each participant, I therefore began the interview explaining my background and interest in the area of EfS and reassured them that I was a novice in this field. In this way, I sought to gain their confidence and enable the participants to express their views without fear of being judged against some idealised conception of EfS that they assumed I might have.

Additionally, when using in-depth interviews as a research method it is important not to turn it into merely a question and answer exchange but to establish a rapport with the participants, for example by asking non-directive questions at the beginning (Taylor & Bogdan, 1998). The interview therefore began by asking open-ended descriptive questions that encouraged the participants to talk about their role at the school. The same basic questions, or an “interview guide” as referred to by Patton (2002, p. 343) were prepared for each person interviewed (see Appendix B). The interview questions were constructed to address the three research questions. For example, Table 4.2 indicates the questions from the interview guide in Appendix B that are related to each research question.

To build a conversational style, I changed the wording of questions spontaneously and asked additional probing questions, all the while remaining focused on the predetermined area of interest, EfS. The use of probing questions assisted in gaining more detail about an event or incident described, thus enabling further clarification of meaning of words and concepts from the interviewee’s point of view (Taylor & Bogdan, 1998). In this way, 12 people were able to be interviewed in a systematic and detailed fashion allowing for their own particular experiences to be articulated. To ensure anonymity, I allocated pseudonyms for each participant.

The 12 interviews consisted of the administration team (the principal and the two deputy principals), eight teachers (including the two subject specialist teachers, art and music, who worked across the school), and the kitchen garden chef. The principal was very supportive and acted as an enabler, providing me with a schedule of the regular cluster meetings, the cluster leader names and their email addresses. There were three grade clusters in the school – Kindergarten and Pre-primary, Years 1-3 and Years 4-6. I attended these cluster meetings and explained the purpose and intent of the research,

provided the teachers with the research information sheet, and opened the dialogue for any questions. From this, teachers in each of the clusters across the school subsequently volunteered to be interviewed so that I was able to gain a perspective across the different years of schooling. Table 4.1 lists all the participants who were interviewed.

The interviews were conducted in a setting of the teachers' choice and at a time convenient to them. Most of the teachers chose to be interviewed during their free time at school, with one teacher requesting an interview time during a school excursion. The interviews ranged in length from 30 minutes to over an hour and a half. I conducted a single interview with most participants, except for the principal and the art teacher who were both interviewed twice. Before each interview an information sheet and disclosure statement outlining all the details of the study (Appendix C) and a consent form (Appendix D) were provided as required by Curtin University's and DETWA's ethics requirements.

Fieldwork observation

To understand the behaviour of others and how people view their context it is important that the chosen research approach gives access to the meanings that guide actions (Punch, 2009). A primary method of data collection in my research has therefore been observation. However, whilst, principally, my role was as participant observer, I found myself moving between a number of roles, at different times, over the course of the research. This follows Bryman's (2012, pp. 443- 444) findings that identify six roles for an ethnographer – covert full member, overt full member, participating observer, partially participating observer, minimally participating observer and non-participating observer with interaction. Geertz (1973) also drew attention to the fact that the ethnographer's role involves more than just being an observer, stating the ethnographer is a "scribe as well as the explorer and quasi insider of both exotic and familiar social worlds" (p. 19). In this research, 'observation' therefore involved immersing myself in the life of the school and classroom for an extended period of time, observing behaviour, listening to what was said in conversation – either directly with me or with others – and asking questions (Bryman, 2012, p. 432). By doing so, I was able to sensitise myself "to the world of others through experience and through construction of that world" (Estroff, cited in O'Reilly, 2005, p. 108).

As a participant observer I occupied a liminal space within the research site, situated between different groups and activities (Lindlof & Taylor, 2011). At times, I would be actively assisting with the classroom activities, not by being the teacher but by supporting the lessons that were occurring. At other times, I would be present at meetings, simply listening and observing. I attended assemblies, sat in the main staffroom and cluster area lunch areas at different times, and had casual conversations about things sometimes related to the research and other times totally unrelated. I watched classes at work in the vegetable garden and asked questions of both teachers and students. I accompanied teachers on excursions and was counted as an additional 'helper', creating the desirable student/adult ratio necessary for such excursions beyond the school gate. At different times, I occupied the role of participant observer where I was more fully engaged in the work of the research context and my role was like that of a teacher. At other times, my role could be described as a partially participating observer where observation was important but not the main data source. At these times, the gathering of interviews and documents took precedence.

One teacher, Anne, agreed to have me in her classroom for extended observations. Anne was a Year 4 teacher who had been teaching for 5 years. She was also the science coordinator for the school. I was able to undertake 40 hours of observation in her class and also attended two Triple S committee meetings that were held once a term. This committee encompassed the learning areas of science, S&E and the overarching school focus of sustainability. The role of the committee was to develop teaching plans that demonstrated the interconnectedness of the learning areas, showing the Curriculum links for other teachers to follow. By attending these meetings I was able to observe the dynamic relationship between the teachers and the ways they constructed a school response to sustainability. It is worth noting here that a number of factors impinged on the number of these observations. For example, changes to the timetable when a visit had been scheduled meant that, at times, Anne's class were with another teacher for a different subject and it was Anne's DOTT time (duties other than teaching). Therefore, the opportunities were reduced to actively observe how Anne dealt with sustainability in her class.

Additionally, the exigencies of working full-time myself during this period meant that, if a scheduled visit was cancelled, my own work commitments prevented me from

easily attending at an alternative time. The ideal scenario would have been where I was able to spend time immersing myself in the school environment during the entire school day; however, the volatility and flexibility of what occurs within school life and my own (researcher's) work and home life meant this did not happen as I would have wished.

Documents

In addition to interviews and observation, collating and examining documents is an additional source of data in ethnographic research. As such, I included document collection and analysis as part of this research in order to answer the three research questions and examine the relationship between policy and interpretation. The documents that became the subject of this research were not produced as a result of the research but rather were unsolicited documents, that is, they pre-existed or were developed during the natural course of events in the research setting (Coffey, 2014). I sought to examine texts that were developed within the school and those developed externally that could possibly have an influence on the school's activities. Using Ball's (1993) premise of policy not just as text but also as discourse, I was interested in how these texts created the discourse of EfS within the research context.

My sources of documentary evidence for this study can be categorised, according to Bryman (2012), into official private documents and official state-based documents. Official private documents, that I refer to as official school-based documents for clarity, included a combination of documents that were the privy of internal staff members, such as the Triple S committee plan, and those documents that were publicly visible and available, including the Amity PS Sustainability Charter (see Appendix G), their Annual Report and their school Business Plan). An additional source of documentary evidence was the web-based information which includes the organisation's website and virtual documents that are embedded within that receptacle (Bryman, 2012). The official state-based documents I collected and examined were the Australian Curriculum v3.0 and v8.3 (ACARA, 2012, 2017), the Sustainability Curriculum Framework (DEWHA, 2010c) and documentation relating to the two programs that were integral to the school's operation in terms of sustainability, the SS-WA AuSSI schools program (DEWHA, 2010a) and SAKGP (Australian Australian Government, 2014). Table 4.3 identifies the official school-based documents and official state-based documents analysed.

Table 4.3: Analysis of official school- and state-based documents

Document	Source / author	Form	Function	Intended audience
Official school-based documents				
Sustainability Charter	Amity PS	Document from school website	Guides the school's mission and ethos	School community and public
Triple S Plan	Triple S Committee at Amity PS	Planning sheet	Guides content related to sustainability across science, S&E and sustainability	Whole of school teaching staff
Amity PS Annual Report (2012)	Amity PS	Report from school website	Promotes the school	School community and public
Amity PS Business Plan (2011-2013)	Amity PS	Document from school website	Guides the school's vision, values and objectives	School community
Official state-based documents				
Australian Curriculum	ACARA	Website	Guides Curriculum planning	All teachers/schools Australia wide
AuSSi schools website	AuSSI	Website	Informs schools of AuSSI's purpose	All schools Australia wide
SAKGP		Website	Guides the mission, ethos of the program and recruitment	All schools Australia wide
Sustainability Curriculum Framework		Website	Guides the incorporation of sustainability throughout the Australian schooling system	All schools Australia wide

Data analysis

Within the interpretive ethnographic methodology of this inquiry I have conducted the analysis of my data according to the principles of the grounded theory approach espoused by Charmaz and Mitchell (2001). Ethnography and grounded theory are complementary approaches which are both consistent with an interpretivist paradigm. This approach to data analysis “uses systematized methods of theoretical sampling, coding constant comparison, the identification of a core variable, and saturation” (Cohen et al., 2011, p. 491). According to Charmaz and Mitchell (2001), data analysis using grounded theory techniques widens the researcher’s lens – as compared to ethnography that may have a more specific focus – in order to encompass a wider, more holistic, view of a context. Therefore, by using systematic grounded theory strategies I was able to gain a more complete picture of the whole situation by studying the processes and connections between events.

Grounded theory data analysis requires two complementary processes – constantly comparing data and asking questions. It is therefore known as the “constant comparative method of analysis” (Glaser & Strauss, 1967, p. 105). Unlike ethnography, grounded theory requires researchers to “(1) compare data with data from the beginning of the research, not after all the data are in; (2) compare data with emerging categories; and (3) demonstrate relations between concepts and categories” (Charmaz & Mitchell, 2001, p. 162). That is, in this approach, there is no separation between data collection and analysis, they occur in conjunction with each other.

In grounded theory data analysis, a first step in ascertaining what is happening in the research context is to begin by coding the data (Charmaz, 2006). The coding in this inquiry was an inductive rather than deductive process where the codes derived were grounded in the data rather than ‘shoehorned’ into predetermined codes. In particular, a critical aspect of grounded theory is to remain close to the data. To do so, my initial action was to immerse myself in the data I had generated which were my observational fieldnotes, interview transcripts and interview recordings, leaving the analysis of documents until after I had dealt with these. The first level of coding in grounded theory data analysis is open coding where the raw data are examined in its entirety and placed in conceptual categories. In this view of data analysis, my initial step was to read the written texts and look for ‘first impression’ patterns. However, patterns,

themes and categories, argue Srivastava and Hopwood (2009), are not self-evident and only emerge as part of a deeply reflexive process. By continual theoretical sampling, where I collected data in an ongoing and iterative way using the constant comparison approach, “saturation” (Cohen et al., 2011, p. 492) of ideas occurred resulting in the development of themes across the data. These themes can then identify both the patterns and the relationships between these patterns. As such, when searching for themes, as suggested by Ryan and Bernard (cited in Bryman, 2012, p. 580), I also looked for:

- Repetition – examining recurring topics
- Metaphors and analogies – finding relationships between ideas and things by comparison to like or unlike ideas
- Similarities and differences – considering how interviewees might discuss a topic in different ways or differ from each other, or exploring whole texts like transcripts and asking how they differ
- Missing data – reflecting on what is not in the data
- Theory-related material – using social scientific concepts as a springboard for themes

The second stage of data analysis was to interpret, or give meaning and significance, to my data. Srivastava and Hopwood (2009) note that the analysis of qualitative data is an iterative process and that is the “key to sparking insight and developing meaning” (p. 76). However, for interpretive ethnographical research there is an understanding that the analysis of data is never complete. There are innumerate lenses that can be applied in the analysis of the same data and thereby any analysis can only ever be a partial representation (Roulston, 2014, p. 308). In adopting an interpretive lens for my research, I therefore recognise the existence of a plurality of interpretations.

As this qualitative analysis also involved coding a substantial volume of text-based material, I used QSR NVivo™, a trademarked product developed by QSR International. This is a software package designed to assist researchers using qualitative, text-based methods to store, categorise and analyse these data. All my interviews transcripts, observational fieldnotes and documents were stored and analysed in NVivo.

Interviews

The analysis of the interview data for this study is best characterised as adopting an interplay of techniques that Kvale (1996, p. 203) terms “ad hoc meaning generation”. Kvale and Brinkmann (2009), view this as a “bricolage” (Denzin & Lincoln, 2000) and suggest that it is a useful way to move within the interview data in order to bring out significant connections and structures. My initial approach to the data therefore did not follow a pre-determined systematic analysis but instead I immersed myself in the interview data to get a ‘feel for what was going on’ across them all – I wanted to have a close familiarity with the data. With this method of analysis, I firstly listened to, and then transcribed, all the interviews. A useful facility of NVivo is the ability to upload audio recordings and then slow them down to enable close listening in order to transcribe. I chose to transcribe the oral interview verbatim complete with gaps and pauses as I acknowledged that by converting the oral interview into formal written text, complete with capitals and punctuation, this in effect may constitute an unwitting first pass at analysis and, thereby, may influence the meaning (Kvale & Brinkmann, 2009). Transcription is, therefore, an important component of data analysis that requires “deep listening, analysis and interpretation” and allowed me to connect with these data (Hesse-Biber & Leavey, 2006, p. 347).

In addition, in alignment with my constructivist research stance I did not ‘collect’ the interview data but rather was mindful that data were co-authored by myself and the interviewees (Kvale & Brinkmann, 2009). In the analysis of interview text, Kvale and Brinkmann (2009) remind us that “the analysis of the transcribed interviews is a continuation of the conversations that was started in the interview situation, unfolding its horizon of possible meanings” (p. 193). Once converted to text, the interview data were read through to get an overall impression, and I was able to return to specific sections to gain a deeper interpretation, visualise some metaphors, and develop some preliminary diagrams to represent the findings. Once I felt familiar with the interview data, I was then able to engage in a more systematic analysis using the grounded theory approach as described in the preceding section.

I used NVivo to code ‘in vivo’ which is a form of inductive or open coding. The process I followed was to listen to the audio and then annotate the text with a short word or phrase that came from the actual language of the participants, and sometimes add also my own rough interpretations next to the transcribed text that represented the

patterns and connections I made at the time. These initial ‘memos’ proved useful later in assisting me to identify relationships between my codes and developing their meanings (Charmaz & Mitchell, 2001). According to (Charmaz, 2006), coding “generates the bones of your analysis. Theoretical integration will assemble these bones into a working skeleton” (p. 45). In this way I was able to make sense in a holistic way, developing some coherence of, what at first glance, appeared disparate information. For example, an excerpt from my reflective journal indicated some of my thinking through this process of analysis.

I sought to make logical links between the categories created through the open coding process. These were then grouped into broader more abstract categories. I re-read and listened to and reviewed the interview transcripts and remembered the informal snippets of discussion had in the staff room and on the way to and from classes. I also re-read my field observations notes. This process began to crystallise ideas and they began to form in larger ‘themes’ in my head. The questions I kept asking myself was “So what are the main messages these people are trying to tell me?” The 23 free nodes were then examined and grouped into larger ideas that fit together, that is, the cluster of nodes was all trying to relay the same or very similar message (JR: L37, 29/10).

Part of the process of analysis is becoming familiar with the research tools. In my case, a large part of the angst of my data analysis came from trying to grapple with the NVivo software, as I describe in this next excerpt from my reflective journal. Working out how the program worked and what I needed it to do took many hours. It has occurred to me since that this entry in my journal mirrored the reasons I chose an interpretive ethnographic methodological approach to my research inquiry – I am always seeking to understand not only the constituent part but their interconnections with one another.

I have always been the kind of person that needs to know how the pieces fit together to make the 'whole' and then the constituent parts and their relationships make perfectly clear sense to me. I found that the instruction I got from the workshops and the tutorials splintered the learning into small discrete steps and prevented me from really getting to grips with the organisational structure of NVivo itself. How was it designed? What can it do well? Poorly? How do the elements all fit in? The analogy of the way I learn best can be seen from my experience with Ballroom and Latin dancing. The more my instructors tried to break down and slowly master each step the more I 'lost the plot' of the whole dance. I found my learning was best when I rehearsed a complete sequence in real time to music. I got the idea of the dance and picked up more of the emotion, the subtle nuances that added flair to the dance performance. NVivo and I weren't dancing well together as yet, I was still restricted to small disjointed steps of learning (JR: L38, 29/10).

In accordance with the open coding procedures, each time I reviewed the nodes and clusters that I had created in NVivo I therefore needed to make subtle changes and shifts in alignments until I felt the way they were structured made sense. Rather than using line by line coding which has the dangers of decontextualising, I opted to use my initial open codes to further analyse using selective coding. Selective coding integrates and subsumes earlier codes and enables a synthesis of large amounts of data with the benefit of organising them into a coherent conceptual framework (Charmaz & Mitchell, 2001). Using this coding approach, the nodes I had previously established within NVivo using open coding coalesced the individual codes into four larger themes of – blockers and enablers of sustainability, pedagogy and curriculum, teachers' personal reactions to sustainability and, finally, knowledge, development and implementation of policy.

Additionally, in analysing the interviews I applied Lather's (1995) post-modern threefold approach of realist, critical and deconstructive readings of the text. Initially, my reading of the interview text was more 'realist', in that I was adopting a 'God's eye point of view' and trying to find out what the interviewee meant by their

statements. Thus, for example, I was scanning the texts to isolate definitions of sustainability in the first instance and mentally categorising their responses. Over time, I found myself re-reading the transcribed interview text and re-listening to the audio interview and beginning to develop a more critical eye.

With this interpretation I sought to go beyond the words actually expressed in the interview and make connections to structures and relations that were not immediately apparent from the text (Kvale, 1996, p. 201). With this view, I became more aware of the hegemonic influences of the larger social, political and economic issues pertaining to the discourse on sustainability in the interview text. I began to realise that the participants' responses were being marshalled towards a particular view of sustainability that may not be helpful in serving the transformative impetus that the EfS movement is purported to have. At this stage, after repeated listening and readings, I decided to leave the interview data and come back to it after a period of time. This period turned into months, during which I busied myself with the demands of full-time work, family and life and when returning to the interview text, much more became apparent. It was as if the pieces of a picture were laid bare and what was not noticed before suddenly achieved much greater prominence.

Additionally, after this gap in time I applied Lather's (1995) third way of analysis, a 'deconstructive reading', to 'destabilise' and 'denaturalise' what I had found before. This time the text was interrogated for its "unconscious silences and unspoken assumptions" (Kvale & Brinkmann, 2009, p. 236). Both this and my time away from the data revealed a series of paradoxes that became the subject of a journal paper (Kuzich, Taylor, & Taylor, 2015). From this third reading, I could now visualise mental images of teachers knowingly caught in the pull between education orthodoxy and the corresponding pull in the opposite direction of the tenets of EfS. What also became evident was that the interview data suggested the necessity for an organisational framework of UNESCO's aforementioned four pillars – economics, ecology, politics and culture – in order to support EfS at the school. It is therefore through this threefold approach of realist, critical and deconstructive readings suggested by Lather that I worked towards a multilayered data analysis (Kvale & Brinkmann, 2009).

Fieldwork observation

Similar to the process for the interview analysis, my first objective with the field notes was to immerse myself in them. During the observation process I took handwritten notes whilst I was in the class or at the school. Later, I would re-read these notes and add to them to enable a fuller, clearer representation of events. Later still, I would type out these notes and, alongside the original observation field notes, add my own thoughts and insights in the form of a reflective journal. This process, as recommended by Liamputtong and Ezzy (2005), assisted me with making sense of the data. Each time I came to the school for further observation I would look over my previous field notes and reflective journal. The purpose was to capture thoughts and ideas and to ensure things were not forgotten as the data progressed, as well as to help with the final writing process, thus ensuring trustworthiness. Monitoring and reporting my processes in an accurate transparent manner during my qualitative analysis was paramount to ensuring trustworthiness (Patton, 2002).

The coding of the observations were also included in the NVivo coding process to compare and contrast to the interview data. Observational data were used to gain a sense of context and to check how my hunches about possible explanations of what was going on at the school were aligned in terms of EfS. The data generated in interviews were also constantly compared to the data generated through my observations and reflections in an iterative way. Constant comparison and memoing were the analytical process I used to identify these “similarities and differences (variation) between conditions (that is, context) and consequences surrounding key events, incidents, and patterns in the data” (Timonen, Foley, & Conlon, 2018, p. 7). My reflections were examples of memos that served to assist me to make connections between the data (Charmaz, 2006). The resulting realisations from this process not only kept me grounded and close to my data but also supported my research to move forward by causing me to either alter the focus of my observation or the kinds of interview questions I asked. Going back into my data to seek explanations for ‘what was going on’ at Amity PS in terms of EfS assisted me to move beyond the obvious interpretations of data in an innovative way to reach new insights. In summary, my approach to the data analysis was to utilise the inductive process of coding, as well to engage in a process of abduction.

Documents

Documents can be thought of as providing signs and symbols through which people, in this case teachers, glean how things are and how things work, and to which they bring their own understandings (Coffey, 2014). Adopting an interpretivist standpoint, I sought to identify what kind of reality the documents were creating and what understanding and interpretation of EfS they were promoting.

By investigating documents as part of my research, I wanted to explore the relationship between three things:

- The kind of discourse about sustainability and EfS generated by my interviews and observations (the micro level).
- The enactment of these meanings of sustainability through the official school-based documents generated by the school that constitute the social world of the participants.
- The discourses that abound outside of the school context at the macro level that may have an effect on teacher conceptualisations of sustainability.

As a first step I conducted a content analysis of the documents. Content analysis is defined by Bryman (2012) as an “approach to the analysis of documents and texts that seeks to quantify content in terms of predetermined categories and in a systematic and replicable manner” (p. 710). I considered it a useful strategy as it is able to describe “the relative frequency and importance of certain topics, as well as to evaluate bias, prejudice and propaganda in print materials” and able to identify and describe “patterns and trends” (Cohen, Manion, & Morrison, 2007, p. 476). As a framework for the analysis of the documents in my study, I drew the four predetermined dimensions of sustainability identified by UNESCO (2010) – economic, social/cultural, environmental and political – from two key documents, the *UNESCO framework for the UNDESD international implementation scheme* (UNESCO, 2006) and a popular teacher resource book *How to succeed with education for sustainability* (Lang, 2007). These two texts were specifically selected as they reflected key themes and concepts representative of the holistic, contemporary interpretation of sustainability I identified in the analysis of the literature in Chapter Two. The four dimensions of sustainability from each document were then amalgamated into a single document, presented in Appendix A.

This process of analysis then involved coding each of the documents identified in Table 4.3 against the four dimensions of sustainability, as represented in Appendix A. As this was derived from previous knowledge this process was therefore classed as an inductive form of analysis (Elo & Kyngäs, 2008) which offered a preliminary and objective way to identify the key words as an indicator of their relative importance in the text's overall discourse. Employing content analysis in this inquiry also offered a systematic and transparent way of analysing the documents, therefore enabling a succinct presentation in visual forms such as graphs and tables. In addition, it enabled longitudinal analysis (Bryman, 2012) of the Australian Curriculum to show the trends over a period of time. This process of coding was conducted in two ways. For the Australian Curriculum, the analysis involved annotations to indicate whether each statement aligned with the four dimensions within an Excel spreadsheet of the K-6 Australian Curriculum. The other documents were imported as Word documents and were coded within NVivo using the same four categories.

In addition, I also identified the frequency of words – and linguistic emphases – in the texts using the word frequency counter program Wordle as a data visualisation tool. For example, by using Wordle the frequency of words used in the Sustainability CCP statements was able to be mapped in a visual display. Data visualisation tools such as Wordle are increasingly being used in a number of disciplines as a means of documentary analysis (Cidell, 2010). The benefit of using this method was that it offered a preliminary and objective way of identifying key words in the Sustainability CCP text that could then guide a fuller investigation into the sustainability discourse present. Wordle does this by generating a 'word cloud' that represents the frequency of word usage in the source text by creating words of different sizes; the size of the words expresses their relative importance in the text's overall discourse. Being cognisant of Ahearn's (2014) cautioning that visual interpretations of the same information can be interpreted in various ways dependent upon the use of font style, colour, background and text direction(s), I selected a consistent approach to all Wordle words created. The font choice was Kenyan Coffee with the colour range labelled Moss, and the text direction selected was mostly horizontal within the Web.20 tool found on Wordle.com.

In the second step of my analysis I sought to explain, rather than just describe. I therefore chose to utilise the concept of discourse in my study in order to offer a critical analysis of the discursive practice where discourse shapes and influences the thoughts and actions of the participants, in this case the staff at Amity PS. I use the term discourse in my inquiry to refer to a set of taken-for-granted assumptions that, unless unravelled, become an invisible, unchallenged reality. According to (Cheek, 2004, p. 1142), discourse can be considered to be:

... scaffolds of discursive frameworks, which order reality in a certain way. They both enable and constrain the production of knowledge, in that they allow for certain ways of thinking about reality while excluding others. In this way they determine who can speak, when and with what authority; and conversely, who cannot.

Through discourse analysis, my aim was therefore to examine how the use of language in official state-based documents (see Table 4.3) constructed the phenomena of sustainability (Liamputtong & Ezzy, 2005). I was also interested in analysing what aspects of sustainability had gained popular currency and which were more marginalised in the discourse. This kind of analysis reveals power relationships represented within the documents and assists in understanding how particular views of sustainability become dominant (Sharp & Richardson, 2001). In this way, I was able to explain why some expressions of sustainability – and particularly EfS – have come to the fore in the school context and why others were excluded or marginalised, as well as what functions these have come to serve.

Conceptual framework for data analysis

The conceptual framework which I chose to use in my data analysis emerged from the iterative processes of coding, engagement and immersion in the data that I have described in the preceding sections. This inductive process resulted in the development of analytic lenses that assisted in the explanation of my findings. My conceptual framework mapped what I thought was ‘going on’ at the school, in effect, as Maxwell (1998, pp. 222-223) posits, it encapsulated “a tentative theory of what is happening and why”.

In arriving at my conceptual framework I used three questions as suggested by (Srivastava & Hopwood, 2009, p. 78) in an iterative way – What are the data telling me?, What is it I want to know? and, What is the dialectical relationship between what the data are telling me and what I want to know? The second question repeatedly refocused me on my research problem – to identify how the Australian education system affords EfS. This enabled me to identify the possibilities that were evident for EfS within Amity PS, but also to identify the mismatch between what was evident across all my data sources and the actual possibilities for EfS in schools that I had identified in Chapter Two. I characterised these reflexive realisations as affordance and paradox. When presenting my findings in Chapters Five and Six I return to these terms and illustrate their application as the conceptual lens for the analysis of my data. The meanings of these terms, as well as how I have used them in my research, are outlined below.

Affordance

Affordance, in the context of this thesis, refers to the relations between the abilities of humans and the aspects of the environment (Rietveld & Kiverstein, 2014). In order to understand how affordances has been used in the context of my research findings, I will firstly clarify some of the key features. Gibson (1986), coming from a perspective of ecological psychology and more specifically visual perception, coined the term to represent perception as being an interaction between living things (humans and animals) and their environment(s). He largely frames his conception of affordance in relation to physical objects in the environment – for example a tree, chair, swing, knife etc.

Gibson proposes that affordances are realised as a result of the interaction of humans with non-human elements in the environment, that is, until an action occurs, the affordance is a passive or latent potential. He explains this idea as action potential, saying “the affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill” (1986, p. 127). It describes an interplay with the inherent property of the object – or structure or process – and the perception, intent and function that is determined by the user. Indeed, we can identify examples of this idea. For instance, in the case of physical objects such as a knife, the affordance of the knife is that it can slice bread and thereby feed a hungry family. Conversely, consistent with Gibson’s idea of “for good or ill” we can also conceive of a knife being

used in a murder. Affordance, state Weeks and Fayard (2007, p. 7), can therefore “connect practice with perception”. What affordance presents are possibilities for use but not necessities, that is they may or may not be used for that purpose. As such, where affordances provide possibility they can also provide constraint, even simultaneously. According to Hammond (2010), “These are not opposites, rather they are complementary, so, for example, a sledgehammer affords the breaking of rocks but the user is constrained by its weight – the very thing that provides opportunity for rock breaking” (p. 206).

Affordance is also described as an ecological concept in that it is a dynamic, connected system of interaction between humans and their environment, often in a broader sense than merely their physical surroundings (Kaaronen, 2017). The idea of humans as separate from their environment is an artifice, Chemero points out, stating “It is only for convenience (and from habit) that we think of the organism and the environment as separate; in fact, they are best thought of as forming just one nondecomposable system” (2013, p. 148). The point is that humans and their environment need to be considered holistically, and there needs to be cognisance that this system as a whole “unfolds over time” (Chemero, 2013, p. 148). The idea of wholeness and systemic thinking resonates well with the concept of sustainability and has an aptness as a means of analysing sustainability within school contexts.

However, whilst Gibson’s focus is on affordance in relation to physical objects in the environment I extended this idea further. My utilisation of the term affordance centres on the idea that humans interact with non-human elements – or, for that matter, other humans – and that the non-human elements are either natural, for example a tree, or human-made, for example a building. Additionally, there can be interactions with structures (for example a policy framework) and processes (how things are done). I infer that the nature of these interactions is characterised by an interdependent mutuality and reciprocity. Thus, this interaction occurs between humans and their environment which includes not only physical, but also socio-cultural and, I suggest, political spheres. This interaction is initiated – or not – in order to create a desired outcome for the human.

I am therefore using the term affordance, in this broader sense explicated above, as an interpretive lens to illustrate how teachers can act upon, and with, different kinds of

infrastructure. In doing so, I illuminate how the very thing that may furnish opportunity could also serve to constrain achievement, and by utilising affordances this enables the inherent tensions of teaching to be more clearly explained. However, in a departure from the literature in the field that uses the term ‘constraint’, I represent this tension by contrasting affordance with counter affordance, as I feel it better represents the idea of potential that cannot be realised due to influences that draw it away from the intended goal.

Paradox

If we were to consider events and happenings described by this research through conventional dualistic logic we could ascribe a meaning to the aforementioned term of counter affordances as being consistent with contradiction, obstacles or negative aspects. However, as I have attempted to clarify throughout the thesis, this dualistic logic does not represent the wholeness and interconnectedness of the world. For example, within the context of my research such a view would deny the complexity of actions and decisions made by teachers and others. I therefore found a more appropriate interpretive lens with which to analyse these data was that of Parker Palmer’s (2008; 2012) concept of paradox. Through paradox I honoured the teachers’ embodiment of living with complexity where interests compete in the world of work and politics where “values cancel each other out” (Palmer, 2008, p. 4). Palmer (2008) speaks to this conundrum that teachers face in their professional lives every day, noting wistfully they “live the contradictions, fully and painfully aware of the poles between which our (their) lives are stretched” (p. 8). Thus, through the lens of paradox transformations enable what may appear as contradictions and shortcomings, an acceptance that in every situation there is what Thomas Merton calls a “hidden wholeness” (cited in, Palmer, 2008, p. 7). I argue that the teachers in this study are part of, and work within, through and sometimes even against, many structures that contribute to this hidden wholeness.

To be clear, I use the term paradox as a lens, and differentiate it from its usage in organisational and management research that draws upon paradox theory. Whilst I do not subscribe fully to the way paradox is represented there (see for example (Elliott & Davis, 2009; Jarzabkowski & Lê, 2017; Lüscher & Lewis, 2008; Sheep, Fairhurst, & Khazanchi, 2017), I do consider, as does for example Schad and Bensal (2018), that paradox signifies tensions, contradictions and competing demands. These

contradictory elements, state Lewis and Smith (2011), are “interrelated... exist simultaneously and persist over time” (p. 389). For example, one aspect of paradox is that these underlying tensions are a reflection of “elements that seem logical individually but inconsistent and even absurd when juxtaposed” (Smith & Lewis, 2011, p. 382).

My view of paradox is therefore aligned to both the way suggested by Palmer (Palmer, 2008; 2012), and to that evident in many eastern religious views where the way forward is to honour the hidden wholeness of the work that needs to be done. In many ways, I consider the tension itself can be a catalyst for change – the very act of identifying the paradoxes brings to light any inconsistencies and areas of opposition. As such, I see paradox as being very much intertwined with the idea of affordance. I have therefore chosen to use the concept of affordance throughout this thesis as a way to illustrate the hidden wholeness and potentiality that exists, but which may not be realised. In this sense my view is similar to the one espoused by paradox theory literature theorist Farjoun (2010) who suggests paradoxes can simultaneously support and oppose one another.

Outline of the approach to the interpretation and representation of the data

This section has two aims. The first is to provide an overview of the process of data interpretation that has led to the development of my conceptual framework for analysis. The second is to set out the rationale for, and explanation of, the mode of representation of my findings.

Interpretation of the data

Interpretation involved a process of pattern discernment through repeated engagement with the data captured in NVivo. Through a process of open coding, then subsequent selective coding of interview transcripts, observation field notes and reflective journals, I had reached a preliminary categorisation of the data into categories as identified in Appendix E.

However, successive coding and consolidation through constant comparison produced a story of the data that “reassembled” (Charmaz, 2006, p. 60) and coalesced under four infrastructural pillars, each with apparent tensions – policy, physical, pedagogical and

people (human). These had greater explanatory power for the data as they more clearly showed the spheres of engagement and influence in terms of sustainability at the school level and clarified the relationships between the disparate elements of the data. I identified that these pillars not only represented the key features of Amity PS practices related to EfS, but, moreover, can be considered essential elements that are required to work in tandem for a school to successfully embrace EfS. They emerged from the data as representations of the infrastructures that had become instrumental in shaping the implementation of EfS at Amity PS. Within each pillar, the tensions were created on the one hand by factors that supported or enabled the elements within to exist or develop and, on the other hand, by factors that prevented or provided resistance. As I have outlined in my explanation of my approach to data analysis in this chapter, I use the terms affordance and paradox to illustrate these inherent tensions. In Chapter Five, I illustrate the paradoxes that emerge from the tension that exists between affordances and counter affordances within each pillar.

As I have described in this chapter, my data analysis was a cyclic, iterative process that ‘re-turned’ the data in order to create different connections and relationships between the elements of data moving to increasingly higher levels of abstraction (Vaismoradi, Jones, Turunen, & Snelgrove, 2016). Whilst the coding into four infrastructural pillars provided a preliminary means of description of the data through a categorisation of the document text and participants’ accounts, it was only through further analysis that the underlying meaning of these emerged. The implicit meaning was only realised when I raised the participants perspective to increasingly higher levels of abstraction (Vaismoradi et al., 2016) through utilising Lather’s (1995) post-modern approach of a succession of realist, critical and deconstructive readings of the text. This approach moved my understanding from what was immediately obvious – that is, a realist approach – to a more critical appreciation of the underlying hegemonic influences of the larger social, political and economic issues on the discourse of sustainability. It was only after a period of time, following this initial ‘pass’ over the data, that the third way, a ‘deconstructive reading’, revealed unconscious silences and unspoken assumptions and a series of paradoxes became evident. In using the threefold approach of realist, critical and deconstructive readings, I was therefore able to achieve a multilayered analysis of the data (Kvale & Brinkmann, 2009). Thus, the analysis moved from simple categorisation to the development of themes that “elicited the

essence of the participant's experiences" (Vaismoradi et al., 2016, p. 102) in a more meaningful way.

Representation of the findings

The representation of findings is very much like Beck's map of the London underground railway system (Cartwright, 2014). This classic map clearly represents all the lines and stops that comprise the entire London underground and works really well as a navigation device. However, when we look at this map, we suspend reality, as the map does not accurately represent distances between stations nor, in many cases, the cardinal direction. Like a written text, the map is designed for a purpose – to provide a clear guide to navigate a complex maze of train lines for tourists and regular users alike. In the same way, this chapter serves as a map to navigate the complex reality of what occurs within Amity PS in relation to sustainability.

In representing my findings I turned to the Hammersley and Atkinson's (2007, p. 198) idea of "synecdoche". Like the metaphor, a synecdoche is a form of representation that seeks to represent the 'whole' by selecting 'parts' that are most representative. That is, to make the morass of data generated by this ethnographic research comprehensible, whilst simultaneously making it interesting for the reader, I found it necessary to select particular fragments with significance. At times, I present these directly from interview transcripts and observation journals (see p. 137 for audit trail codes). I have elected to use italics to distinguish quotes from participant interviews. In this way I am highlighting their voices in this inquiry. At other times, I engage in authorial vignettes, produced during the writing of the thesis drawn from my reflective journal, to share my thinking. These vignettes are marked by a different font and presented in a box to distinguish them. I used vignettes to form "snapshots or short descriptions of events or people that evoke the overall picture" (LeCompte & Schensul, 2013, p. 269) that I as the ethnographer am trying to paint.

In Chapters Five and Six I present my findings alongside interpretation of the data generated from my research inquiry at Amity PS. I begin with an examination of the policy infrastructure, followed by the physical infrastructure, in Chapter Five. This is followed by a presentation of my findings in relation to the pedagogical and people (human) infrastructure in Chapter Six.

Ethical requirements

The research was conducted after gaining approval from the Curtin Human Research Ethics Committee and ethical approval from DETWA. It met all the requirements prescribed in this process. For example, before any data were collected all participants were fully informed of the nature, methods and purpose of the research and were provided with a research information sheet and disclosure statement (Appendix C) and consent form (Appendix D), in accordance with DETWA and Curtin University's ethics requirements. Participants were guaranteed anonymity and assurance that they could withdraw at any time during the research process without prejudice or any adverse consequences. All the participants agreed for our conversations and/or interviews to be recorded and permitted field notes to be written.

Data collected from schools and teachers were given a numeric coding to preserve participant anonymity. Similarly, pseudonyms were used for all participant, school and locality names. The participants were assured that recordings and field notes would be stored securely, and only my supervisors and I would have access to these data. All electronic data collected during the study was stored on a computer protected by passwords and only my thesis committee and I had access to any data. All electronic and paper format data produced were stored in a safe and secure location in the School of Education at Curtin University and will remain there for a period of 7 years after publication of the thesis, after which all data will be destroyed.

The three ethical principles of non-maleficence, beneficence and fairness were considered in this research (Cohen et al., 2007). The principle of non-maleficence requires that the rights and welfare of research participants be protected to preserve human dignity, which was achieved through ensuring all participants were anonymous, and had full control of what information they wished to be included in the research process, through a process of member checking. Beneficence addresses the need for at least a balance of benefit arising from the research for both the researcher and participant, and in the information letter to schools and participants the anticipated benefits to both the participants and the wider community were clearly stated. Finally, fairness in research requires methodological rigour to ensure it represents the participants' views and does not privilege those of the researcher. I ensured this was

the case through such measures as diligent notetaking, transcription of interviews and inclusion of participants' voices in the writing of the thesis that represented their thoughts and views. It is through measures such as informed consent, ensuring anonymity and confidentiality, and methodological competence that these ethical considerations were addressed.

Research quality considerations

A constructivist perspective in research makes the assumption that there is no absolute truth in the traditional sense, rather that reality is a construction in people's minds (Merriam, 1998). As the researcher, my role is to describe in a systematic manner the patterns that are derived from my analysis and offer an interpretation of the data generated.

Within a constructivist paradigm terms such as credibility, transferability, dependability, trustworthiness and confirmability parallel the positivist criteria of internal and external validity, reliability and objectivity (Denzin & Lincoln, 2000, p. 21). The intent of these is to ensure "understanding" and "authenticity" (Maxwell, cited in Cohen et al., 2007, p. 134). Guba and Lincoln (1989) offer a way to ascertain the quality of research that is consistent with the constructivist belief system and is parallel to the positivist quantitative and experimental quality criteria of reliability, validity, generalisability and replicability. However, we cannot merely transplant quality criteria from the quantitative, positivist paradigm to constructivist, ethnographic research as these criteria for 'goodness' are "rooted in the assumptions of the paradigm for which they are designed; one cannot expect positivist criteria to apply *in any sense* to constructivist studies..." (Guba & Lincoln, 1989, p. 236). Therefore, Guba and Lincoln (1989) propose two sets of alternative quality standard criteria – trustworthiness and authenticity – and I now turn to how my inquiry addresses each of these.

The standard of trustworthiness comprises credibility, transferability, dependability and confirmability (Guba & Lincoln, 1989). The first step in this process is that the conventional criteria of internal validity, external validity, reliability and objectivity are replaced with the notion of credibility using four guiding principles – prolonged engagement, persistent observation, peer debriefing and progressive subjectivity. For example, in this research a prolonged engagement and persistent observation of over

1 year in the field help establish credibility, enabling a rapport with the participants to develop. This substantial immersion in the culture of the school led to sufficient understanding and detail of the study content (Guba & Lincoln, 1989, p. 237).

Peer debriefing was also an important aspect ensuring credibility. I sought the perspective of my supervisors and other academic colleagues, testing out my findings. They posed questions of me to help me establish my role, values, and guide the next steps in the emergent research. Monitoring my own subjectivity was achieved through such peer debriefing and in laying bare and recording my a priori construction of what I had anticipated to find next at each stage of the research. Since constructivist inquiry acknowledges that no researcher comes to an inquiry with a blank mind, a *tabula rasa*, such researchers take steps to develop greater self-awareness so as to limit the effect of preconceived notions and the privileging of researcher expectations (Guba & Lincoln, 1989).

Finally, progressive subjectivity (Guba & Lincoln, 1989) in my inquiry was an ongoing process of monitoring my own constructions and ensuring this was not privileged over that of others. I approached this research with an open mind and sought to actively reflect on my expectations and preconceived ideas throughout with an explicit understanding that any construction would be a joint one between the research participants and myself as researcher. For example, I ensured member checking, which involved showing the research participants what data had been collected and asking them to verify, add or amend these. According to Guba and Lincoln (1989), who reject using triangulation with its more positivist connotations, member checks were “the single most crucial technique for establishing credibility” (p. 239). As such, all the interviews in this research were presented back to the interviewees for confirmation or amendment and the written observations conducted in the classroom were presented to the teacher after each session and a verbal overview of my notes and my thoughts were also discussed.

Similarly, Laurel Richardson (2000) reject using triangulation as a legitimate way of validating findings and instead ask us to consider a “crystal” as the central imagery. “Crystallisation”, proposes Richardson (2000, p. 934), “combines symmetry and substance with an infinite variety of shapes, substances, transmutations, multidimensionalities, and angles of approach... Crystals are prisms that reflect

externalities and refract within themselves, creating different colour” and is therefore a more apt metaphor for post-modern research in that it does not represent a unitary truth and elucidates its depth and complexity, representing the multiple perspectives of the researcher and also of the receiver of the research. Using this metaphor, in effect, reiterates inherent limitations of all knowledge, an idea that is central to interpretive ethnographic research. As Ellingson (2011, p. 13) suggests, through providing complementary partial accounts we build up “...pieces of the meaning puzzle” but can never actually complete it. Therefore, in this inquiry I rejected the use of triangulation as an appropriate strategy as it implies there is a neat dovetailing of immutable facts that are easily corroborated from multiple sources.

Transferability is also important. Instead of the researcher, or ‘inquirer’, considering how the research can be generalised to other contexts, qualitative research asks the reader, or ‘receiver’, to transfer these judgements to relate to their own present or future contexts (Guba & Lincoln, 1989, p. 241). Thus, in order to enable the receiver to make such judgements, I have endeavoured to provide as much detail as possible about the context in the form of what Clifford Geertz (cited in Guba & Lincoln, 1989, p. 241) labels “thick description”. That is, in endeavouring to make the descriptions sufficiently explicit, or ‘thick’, in order for the reader to make their own comparisons between like and unlike groups, I have sought to make comparability possible through providing enough information for the reader to be able to make their own judgements about this study (Cohen et al., 2011) and its applicability to their own context.

The third standard of trustworthiness is dependability. As my inquiry was an emergent research design, ongoing changes and refinements were made along the way in order to render it more dependable. As advised by Guba and Lincoln (1989), I ensured these changes and shifts were tracked and available for public inspection so that the process, decisions made and salient factors could be adequately judged. To ensure such dependability of the data (Guba & Lincoln, 1985) I conducted member checks of my field notes, kept reflexive journals, ensured sufficient time was devoted to my fieldwork, and generated data from multiple sources such as interviews and teacher documents. Through these extensive field notes, personal jottings and reflections I have created a dependability audit trail that shows the logic of progression of this research from one step to the next.

However, whereas the dependability audit tracks the process, a further step, a confirmability audit, tracks the confirmation of data and their subsequent interpretations (Guba & Lincoln, 1989). Guba and Lincoln (1989, p. 243) explain that:

... confirmability is concerned with assuring that data, interpretations, and outcomes of inquiries are rooted in contexts and persons apart from the evaluator and are not simply figments of the evaluator's imagination... the constructivist paradigm's assurances of integrity of the findings are rooted in the data themselves. This means that data (constructions, assertions, facts, and so on) can be tracked to their sources, and that the logic used to assemble the interpretations into structurally coherent and corroborating wholes is both explicit and implicit in the narrative of the case study.

To assist the audit trail I therefore identified the source, type and date of each entry in this thesis and ensured I used pseudonyms throughout to preserve anonymity. I referred to the data types as:

T – interview transcripts

JN – notes made in my original field note research journal

JR – reflections upon the notes previously made in my journal

L – the line of the interview transcript, the journal entry or the reflection, including the day and month in which the data were generated.

Using this, the citation (Adam, T: L3; 15/11) refers to comments found located at line 3 within the transcript of an interview with Adam on the 15 November. If the participant's name was already in the sentence stem the name would not be included within the brackets. If there was more than one interview it was noted as T1 (Transcript 1) and T2 (Transcript 2). The combination of these confirmability and dependability audits in my research seeks to safeguard it from what Cohen, Manion and Morrison (2007, p. 149) call a "charge levelled at qualitative researchers, namely that they respond only to the 'loudest bangs or the brightest lights'".

The standard of authenticity is the second quality standard proposed by Guba and Lincoln (1989) which I have considered in my research. Patton (2002, p. 546) defines authenticity as "reflexive consciousness about one's own perspective, appreciation for the perspective of others, and fairness in depicting constructions in the values that

undergird them”. The social world of my research was classrooms within an education system that must be studied and reported holistically. An ethnographic account of this world was supported by scholarly and justifiable interpretations based on multiple sources of evidence that can confirm my views and opinions (Duncan, 2004). Rigour was enhanced through the processes of crystallisation at the source of the data, throughout data collection and the subsequent analyses (Mathison, 1988). A range of data sources – including institutional and individual teacher documents, teacher resource material, the classroom and teachers themselves – were examined. Additionally, multiple data collection methods such as field note taking, audio recording and interviewing as well as document analysis were utilised. As further verification, peer researchers examined the data analysis and interpretations to identify any disconfirming evidence. Authenticity required that all these factors be explicitly considered, offering a balanced and complete representation of the multiple constructions of a situation and the realities of all participants to ensure fairness (LeCompte & Preissle, 1993).

Chapter summary

In this chapter I have described the philosophical background of the research, my chosen research methodology of interpretative ethnography, as well as the context of my research. I have outlined my beliefs and values that guided my research as being consistent with the interpretive paradigm which values a respectful, reflexive approach in the co-construction of meaning. I considered the three main research methods I used to generate data – interviews, fieldwork observations and documents – and explained how these were analysed in relation to the research questions. I outlined the development of the conceptual framework for data analysis of affordance and paradox. In addition, I provided a rationale for the interpretation and presentation of data in the format of four infrastructures- policy, physical, pedagogical and people (human) in my findings chapters. To conclude, I clarified any ethical considerations to the study and described both the standards of research quality and my approaches to ensure these considerations were upheld. In addition, I included details of an audit trail that assisted in tracking the decisions I made. In the following chapter I will present my findings in relation to the policy and physical infrastructures of Amity PS.

Chapter Five: Infrastructures in relation to EfS – Policy and physical

Introduction

My findings from data generated with participants at Amity PS are presented over two chapters. I draw upon the data generated from interviews, observations and reflective journals, as well as evidence from the analysis of official school-based and external (official state-based) documents. Chapter Five, this chapter, addresses the policy and physical infrastructures. Chapter Six focuses on the findings in relation to the infrastructures of pedagogy and people. In both Chapters Five and Six I present the findings and interpretations simply to develop a narrative across each particular infrastructural domain and draw these together into paradoxes in the conclusion of each. It is only in Chapter Seven that I weave these infrastructural threads together in a different way to develop a deeper thematic analysis and discussion.

This chapter is divided into three parts. In the first part I outline my approach to the interpretation and representation of data across both findings chapters. Within this section I explain the process of coding that produced my interpretive lenses of affordance and paradox, and also introduce the four infrastructural pillars I have adopted for the data analysis – policy, physical, pedagogy and people (human). In the second part of the chapter I present my findings in relation to, firstly, the policy infrastructure that is evident, and that acts upon, Amity PS. The final part of the chapter examines the findings in relation to the physical infrastructure of the school. I conclude the chapter with a summary of the key findings.

Policy infrastructure

In this section I outline the policy infrastructure, both macro and micro, that support EfS at Amity PS. This chapter draws from multiple data sources, including interviews, field notes, reflective journals, as well as evidence from document analysis. The data is presented in three parts. The first presents the policy support for sustainability through funding in particular. The second part outlines the support for EfS in policy documents, and examines in turn the mandate for sustainability, visibility and coherence of sustainability, and the conceptualisation of sustainability at the school.

In the third part of the section I address the impact of accountability and reporting on EfS, with a particular focus on the emphasis on NAPLAN.

There is a panoply of policy influences that shape, guide and inform teachers' work and it is difficult to unravel where the effects of one begins and the other ends. That is, whilst it is appealing to visualise a direct cascade of policy directives because we are dealing with complexity in the form of school contexts and human beings, it is not possible to simply follow a linear pathway from policy idea through to development and then application. Suffice to say that in examining the policy infrastructure of the school I am paying more attention to the concomitant results of such influences, thus noting what has occurred but also at times illuminating what has not occurred, to note the gaps and omissions.

Guiding teacher practice at Amity PS were a number of policy initiatives and programs. Within the pillar of policy infrastructure I considered those aspects that were official or mandated for the school, as well as those that the school had chosen to be a part of voluntarily, and, additionally, those that exerted both a direct and indirect influence on school practice. Thus, in interpreting my findings, I have adopted a broad definition of policy as being "... any course of action (or inaction) relating to the selection of goals, the definition of values or the allocation of resources" Codd (1988, p. 235). Therefore, my view is that policy not only encompasses 'formal' or 'official' texts, such as policy documents, but is also evidenced in the form of physical "things" (Adams, 2015, p. 294) and practices within the school. These policy influences are manifest in an interdependent set of practices represented across the pedagogical, physical and people (human), as well as micro level school-based policy infrastructures. However, in presenting the findings, for the sake of clarity, I have chosen to address the policy, pedagogical, physical and people (human) infrastructure in turn, even though I am fully aware these are not separate in reality.

Policy support through funding

The national policy framework, informed by international policy trends and identified in Table 3.3, can certainly serve as an affordance for EfS in schools. It provided a strong imprimatur to any school in Australia that wished to pursue EfS and, in many instances, provided tangible support for their sustainability endeavours by providing funding. This was the case with Amity PS, with the initial building commissioned in

2004 and funded by the WA state government to incorporate ecological sustainable design principles within its built environment. The school had additional features included as part of these sustainable design principles – for example the central computerised building management system (BMS) that controls airflow, temperature and lighting and the greywater recycling system – that ordinary WA schools did not (see Chapter Four, p 105, for further elaboration on the school design). The school principal Annette acknowledged that “...*there is no other school like this in Australia, basically, or in WA. We’ve never seen a school like it. At that time, it cost two million more than a normal template school, new school...*” (T1: L24, 8/9). Annette seemed aware that this was a unique school: “*The fact that it cost so much more than another school to build... that’s not viable for the government really to spend an extra two million whether we agree with those philosophies or not. They’re not going to easily make a decision to spend two million more. What they wanted to do, too, was maybe use some of the features of these schools in other schools, but I’ve been to a few new schools, I haven’t really seen any of them*” (T1: L26, 8/9). Thus, the school remains the only one of its kind, as it appears that the magnitude of funding required to establish it, in comparison to schools built to the normal template, is far greater.

Whilst initial funding was provided to establish the school, recurrent funding for the maintenance and upkeep of the systems was not. The administration team of the principal Annette and deputy principals Margaret and Janine noted some of the issues with the sustainability features that were part of the school design: “*The recycling of the grey water never worked and has now been – decommissioned... that was through the central part of the buildings... we’ve turned that into an area now for children... we [also] had difficulty with... the central Building Management System for years and we’re still having difficulty with it*” (T1: L87, 8/9).

However, they felt privileged to have it and expressed a commitment to support the features. According to Annette: “...*because it’s been problematic, they’re not going to put it in any other schools. But we’re quite passionate about it because if we are a sustainable school then it should be something we have access to. It’s been something that’s been put in our school so we’ll continue to drive it, but it’s problematic*” (T1: L111, 8/9). Funding had not been directed to address these issues and none of these sustainability features had been repaired, suggesting that while the administration team

appreciates they make the school unique, they are considered ‘optional extras’ to perhaps the ‘real business’ of the school.

Thus, it appeared that some of the very features that made the school a uniquely sustainable school, such as the greywater recycling and the BMS that controlled heat, light and airflow, caused consternation. In addition, as an Independent Public School (IPS), the school could no longer request additional funding from the state government to ‘top-up’ expenses, as may have once been the case, but instead had to manage its own expenditure for every aspect of the school operations from a one-line budget. Therefore, Amity PS was forced to make a difficult choice – in order to keep the ecological sustainability design elements viable over the long-term, the school could either prioritise these elements over other expenses or, conversely, neglect them in order to achieve other school needs and priorities. Thus, despite the imprimatur for sustainability from the state government in providing such a purpose-built school in the first instance, their commitment to funding DETWA stopped when the building was complete, and excluded funding for ongoing maintenance and support of these systems. Whilst this is only one example of the impact of funding on Amity PS, additional examples are presented in the physical infrastructure section of this chapter, particularly in relation to the SAKGP.

Funding and school expenditure are concrete manifestations of policy in practice. As I identified in Chapter Three, issues with funding occurred when the federal Australian government funding for the AuSSI program, that provided much needed initial professional development and advice on setting up the physical infrastructure within the school, ceased in 2013 (Gough, 2016). The onus was then put on to each state and territory to continue to fund the program, resulting in a much reduced level of support offered through SS-WA by DETWA. This cessation of funding and the decommissioning at the national level of, not only AuSSI, but also *Living sustainably* (DEWHA, 2009b) and the *Educating for a sustainable future* (DEH, 2005) coincided with the election of a ‘conservative’ government in 2013 (Lasen et al., 2017), as I identified in Chapter Three.

Thus, whilst such policy and funding can be seen as an affordance, there were other factors that created a counter affordance. The change of government and subsequent axing of AuSSI funding sent the message that sustainability in schools was not of great

importance for the federal government. This act ran counter to and in direct contradiction of decades of policy development that had been instrumental in building a momentum of action for EfS. Consequently, in terms of the policy infrastructure, a paradoxical situation was evident in that at the same time the world was experiencing an escalation in severity of environmental, social, economic and political crises, as I noted in Chapter One, the Australian federal government wound back its commitment to both policy and material/financial support of EfS initiatives. This leads me the first of the paradoxes I outline in this paper – ***Paradox 1: Increasing global environmental, social, economic and political crises are met with a cessation of funding and policies, and a reduction in funding of programs and agencies supporting EfS.***

Support for EfS in policy documents and initiatives


The policy framework under consideration in this study, as identified in Table 4.3, include both the key macro level documents that influence the way sustainability is framed, and the key micro level documents that outline how sustainability is interpreted and may be expressed in the practices at Amity PS. To illustrate the support for EfS in policy documents and initiatives I discuss three aspects – the mandate for sustainability, the visibility and coherence of sustainability, and the conceptualisation of sustainability. I then look at the local, micro level of sustainability in more detail.

The mandate for sustainability


A key macro level policy that teachers at the school were conscious of was the Australian Curriculum which had sustainability woven through it as a CCP. Anne, a Year 4 teacher, expressed an understanding of the importance, and place of, sustainability within the Australian Curriculum through its inclusion as one of three CCPs, saying “...they underpin the whole curriculum and they’re interwoven throughout it and sustainability is – there are three, and sustainability’s one, so it’s very important for us to be integrating it” (T1: L102, 8/9). Whilst it could be argued that through the CCP of sustainability the Australian Curriculum provided an affordance for EfS, there were, however, a number of factors raised by teachers at Amity PS that acted as counter affordances.

One was that, ultimately, whilst the Australian Curriculum was a legislated, mandated document, the Sustainability CCP effectively did not need to be included in any classroom assessment and reporting. For Adam, the sustainability coordinator at the

school, an issue appeared to be that having sustainability as a CCP meant “...that it’s undervalued in the curriculum at the moment” because “...it is not as prominent as it should be” (T1: L365, 14/9). He suggested it should be embedded in the actual content descriptors, which are an assessed aspect of the Curriculum, and that these should specify the “...skills that have to be taught” rather than “...this cross-curriculum link where it says we **could** [emphasis in original] do this in maths, or it **could** [emphasis in original] fit in English in this way” (T1: L370, 14/9). The difficulty, as he saw it, was that the Sustainability CCP “...really needs to have its own assessed strand that has to be reported on. And because it’s not reported on, it’s not talked about, and it [therefore] doesn’t form part of your curriculum and – if you’re running out of time and you have to cut something, [you] cut that because it’s not coming up in your reporting cycle” (T1: L372, 14/9). The result of this, he suggested, is that “...you are fighting to get teachers [to teach it]... and justifying to them why they should be spending some of their precious time, that we get so little of as it is, on sustainability” (T1: L676, 14/9). Mary, a Year 4 teacher, confirmed this view of colleagues’ attitudes towards sustainability: “I think it is a kind of thing that people see as an extra and there are so many other things that you have to do... they are just brushing it to the side” (T1: L28, 30/11). Thus, the evidence suggests that teachers at the school make pragmatic judgements about what to prioritise in their teaching which may leave sustainability sidelined or even omitted.

In examining the actual Australian Curriculum documentation, three reasons for this potential sidelining of the Sustainability CCP by teachers became evident. The first reason, lack of visibility, I explain next, whilst the other two, fragmentation and incoherence, are dealt with later in this chapter. The Sustainability CCP was tagged throughout the Australian Curriculum by means of the placement of an icon of a three pointed leaf  alongside either some content descriptors in the early iteration of v3.0 or, in the later iteration of v8.3, both alongside some content descriptors and some elaborations. For each year level of schooling, and in each learning area, there are multiple content descriptors that “specify the knowledge, understanding and skills that young people are expected to develop across the years of schooling” (ACARA, 2012, p. 5). These content descriptors are accompanied by content elaborations which act as support materials in that they provide teachers with illustrations and/or examples of how they could teach the particular content descriptor. Only the content descriptor

forms part of the compulsory Curriculum that teachers are required to teach and assess. In contrast, the content elaborations are only suggested ways to teach and do not form part of any required assessment.

One difficulty was the possible lack of discernible connection between the tagged content descriptor, which may not explicitly be framed in a way that makes the link to sustainability, and the content elaboration, which may, in fact, encourage teachers to make a link to sustainability. An example of this is in Year 2 mathematics, shown in Figure 5.1, where on first glance even though the content descriptor on the left of the diagram is tagged with the , the text of the descriptor is not immediately relevant to sustainability. The connection to sustainability only becomes evident when viewing the elaborations, shown on the right of the diagram, namely “determining the variety of birdlife in the playground and using a prepared table to record observations”.


Data representation and interpretation	Elaborations
Identify a question of interest based on one categorical variable. Gather data relevant to the question (ACMSP048) 	<ul style="list-style-type: none"> determining the variety of birdlife in the playground and using a prepared table to record observations

Figure 5.1: Mathematics Year 2 content descriptor in the Australian Curriculum (v3.0)

The problem, this example highlights, is one with the navigational architecture of the Australian Curriculum webpage. It is important to be reminded here, as I identified in Chapter Three, that the Australian Curriculum has only ever been available as an online, web-based document, it has never been available to teachers as a hard copy document. As an illustration of the issue, a teacher viewing the primary science Curriculum, for example, would arrive at a web interface that, by default, only displayed the content descriptors. The content elaborations remained hidden from immediate view, behind another link. Thus, with reference to sustainability only made apparent when the elaboration was made visible, a teacher viewing the content descriptor only, where it says for example as in Figure 5.1 “identify a question of interested based on one categorical variable”, would have difficulty discerning how they were to address sustainability. That is, the connection between the wording of this content descriptor and sustainability was not self-evident.

I have termed these ‘neutral’ and largely unhelpful sustainability tags, in that they can be interpreted in a myriad of ways and not necessarily through the lens of

sustainability. They are 'neutral' in that upon reading they do not immediately declare 'their intention' towards sustainability, and thus are in fact 'inert signifiers'. Thus, of the 58 Curriculum content descriptors tagged in the Australian Curriculum v3.0 from K-6, there are 30 that teachers may not be able to discern a clear relationship to sustainability, and therefore are susceptible to omission. The greatest number of tagged content descriptors were evident in science and English, yet not one of the content descriptors in English and mathematics had any evident connection to sustainability and presented as rather obtuse references to sustainability. Similarly, only in some cases did the elaborations, connected to the particular content descriptor, demonstrate any explicit relevance to sustainability. The clearest links between the content descriptors and elaborations and the concepts and ideas of sustainability were found in the science and the history learning areas.

Thus, two factors appeared to weaken the Australian Curriculum Sustainability CCP as a policy directive. One is where the icon was not flagged at the level of the content descriptor, a mandated requirement, but rather was attached to the content elaboration that was not a compulsory, assessed component of the Curriculum. The other was where the icon was attached to the content descriptor but where this descriptor had no discernible relationship to sustainability. This meant that teachers would not necessarily pay attention to the icons that the ACARA Curriculum Design Paper 3.1 (June, 2013) explained were designed to alert teachers to the need and opportunity to address the Sustainability CCP.

Thus, it appears the Sustainability CCP was ephemeral in nature. It had the status of being a voluntary extra or 'add on' as it did not sit within the mandated Curriculum content strands but rather sat precariously and tenuously across only some. Therefore, when teachers make decisions about what they need to focus their attention and energies on to implement in a school setting, priority is more likely to be given to those aspects of the Curriculum that have the greatest consequences, that is, those that are mandated, and those that are assessed. Therefore, the Australian Curriculum Sustainability CCP provides only a very weak policy mandate to include sustainability in teaching.

In addition, evidence from the interviews suggests teachers are not responding to the CCP strongly enough due to competing priorities, such as those where outcomes for

students are measured. It is these outcomes where their work as teachers is judged. Thus, outcomes that are not assessed are given less, if any attention. If a school like Amity was having difficulty with ensuring it addressed and incorporated the Sustainability CCP, given sustainability's prominent focus within the school ethos, Adam felt that other schools would certainly find it more difficult to achieve, cautioning that "...it can fall by the wayside too easily!" (T1: L379, 14/9).

In terms of other policy mandates there certainly were some well-developed Australian whole-of-government policy statements and whole-school programs whose aim was to set in train support for EfS in the school education sector, as set out in Table 4.3. Frameworks such as *Educating for a sustainable future* (NEES) (2005) and *Living sustainably* (DEWHA, 2009b) simply heralded government commitment, whilst whole-school initiatives such as AuSSI – which devolved into SS-WA – offered actual planning and practical support. Yet, none of the aforementioned documents had any compulsion associated with them – they were only to be adhered to if the individual schools wished. Therefore, there is no specific document, no written text, which can be construed as a mandated EfS policy imperative that claims to guide and direct teacher practice.

What does exist, however, are very many elements that are assembled in the professional lifeworld of teachers and schools that do indeed have an influence on teachers' work in relation to EfS, albeit an indirect one. These influences can be characterised as 'quasi policies' where guidance is co-opted into other mandated elements, such as the mandated legislated Australian Curriculum that encourages the enactment of the non-compulsory – but certainly advisory – cross-curricular dimensions, of which sustainability is one. In the same vein, broad guidance is given to teachers through the *Melbourne Declaration of Educational Goals for Young Australians* (MCEETYA, 2008) that has set the basis for our Curriculum design and assessment priorities within Australia. Alternatively, the Sustainability Curriculum Framework (DEWHA, 2010c) is another guidance document that schools may use for developing EfS curriculum, yet there is no government agency, or otherwise, that enforces its use. Instead, teachers and schools are guided at a distance with respect to EfS.

At present, schools are neither measured nor judged on their alignment or lack thereof to sustainability outcomes. That is not to say that developing it as a mandated, assessed aspect would be fruitful, in fact it could be quite counterproductive, but rather it should cause us to reflect on what the business of *schooling* is, and to the wider questions of what *education* is actually for, and examine the intrinsic differences between the two. In conclusion, we come to our second paradox that speaks volumes about what the Australian government says it values and what it really does – ***Paradox 2: The affordance of sustainability as a CCP in the Australian Curriculum versus a lack of policy mandate to teach it*** (Kuzich, Taylor & Taylor, 2015).

The visibility and coherence of sustainability

In addition, guidance from policy documents in relation to sustainability emerged as an area of concern for some teachers. In particular, in relation to guidance provided by the Australian Curriculum documentation, Tarryn, a Year 2 teacher, described it as “...not very explicit at the moment for me” and “...very airy fairy” (T1: L138, 14/9). Adam, noted the issues as “*The big problem with sustainability... in the curriculum, [is] it’s not explicit to the teachers what they need to be teaching and how it fits with everything else*” (T1: L207, 14/9).

The administration team understood sustainability as being a thread that was meant to run through the Curriculum, and expressed concern that teachers tended to want to only pay attention to sustainability within single learning areas, such as S&E or humanities, as this example from Margaret, the deputy principal, indicates: “...*the concern is, where the sustainability fits? Sustainability has been attached to S&E. It’s not attached to S&E. It’s attached to anything. It needs to flow freely across...*” (T1: L434, 8/9). The school had, according to Adam, initially, “...*put sustainability with social studies*” (T1: L55, 14/9), and then later formed a committee that encompassed science, S& E and sustainability, which became known as the Triple S committee. Adam considered that through the development of the Triple S plan, which I outlined in Chapter Three, by this committee being comprised of a teacher representative at each year level, the teaching of sustainability was made more “*explicit*” in terms of connections with S&E and science, and thereby gave “...*the teachers a bit of confidence in what they’re doing*” (T1: L202, 14/9).

Thus two issues were flagged from these interviews. One was that the Australian Curriculum does not appear to provide strong explicit guidance for how sustainability needs to work in relation to all eight learning areas of the Curriculum. The second was that teachers are interpreting sustainability as ‘belonging’ to particular learning areas above others. My document analysis of the Australian Curriculum indicated some possible reasons for this finding.

Taking the first issue, it appears that ACARA’s early intention of ensuring “the curriculum documents will be explicit on how the perspectives are to be dealt with in each learning area and how links can be made between learning areas” (2009a, p. 23), was not fully realised. The two ways sustainability was signalled in the Australian Curriculum was through the nine SOI (see Table 3.4) and the tagged Sustainability CCP statements.

However, the SOI were not even mentioned by the teachers at Amity PS, indicating these were not used as part of their understanding nor interpretation of sustainability at the school level. Designed to operate at a meta-curriculum level, the SOI were meant to guide the understanding of the Sustainability CCP through the crystallisation of sustainability ideas into the three overarching concepts of systems, worldviews and futures. Therefore, it was surprising to find that teachers at Amity PS were not aware of them. I identified a number of reasons why this might be the case. One was that the nine SOI were presented in their own separate section of the ACARA website (ACARA, 2014). In practice, they remained in their own separate plane as they were not visibly connected to the Curriculum in a tangible way, that is, they had no explicit link to any of the tagged content descriptors within the individual learning areas. The shortcomings of this approach were that it necessitated teachers making their own connections to how each Sustainability CCP statement invoked one or more of the SOIs. Coupled with the fact that they are housed in a separate section of the website and disconnected from the content in each learning area, such an ‘overview’ of sustainability was not likely to be given much attention when teachers accessed the Curriculum. Therefore, it was possible that teachers remained unaware of the existence of these three concepts.

Examining the second way sustainability was signalled in the Australian Curriculum, through tagging content descriptors within and across the four learning areas of the K-

6 Australian Curriculum, revealed a skewed and uneven distribution. As identified in Figure 5.2, the greatest concentration were present within science (53%) followed by English (33%), then equal numbers present within mathematics and history (7%).

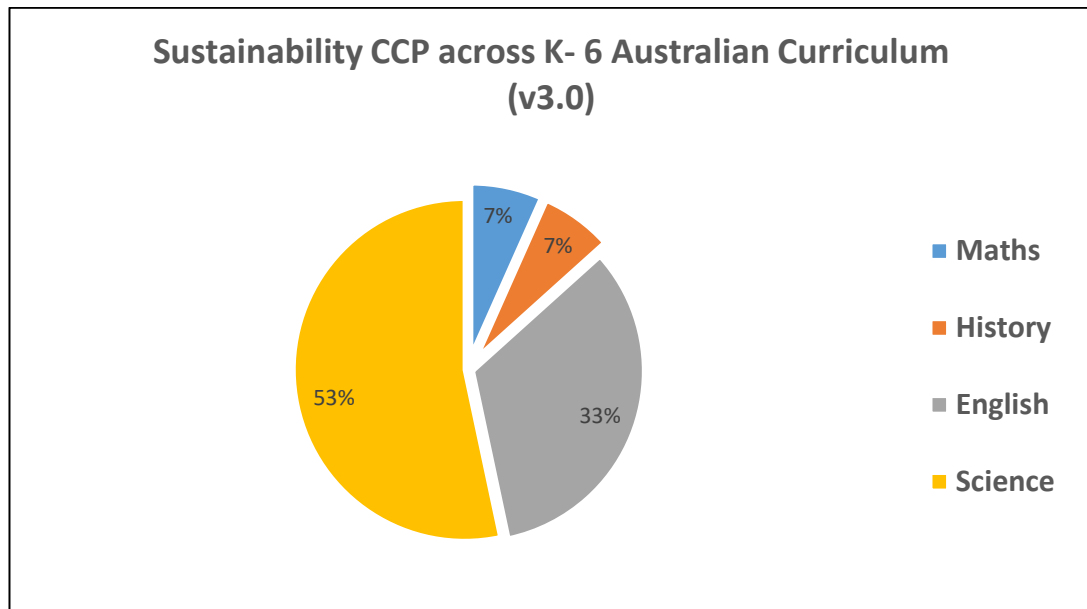


Figure 5.2: Distribution of the Sustainability CCP across the Australian Curriculum (v3.0) from K-6

Whilst the Australian Curriculum v3.0 was in use at the time of my study, even later iterations showed that the Sustainability CCP, for example in v8.3 in use from 2016 onwards, was not spread evenly throughout the Curriculum documentation. In the later versions of the Australian Curriculum, as the rollout of the other learning areas progressed, the Sustainability CCP statements were reconsidered and reconfigured. Note, for this comparison I have only considered the same four learning areas that were in existence in v3.0, mathematics, science, history and English. If we compare Figure 5.2 which shows the results for v3.0 with Figure 5.3 that shows v8.3, we can see that there has been a substantial shift and realignment across the learning areas.

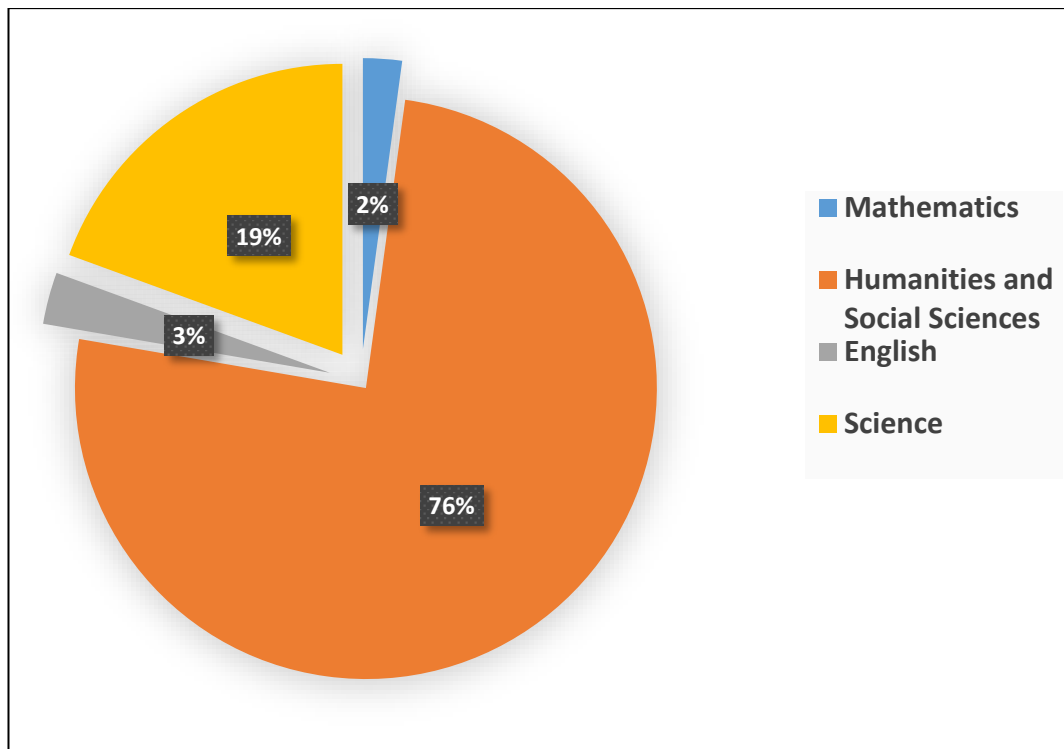


Figure 5.3: Distribution of the Sustainability CCP across the Australian Curriculum (v8.3) from K-6

Comparing Figures 5.2 and 5.3 it is evident that there has been a shift of emphasis from Sustainability CCP statements residing largely within the science learning area (53%), followed by English (33%) in v3.0, to a greater concentration within humanities and social sciences (HaSS) (76%) – noting that history was subsumed into this amalgamated learning area in later versions of the Australian Curriculum – and then science (19%) in v8.3. In terms of actual numbers of sustainability tags or CCP statements in the Australian Curriculum v3.0, there were 32 in science, 20 in English, four in history and four in mathematics. In comparison, the Australian Curriculum v8.3 had 105 Sustainability CCP statements in HaSS, 39 in technologies, 27 in science, four in English, four in the arts, three in mathematics, and two in health and physical education.

An additional issue was that representation of Sustainability CCP statements in each learning area, as noted above, was also evident across the different year levels in each learning area. For v3.0, Figure 5.4 indicates that history does not touch upon sustainability at all in Foundation/Kindergarten, Year 1, Year 3 and Year 6. Similarly,

mathematics has no sustainability tags in Foundation/Kindergarten, Year 1 and Year 6, with only one tag in each of Years 2, 3, 4 and 5.

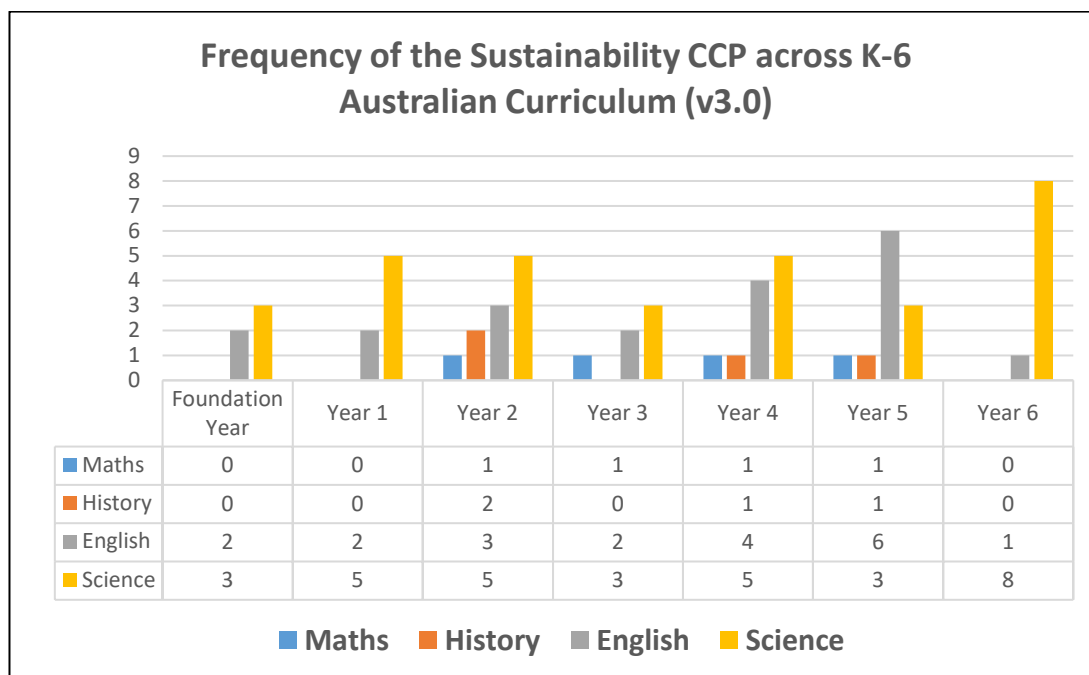


Figure 5.4: Frequency of the Sustainability CCP across the Australian Curriculum (v3.0) from K-6

Figure 5.4 indicates the greatest concentration of activity relevant to sustainability was in Years 2, 4 and 5. Table 5.1 sets out the differences and similarities across the two versions of the Australian Curriculum. From this table it can be seen that the later version of the Curriculum suggests that the three upper years of primary schooling in Australia (Years 4, 5 and 6) have more responsibility to deal with sustainability. In contrast, the earlier v3.0 had a relatively more uniform spread of sustainability ideas across Years 2, 4 and 5 and to a lesser extent Year 6 and 1.

Table 5.1: Total Sustainability CCP tags across the Australian Curriculum (v3.0 & v8.3) from K-6

	F-/K	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Version 3.0	5	7	11	6	11	11	9
Version 8.3	4	11	16	13	34	39	21

Thus, it appears that in neither the Australian Curriculum v3.0 nor v8.3 were the Sustainability CCP statements distributed evenly across all learning areas, and in both there was a dominant representation of sustainability within particular learning areas.

The same appeared to apply for year levels. Thus, teachers, in referring to the Curriculum for guidance for their teaching, may not be able to readily discern that sustainability itself was premised on a systemic, holistic approach to knowledge. In addition, this ‘pocketing’ of sustainability in certain Curriculum areas, and in particular year levels, reinforced the notion that EfS was an ‘add on’ to the existing Curriculum that did not necessarily apply to all teachers but was rather than a mechanism for transformation of it. Whilst it could be argued that through the CCP of sustainability the Australian Curriculum provided an affordance for EfS, conversely the lack of explicitness within the document acts as counter affordance. Teachers are not given enough detail and guidance to know what and how to teach about sustainability. This lack of detail and assistance with understanding sustainability, I would argue, renders the Australian Curriculum a ‘hollow’ policy document.

A secondary issue with the Australian Curriculum, but of importance nevertheless, is the visibility of tags when downloading learning area materials. A curious persistent anomaly that featured from v3.0 to v8.3 of the Australian Curriculum was the inability of educators to download the learning area(s) and year level(s) with the sustainability icons, or for that matter, any other CCP icons, visible. The ACARA Curriculum website enabled teachers to apply filters in order to only download particular learning areas and elements within those learning areas; however, there was no capacity to select sustainability as a filter option. The result was that when a learning area of the Australian Curriculum was downloaded there were no visible sustainability tags associated with any Curriculum elaboration. An example of the screen view of Year 4 science content is available in Appendix H. Ultimately, the only way a teacher could view the elements related to sustainability was to go to a completely separate area of the website titled download resources (<https://www.australiancurriculum.edu.au/download?view=excel>) where it was possible to download the Sustainability CCP statements, by selecting the filter mechanism within the Excel spreadsheet. Ironically, if instead of going to the ACARA website, a teacher went to a search engine browser and entered the search term ‘Australian Curriculum downloads’ they would be taken to the site <https://www.australiancurriculum.edu.au/download/> which enables downloads of each learning area, complete with sustainability icons.

Thus, I suggest, the architecture of the online Australian Curriculum serves as an inhibitor of the awareness of sustainability and holistic understanding for teachers for

a number of reasons. Firstly because the Sustainability CCP statements are decontextualised in that they are presented as a list of disparate statements by year level and learning area within an Excel spreadsheet. In addition, a teacher is required to be quite proficient with Excel to locate and enact the filter in the spreadsheet so as to isolate the Sustainability CCP statements. Furthermore, it is not clear from the Excel spreadsheet how the elaborations are associated with either the content descriptions or the category headings of the learning area above these such as biological sciences etc. As such, teachers cannot see how sustainability fits with the scope and sequence of the learning area. Moreover, there is no sense of how the Sustainability CCP statements are connected to the nine SOI nor how they may be connected across multiple learning areas. Additionally, the sustainability icons cannot be downloaded with the mechanisms for Curriculum download most readily available, and are therefore not made visible. Finally, teachers who are looking to program with sustainability in mind are less likely to embed concepts and ideas of sustainability across their learning area(s) due to this decontextualised and fragmented form of presentation which does not assist them.

Thus it can be concluded that the Sustainability CCP has not been accorded the status of a ‘priority’ at all but instead has been consistently rendered invisible and impotent within the Australian Curriculum (from v3.0 to v8.3) due to a number of factors. From the outset, there has been a lack of clarity of what exactly sustainability entailed, as demonstrated by the inaccurate mapping of sustainability icons against content descriptors and elaborations in v3.0. Persistent issues with representation within the online architecture of the Australian Curriculum, coupled with a number of other issues – such as the lack of detailed information to guide teachers’ interpretation and enactment of sustainability in their classroom practice, the disconnect between the SOI and the Sustainability CCP statements and a lack of clear indication that sustainability is meant to be transdisciplinary – has conspired to negate the lofty goals originally set out. I argue that presenting the Sustainability CCP statements in this way may, in fact, have been a hitherto imperceptible deterrent to a substantial engagement and uptake in teaching through a lens of sustainability.

The Australian Curriculum, as I described in Chapter Three, arose from a desire to privilege the teaching and learning of sustainability ideas and principles. However,

despite this strong policy imprimatur for teachers and schools to engage with sustainability, the counter affordances of the issues, outlined in this previous section, give rise to this next paradox – ***Paradox 3: The affordance of a policy framework that has the potential to engender strong, effective understanding and interpretation of EfS versus a fragmented and disconnected representation of ideas and concepts about sustainability within the policy documents.***

The conceptualisation of sustainability

I begin this section by offering a brief overview of the conceptualisation of sustainability expressed by teachers at Amity PS, through their interviews, and provide a fuller exploration of these ideas within the part of this chapter on pedagogical infrastructure. I follow this with an analysis of the documents referred to in this study (see Table 4.3) to identify the relationship between teachers' conceptualisation of sustainability and the orientations discerned from these documents. Firstly, I outline some of the general observations about the understanding of sustainability within Amity PS – namely that it follows a predominantly environmental dimension of sustainability – in order to set the scene for a more detailed interpretation of the policy documents. I then go on to examine the four school-based and the four official state-based documents against the four dimensions of sustainability.

A number of teachers at the school expressed the same understanding of sustainability. As an example of this view, Robert, the Year 6 teacher, analysed the sustainability orientation of the school, stating that it was, “...*primarily environmental*” (T1: L192, 20/11). He explained his reasoning, saying “*I think that really stems from the setup of the school because we've got the water tanks, we've got the kitchen garden, we've got the solar panels and all of that so it makes sense that is a built sustainable school, let's learn about that... which is inevitably the environment*” (T1: L192, 20/11). His reasoning suggests that teachers were influenced in their understanding and interpretation of sustainability largely by the physical infrastructure, of which a dominant feature was the permaculture garden. The garden was the central focal point for sustainability at the school and represented a key feature of the nationwide initiative, the SAKGP, as well as being a physical manifestation of engagement with sustainability promoted by the AuSSI (known as SS-WA in WA) program, both of which Amity PS were part of.

Interviews with other teachers supported Robert's view, with all the other participants largely focusing on the environmental aspects of sustainability. Some illustrations of these response include, for example, those of Anne who identified that "*The Year 4... are involved in the Stephanie Alexander Kitchen Garden Project through which we have a permaculture garden at the school... they learn how to plant and harvest foods*" (T1: L14, 8/9). She also mentioned that "...*the whole school focus on being water wise*" (T1: L21, 8/9), as well as the emphasis on "...*recycling, turning lights off, conserving power, consciousness about [excessive] packaging*" (T1: L165, 8/9), and the school's "...*bins for collecting food scraps which we take to the worm farm and feed the chooks as well*" (T1: L186, 8/9). Christine also noted other aspects of environmental sustainability: "*There are things we do [for sustainability] like the red bucket for food scraps, Crunch and Sip, and waste free lunches*" (T2: L42, 23/3).

Christine also saw another initiative, a school dance competition called Wakakirri, as an example of school involvement with sustainability that focused on environmental aspects, as she noted the emphasis was on "...*the Wakakirri performance – teaching about water scarcity and water wells*" (T2: L105, 23/3). Wakakirri (Wakakirri, n.d.) is one of Australia's largest performing arts event for schools and was also highlighted within Amity PS' Annual Report. Amity PS won the prize for Best Creative Use of Materials and also won first place for its Wakakirri storydance. The storydance, titled *Access H2O*, was connected to the water theme and its aim was to raise awareness of how people can help African communities through sponsoring of a well. Part of the judging criteria for the competition addresses environmental sustainability. The Wakakirri website informs schools of the need to "...*minimise their environmental footprint when creating props and costumes for their performance... Special awards are available to schools that can demonstrate additional ways they have reduced their footprint*" (Wakakirri, n.d.). As I watched the school assembly where all 80 students who performed in Wakakirri replayed parts of their winning performance for the school community, I noted my thoughts in my field journal. Reflecting upon this entry much later, as can be seen in the excerpt from this journal below, I realised that public demonstrations like that are important to showcase sustainability, in this case with an emphasis on the environment, very visibly:

Being part of an external public performance like Wakakirri is a great galvanising strategy. It brings a sense of pride to the whole school (JR: L587,13/8)

I felt this performance was like a public declaration of the school's sustainability ethos for the school community. It not only highlighted the visible, tangible aspects of sustainability, that is aspects of the environment, but it did it in a visible tangible way – through public performance.

Furthering this idea, Annette's discussion about the review of the sustainability program across the school focused on allocating responsibilities to look after the physical, visible environmental aspects, with such comments as "*...a certain group were looking after the worms and a certain group were looking after the chooks and they all collaborated with the gardener*" (T1: L216, 8/9). Much of this interview also focused on other environmentally related aspects including the physical infrastructure of the school buildings such as the grey water recycling, the BMS, both the SAKGP kitchen and permaculture garden, but also on the Waste Wise and Water Wise program accreditation, the Wakakirri dance performance and the recycle, reuse and reduce mantra the school had adopted. Annette's commentary on the themes chosen for the Wakakirri dance performances the school has entered over the past few years again reinforced a singular sustainability emphasis, "*We have always chosen environmental themes because of the nature of our school*" (T1: L145, 22/11). She also noted a growing emphasis on the environmental aspects of sustainability in class assemblies, remembering one recent example that was, "*...a fabulous play*", with a theme of, "*...the pollution of the ocean*" (T1: L500, 8/9).

This environmental view also appeared to be reflected in the school-based documents created by the teachers. In addition to this environmental understanding of sustainability, another finding across all the documents was a preoccupation with school action at the micro/local, extending in some instances to the community level. To demonstrate this orientation to sustainability, in the following section I present the key findings for each of the school-based documents. Elaborations of these findings are provided for each document in the associated appendices – the School

Sustainability Charter in Appendix G, the Triple S Plan in Appendix I, the Amity PS Business Plan in Appendix J and the Amity PS Annual Report in Appendix K.

As I have described in Chapter Four, the way I approached this analysis was to identify the emphasis evident in each document by comparing the text to the four dimensions of sustainability (see Appendix A). For three of the documents, the Triple S Plan, the Amity PS Business Plan, and the Annual Report, the emphasis on the environmental dimension was readily discernible. For example, within the Triple S Plan (see Appendix I for the extended analysis) the majority of statements related to the environmental dimension (74), slightly fewer to the social/cultural dimension (69), and very few to the economic (6) and political dimensions (4). This overwhelming orientation to environmental and social/cultural dimensions of sustainability is represented visually in Figure 5.5.

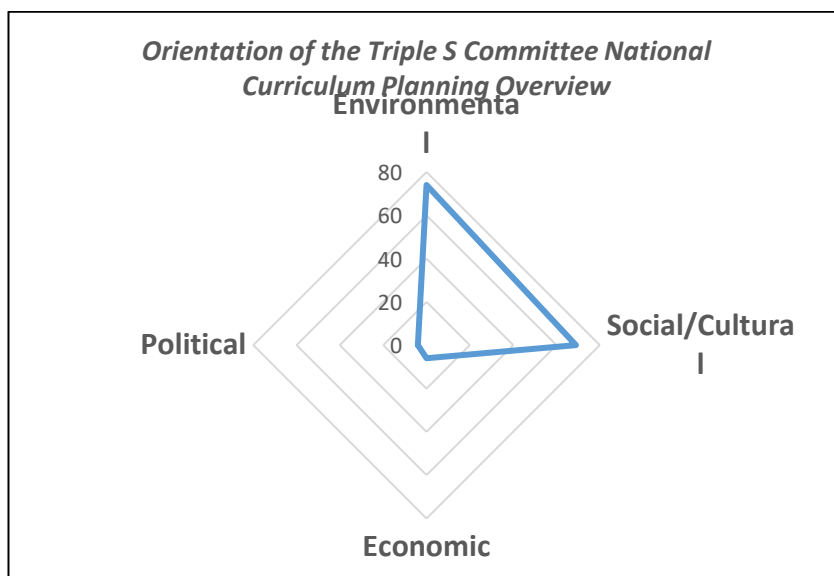


Figure 5.5: Orientation of the Amity PS Triple S Plan to the four dimensions of sustainability

Similarly, the Amity PS Business Plan (see Appendix J for extended analysis) had as its primary foci three things – the environmental dimension of sustainability with a lesser emphasis on the social dimension, a strong emphasis on engagement with sustainability through the Year 3 and 4 SAKGP, and a limited whole-school approach targeting environmental behaviours. These same ideas were reinforced within the Amity PS Annual Report. The report placed an emphasis on the environmental dimensions of sustainability when naming activities connected to sustainability and

formulating recommendations for the future. This showed that the central spoke of sustainability activities at the school was the SAKGP and there was a great emphasis on reporting on visible, tangible demonstrations of practice reflecting sustainability such as Wakakirri, SAKGP and the Artist in Residence (AIR) program.

As with the Wakakirri, the focus of the AIR program was on water. This program was a year-long immersion with a local artist at the school who worked with each class to generate art works based on the theme of water. The Amity PS Annual Report stated that all these school activities were designed to highlight the value of sustainable practices in relation to water. The culmination of the AIR program was the unveiling of a series of full height photomontage murals in the undercover assembly area of the school. These were constructed using many of the recycled and reusable materials sourced from REmida, a community not for profit organisation that collects clean, unused off cuts, discarded and discontinued products from industries. An example of the artwork is shown in Figure 5.6 where the frog's body is made from green plastic bottle tops from REmida (source Amity PS Annual Report, 2012).



Figure 5.6: Example of the artwork using REmida materials as part of the AIR program at Amity PS

Conversely, the Sustainability Charter was less clear and explicit about the intended meaning of sustainability (see Appendix G). However, the only reference to any dimension of sustainability was environmental, and therefore it can be construed that this document also aligns with the others. Indeed, across all the documents the environmental dimension was dominant with a much lesser emphasis on the social/cultural dimension. Of note was that only an oblique reference was made across

any of the documents to the economic dimension of sustainability, with the political dimension of sustainability almost completely absent.

To investigate how this school understanding of sustainability as being primarily concerned with the environmental dimension may have been derived, I also examined four official state-based documents (the Australian Curriculum, the AuSSI/SS-WA program, the SAKGP and the Sustainability Curriculum Framework, see Table 4.3) that reflected the policies and initiatives operating at the school. As with the school-based documents, each of these four document texts was analysed, as I described in Chapter Four, against the four dimensions of sustainability (see Appendix A). In addition, I used the data visualisation tool Wordle for the Sustainability CCP of the Australian Curriculum.

What became very clear was that all of the documentation was relaying an expression of sustainability that was consistent with the teachers' conceptualisation, and of the school-based documents – that of sustainability being primarily equated with environmental concerns. To illustrate these findings, I present a brief summary of the findings for each document and offer more detailed explanations, where relevant, within their respective associated appendices. I conclude this section with a summary of the conclusions from the analysis of these four documents.

For the Australian Curriculum v3.0 and v8.3, the SOI (see Appendix L), statements and the tagged icons in the Sustainability CCP were examined. Firstly, the findings for the SOI showed a distinct relationship to the environmental dimension of sustainability (100% of all statements). In decreasing order, it was evident a smaller number related to social/cultural dimensions of sustainability (67% of all statements), followed by fewer again, economic (44% of all statements), with only one SOI related to the political dimension of sustainability (11%).

The next layer of analysis looked at the sustainability CCP statements by using Wordle as a data visualisation tool to count word frequency and therefore gauge linguistic emphasis of the text. Wordle generated a word cloud that represented the frequency of word usage in the Sustainability CCP statements by creating words of different sizes. The size of the words expressed their relative importance in the text's overall discourse.

The words emphasised in the Sustainability CCP statements of the Australian Curriculum v3.0 were materials, knowledge, environment, information and people (see Appendix M). In order to identify the most stressed key ideas and terms within both the tagged content descriptors and elaborations of the Australian Curriculum v3.0, I removed all but the top 20 words, as shown in Figure 5.7. The greatest emphasis was on materials, environment, knowledge, Aboriginal, information, events and water. Further analysis against the four dimensions of sustainability showed the greatest alignment was with the environmental pillar (for example environment, water, plants, animals living), with a lesser emphasis on the social/cultural aspects (for example Aboriginal and Torres Strait Islander, people, local).

To compare curricula over time, I conducted the Wordle with the Sustainability CCP statements in the Australian Curriculum v8.3 (see Appendix M). Here the words that received more emphasis were environment/environmental, people, local, sustainability, resources. Of the top 20 words most frequently used, the most emphasised words were environment, environmental, local, people, sustainability, different and resources. I concluded from these visualisations of text that the greatest emphasis within the Sustainability CCP statements across multiple iterations (of which v3.0 and v8.3 serve as comparative points) was on the environment, the people and a focus on the local.



Figure 5.7: Twenty most frequent words created by Wordle within the Sustainability CCP statements of the Australian Curriculum (v3.0)

Next I examined the sustainability tagged icons of the Sustainability CCP. As the Australian Curriculum v3.0 had the Sustainability CCP icon attached to the content

descriptor and not the elaborations – of which there could be multiple for each content descriptor – I categorised both the content descriptors and the elaborations against the four dimensions of sustainability. Where a statement aligned with more than one dimension of sustainability, this was recorded. So, for example, a single content descriptor could simultaneously have elements of a number of dimensions of sustainability. What can be clearly ascertained from Figure 5.8, showing v3.0 of the Australian Curriculum from K-6 across the four learning areas of English, mathematics, history and science, is that there is a marked orientation towards the environmental dimension of sustainability with a lesser emphasis on social/cultural aspects, followed by economic and then political. These results hold true regardless of whether you look at the instances of alignment with the four dimensions of sustainability in relation to just the content descriptors, just the elaborations or both combined, as evidenced in Appendix N. In addition, if we look at Australian Curriculum v8.3, as shown in Appendix O, this orientation towards the environmental dimension of sustainability persists. Therefore, it is evident that consistently, across the different iterations of the Australian Curriculum from v3.0 to v8.3, the SOI, and the sustainability CCP statements serve to indicate to teachers the relative weight of importance of the environmental dimension of sustainability and to a lesser extent the social/cultural dimension.

The second policy documentation was that of the AuSSI program (DEWHA, 2010a, 2010b). I analysed two elements – the goals of the national program (Appendix P) and the action areas for both the national (AuSSI) (Appendix Q) and the state (SS-WA) schools program (Appendix R and S). The action areas, listed in Appendix S, represented the spheres of activity that schools engaged in under the encouragement and direction of the materials and professional network AuSSI/SS-WA influence (DEWHA, 2010a, 2010b). The 12 national action areas were reduced by SS-WA to 10 elements – one on each finger of the hand and toe on the foot – as represented in the ecological footprint and the social handprint (see Figure 4.2).

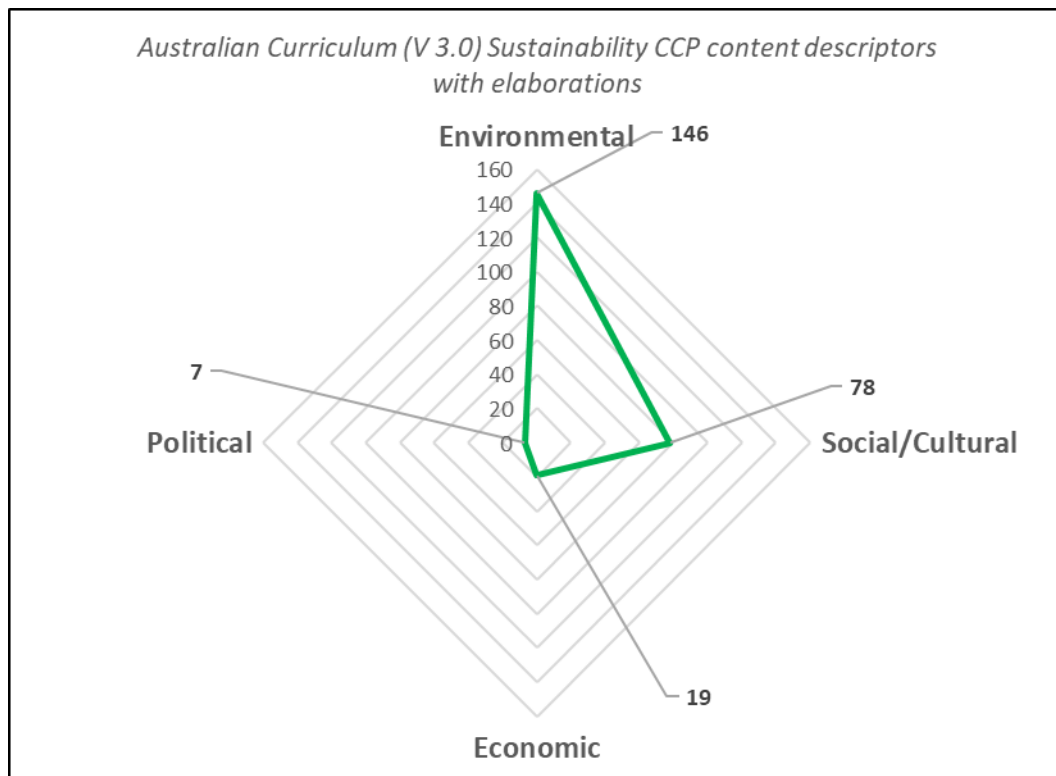


Figure 5.8: Orientation of Sustainability CCP statements [content descriptors with elaborations] (v3.0) to the four dimensions of sustainability across English, mathematics, science and history

The same results were evident for each of these data sources. Appendix Q indicated that of the four dimensions of sustainability, the major emphasis within the AuSSI program was on the environment. There was a lesser emphasis on social/cultural and less still on the economic; however, there was no acknowledgment of the political dimension of sustainability. Appendices R and S, summarised in Figure 5.9, replicated the pattern indicated in Appendix P. Therefore, I concluded that both AuSSI and SS-WA promoted the view that the environmental dimension of sustainability was most important, followed by the social/cultural, then the economic; however, the political dimension of sustainability was completely neglected.

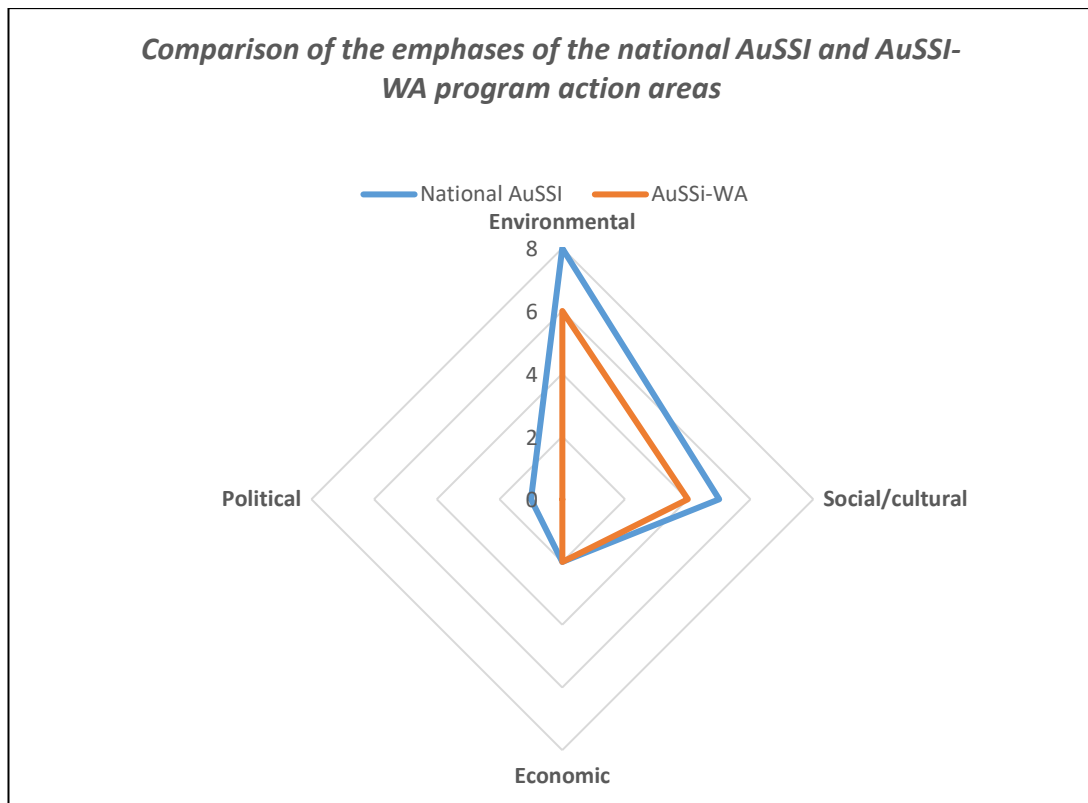


Figure 5.9: Comparison of the emphases of the national AuSSI and the AuSSI-WA program action areas against the four dimensions of sustainability

These findings, particularly for SS-WA, contrast with the definition provided in the guidance document for teachers, *A practical guide to sustainable schools WA (SS-WA)* (DETWA, p. 1), that appeared to present a more holistic interpretation of a definition of sustainability that did not focus entirely on the environmental dimensions: “The protection and replenishment of our natural environment, and the development of just, diverse societies supported by effective economies”.

The third program documentation under consideration was the SAKGP. I analysed a teacher reference book, *Tools for teachers*, identified Annette as being used by the kitchen garden chef, Audrey, for lesson ideas in relation to the kitchen garden program at the school. As there was very little other information on the SAKGP available, to gain further insights into the intention of the program, I also examined the report produced as a review of the program, the *Stephanie Alexander Kitchen Garden National Program evaluation: Final report* (Yeatman et al., 2013).

The units of work in *Tools for teachers* included: garden life; measurement; fractions and decimals; people and food; recipes and menus; planet food. A really helpful feature

of each lesson plan was the identification of the links to the Australian Curriculum of the lesson content. The lessons spanned across the learning areas of science, mathematics, history, English and languages other than English (LOTE). Interestingly, given that the SAGKP was a central aspect of sustainability at Amity PS, there were no explicit references to sustainability at all within the *Tools for teachers* booklet. Furthermore, no connection was made between the Sustainability CCP statements of the Australian Curriculum and the stated Curriculum links within the booklet.

My analysis of the 37 Curriculum links identified that only three were specifically related to the environmental dimension of sustainability. These were in the science learning area – “living things have life cycles (SSU072)”, “living things, including plants and animals, depend on each other and the environment to survive (ACSSU073)” and “living things have structural features and adaptations that help them to survive in their environment (ACSSU043)” (SAKGF, 2011, p. 1). There were four links evident in the history learning area that could be considered part of the social/cultural dimension of sustainability – “Days and weeks celebrated or commemorated in Australia and the importance of symbols and emblems (ACHHK063)”, “the role that people of diverse backgrounds have played in the development and character of the local community (ACHHK062)”, “identify different points of view (ACHHS069)” and “pose a range of questions about the past (ACHHS067)” (SAKGF, 2011, p. 31). The remaining 30 Curriculum links were largely related to generic skills that could be interpreted in numerous ways, for example – “use comprehension strategies to build literal and inferred meaning and begin to evaluate texts by drawing on a growing body of context, text structures and language features (ACELY1680)” (SAKGF, 2011, p. 40). There were no references to the economic nor political dimensions of sustainability.

The review report outlined, much more clearly than the website, the aims and philosophies of the SAKGP. The program philosophy strongly suggested a congruence between what needed to occur to establish and engage with the SAKGP at the school level, and environmental sustainability, reflecting this in a number of statements (Yeatman et al., 2013, p. 4), including “the program is designed to be fully integrated into the primary school curriculum as it offers infinite possibilities to reinforce literacy, numeracy, science, cultural studies and all aspects of environmental sustainability”. In

addition, the mention of “fresh, seasonal food’, vegetables, herbs and fruits grown season by season... organic gardens” and also “all aspects of environmental sustainability” confirm an emphasis on some environmental aspects of sustainability.

In other statements, social sustainability was reflected as there was an emphasis on social inclusion: “the Program delivers observable social benefits to all students, including those with special needs” (Yeatman et al., 2013, p. 4). The rationale for this was provided in the summary of the literature of the evaluation report by Yeatman et al. (2013, p. iii), where evidence was cited of school gardens promoting social inclusion and community gardens facilitating “increased mutual trust, social connections and interpersonal relationships”. In addition, “School gardens also had the potential to engage students from multicultural backgrounds with the school curriculum”. Other factors cited as positive outcomes of gardens included “engaging students who were otherwise difficult to engage with learning in the classroom, students with special needs, and students from diverse backgrounds, including indigenous students” and “members of the broader school community... engage with schools and with their student’s learning, fostering civic engagement and volunteerism” (Yeatman et al., 2013, p. iii).

The fourth document that forms part of the policy milieu influencing teachers, albeit indirectly, designed as a guide for curriculum developers within schools or education departments, was the *Sustainability Curriculum Framework: A guide for curriculum developers and policy makers* (DEWHA, 2010c). Whilst there was no explicit reference to this document by any of the teachers in this study, nevertheless its inclusion is warranted as this is one of the documents that was designed to be used alongside the Australian Curriculum as an additional source of information about the implementation of sustainability. I use this document as another point of triangulation that affirms the Australian government’s direction and intent in terms of EfS.

The intent of this document is to provide “curriculum developers and policy makers at national, state and territory levels (and, indirectly, all who use curricula in learning environments)... information and guidance on how education for sustainability may be structured to support a progression of learning from Kindergarten to Year 10)” (DEWHA, 2010c, p. 4). There are two key spheres of understanding (DEWHA, 2010c, p. 10) –one being the knowledge of ecological and human systems, and the other

mirroring the SOI present within the Australian Curriculum, namely, repertoires of practice, world viewing, systems thinking, futures and design thinking.

As with the other documents, I considered the key content knowledge and ways of viewing the world presented in the document across the four dimensions of sustainability from K-6. This analysis is presented in Appendix T. Of note here is that within this guidance provided to Australian Curriculum developers there is an over representation of the environmental aspects of sustainability in comparison to the other three – social/cultural, economic and political – with, by and large, an almost complete neglect of guidance for the dimension of political sustainability.

In summary, the documents identified in the previous sections appear to have the same orientation to sustainability. They all show a very strong orientation towards the environmental dimension of sustainability. They have much less emphasis on the social/cultural dimension, with less again of the economic and, in most cases, almost total neglect of the political dimension of sustainability. These findings help explain the reasons that teachers may also hold the same views about sustainability. Thus, whilst the documents appear to afford a holistic consideration of all four dimensions, and suggest that the sustainability entails examination of these dimensions in an interdependent way, the paradox is that by teachers following their advice, mostly serves to reinforce a narrow, environmental view of sustainability – ***Paradox 4: Policy rhetoric espousing holistic consideration of all four dimensions – environmental, social/cultural, economic and political – in a systemic, interdependent way versus reality presenting EfS as largely being synonymous with narrow, environmental aspects.***

The emphasis on a local, micro level of sustainability

In examining the documentation of the Australian Curriculum, AuSSI and SS-WA, the SAKGP and the Sustainability Curriculum Framework, another commonality became apparent. Not only were each of these biased towards a largely exclusively environmental interpretation of sustainability, they also had a tendency to privilege actions within the micro or local sphere. Indeed, there was a noticeable lack of acknowledgment of the necessity for international or global action. For example, the emphasis of the Australian Curriculum sustainability, over time from v3.0 to the v8.3, as indicated in Figure 5.9, remained consistently on the environment, with a focus on

the local. Within the environmental dimension the Sustainability CCP statements reflect a localised, micro-focused approach, where students are largely expected to only consider issues at the micro scale. This mirrors the micro level and environmental focus explicitly flagged in the nine SOI that are designed to govern the parameters of sustainability as expressed within the Australian Curriculum. In addition, there is relatively little attention given to the economic and political dimensions but where it is mentioned, again, similar to the micro approach for the environmental dimension, the students – and teachers – are directed to more localised issues. In summary, the Sustainability CCP, as expressed within the Australian Curriculum, is therefore misleading teachers and students in their endeavours to implement EfS in its broadest, most transformative sense. Instead, teachers following the Australian Curriculum are steered down a green and local pathway in terms of sustainability.

Similarly, both AuSSI and SS-WA, as indicated in Figure 5.10, identified that the majority of the suggested action should occur within the environmental dimension of sustainability, with this activity largely being focused on school and local community actions. Moreover, Appendix R showed that, in the majority of cases, the projects listed under each action area the focus was at the school level, and of these a large number focus on individual action. This individual action was of the kind that each person could undertake, independent of others, for example personally putting your own rubbish in the correct recycling bin, growing your own vegetables, walking instead of driving etc. This kind of thinking was evidenced in responses Amity PS teachers gave about their own understanding and actions in relation to sustainability within the pedagogical infrastructure in Chapter Six.

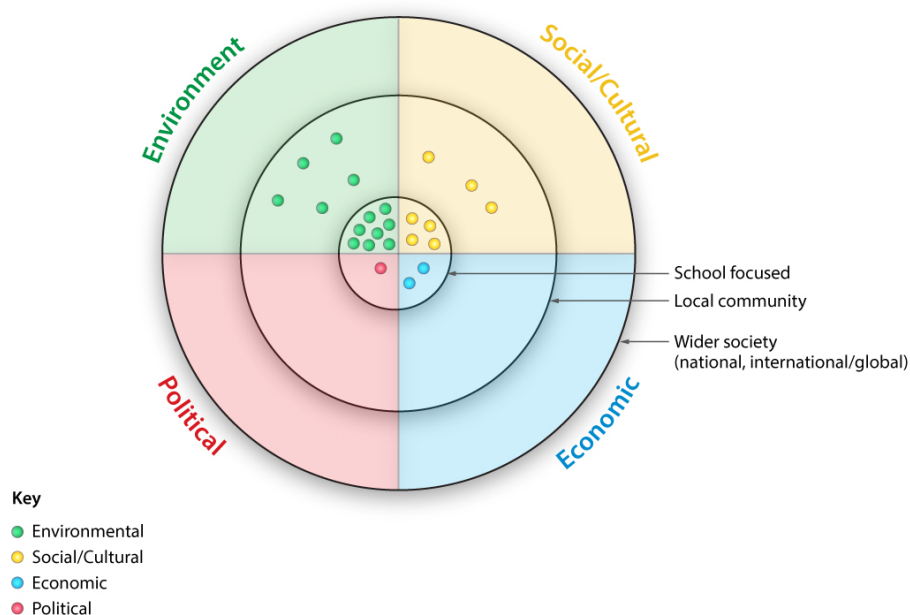


Figure 5.10: Identification of location of intended sphere of action for schools in relation to the four dimensions of sustainability of the national AuSSI program

The document *A practical guide to sustainable schools WA (SS-WA)* reinforced the idea that action was only necessary at the local level, whereas, at the global level, only knowledge of, and thinking about, global issues was all that was recommended, for example act local, think global. Indeed, there certainly was an emphasis of sustainability actions that focused within the school, as in this statement, “the initiative supports consideration, and efficient use, of schools’ resources (for example energy, water, products and materials) and the sustainable management of schools grounds (for example biodiversity, waste, landscape design and vehicular traffic)” (DETWA, p. 1). The intention here is to keep all efforts specifically related to ‘school resources’ and within ‘school grounds’. Yet, in the very next sentence, the need for action is sublimated with, “In addition, it promotes key concepts and themes such as social justice, participation, fair trade, human rights and cultural diversity and respect consistent with an holistic integrated model of sustainability” (DETWA, p. 1). Here, and elsewhere throughout all the documentation provided by SS-WA, there is no clear explanation of how the conducting local action, in the name of sustainability, would

impact global issues in any way. There was just an implied association between the two.

The emphasis on local action was also reflected within the SAKGP. Assessing the SAKGP materials according to the sphere of action for sustainability, the school-centric nature of the program was evident in that actions were largely limited to the individual school thus reinforcing a narrow, local focus. There were, however, aspects of the program that involved the wider community. For example the sourcing of materials and goods from local businesses and the need for volunteers from the community to contribute to the upkeep and running of the program (Yeatman et al., 2013). There was also the potential of wider community engagement by the establishment of an online support community where schools – or more specifically the SAKGP coordinators – could find information and ways of managing the demands of the program (DEWHA, 2010a). There was no explicit direction given to teachers and schools through the information provided in this program, however, to suggest that they should engage with, or have any impact, beyond their local community.

Again, with the Sustainability Curriculum Framework this emphasis on the local, micro sphere was evident. An illustration of this can be found in the statements for Years K-2, human agency was curtailed to the local environment – “acting with regard to the safety of self, others and the immediate environment” (p. 14), “observable stages of the life cycle of common/local species” (p. 15) and “diversity of living things found in nearby environments” (p. 15) (DEWHA, 2010c). There was only one link to the global under Civics and Citizenship – “how children all over the world are working for sustainability and the reasons why it would be valuable to link up with them” (DEWHA, 2010c, p. 16). Even from Year 3 to 6 there was very little reference to issues beyond the local.

However, whilst a greater number of statements referred to local concerns, there were a few exceptions that appeared to suggest the need to consider sustainability across the wider arena. For example: “Groups and organisations that need to take sustainability into account when making decisions and taking action, including our school, the local council, businesses, clubs, state and federal parliaments and state and federal governments, international agencies”; “Ways people and their communities are connected throughout the world, and how people can act as global citizens”;

“responsibilities of global citizens to future generations for achieving ecological sustainability, and sustainability issues in relation to food production and nutrition including local and global equity” (DEWHA, 2010c, p. 23). Yet, the dominant emphasis of the Sustainability Curriculum Framework, like the other official, state-based documents analysed, was limited to the local, micro sphere.

These macro level official documents collectively had the effect of a reverberation across Amity PS that sustainability was something that required consideration and action at the local level. Indeed, there was very little evidence of a wider emphasis in any of the other school level documentation. The Amity PS Business Plan, the Triple S Plan and the Sustainability Charter all suggested promoting sustainability would require a focus primarily on a narrow, localised, micro level sphere of action. There was some, but limited, intended impact on the immediate community – these were seen to be at the meso level. There was no reference to action effecting change to the wider society either national, international or global, that is, at the macro level. The key emphasis in terms of sustainability practices at Amity PS from all the macro or micro level documentation appeared to be the SAKGP where, as I have discussed in this section, the majority of efforts and action was primarily localised to the school. Thus, whilst the broader literature on EfS, as identified in Chapter Three, has as a goal the transformation of global society as we know it, what schools are provided as guidance appears to reflect a very insular, local approach to sustainability – *Paradox 5: EfS’ espoused intent is to effect global change versus the actual result of guidance provided to schools that limits the sphere of action to largely individual actions within the local, micro level.*

Accountability and reporting

What became evident through the interviews and my observation field notes was a growing awareness of the omnipotence, as I identified in previous sections of this chapter, of NAPLAN. I had noted the impact in excerpts from my field journal after a period of observation of Anne teaching her Year 4 class:

NAPLAN was a driving force in Anne's teaching. I would often come into her classroom and she would almost apologise that there is no other work being done because we need to concentrate on NAPLAN (JN:L425, 21/9).

Anne's actions relay the message that there are more pressing priorities (NAPLAN) and sustainability can only be considered if it fits to meet the literacy and numeracy outcomes. Sustainability is definitely an 'add on', not a central organising concept here (JR: L827, 23/10).

From the interviews the same story was reinforced. Upon being asked what is preventing teachers from being engaged with sustainability in their classrooms, Adam offered as a first response – “NAPLAN”. He went on to explain that the media and public perception of its importance is a driver, “*You see in the news every day the schools focus on getting those good literacy and numeracy skills*” (T1: L685, 14/9).

Like many other schools across Australia, Amity PS has been prompted to look at students' literacy and numeracy achievement through the externally validated NAPLAN tests. These have become a very strong feature of teachers' work, particularly over the last few years when the new principal Annette was appointed. The school actually fares quite well in comparison to its 'like-school' counterparts so there is no sense of crisis; however, there is pressure to ensure that standards are maintained and improved.

The main business of schooling is reiterated within the micro level documents such as the Annual Report and the School Business Plan where the emphasis of the reporting is on the key contemporary educational markers of a neoliberalist ideology. This is affirmed through the highlighting of NAPLAN scores and other evidence of academic achievement in literacy and numeracy that form the most prominent and vociferous part of the school's communication to the community. For example, the School Business Plan (see Appendix J for extended analysis of this plan) identified the source of the student achievement data that informed the decision to identify the three key focus areas of Achieving Academic Excellence, Excellence in Teaching and Sustainability. This student achievement data noted in the section of the document labelled School Self-Assessment only referred to the results for standardised

assessments. The plan listed the Year 3 and Year 5 literacy and numeracy NAPLAN performance over the previous 2 years and also the Western Australian Monitoring Standards in Education (WAMSE) for science and S&E for Year 5.

The Achieving Academic Excellence section, which focused on student performance, and the Excellence in Teaching section, that focused on teacher expertise and performance, of the Business Plan were dominated by lists of items under Achievement Targets and Milestones related to statistical measures of desirable future literacy and numeracy performance. The Strategies under each of these listed ways the school intended to achieve these. Of the two Milestones listed under Achieving Academic Excellence one made an only an oblique reference to sustainability as it referred to the need for Year 3 and 4 teachers to make links between the SAKGP, one of the features of the school sustainability program, and the English National Curriculum. The Achievement Targets and Strategies identified by Amity PS as a way of Achieving Academic Excellence and Excellence in Teaching were dominated by the language of standardisation and accountability. There were numerous references to the need to perform equal to or above “statistically similar schools” which reflected the way the school’s ranking in the NAPLAN scores were made publicly available through the My School website. My School ranking was a focus of teachers, schools and the education system as it is taken as a strong proxy measure of the quality of the school itself. Thus, whilst the school publicly espouses a value of sustainability, the objectives of the Business Plan are what is it assessed against and therefore, by default, becomes drivers of school activity and priority.

The conclusions I drew from the way the Business Plan was presented were that:

- The Vision, Values and Objectives made no direct reference to sustainability and thus indicated a very weak commitment to sustainability.
- Instead, the Objectives had as a first priority an emphasis on high standards of achievement in literacy and numeracy.
- The sections Achievement Academic Excellence and Excellence in Teaching were presented first – before Sustainability – and took up the majority of the space within the whole document itself, thus reinforcing the view that they were the school’s first and foremost concern and priority.

- The kinds of Milestones and Strategies suggested to develop literacy and numeracy represented a very reductionist, mechanistic view of curriculum and pedagogy (I discuss this further under pedagogical infrastructure in Chapter Six).

The Amity PS Annual Report also reflected the focus areas listed in the Business Plan. Just looking at the contents page, I noted the prominence of numeracy, literacy and NAPLAN in comparison to sustainability. In order of appearance, numeracy was the sixth heading, literacy was the seventh, NAPLAN the tenth, with sustainability being the 18th in a list of 19. Sustainability was considered a separate category, set apart from all the other learning areas and concerns of the school. Under the heading of ‘sustainability’ the key aspects noted were the development of the Triple S Planning Overview that was now being used by staff to plan classroom practice. Sustainability was not a central organising principle, despite the espoused school’s sustainability ethos and accoutrements. The key priorities of the school continued to be the traditional learning areas, but with a much greater emphasis on accountability and achievement associated with literacy and numeracy.

It can therefore be determined that even with the strong EfS ethos at Amity PS, teachers found it difficult to engage with sustainably in their teaching due to the need to respond to the pressures of yearly NAPLAN testing. Indeed, this public perception of the importance of literacy and numeracy had affected parents at Amity PS. Annette commented that parents were not necessarily supportive of students being engaged in the SAKGP as there was a perception this was taking time away from literacy and mathematics, “...but my child is gonna (sic) spend 90 minutes once a fortnight in the kitchen and 60 minutes once a fortnight in the garden. That’s a substantial amount of time and that is how they saw it” (T2: L325; 22/11). This attitude evidenced the extent to which parents have taken on the NAPLAN policy rhetoric.

This emphasis on NAPLAN, in response to a greater intensification in accountability in the sphere of education, according to Christine, had resulted in the “...role of the classroom teacher becoming tunnel visioned” (T2: L109, 26/3). According to Adam, NAPLAN had become a dominating force in teachers’ consciousness. He summarised NAPLAN’s impact on EfS at the school saying, “...unless you can justify sustainability [as] teaching literacy and numeracy [teachers] don’t want a bar of it

because they know they are getting assessed on the quality of their job based on their NAPLAN results!” (T1: L686, 14/9).

Even Robert, the Year 6 teacher whose class is not subject to any preparation pressures for NAPLAN, recognised the school was measured on literacy results and the effect of this was that, “...*the most accountability is in literacy. We do a lot of literacy testing... we collect a lot of data*” (T1: L330, 20/11). Like Robert, all the other teachers identified that an important part of their work and accountability was preparation for NAPLAN. Even those, like Robert, that were not teaching the year groups sitting the test, were conscious of the fact that they had to put in the preliminary work with the year level below – for example the Year 2 teacher started to prepare the students for the Year 3 NAPLAN test the year before they had to sit it.

Given that these are assessed aspects of the Curriculum – coupled with the fact that they are also a mechanism for judgement of individual teacher and school effectiveness and excellence – it is not unexpected that given a choice between achieving highly in the mandated NAPLAN or trying to figure out what and how to fit EfS into their curriculum, teachers at Amity PS are more likely to choose only that which is mandated. The dilemma becomes evident according to Adam who says, “*Because it is not reported on, it’s not talked about and it doesn’t form part of your curriculum, and... if you are running out of time and you have to cut something, cut that because it’s not coming up in your reporting cycle*” (T1: L373, 14/9).

In summary, whilst sustainability is included in the Australian Curriculum, teachers at Amity PS do not appear to be responding to the CCP strongly enough due to competing priorities, including where outcomes for students are measured and, therefore, their work as teachers was judged. Thus, outcomes that were not assessed, such as sustainability, were given less, if any attention. If a school like Amity was having difficulty with ensuring it addressed and incorporated the Sustainability CCP, given sustainability’s prominent focus within the school ethos, I surmise other schools would certainly find it more difficult to achieve. Teachers at Amity took a very pragmatic approach in determining whether to prioritise sustainability or NAPLAN. Overall, all the teachers interviewed, but interestingly not the leadership team, saw sustainability as having a peripheral status in terms of teaching and learning due to the accountability and reporting pressures of, in this case, NAPLAN, thereby giving rise to – **Paradox 6:**

Schools afford great possibility to nurture EfS-focused pedagogy versus accountability and reporting imperatives as a strong ‘counter affordance’.

Summary of key findings

The dominant conceptualisation of sustainability evidenced in examining documentation and practices within Amity PS was that it was primarily concerned with environmental issues and these issues were best dealt with in the context of a local/school or community sphere of action – a green and local view of sustainability. The AuSSI/SS-WA Schools Program in particular emphasised the value of individual actions and responses to unsustainability. There was a marked reduction in emphasis on the social/cultural dimension of sustainability in comparison to the environmental, and even less for the economic dimension. The political dimension was represented only marginally in the Australian Curriculum and the Sustainability Curriculum Framework, however, was silenced in both the national AuSSi and the SS-WA, and also in the SAKGP. Given that the dominant sustainability policy influence at Amity PS were the latter two programs, a skewed and narrow conceptualisation of sustainability was reinforced for teachers.

In addition, the Australian Curriculum consistently presented a view of sustainability as not necessarily being important or of relevance to every learning area or for every year level of schooling (from K-6). This in turn may suggest to teachers that EfS is not a transdisciplinary enterprise, and that ad hoc intrusions of sustainability ideas into the Curriculum documentation will suffice. This approach to sustainability within the Australian Curriculum belies and diminishes the enormity of the task that faces education systems across the globe in ensuring EfS expressed its potential. As can be seen by this expression of EfS in the Australian education system at present, we are a long way yet from education *as* sustainability as has been proposed by Sterling (2011).

My findings show that external, macro policy documents and initiatives perpetuated the same view through the internal, micro school level documents. The Triple S Plan, the Amity PS Business Plan and the Annual Report all mirrored the emphasis on sustainability as being largely concerned with the environment, and to a lesser extent social/cultural, with only the Triple S Plan acknowledging the political dimension. In addition, all three of these documents reaffirmed that the sphere of action in terms of sustainability was the local (micro), community (micro/meso). The school’s

Sustainability Charter made no explicit mention of any dimension of sustainability except for a very vague reference to the environment, nor did it suggest any sphere of action. In effect, as a document to guide a common understanding of the meaning, practices and ethos associated with sustainability, it was hopelessly impotent.

As with the macro level documents and policy initiatives, I found that the micro, school-based documents affirmed sustainability as being subservient to the real business of the school. The Business Report and Action Plan relegated sustainability to the status of a peripheral enterprise, instead privileging the core matters – such as literacy and numeracy, academic achievement, and teacher excellence – as being of primary importance. This is particularly so when coupled with the findings from interviews with the teachers regarding the impact of NAPLAN on all aspects of their teaching practice, including sustainability. These findings are summarised in a pictorial form in Figure 5.11 and they address my second research question – What conceptualisation of sustainability is presented in EfS initiatives and policies?

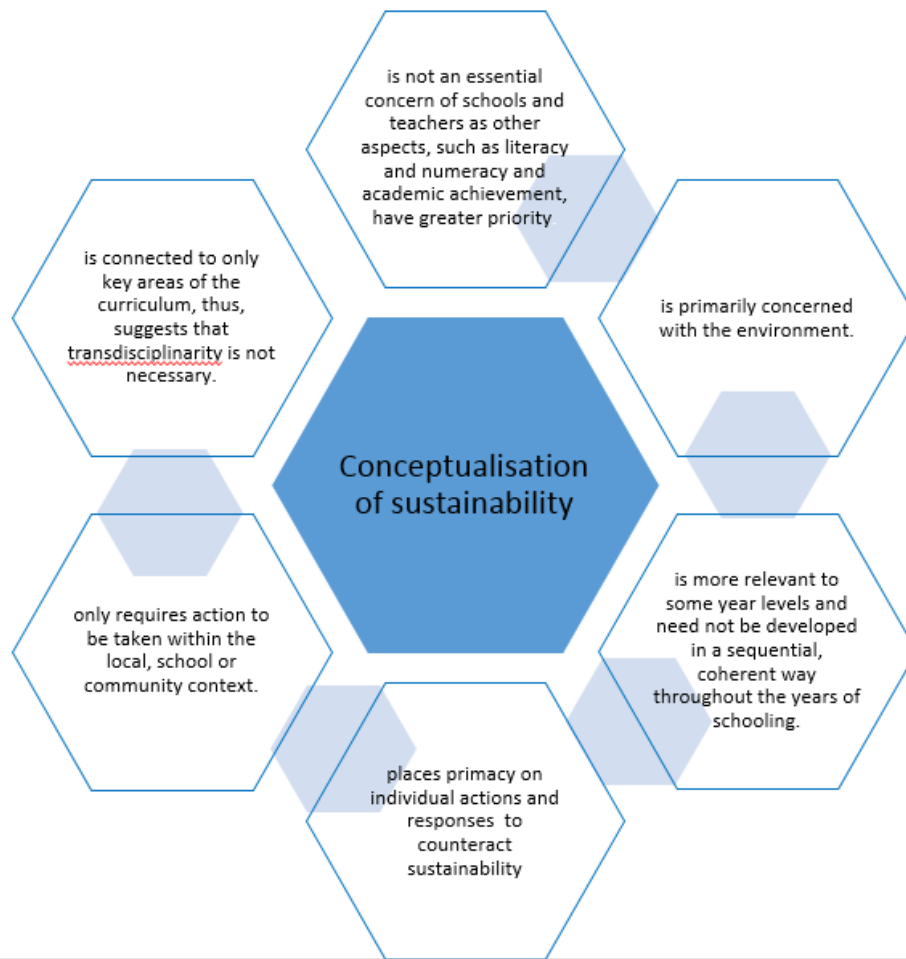


Figure 5.11: Conceptualisation of sustainability in EfS initiatives and policies

Physical infrastructure

The physical infrastructure comprises all the material elements within the built environment of the school; this also includes the natural landscape that the school can take advantage of due to its location. As such, two key areas of the physical infrastructure will be examined in this section – the features of the built environment developed in response to the SAKGP, such as the permaculture garden, and the school buildings which were constructed along ecological sustainable design principles.

Built environment in response to SAKGP

The most noticeable aspect of the physical infrastructure at Amity PS is the permaculture garden that is a key feature of the nationwide initiative the SAKGP. I have described the aims of the program, and also discussed the view of the program as the centrepiece for activities related to sustainability at the school in Chapter Four. In

this section I focus on how the physical infrastructure is both a response to a particular view of sustainability and a determinant of this view.

As I identified in the discussion of policy infrastructure in this chapter, the intentions of the SAKGP did not specifically target sustainability as a key goal. Nevertheless, a number of teachers appeared to consider it integral to shaping the sustainability program through the activities associated with the kitchen garden, such as the worm farming, composting and keeping of chickens for food production. For example, the comment by Robert, which I noted in the section on the conceptualisation of sustainability under the policy infrastructure, expressed a view that entwined the SAKGP with sustainability at the school. Similarly, when asked about the sustainability aspects she was involved with in the school, Anne's response centred on the SAKGP: *"The Year 4s... are involved in the SAKGP... we have a permaculture garden in the school and they learn to plant and harvest foods. Then they go into the kitchen where we do cooking, so that's all sustainability"* (T: L15, 8/9). According to Anne, the school showcased the kitchen and the permaculture garden to visitors as an exemplar of their sustainability activities, saying, *"...we had some students from Singapore visit us yesterday and we gave them a tour of the school, and my students took them into the garden... and it was really good to see how much they had learned about sustainability over Year 3 and Year 4"* (T: L195, 8/9).

When asked about what sustainability activities her class was involved with, another Year 4 teacher, Mary, also centred her response on the SAKGP, saying, *"In the garden we do hands on gardening, like planting and that kind of thing. We look at aquaponics, or worms or different things that can go on within the garden... they find as many worms as they can and measure the length and count the number of fish in the pond... there is a chicken care group so they cut up all the scraps and put it into the worm containers and there is often a group that is doing weeding or mulching"* (T1: L23, 30/11). Other teachers, such as the Kindergarten teacher Nancy, identified the garden as a central aspect of her teaching of sustainability even though her class could not formally take part as the access to the SAKGP was limited to the Year 3s and 4s: *"...for me it's all about exposure with the kindy children... we take the scrap bins at lunch time to the garden and put them in the compost... I am educating them about sustainability by taking them to the garden and showing them those processes and how*

they all fit together” (T1: L12, 6/12). She was very keen for her students to use the kitchen the following year – even though she would not, as she did not have a Year 3 or 4 class, have the assistance of the kitchen chef, Audrey – just so her students could “...see the whole process from growing to picking to cooking to eating” (T1: L411, 6/12). Tarryn’s Year 2 class, like Nancy’s, was not part of the SAKGP, but also collected scraps for the chickens (Figure 5.12 – photo courtesy of school website) that were part of the garden and she was looking forward to greater participation, stating “*We’re Year 2, so we’re not involved in the [SAKGP] garden project yet... but we do collect the eggs once a fortnight*” (T1: L37, 14/9) and, like some other classes at the school, she was looking forward to engaging in sustainability through gardening: “...we’re actually quite excited. We’ve been given an allowance for a garden bed... just outside our classroom” (T1: L38, 14/9). She was aware that “...the kitchen/garden is not the only sustainable side of things”; however, its centrality was evident to her as she stated, “...but it’s one big thing that the school does” (T1: L515, 14/9).



Figure 5.12: Amity PS chicken coop

Annette confirmed that, for the school’s sustainability focus, “...there has always been an expectation that they [the staff] will embed sustainable principles around the permaculture garden... as part of the environmental approach” (T2: L184, 22/11). In fact, she stated that even before she arrived at the school much of the physical infrastructure had already been put in place by a teacher whose role was to “...run the sustainability program and develop a permaculture garden”, and that they have

“...focused on the SAKGP for the last three years... because you need to embed sustainability” (T2: L518, 22/11).

That the SAKGP was highly valued by the school as a cornerstone of sustainability was also evidenced by the continued funding to support the activities associated with the program. Audrey, the SAKGP chef, clarified how the funding worked from SAKGP: *“There was a grant from Stephanie Alexander. I think it’s a federal government grant where the school got \$60000 for the infrastructure and that grant money is purely just for implementing the program. So that’s setting up the garden, the kitchen... It doesn’t cover any consumable products. It covers, say, a tree in the garden that will produce fruit, but, say if, the garden specialist bought in seedlings, they’re not covered because that’s totally consumable – so [the grant money would not pay for things like] spinach seedlings or tomato” (T1: L44, 16/9).* Thus, the initial start-up funding was only enough to set up the initial physical infrastructure as Audrey identified. The school therefore paid the ongoing costs of a kitchen garden chef to run the kitchen, and a gardener to run the kitchen garden, as well as materials and consumables for each of these. This meant they had to work hard to supplement their funding. One way they did that was by *“...obtaining grants... because we have to basically fund ourselves... [we] write grant letters to companies like Bunnings, food service companies” (T1: L257 16/9).*

As I identified in the policy infrastructure section, Amity PS had a one-line budget from which to pay for any additional expenses, and like other schools who valued the kitchen/garden concept, they had to carve out money from their budget to maintain the program. There was no additional government funding for those schools. Audrey explained the funding arrangement for the SAKGP: *“The principal allocated money to the kitchen garden program (from the Finance Committee) and the students pay \$10 a term for it as well. So that’s where we get our money for the consumables and then we try and use the market trolley and sell things off” (T1: L55, 16/9).* She tried to ensure that some expenses were recouped through selling goods that were cooked in the kitchen, for example soups and bread rolls were sold to staff for their lunches, and items grown in the garden such as vegetables, dried herbs etc were put on the market trolley and sold to staff and the community.

Margaret, one of the deputies, noted her reasons for supporting the SAKGP was to promote sustainability: “...we wanted the teachers to own it [the garden] and to grow it, but we needed enough for them to start with, and Stephanie Alexander at that point had produced a really useful manual for teachers... it was a little step, better than a big step... they [the teachers] had something to start with and to see the connections with the Australian Curriculum” (T1, L188, 8/8). My interpretation of her comments was that she saw the SAKGP as a crucial beginning step for teachers to grapple with sustainability, as there were lesson materials already created by SAKGP in the *Tools for teachers* manual (see further information about this resource under policy infrastructure) that would direct teachers in their engagement with the garden. She noted: “...we didn’t have to make that up. It was a fabulous starting point” (T1, L207, 8/8). Audrey also identified that the SAKGP was communicated to parents in “...the prospectus for the school... [as] sustainability is at the forefront of the school and it states about the program and how it is implemented into the school... the school’s long-term vision is to have this – the [kitchen garden] program here up and running and being part of their sustainability ethos” (T1: L291, 16/9). Thus, even though the SAKGP was not specifically designed as a program focused on sustainability, nevertheless, at Amity PS it appeared to become a proxy what occurred under the banner of ‘sustainability’.

However, as central as it was to sustainability practices at the school, a number of teachers commented on the fact that the cost of the program meant access to the kitchen and garden activities was restricted to only the Year 3 and 4 classrooms. Christine saw the selective use of the garden as an issue, stating “...that is one of the problems [with developing whole school understanding of sustainability] when the kitchen garden’s only for Year 3 and 4... I thought everyone was in the garden and then I found out that it was just to do with the SAKGP... it definitely was inappropriate” (T1, L: 35, 23/11). Like Christine, Robert appeared uneasy about this and questioned the understanding of sustainability across the school if it remained focused on the SAKGP, saying, “I think that Year 3, 4, is done really well because they’ve got the kitchen garden so they run the garden. They cook with all their produce, have the chickens... and so they learn about how all the systems work down there, but up until Year 3 that doesn’t happen, once you finish Year 4 it doesn’t happen again. So, Year 3, 4, it’s great, it’s

happening but there's not much happening after, and there's not much happening beforehand. So I think that needs to be addressed" (T1: L59, 20/11).

I suggest that this lack of access by all students, in all years across the school, to the SAKGP as a result of funding difficulties, serves as a counter affordance to the school's EfS program. However, what the SAKGP did do was promote a view that sustainability is 'evidenced' through the visible, tangible features of the SAKGP, such as the worm farms, compost heap, chicken coop, scrap buckets, vegetables, etc. Thus, paradoxically, whilst the SAKGP was being used as the initial mechanism for teachers to engage with sustainability, it perhaps inadvertently privileged the visible, environmental aspects, and therefore may engender an understanding of sustainability as being largely about only those aspects – ***Paradox 7: Teacher engagement with the tangible structures and features of the SAKGP creates a view that sustainability is largely about visible, environmental aspects.***

Ecological sustainable building design

As discussed in Chapter Four, and also within the policy infrastructure section of this chapter, the school's ecological sustainable building design, construction materials and sustainability features were a unique feature. However, those very features that supported the understanding of sustainability appeared to cause some concern for a number of the teachers, due to either lack of initial installation, a malfunction that has never been repaired, or a lack of awareness of the function of these features.

For example, due to the eco-efficient principles that utilised passive solar design it was considered in the original architectural design that the school would not require air-conditioning. Instead, a BMS was designed to manage and monitor the temperature (Figure 5.13), and thus the natural airflow, by controlling louvres along the bottom and tops of buildings. This was an eco-friendly feature that was meant to keep the rooms cool in the hot WA summers and prevent the need for air-conditioning. The idea was that correct positioning of the louvres would create a chimney effect by drawing in cool air from the bottom of the building to displace the hot air which would be released through vents in the roof.

Figure 5.13 show the louvres at ground level and ceiling height of a classroom – photos courtesy of the school promotional presentation provided to the researcher. Figure 5.14 shows the monitoring of the classroom temperature by the BMS when working.

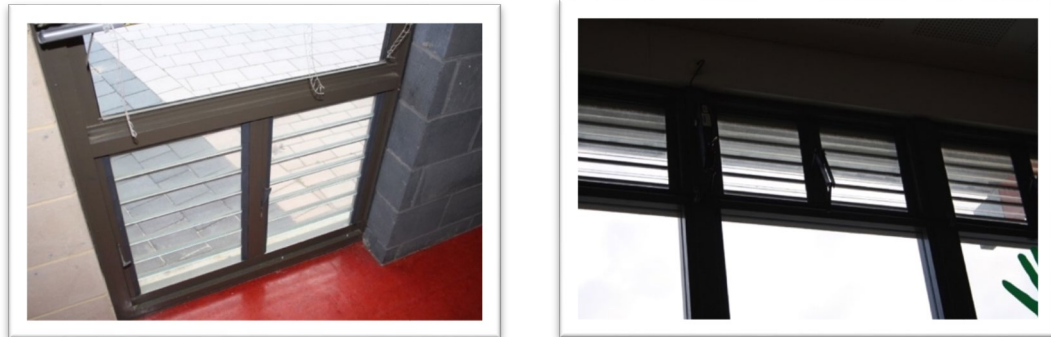


Figure 5.13: Louvres at ground level and at ceiling height at Amity PS



Figure 5.14: Temperature display controlled by the BMS at Amity PS

However, there have been a number of issues with the system. Janine, the deputy principal, elaborated on some of the issues: *“We had difficulty with the Building Management System... [there is] a designated computer that lives in the library... there are sensors in the classrooms and it manages those”* (T1: L94, 8/9). Unfortunately, due to the continual malfunctioning of the technology, sometimes the system *“...went haywire”* according to Janine, explaining, *“Sometimes the louvres open and close ten times an hour. Sometimes they’re open and you’re thinking, Wow! It’s freezing now!... We have little temperature monitors inside the buildings... and we know they just aren’t correct. That’s not 19 degrees all year round!”* (T1: L103, 8/9). Susan, the music teacher, went on to explain that another issue with the malfunctioning of the BMS was that teachers would often need to manually override the system. This again contributed to the problems with heat and airflow: *“...to be fully effective the louvres need to be opened at 5-6 am in the morning. Teachers are not here at that time [to open the louvres manually]”* (T2: L56, 26/3). According to Janine, the louvres also

appeared to affect students: *“There’s also an issue with the amount of light that’s been coming into the wet areas in the [teaching] blocks, particularly in summer. We attempted to have banks of computers along certain walls and you actually couldn’t see what was on the screen because of the angle of light coming into the louvres”* (T1: L133, 8/9). Margaret also noted that *“When it’s very hot in summer it can get quite hot for groups of people working there so there’ve been a number of issues physically”* (T1: L135, 8/9).

This also raised the ire of Christine, who was incredulous at the lack of consultation or forethought by the building designers in developing a school design that patently did not consider the needs of the teachers and students: *“Children should have been considered as little light bulbs. The heat generated by 30 plus bodies is not compensated by the natural airflow”* (T2: L67, 26/3). The reality of long, hot, dry Perth summers where daytimes temperatures regularly reach in excess of 30°C, appeared not to have been taken into account.

Again, this was an example of an architectural feature that was not working as intended, yet the administration team did not express a commitment to repairing it. Instead, teachers and students accepted the situation and did their best to work around it. However, the negative effect of this heat on children became an issue for the school, *“...it is very hot in summer and very uncomfortable... unbearable and I think it does affect the children’s learning... I think we are disadvantaged [in comparison] to the school down the road that has air-conditioning... when we’re preparing for NAPLAN and things like that”* (T1: L82, 8/9). Consequently, the impact of the faults in the physical design of the buildings coupled with lack of air-conditioning was not only related to immediate student discomfort but also appeared to have wider educational ramifications.

Another feature noticed by the art teacher, Christine, were the glass doors in her room (Figure 5.15). However, again, she had only gleaned these were meant to be a sustainability feature but she claimed she has never found out what they do: *“Apparently, they’re meant to, at some point in the day, open them up, and I let the cool air in and the hot air out but that room is so hot... but I don’t think it’s the school’s fault ‘cause (sic) it was an architectural experiment and obviously didn’t work well enough to keep it cool really”* (T1: L179, 23/11).



Figure 5.15: Glass doors at Amity PS

In fact, the thermal (Trombe) wall design feature designed to absorb winter heat actually exacerbated the natural heat in summer as it continued to heat the walls of the classrooms all year round. The principal lamented the issues: “*The grey thermal walls, are great, but when they’re exposed to direct heat in summer they heat the room that is already hot*” (T1: L126, 8/9). Figure 5.16 (Reardon, 2013) provides an illustration of how the design of the Trombe wall is supposed to work.

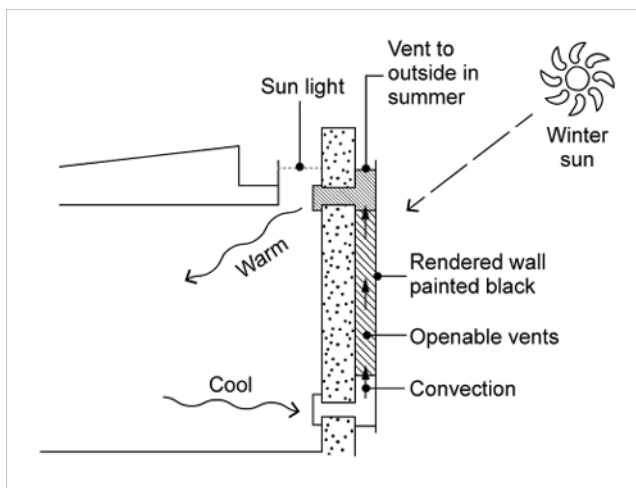


Figure 5.16: Illustration of how a Trombe wall works

This typified other comments from teachers suggesting there was a lack of awareness as well as and conscious, active ignoring of the BMS. Tarryn suggested that if something does not work people start ignoring it or work around it: “*...you move on... your attention’s certainly better somewhere else*” (T1: L550, 14/9). Indeed, there

appeared to be no indication from any of the discussions I had with any staff member that there was the possibility of fixing the BMS. This was also illustrated by Tarryn's lack of understanding of the BMS where she stated, "*I guess I don't know what exactly is expected [by] the school... we don't know much about the... where it tracks the electricity... I think it works better now, but it certainly wasn't working when I first came, and that was very much an attitude, Oh yes, never runs. It's been wrong since it was built <laughs>*" (T1: L507, 14/9).

One of the main issues regarding teachers' PCK of the sustainability features of the building was their starting time at the school. Christine had been there for 6 years but had not been part of the initial cohort of staff and, from my discussion with Annette, only those staff who began teaching from the commencement of the school had been given an explanation of the architectural features that were designed to make the school sustainable. Susan was one of the original cohort, yet as a music teacher, she had very little opportunity to incorporate her knowledge of these sustainability features into her own teaching. However, she affirmed what Christine had been saying, "*The school design is not really sustainable. In 1 year the school was the one with the highest water consumption!... Nothing was ever connected properly*" (T2: L51, 26/3).

As illustrated by the teachers, a primary source of difficulty is that they did not have a good understanding of the existence or purpose of features such as the thermal walls, louvres, solar passive design etc. Annette identified there were very few of the original staff cohort left at the school and there was a fairly constant and substantial staff turnover. This meant many staff were new, including Annette who had only been there 3 years. Thus, not having been part of the original design process, nor receiving an introduction to the various features of the physical infrastructure when the school was first constructed in 2003, meant that staff were not aware of the sustainable aspects of these. Without a formal introduction to these features in the school it seemed there was possibly an assumption made that teachers would 'intuit' the teaching and learning potential of these features. However, the physical infrastructure appeared as a recurring theme in a number of teachers' comments even though I had not geared my questions to elicit information about it. Some teachers expressed concern that although they knew many of the sustainable features existed, they did not have enough background knowledge about their function to fully realise their potential in their

teaching. Lamentably, a number of these features had a history of malfunction and were now either defunct or remained unused and subsequently ignored within the Curriculum. Gradually, as original sustainability design features, such as the grey-water recycling system that was designed to water the kitchen garden and school grounds, starting malfunctioning, there was a lack of impetus to repair them due to the cost of this feature needing to be rationalised against other pressing financial needs, as I have indicated in the policy infrastructure section of this chapter.

Amity PS, like so many other schools in the same situation, therefore had to reign in innovative aspects of the material environment that would in effect act as, Malaguzzi would have termed it, “a third educator” (Merewether, 2017; Torquati & Ernst, 2013). Ultimately, the Australian federal government, as part of an economic stimulus package to offset the effects of the Global Financial Crisis (GFC), installed grid powered air-conditioning. Thus, the original environmental intent of the school was overridden with the GFC resolving the school’s dilemma of wanting to provide a comfortable teaching and learning environment for students and staff but not making decisions that ran counter to the school’s sustainability principles. The fact that it was a political decision rather than a school-based decision was stressed firmly by Annette: *“So we didn’t ask for air-conditioning... It was just a [government] program... we were one of the early schools off the rank in this area ‘cause (sic) we are a marginal seat... so they would have wanted to ensure we got it first... in fact I wasn’t consulted at all about what type of air-conditioners, where you want them, nothing. Not consulted at all”* (T2: L689, 22/11). Annette’s view was that if the air-conditioning is only used when necessary it can be consistent to some extent with being ‘sustainable’: *“...the environmental aspect comes in in making sure that we use our natural sustainable cooling devices the right way to ensure that we’re only using the air-conditioning when necessary. That’s what we’ve got to teach our teachers”* (T2: L698, 22/11). Thus, it appeared that the design of the buildings, whilst potentially a very rich source of sustainability learning and teaching, ultimately remained unrealised due to a lack of both maintenance and knowledge – ***Paradox 8: The affordance of sustainability infrastructure versus malfunctioning elements paired with ignorance of key sustainability features*** (Kuzich, Taylor & Taylor, 2015).

Summary of key findings

In this chapter I identified eight paradoxes that appear to influence the interpretation of sustainability through EfS at Amity PS.

- Paradox 1: Increasing global environmental, social, economic and political crises are met with a cessation of funding and policies, and a reduction in funding of programs and agencies supporting EfS.
- Paradox 2: The affordance of sustainability as a CCP in the Australian Curriculum versus a lack of policy mandate to teach it.
- Paradox 3: The affordance of a policy framework that has the potential to engender strong, effective understanding and interpretation of EfS versus a fragmented and disconnected representation of ideas and concepts about sustainability within the policy documents.
- Paradox 4: Policy rhetoric espousing holistic consideration of all four dimensions – environmental, social/cultural, economic and political – in a systemic, interdependent way versus reality presenting EfS as largely being synonymous with narrow, environmental aspects.
- Paradox 5: EfS' espoused intent is to effect global change versus the actual result of guidance provided to schools that limits the sphere of action to largely individual actions within the local, micro level.
- Paradox 6: Schools afford great possibility to nurture EfS-focused pedagogy versus accountability and reporting imperatives as a strong 'counter affordance'.
- Paradox 7: Teacher engagement with the tangible structures and features of the SAKGP creates a view that sustainability is largely about visible, environmental aspects.
- Paradox 8: The affordance of sustainability infrastructure versus malfunctioning elements paired with ignorance of key sustainability features.

From these paradoxes it is evident that even with a strong sustainability ethos at the school, coupled with broad policy support for EfS, the policy infrastructure frames teachers as 'tight-rope walkers' teetering between professional accountabilities and sustainability desires. In a time of increasing crises, not only environmental but also economic, social/cultural and political, the policy response has been enfeebled.

Weakly defined and decommissioned policy imperatives along with a non-mandated Sustainability CCP of the Australian Curriculum serve as strong counter affordances and face pressure from ever increasing teacher accountability and national testing regimes. The intent of these regimes actively contradict the philosophy and principles underpinning EfS, limiting teacher focus to a narrowly defined set of Curriculum outcomes. Teachers at Amity PS navigate these tensions with every teaching act. These findings serve to address my research question 2: *“What conceptualisation of sustainability is presented in EfS initiatives and policies?”*; and question 3: *“How are teachers supported in their understanding and interoperation of EfS?”*

The school has a well-developed physical infrastructure that has been designed and built incorporating sustainability principles which furnishes the affordance of a rich teaching space and resource. Yet, the paradox here is the school has not been able to fully realise the potential due to a lack of awareness of the sustainable features by staff, coupled with the impost of the costs of maintenance which has not enabled the physical features to function correctly. What is clearly evident is the preponderance of effort and emphasis on the visible and tangible environmental dimension of sustainability. These findings serve to address research question 1: *“What do teachers understand by, and how do they interpret, sustainability?”*

Chapter summary

Within this chapter I outlined my approach to the interpretation and representation of data across both findings chapters. I identified how the process of coding produced my interpretive lenses of affordance and paradox, and provided a rationale for the presentation of my findings in the form of the four infrastructural pillars of policy, physical, pedagogy and people (human). I firstly examined and reported my findings in relation to the policy infrastructure that was evident at Amity PS. Then, in the final section of the chapter I presented my findings illustrating the relationship between the physical infrastructure of the school and EfS. I concluded the chapter with a summary of the paradoxes that arose and an overview of the key findings. In the next chapter I present the findings in relation to the remaining two infrastructures, pedagogy and people.

Chapter Six: Infrastructures in relation to EfS – Pedagogical and people

Introduction

This chapter examines the findings regarding the pedagogical and people infrastructures in relation to EfS that arose from the generated data. In the first section of the chapter I present the findings and my interpretations in relation to the educational practices, ways of thinking and allocation of resources that make up the pedagogical infrastructure at Amity PS. The second section of the chapter deals with the human element that has enabled sustainability to be interpreted in the educational context. This infrastructure of people is focused on teachers at Amity PS in the context of this chapter, yet it references the need to consider all humans and, I would suggest, all life, in this shared endeavour towards global sustainability. At the conclusion of the chapter I draw together the two sets of findings and interpretations into a summary of the paradoxes that have arisen.

Pedagogical infrastructure

If the policy and physical infrastructures can be viewed as structural support, as in the case of a scaffold for a building, thus the pedagogical infrastructure forms the actual corpus of education within the school. It is what gives life, substance and purpose to the policy and physical architectures. Pedagogical practices at any school are derived from a dialectical interplay between the individual and social or collective that make up the school's ethos (Alexander, 2008). In turn, this ethos shapes and reshapes teaching practices and priorities. In terms of the teacher, pedagogical infrastructure refers to what they contribute to the ethos but also how the school as an entity views their needs for learning and development. In this section I outline the pedagogical infrastructure by examining how teachers supported the shift to EfS within the school through both their personal knowledge and interest in sustainability, and also their understanding of how to translate this into practice, as EfS. I also discuss the support provided for teachers by the school to further develop these aforementioned aspects, in particular through professional learning opportunities.

Teacher knowledge and practices

A number of teachers spoke to me of their familiarity and engagement with sustainable practices in their personal lives. In Tarryn's personal life and experiences, sustainability understandings and actions were evident, for example, *"I've got a compost heap at home... and four vegie patches, I enjoy growing my own vegies. We have put solar power in at home, and have swapped cars [with my partner] as he drives further. That uses less fuel"* (T1: L569, 14/9). She also was very conscious of consumerism, and was aware how much packaging was used for products: *"There are only two people living in the place, and by the end of two weeks it [the recycling bin] is 'chockers' [full]"* (T1: L598, 14/9).

This personal connection to sustainability was also evident with other teachers. Nancy declared herself *"sustainability minded"*, explaining that this meant *"I try not to use plastics and I don't drink out of plastic bottles. I'm vegetarian, so... that has less impact on the Earth... I just try and be green. I don't use chemicals. I do the obvious recycling and everything at home"* (T 1: L70, 6/12). Like the other two, Anne also reflected sustainable practices in her personal actions, but perhaps to a lesser degree, *"I try and recycle everything. I'm bringing in things in here [Amity PS] for them [her class] to reuse when we are doing art and craft. There's a lot of waste that I see at other schools and that makes me angry"* (T1: L275; L293, 8/9). Christine also identified herself as *"pretty environmental"* (T1: L83. 223/11).

This enthusiasm of teachers was noted by the leadership team and appeared to be considered a great asset to the school. While explaining the planters that were to be installed in front of a number of classrooms, Margaret, the deputy principal, noted the enthusiasm for this idea from the teachers, saying, *"There's a lot of teachers... that are very interested... there's a lot of passion... we've got teachers with a farming background that they're able to bring to the school"* (T1: L308, 8/9). Thus Margaret appeared to identify the skills and interests that teachers have outside of school as being an asset to their teaching with sustainability in mind, in particular the environmental activities associated with gardening. The school even actively recruited new teachers on the basis of this, as Annette confirmed: *"Ten new staff members, all who knew that sustainability was the philosophy on which we do everything here, so only those that were capable of doing that have been selected to the school"* (T1: L370, 8/9).

One of the ten, Adam, was the only one with formal qualifications in environmental science; however, while Annette realised the others did not yet “...*have his level of skill*”, she appeared confident in their abilities when she stated “...*but they all understand and believe in sustainability principles*” (T2: L377, 22/11). Indeed, it seemed that there was a perception that this ‘outside of school’ understanding of sustainability could seamlessly translate and transfer to their classroom teaching. However, in at least one example, despite her personal interest and engagement in sustainability outside of school, Anne identified a schism in this way of thinking: “*I find even though in my everyday life and in here [Amity PS], I am modelling it, I wouldn’t say that I teach sustainability, so yeah... it’s just an alien concept in the teaching world for me right now but I’ve got the awareness and I’ve got the motivation for it*” (T1: L309, 8/9).

Thus, a knowledge of sustainability outside of the school context did not seem to equate to a knowledge and confidence with teaching it in the school context. This was certainly evident with Anne who, despite her knowledge outside of school, seemed to lack knowledge about sustainability in terms of what, and how, to teach it, saying “*I don’t really have any ownership of my sustainability teaching right now but I have recognised that as a gap for me*” (T1: L159, 8/9). Since sustainability was still a relatively new idea that was being more actively promoted by the Sustainability CCP of the Australian Curriculum, it was perhaps not unexpected that there were a number of other teachers at the school who also expressed their lack of knowledge about sustainability, the expectations for sustainability teaching, and also what was actually happening across Amity PS in other teachers’ classrooms.

One example was Tarryn who was unsure whether she was doing enough about sustainability. As it was her first year at the school she was concerned that she “...*didn’t know what was expected*” (T1: L514, 14/9). She had heard about a Year 3 teacher who had been using ‘dilemma stories’ as part of teaching about sustainability in her classroom but apart from that was not very sure what other teachers were doing. Tarryn knew that sustainability was clearly part of the school environment as she had researched the school before applying for her job, saying, “*It’s certainly an expected thing*” (T1: L150, 14/9). She was clearly fascinated with what she had seen on the website; however, there were elements she was unfamiliar with: “*I was quite*

impressed with [some things], particularly the things they had on the website and particularly the garden and the Stephanie Alexander Kitchen Garden Project, obviously not knowing much about it. I'd not heard of it before... seeing all the things they did... with the fish and everything. They've got chickens, all sorts. That was pretty impressive" (T1: L21, 14/9). Anne's response to my query about what she needed in order to be able to incorporate sustainability in her teaching was: *"I think that as a teacher you sometimes reflect on the way you were taught. That is not something that I was taught to be at all, so I have no, like, prior knowledge of having a teacher teaching it"* (T1, L:326, 8/9). This response both highlighted the newness of the teaching of sustainability and the importance of role models for teacher practice.

As part of my more detailed observation in Anne's class over the space of a year I noted the pedagogical practices she employed and noted any connection between her pedagogy, Curriculum content and sustainability. My observational notes from visits to Anne's classroom identified very few examples where sustainability was made visible and prominent. The majority of the time in her class I was watching and participating in everyday lessons, for example spelling lists, word sorts, mathematics, without any overt acknowledgement or links to sustainability. I captured my impressions of Anne, a relatively new teacher to the school, and her knowledge about sustainability, in my field notes in this excerpt:

Anne had expressed to me in the interview that she was really new to sustainability. This was her second year teaching here (at Amity Primary School) and she had decided that she really needed to actively teach it. She did admit that she was not really doing much now so I knew not to expect too much 'obvious sustainability' evident in the classroom. I was hoping that between my observations informed by my readings and Anne's own heightened awareness because of my presence and my investigation topic we might be able to identify where elements of sustainability were being taught. It was a very loose idea of what I might find – no real preconceived notion of what would constitute sustainability. It felt like I was doing a jigsaw puzzle with no picture on the box with a complete image of the finished product to guide me. Since there were no

(cont'd from previous page) real lessons aimed at 'sustainability' Anne invited me to come along whenever she was in the classroom and I had free time from my other work/teaching commitments. This was ad hoc and sporadic really. We were trying to catch a fleeting invisible butterfly that few could really see and even fewer believed were real (JR: L4, 12/9).

From my reflections it was evident that both Anne and I were both on a journey of discovery in terms of sustainability practice in the classroom. Neither of us knew exactly what it would look like, hence my analogy to sustainability in her classroom as an 'invisible butterfly'. Anne expressed her own analysis of where she was in terms of teaching with sustainability, stating, "I see sustainability as this thing over here and then, I'm like, 'Oh, I've gotta go and do this'. I am not integrating it into other things yet, so, I'm sort of like, there's a continuum and I'm right at the start" (T1, L217, 8/9). She knew that she was not au fait with this thing that has been labelled EfS – the teaching of and with sustainability – just yet. One day Anne invited me to watch a lesson, and I noted these observations about the visibility of sustainability in her teaching:

On the whiteboard there is some information about the Australian system of government. The words laminated and stuck on the board say: democracy, absolute power, dictatorship and monarchy. I asked Anne about these and she said the class were studying natural and social systems in society and environment. The topic today was governments. Students were given printed statements that were answers to questions. In pairs they had to match the questions to the answers on a worksheet. Whilst Anne was aware I was there to observe any aspects of classroom activity that were related to sustainability she didn't elaborate on how, or if, this activity was related. I felt awkward about pushing and asking at this point. After the lesson finished she admitted she wasn't very knowledgeable and not an expert on sustainability and she hadn't given much thought about incorporating it into her teaching until I came along. This surprised me given that the school supposedly had a sustainability focus and that she was the science coordinator (JR: 153, 25/11).

The lesson described above had very little discussion about the actual concepts and certainly did not relate them to wider issues, for example the social or political aspects of sustainability. It was, as many other lessons that I saw were, focused on the skills, in this case matching definitions to concepts. I noted again in my reflective journal:

I feel there are so many teachable moments about sustainability that are not being explored. Anne is operating from a skills-focused, task-based teaching style. I had trouble making the connections between the different elements her class was being asked to learn, it didn't seem holistic and I couldn't see how the links were made explicit (JR: 198, 25/11).

However, there were examples when sustainability was uppermost in her thinking in her lesson planning. On one such occasion she called me in to watch a lesson on factory farming as a way to focus on sustainability. The idea was, she explained, to be a parallel to the SAKGP at the school where children were shown the whole process from seed to plate, thus her aim was for children would get a better understanding of where their food comes from and how food is produced. Her intention was to address sustainability; however, as I noted in my reflective journal:

Anne had found a video resource from a site called the Meatrix that showed the inhumane ways some animals are treated on farms. She put up two questions on the board 'Where does your food come from?' and 'Where do your eggs, milk and meat come from?' Students are asked to discuss with each other and write their answers on a mini whiteboard. There is no introduction to the topic and no explanation of why she asked these questions. Instead she simply says next, 'Let's watch and find out'. My concerns are there is very little holistic introduction to the topic. There was no linking to previous work nor did she put it into a context as she did for me when she explained the need for students to see where their animal products come from as they do with their plant products from the kitchen garden. After the video they are set a task to create a persuasive poster either promoting the positives of family farming or the negatives of factory farming. There is very

(cont'd from previous page) little discussion except to refocus on the types of persuasive language they have been practising in rehearsal for their NAPLAN test (JR: 284, 25/11).

This lack of both explicitness and integration of sustainability was not confined just to Anne's class. Other teachers commented on what they had noticed happening at the school in relation to this. Even those teachers that were actively part of the SAKGP, the Year 3 and 4 teachers – who went with the children in the garden to watch the gardener conduct a lesson with the children and who could also participate (but didn't have to stay with the chef) while they did cooking – did not seem to bring that knowledge back into the classroom. For example, Mary, speaking about her Year 4 class on how to manage the links between the sustainability in the SAKGP and the rest of the Curriculum noted, *“Every week we have a one and a half hour to two hour session depending how long it takes them to get through each activity. Every second week we do the garden and every other week we do the kitchen stuff. I think it is a great program; however, the teachers really need to be responsible for integrating that into their classroom... I think if you don't integrate and make a link, it is a big waste of time... to justify the amount of time... spent outside the classroom you really do have to integrate otherwise you spend too much time on things and you find it hard to catch up with all the other things you have to teach”* (T1: L4, 30/11).

So, despite the outside of school background knowledge teachers had with aspects of sustainability like gardening this did not seem to assist teachers with incorporating the school-based SAKGP program into their regular classroom teaching. I also pondered in my reflective journal what I suspected was another reason for this lack of integration:

Because the classroom teachers were not involved with the planning (the kitchen and garden activities were devised by the chef and the gardener) they saw them as quite separate from what they were responsible for within the four walls of their classroom. It seemed like a wasted opportunity of a rich outdoor experience. The 'real world of teaching' took over as soon as they walked back in the door – if it could speak it would say 'right kids, forget that fun stuff – let's get on with real education within this classroom' (JR: L199, 12/9).

This schism I identified in these notes reflected what Anne had expressed previously in this section, that teachers at the school appeared to have one conception of the ‘real world of teaching’ and another of the ‘world of teaching with sustainability in mind’. Thus, it could be surmised that there was a need for some way to bridge this conceptual gap that referenced the differences in intention for schooling, that is traditional learning versus learning with sustainability. Compounding the issue of this gap, in my conversation with Adam he noted a disjunction between the visible sustainable practices that teachers seemed to engage in, and were aware of, and the deeper, underlying concepts that reflected a holistic understanding of sustainability. For example, in his role as the school’s sustainability coordinator, Adam was in a position to have numerous conversations with teachers during which he noticed that teachers were not always aware of the elements of sustainability they were actually already teaching: *“They do it but they don’t necessarily realise they are doing it... it is just a matter of having that language and making it explicit to the kids – ‘Well this is sustainability because-’ ... so they’re teaching the skills but not necessarily the vocab to apply it to the field”* (T1: L191, 14/9). He elaborated that teachers were relatively confident and familiar with the ‘visible’ aspects of sustainability but they needed to move to the next stage: *“They’re very good at the surface, turn the tap off, use solar power, the ones everyone knows”,* yet, he stressed, they need to develop *“deeper underlying skills... how by turning the tap off... does that improve dams? They still need that”* (T1: L244, 14/9).

Adam expressed empathy for the teachers in grappling with sustainability as, even in his own teaching course, a graduate diploma in education, he noted that *“The word sustainability wasn’t mentioned”*. He went on to explain that *“unless you want to go back and do a Masters in Environmental Education, you don’t get content knowledge”* (T1: L295, 14/9). A reason for this he suggested was that *“...the unis are honestly 4 or 5 years behind on what’s actually happening in schools... they don’t even mention sustainability at uni”* (T1: L617, 14/9). As such, because sustainability is not being taught as part of teacher education teachers like those at Amity PS cannot be expected to have any depth of conceptual understanding of sustainability, nor how to teach it as is it is understood in EfS.

It became evident through my interviews and observations that teachers at the school knew something of the ‘what’ of sustainability, but were much less familiar with the ‘why’. From what teachers like Anne and Tarryn said, they also appeared to have had difficulty with the ‘how’, as even with their outside of school familiarity with sustainable concepts and practices they seemed to be struggle with translating and mapping what they did know into the language or vocabulary of sustainability. This perhaps could be traced back to the idea that I discussed in the section of policy infrastructure of the Australian Curriculum SOI being disconnected from the Sustainability CCP therefore rendering it as an ineffective source of conceptual guidance for teaching sustainability. Consequently, in the absence of such guidance, the school had sought assistance for teachers with the teaching of sustainability by purchasing commercial black-line masters, which are books comprised of worksheets on sustainability. Adam questioned their usefulness as he felt, “...*sustainability is a very personal thing and it requires not only content knowledge but a change in your beliefs, essentially. You don’t get that from a worksheet!*” (T1: L269, 14/9). However, he understood the appeal of these given the pressures on teachers in terms of time and the overcrowded curriculum, coupled with their own lack of content knowledge about sustainability: “...*you have to understand your teacher doesn’t necessarily have the time to do it all when they are also having to go home at night and learn the background content themselves*” (T1: L277, 14/9). Therefore, not only did teachers not necessarily have conceptual knowledge, they also did not appear to have strong content knowledge for the teaching of, and with, sustainability.

To summarise, as I discussed in Chapter Two, there is evidence to support that the PCK of teachers has a positive impact on student outcomes. The evidence from my interviews and observations seems to suggest that the extent to which teachers engage with, and implement EfS, is determined largely by their level of knowledge, skill and confidence, of interpreting and enacting sustainability in an educational setting. However, interestingly, and quite counterintuitively, what teachers know and do in their personal lives outside of school appears to have very little impact on their PCK. Therefore, knowledge of sustainability (the what) does not appear to equal knowledge of EfS (the what, why and how), which suggests there is a bridge that needs to be created more strongly between the two aspects. This understanding presents us with –

Paradox 9: A school staff with personal interest and engagement with sustainability

as useful but not sufficient to ensure sustainability is imbued within the school-based curriculum.

Professional learning

The findings presented in the previous section indicated that Amity PS staff had a very superficial knowledge of sustainability and were still finding their way with incorporating it effectively, or at all, in their classroom teaching. To develop their PCK for teaching with sustainability, teachers therefore required additional professional learning opportunities. Teachers spoke of two main sources of professional learning – informal, peer consultation and learning, and formal presentations. The formal presentations were either offered within the school by colleagues (for example peer professional learning days), or were offered by external providers who came to the school, or were where teachers were funded to attend programs outside of the school context.

Within the school, the main source of professional learning mentioned by a number of teachers was the Year 4 teacher and sustainability coordinator, Adam. These teachers expressed great confidence in Adam and saw him as a source of knowledge for the school on sustainability. So much so that staff were seemingly quite reliant on Adam to source, filter and disseminate everything teachers needed in terms of sustainability. Robert, for example, noted, *“What I’ve tended to do with sustainability [is not look closely at the curriculum materials and resources] because we are getting fed information from Adam”* (T1: L444, 20/11). Anne also valued Adam’s guidance, saying, *“Adam [is] also a Year 4 teacher so I have lots of informal conversations with him about it but I am thinking of actually approaching him for some lesson ideas ‘cause (sic) it’s not an area that I am the most confident teaching in. I feel like I don’t really have that background knowledge. He has an environmental science degree so he’s like a bundle of knowledge. So it’s good to have a person as a resource at the school and someone who I feel comfortable talking with”* (T1: L47, 8/9).

Adam was the central knowledge base for sustainability at the school and as well as informal conversations, he also delivered professional development about sustainability within the school for his peers. He was also the one who was selected to attend, for example, the AuSSI schools conference along with the principal, Annette, and the two deputy principals, Margaret and Janine. Their knowledge base of

sustainability was therefore continually being enriched with being exposed to this kind of professional learning. The idea was that teachers would reap the benefits of their attendance at the conference, particularly with Adam, as he would then be an even greater resource for their learning about sustainability. Adam himself pointed out that *“Obviously, they [teachers] can come to me. I should know”* (T1: L252, 14/9); however, he also realised *“...there’s just me and a teaching staff of nearly 40, and it’s really hard for me to get around regularly to work with everyone”* (T1: L256 14/9). However, whilst there was some external professional learning that was available for teachers, there was a financial disincentive for sending additional teachers. As Adam noted, *“You’re looking at a cost of \$200 to begin [registration] and the schools gotta [sic] pay \$200-300 per teacher for relief to get you out of the class for the day. So it’s not really financially viable to do it”* (T1: L261, 14/9). Consequently, the school did not prioritise teachers other than Adam attending professional learning about sustainability.

This was an understandable position as Independent Public Schools (IPS) like Amity PS have to manage funds themselves. Principals now take full responsibility for finances, so much so, they are in effect financial managers, more so than pedagogical leaders in some cases. Therefore, when Annette, Margaret and Janine were asked about what formal professional learning had occurred in relation to teaching with sustainability, it transpired that in the year this study was undertaken, staff had not engaged in any. It was explained by Annette that the school had had a very full and busy year but she felt that there were quite a range of resources available. To her it was more about *“...knowledge [being] permeated out”*, with *“...one or two [people] getting skilled and sharing that information. We have some resources in the library... there’s so many online resources now. AuSSI schools have a lot of stuff. The Triple S committee directs staff to areas they can seek knowledge from. They seek knowledge from each other as peers”* (T1: L786, 22/11). Indeed, Anne, Tarryn and Nancy pointed out to me that they did have to turn to the internet for information about sustainability; however, this was largely to get one-off lesson ideas or inspiration for new topics. Adam acknowledged that there were resources online for teachers to develop their content knowledge, especially the AuSSI schools program materials, but that finding this material was, *“...slightly confusing sometimes [finding] stuff on the website and navigating your way around it”* (T1L L353, 14/9) even for him despite his strong

knowledge gained from his first degree in environmental science and environmental restoration. He commented that if he had difficulty identifying what was useful, he wondered how teachers who had less knowledge about EfS would do so. Consequently, it would seem even more imperative, in my view, that teachers were afforded the opportunity for professional learning for sustainability.

The only specific professional learning in terms of sustainability was mentioned by Annette and this was centred on the proper operation of existing physical resources. Due to the malfunctioning of the BMS that operated the louvres, as I identified in Chapter Five, professional learning for the staff was organised on a whole-school pupil-free day. This session was to show the staff how to manually override the digital BMS system. It was recognised that teachers may not have that foundational knowledge of how airflow works and how the school physical infrastructure, for example the louvres, can be utilised to regulate the temperature, *“We had a team talking [to the staff] about opening your louvres at night. You know that’s essential; that releases the hot air... we need to revisit that... because we can override it and have it on at a certain temperature... so we’ve really got to train teachers on the best way to use this”* (T2: L714, 22/11).

Whilst it was recognised that teachers needed this knowledge, the professional learning did not appear to have the aim of raising teacher awareness about the principles and concepts behind sustainability in the broader sense. I noted there could be a possible connection between one of the central goals of the AuSSI schools program that I discussed in the policy infrastructure section, that of a focus on the economic savings that can be made at the school level as opposed to a focus on economic sustainability which has a more expansive and transformative view such as seeking to make changes beyond the school gates. In fact, the discussion around the reasons for this professional learning with Annette about how to use the louvres effectively appeared to emanate from cost savings rather than necessarily primarily pedagogical growth: *“Is the best way to have it [the air-conditioning] on when they [the children] come in from lunch so you can get the temperature to 24? We really need to work to make sure that we get it to 24 and then we switch off. But is it more economical? ... it might be more costly... that’s where a fan can be better. And that’s... another aspect we’ve gotta (sic) learn with our sustainability. Where do fans come in helping us with cooling as far as do we*

get it to 24, switch off the air-conditioning, and then leave the fans on? ... there is a cost benefit to us if we can cut down the costs” (T2: L722, 22/11). Thus, where professional learning about sustainability was offered to teachers at the school, it focused on low, level perfunctory elements that appeared to contribute little to teacher PCK nor understanding of the concept in a deep holistic and transformative sense. For example, teachers were mainly offered such learning on the whole-school pupil-free days, and as these sessions were run by Adam, they did not incur any cost.

In contrast, there was a discernible emphasis on professional learning opportunities for teachers in literacy and numeracy which is illustrated in the list drawn from the school’s Annual Reports from 2012-2017 in Appendix U. I suggest that the emphasis on accountability and mandated reporting, as I identified in the section on policy infrastructure, not only impacted the type of professional development offered within the school, but also the type provided by external providers that teachers were funded to attend outside of the school context. In fact, Christine voiced concerns about the narrowness of what had become acceptable uses of professional learning time and money saying, *“All professional development is now related to literacy and maths. They complain because the health person wants to do a session on diabetes –they say this is wasting time” (T2: L90, 26/3).* Indeed, over my time in the school this sense of a focus on literacy and numeracy became quite strong in my mind as I noted in my field notes:

The teachers speak of a lack of connection, integration, lack of real direction and knowledge about sustainability. Anne’s actions [in her classroom teaching] relay the message that there are other more pressing priorities (NAPLAN) and sustainability can only be considered if it fits to meet the literacy and numeracy outcomes. Sustainability is definitely an ‘add on’, not a central organising concept here (JR: 284, 25/11).

In particular, this focus on improving NAPLAN performance had appeared to negate the need for professional development for teachers in what and how to teach EfS (see Chapters Three and Five for additional information on the effects of NAPLAN). Annette acknowledged this shift away for professional learning related to

sustainability and admitted one of the barriers was the cost, as Adam has also identified. That said, despite an ethos of sustainability espoused by the school, as I identified in earlier chapters, a key driver of the school did in fact appear to be literacy and numeracy. Annette explained the school's focus on literacy and numeracy was necessary as they have had to "...pick up our standards" (T2: L585, 22/11) and was pleased this seemed to be paying off with higher NAPLAN results. She recognised the irony of sustainability being one of the three central planks of their Business Plan but not receiving much attention, saying "...the actual professional learning involved with sustainability has just gone to the back a little bit, but it's not lost... we used to... do a lot back here [then] you know" (T2: L585, 22/1). Wistfully, Annette lamented the principal's role, "Every area wants a little bit of you and then you've gotta (sic) balance that with, well, the kids who basically gotta be able to read and write and [be] numerate so that's gotta come first" (T2: L616, 22/11). Thus, the core business of school was still about basic skills of reading and writing which seemed to relegate issues such as sustainability to the periphery.

This was perhaps due to the current pedagogical climate as one that privileged the attainment of results in literacy and numeracy as attested to by Christine in her comments about this being the driving force with even very young children: "The pre-primaries have to do an hour of literacy and an hour of mathematics every day. And they don't do any art and very little play... [even though] they learn through play" (T1: L129, 23/11). Moreover, the need to get through the literacy and numeracy materials in preparation for NAPLAN testing had an effect on the kind of teaching that was implicitly encouraged for all teachers and, for Robert, this expressed the way his teaching had to change over time, saying there was "...a massive focus on... explicit teaching, so I was going from the 'learning your own way stuff' to explicit, 'this is how it's done'" (T1: L339, 20/11). He also observed that the type of professional development provided for the school reinforced this message and went on to talk about the way they are now encouraged to teach which is through explicit teaching, saying "They call it 'I do, you do, we do'. So (when) you do something you show it exactly how it needs to be done then you do it together then they do it independently rather than the exploring learning" (T1: L340, 20/11). As a consequence, the effect of this type of prescriptive, directed teaching that is perceived as efficiently teaching the discrete facts and skills required, permeated to Robert's Year 6 class, and those other

year levels who were not subject to the NAPLAN testing. Other teachers such as Adam, Anne and Mary also made similar comments supporting this view that this had become a pervasive feature of the school pedagogical climate.

Reflecting on this apparent contradiction in practices at Amity PS, Christine offered a rationalisation for it, saying that the principal and deputy principals of the school had *“Their own agendas... they’ve got to have visible things to show for the work they have done”* (T1: L343, 23/11). By this she explained to me that she understood this was the system of education in Australia and she didn’t blame her leadership team as there was just so much change in schools it had become so difficult to embed any new program or idea. She understood the pressures faced by school leaders who would be held accountable for how their school performed on external measures such as NAPLAN and the My School website (see Chapter Three). To illustrate this thinking further, she pointed out the prescriptive expectations of the Australian Curriculum on teachers to cover content: *“There is not enough time to teach because there is so much to cover in the curriculum, therefore only drill will work”* (T2: L78, 26/3). This means that teachers are overly concerned they have covered all the topics rather than devoting more time to teaching in depth. My reflections in my field journal regarding Anne’s Year 4 class echo the sentiments of the teachers undergoing this performative regime:

It really jars me as teachers when I see the kids come in from the garden and there is no pedagogical segue from the garden lesson to the lesson on phonics. It reminds me of the arbitrariness of our system of schooling that encourages us (and rewards us) for dividing our day into segments that ensure we meet our instructional time targets for each precious subject area. Dare we blend and blur the time boundaries and we risk the danger of ‘leaving something out’, ‘pushing something important aside and focusing on our pet subject likes’ (JR: L47, 12/9).

I wondered to myself after reading this journal entry again, what kind of teacher can actually marry the requirements of DETWA – with such a broad Australian Curriculum to cover and also with the spectre of tests such as NAPLAN looming over their heads – with the goals of EfS? How do schools reconcile such competing demands? I felt Christine summarised the paradox of the emphases the school had

adopted when she said “*It kind of... looks good on the surface but when you scratch deep, there’s not very much there. It’s a bit like an IKEA school: it’s quite good for that short time and it looks good and shiny... but the point is it doesn’t last long*” (T1: L392, 23/11).

These competing pressures on teachers at Amity PS meant that in the few precious whole-school professional learning days at the beginning of each year and at the beginning of each term, the priority was clearly literacy and numeracy. In effect, the staff were left bereft of any further knowledge development about sustainability unless they were prepared to put in their own personal time and effort, and often this was after hours. Even with the moral support of the leadership team, as is the case with this school, the lack of redirection of funding – and thereby impetus – means the steps towards EfS are very small and incremental indeed.

I would like to stress that this is not only the case for sustainability but it remains ‘the elephant in the room’ when policy makers or educational critics lament about teachers not adopting shiny new initiatives. There is a distinct lack of recognition of the enormity of the task and the cognitive and physical effort required to take on new things or to steer their schools in new and different ways. I believe it does take deep teacher PCK of sustainability to pursue EfS, as has been shared with me by the teachers at the school, and as such they need support with this through ongoing professional learning. My conclusions here were that schools had no choice in this environment of audit and accountability; however, the resultant effect was contrary to the goal of EfS – superficial learning and no deep embedded change in terms of sustainability. The emphasis on literacy and numeracy has shown itself to be detrimental to EfS at Amity PS, thus we are faced with – ***Paradox 10: EfS requires deep teacher PCK of sustainability concepts versus reduced professional learning favouring literacy and numeracy*** (Kuzich, Taylor & Taylor, 2015).

Summary of key findings

There were two paradoxes that emerged from the findings:

Paradox 9: A school staff with personal interest and engagement with sustainability as useful but not sufficient to ensure sustainability is imbued within the school-based curriculum.

Paradox 10: EfS requires deep teacher PCK of sustainability concepts versus reduced professional learning favouring literacy and numeracy.

The first finding from examining the pedagogical infrastructure at Amity PS was that having teachers who have had personal, ‘out of school’ knowledge of, and engagement with, sustainability practices, was useful but not sufficient for EfS. Paradox 9 speaks of the chasm between personal knowledge and practices in sustainability and the necessity for deep engagement, and conceptual content and pedagogical understanding. Paradoxically knowledge of, and engagement in, everyday practices of sustainability can also act as a counter affordance to EfS because the sphere of engagement may restrict and redirect attention to purely visible and largely environmental aspects of sustainability. Therefore, personal interest and engagement with sustainability, whilst identified as a valuable asset to the school, did not appear to translate into PCK of EfS. This finding addresses the first research question: “*What do teachers understand by, and how do they interpret, sustainability?*”

The second key finding was in relation to the impact of teacher knowledge and professional learning in sustainability on how EfS is embedded into school practices. This finding relates to research question three: “*How are teachers supported in their understanding and interpretation of EfS?*” As evidenced with the data presented for Paradox 10, competing priorities emanating from a paradigm of teacher accountability have seen literacy and numeracy take precedence over EfS for teacher professional development time and funding. This propensity has the effect of a counter affordance to teachers developing deep knowledge and understanding of sustainability, and therefore impacts on their PCK for EfS. These findings must be measured against the fact that schools face the ongoing dilemma of distributing finite resources to ensure educational outcomes are met and have to reconcile competing demands in order to do so. The decisions made reflect the status or priority given to any given area at any given point in time but may not necessarily remain static. New priorities are established through a continual reflection and review process and funding allocation can alter accordingly, therefore, the information presented in this chapter is best viewed as a snapshot in the school’s developmental continuum.

People (human) infrastructure

In this section I focus on people, the human element within Amity PS, who have enabled the latent potential of the policy, pedagogy and physical infrastructures to come to fruition. I have chosen the label people (human) quite deliberately as to serve as a touchstone for the endeavours toward sustainability. People (human) serves to remind us that when we are discussing embedding EfS in schools we need to step back and think about those young humans we are educating and how well our policy, physical and pedagogical infrastructures that govern our system of education serve them in pursuing sustainability. It reminds us also that all staff, teaching, non-teaching and administrative, are integral to this endeavour and therefore they deserve the respect and support to enable them to carry out the important work of EfS as well as recognition for what they have and continue to achieve.

Sharing and ownership of EfS

As I have identified in the section on pedagogical infrastructure, a number of teachers at Amity PS expressed their lack of knowledge and awareness of sustainability, noting they needed further support. One example of this was Tarryn who identified that, for her, *“Adam tends to take the sustainability stuff all on his side so I’m not aware of a lot of the stuff that’s happening, but I’m becoming more aware of it”* (T1: L168, 14/9). While she was aware of all some of the physical and visible aspects of the environmental dimension of sustainability (see my explanation in the section on pedagogical infrastructure above) she was not au fait with how the school was operating in terms of sustainability. In fact, despite the school being part of the AuSSI/SS-WA network and having handprint and ecological footprint symbols around the school, Tarryn expressed surprise at what these were, declaring *“AuSSI schools footprint and handprint, what’s that?”* (T1: L409, 14/9). It was noted that as she was a Year 2 teacher, her involvement in sustainability was considered to be more peripheral than for those Year 3 and 4 teachers who were part of the SAKGP. As with Tarryn, Robert also expressed a lack of awareness of what was occurring across the whole school with regards to EfS rather than just in the SAKGP focus Years of 3 and 4, stating *“Everyone throughout the school might be doing something amazing with sustainability. But I don’t know personally what people are doing”* (T1: L45, 20/11). Similarly, Audrey commented that she was not connected to what was happening with

sustainability at the school as “*Adam kind of takes on all the sustainability part of it*” (T1: L294, 16/9).

Nancy also appeared to have very little formal connection to what was occurring in terms of sustainability within the school. Like Tarryn, she also expressed an awareness of many of the same concepts about sustainability (see again my comments in pedagogical infrastructure). She did, however, relay to me that she had taken the initiative in taking her class to visit the kitchen garden. However, this was quite a restricted visit as her Kindergarten children are not allowed to pick the vegetables, or collect the eggs – this is only permitted for the children in Year 3 and 4. As such, she knew that her class “*...don't really have a role in the garden in kindy*” (T1: L22, 6/12). Nancy also wanted to use the kitchen; however, she voiced concerns about her “*...children being able to work at the benches*” because they were designed for bigger children, as “*...they're so tiny and it's hard for them to stir [the food in the kitchen]*” (T1: L114, 6/12). Even if they were permitted to use the kitchen, Nancy knew that it would be on the days the kitchen chef was not there. As a result, the Kindergarten teacher and children would be unsupported, unlike the Year 3 and 4 classes who always have assistance provided by the chef.

She also found that resources on EfS were somewhat lacking, noting “*I made a book 'cause [sic] I couldn't find a book in the library about caring for the world that the Kindergarten children would like*” (T1: L230, 6/12), also claiming that there were none that were useful or appropriate for such young children. Therefore, it can be seen that support for her desired activities relating to sustainability was not readily provided by the school, a fact she partly attributed to a lack of connection with the main part of the school as the Kindergarten and the school only had two meetings a year. Nancy mused this was because of “*...an ongoing problem between the lower primary and the upper primary that there's a disconnection*” (T1: L389, 6/12).

There was, however, some attempt at introducing more collaboration and collegiality within the school in relation to EfS. For example, Robert was poised to take over the sustainability coordinator role from Adam the next year. This was with an aim to share the workload in managing sustainability at the school. He seemed to acknowledge the lack of awareness of what was happening in terms of sustainability at a whole-school level and he described that his first task was going to be implementing what he termed

“...the accountability of sustainability”, explaining, “...so that [we can all see] what people are actually doing in regards to sustainability in their classrooms” (T1: L42, 20/11). Robert’s aim was to showcase and share ideas across the staff of how sustainability could be – and is being – incorporated into everyday teaching. However, he was conscious of his own lack of knowledge as, despite being a teacher for 4 years, the first 2 years he taught outdoors as a physical education specialist. This year was the first time he had had to implement actual content from all curriculum areas into his own teaching. As such, he felt a little lost with his own practice as a teacher first of all, as he was still developing as a teacher, but also more so in terms of sustainability, expressing his concern that “I might not be quite doing it in the right way and everyone else is actually incorporating a lot more than me...” (T1: L160, 20/11). However, he was hopeful that with the new school Business Plan and operational plans like the Triple S, he would “Get it [sustainability] into... the consciousness of people” (T1: L171, 20/11).

However, in the current year, of all the current teachers interviewed, it became clear that it was Adam who bore the brunt of the responsibility for sustainability within the school. As well as being a teacher for his own Year 4 class, Adam also had a huge responsibility in the school, managing the SAKGP as well as being the sustainability coordinator, particularly given he was only in his second year of teaching. He knew he was given these roles despite his teaching inexperience due to his science background, saying *“I certainly think it helped. Obviously, it showed that I’ve got a passion for sustainability and it was also having that unique skill set that other teachers don’t have. So they obviously thought we will give him a shot at it” (T1: L114, 14/9).*

He explained to me his roles spanned *“...two separate programs. So there’s the sustainability program and the Stephanie Alexander program. So my job description pretty much falls in as program coordinator of the two” (T1: L28, 14/9).* He was also instrumental in setting up multiple sustainability programs such as *“Waste Wise, Water Wise, all the programs which are of part Energy Wise” (T1: L33, 14/9).* Adam elaborated on his role further, stating, *“I did all the paper work, the grant applications, help teachers integrate them into their classroom. With the Stephanie Alexander, I did the liaising between the kitchen and the garden specialist, and the classroom teachers, and the admin and again do a lot of that trying to integrate it into the class curriculum”*

(T1: L35, 14/9). In summary, he suggested his *“Most important role was to manage the grants and the sustainable infrastructure around the school ‘cause (sic) we were a purpose-built sustainable school. So I have to go out and get the funding, make sure that any funding we have received is acquitted and that we’re following the policy guidelines, make sure teachers are using that infrastructures there so they’re teaching the kids about the water tanks and the solar panels”* (T1: L66, 14/9).

Adam also directed the curriculum for sustainability. For this he sat down with the kitchen garden chef and the gardener to create the planning documents for the activities for the Year 3s and 4s involved with the SAKGP. This appeared to be the exclusive province of Adam as other class teachers did not appear to get any input into this process. Mary noted that, *“As far as the classroom teacher and the garden and kitchen specialist sitting down to plan, that doesn’t really happen. They send out a document at the beginning of the term outlining what they are doing”* (T1: L65, 14/9). This comment, coupled with the statements made by other teachers (see pedagogical infrastructure), indicated to me that there was not a sense of ownership of planning for sustainability.

Adam appeared to realise this as he indicated to me that he was very keen to empower teachers and get them engaged in integrated, cross-curricular thinking. He formed the Triple S Committee (see policy infrastructure) which Nancy, Anne, Robert and Mary also became part of. Although these teachers had expressed previously that they felt somewhat disconnected from sustainability within the school, they expressed to me that this committee had begun to enable them to feel increasingly connected. They were all working together to create an integrated planning document to enable teachers to make explicit what sustainability aspects could be taught and to show the interconnections and natural synergies between the different curriculum learning areas.

In reflecting upon their sustainability journey, Annette acknowledged with gratitude that the first sustainability coordinator at the school, Elaine, had created an impressive physical infrastructure and had also established processes and ways of working in the kitchen garden and the SAKGP. There was no question that Elaine, like Adam, had great knowledge, however, she preferred to work alone and thus had not engaged the teachers across the school in the thinking and practices of EfS. However, she had been

instrumental in getting grants that helped establish a dedicated and equipped kitchen area, the corresponding garden space to harvest, as well as the aquaponics system that was associated with the SAKGP.

The physical infrastructure for sustainable practices was evident and strongly represented within the school. It was an important visible manifestation of sustainability within the school grounds. However, there was a sense that developing the physical infrastructure was a first and necessary step but that the next step needed to be building a culture of sustainability in the school. The expectations are that the school should have sustainability embedded within all its practices as they are the implicit expectations of being such school built on sustainable principles. In terms of integrating EfS across the school, however, it is now recognised that the key change agent in the past had actually been a counter affordance. Professional sharing was a key aspect to teacher engagement with sustainability and with the new sustainability coordinator, Adam, this was only now beginning to occur. When Elaine left her role, it was time to move to a new phase of development for sustainability at the school.

In this new phase of development, with much of the physical groundwork done, Annette saw that there could now be a greater emphasis and consolidation of sustainability across the school – Adam was effectively considered a change agent. Employing Adam through a merit selection process enabled the school to select him for not only his knowledge but also for his potential capacity in terms of his interpersonal skills. Annette saw these affective skills as a huge advantage for the promotion of EfS, *“Having good interpersonal skills can actually bring groups of people together to actually talking about things and I see that... is going to continue to make a really big difference”* (T1: L147, 8/9).

Annette reflected on the difficulties with the way things worked with the previous coordinator, where people felt imposed upon rather than part of the sustainability developmental journey, and noted how things were changing now the school had Adam: *“The inhibitors to that was that she worked alone and it was very difficult for her to articulate in a way that people were inspired or enthused so they didn’t come on board easily. So things she did or set up she basically did alone and it became ‘have tos’, which didn’t work particularly well but she put a lot in place. She really did put*

a lot in place, but now, it's really interesting those practices are happening. People are involved" (T1: L151, 8/8).

The lack of engagement and collaboration with the staff at the school at that time meant that Elaine appeared to be taking excessive ownership of the sustainable garden and affiliated resources – such as the enclosure for the chickens – and, as such, teachers and students found it difficult to feel included. Annette noted, *"So it was obviously easier to keep the garden locked than to have to deal with kids that are in there and then obviously the teachers that are involved, or the programs, and teachers found very much so that if they looked after the chooks it was never done properly or they'd get there and the eggs had already been collected"* (T1: L358, 8/9). It therefore was evident that Annette appreciated that knowledge alone was not the key to change towards sustainability.

Annette also relayed to me her observation that teachers adopting a new initiative need opportunities for trial and error and to grow in their knowledge through problem solving collectively. She commented this was not possible previously but was now beginning to occur and highlighted the need for complementarity of both the physical infrastructure and the people infrastructure: *"...the next step hadn't been taken... it should've involved all of the staff... making it a program that everybody was actually [a part of]. It's just a given culture at our school and that wasn't there, and a lot of that boiled down to the leader not being able to collaborate or lead others"* (T1: L355, 8/9).

I would also suggest here that none of the other infrastructural elements stand-alone – they each interact and intersect with each other in multidirectional ways and are constantly shaped and reshaped over time. Therefore, when considering the embedding of EfS within a school, we need to consider not only the physical and people infrastructure but also the policy and pedagogy. These four elements are best thought of as a 'system' that creates the 'whole' and is what I argue should be considered in the development of whole-school sustainability plans.

Annette's statements implied that Adam in the role of sustainability coordinator made it easier for staff to get involved and shared the ownership of sustainability across the school. So, employing people with particular skills – as was the case with Adam,

Audrey and the gardener – was a deliberate choice and has been effective in highlighting to teachers visible aspects of sustainability around the school. Yet, in terms of embedding sustainability within the curriculum, that is EfS in the classroom, it is the teachers that are formally responsible for this. As we have evidenced earlier, although the teachers interviewed certainly expressed some knowledge about aspects of sustainability, the leap to teaching EfS still needs a great deal of support.

I concluded from all this that establishing new practices in a school, such as EfS, requires key personnel who can initiate and drive the new ideas and structures and act as ‘change agents’; however, it also requires the ability of those key personnel to ensure all staff can feel ownership and agency. It is evident from the commentary from teachers that other examples of individual sustainability practices are occurring at Amity PS that contribute to a potentially strong pedagogical infrastructure for sustainability that serves to afford EfS at the school. Yet it still remains that teachers have not engaged beyond a superficial and restrained way due to both perceptions of more pressing priorities and the absence of professional sharing, therefore we arrive at – *Paradox 11: A school culture driven by change agents and professional sharing promoting EfS versus a lack of ownership and understanding by teachers* (Kuzich, Taylor & Taylor, 2015).

Summary of key findings

Examining the data has from the people (human) infrastructure at Amity PS has identified a key paradox- Paradox 11: A school culture driven by change agents and professional sharing promoting EfS versus a lack of ownership and understanding by teachers (Kuzich, Taylor & Taylor, 2015).

The people (human) infrastructure, I would argue, is at the fulcrum of the embodiment and transformation of EfS from a theoretical aspiration to a situated reality. The very essence of sustainability, in its broadest conception – with EfS as its pedagogical manifestation – encapsulates a systems view where no element and, by analogy here, no human (people) takes precedence. Whilst it cannot be disputed that individual humans can effect progress and change towards EfS, as can be seen by the examples of the change agents at Amity PS that this situation creates a counter affordance. The paradox here is that change agents are required to create change but must very quickly dissolve their ‘lead’ in order to build agency and ownership of EfS in others. It is

therefore not only about the change agent sharing knowledge, as was identified in Paradox 11, but also about building capacity.

Overall, the three paradoxes that have emerged from the pedagogical and the people (human) infrastructures have illuminated the contrast between the idealised intentions of EfS with the reality of the school.

Chapter summary

In this section I have examined how pedagogical and people (human) infrastructures have provided affordances and also served as counter affordances for implementation of EfS within Amity PS. I have identified three paradoxes that have arisen from my interpretation of the data in relation to these two infrastructures. In the next, and final chapter of the thesis I draw together the findings from both Chapters Five and Six in relation to the policy, physical, pedagogy and people (human) infrastructures. I reframe the findings from Chapters Five and Six and discuss them in relation to the three emergent themes of fragmentation and disorientation, dislocation of affordances, and deep inertia. In addition, within this analysis I revisit the literature to explain my enhanced understanding of issues generated throughout the thesis. This thematic analysis is concluded with a summary of the key findings in response to firstly, each research question, and then, to the overall aim of this research. I then offer personal final reflections on my learning through engagement with this research. I follow this with an outline of the limitations of the study. I conclude the chapter with recommendations for infusing sustainability ideas and concepts into our education system.

Chapter Seven: Discussion and conclusions

This study investigated how sustainability was understood and interpreted in the context of Amity PS, a purpose-designed and built primary school in WA that incorporated ecological sustainable design principles as an integral element of its built environment. Through data generated from in-depth interviews, fieldwork observations, reflective journals and document analysis, I laid bare the elements of, and happenings within, the school site, and also within the policy frameworks at both macro and micro level, in order to ascertain my overall research aim – how the current system of schooling in Australia affords EfS.

The purpose of this chapter is to frame and discuss the findings I have presented in Chapters Five and Six in relation to my three research questions in order to address and draw conclusions about my overall research aim. The research questions were:

1. What do teachers understand by, and how do they interpret, sustainability?
2. What conceptualisation of sustainability is presented in EfS initiatives and policies?
3. How are teachers supported in their understanding and interpretation of EfS?

The chapter commences with a re-presentation of the 11 paradoxes generated in Chapters Five and Six that form the key findings of my initial analysis and interpretation of interviews, observations, reflections and documents. In the next section I introduce the three key themes that form the basis for my discussion in this chapter– fragmentation and disorientation, deep inertia, and dislocation of affordances. I also provide an explanation of how these three themes emerged from my findings and provide a rationale for their use in this discussion chapter. Following this, I analyse and discuss each theme in depth. As part of my analysis, I also draw from the wider research literature previously presented in my literature review in Chapter Two, and bring in new literature from complementary and relevant theorists to explicate my ideas as required. The analysis and discussion of the three themes are then brought together into a summary of responses to each research question, and to the overall research aim.

The final parts of the chapter offer reflections on my own learning in light of the journey of inquiry I have undertaken in relation to sustainability and EfS at Amity PS,

and acknowledge the limitations and considerations of the study. I conclude the chapter with recommendations for a number of stakeholders – schools wishing to engage in the EfS journey, including Amity PS, policy makers and curriculum developers, and those who may wish to conduct further research in this area.

Digging deeper into the paradoxes

In the previous two chapters, Chapters Five and Six, I presented my research findings. In these, I have deliberately allowed the empirical material to form its own sets of narratives and have eschewed the application of any specific theoretical or thematic lens. My preference was to enable the ‘salient narratives’ to emerge and I did this through repeated engagement with the materials, disturbing, ‘re-turning’ as you would do when tilling the soil, and contemplating the findings. Therefore, through these two findings chapters my aim was to disassemble what was occurring both at the school and at a policy level in order to more clearly examine the different components.

As a means of this diss-assembly, my findings in these chapters were presented in relation to the four infrastructures described in Chapters Five and Six – policy, physical, pedagogical and people (or human). These were determined from my initial data analysis as having constellated to describe the practices apparent within Amity PS. The crystallisation of these collective findings was articulated through 11 paradoxes which I now represent here collectively:

Policy infrastructure

- Paradox 1: Increasing global environmental, social, economic and political crises are met with a cessation of funding and policies, and a reduction in funding of programs and agencies supporting EfS.
- Paradox 2: The affordance of sustainability as a CCP in the Australian Curriculum versus a lack of policy mandate to teach it.
- Paradox 3: The affordance of a policy framework that has the potential to engender strong, effective understanding and interpretation of EfS versus a fragmented and disconnected representation of ideas and concepts about sustainability within the policy documents.
- Paradox 4: Policy rhetoric espousing holistic consideration of all four dimensions – environmental, social/cultural, economic and political – in a

systemic, interdependent way versus reality presenting EfS as largely being synonymous with narrow, environmental aspects.

- Paradox 5: EfS' espoused intent is to effect global change versus the actual result of guidance provided to schools that limits the sphere of action to largely individual actions within the local, micro level.
- Paradox 6: Schools afford great possibility to nurture EfS-focused pedagogy versus accountability and reporting imperatives as a strong 'counter affordance'.

Physical infrastructure

- Paradox 7: Teacher engagement with the tangible structures and features of the SAKGP creates a view that sustainability is largely about visible, environmental aspects.
- Paradox 8: The affordance of sustainability infrastructure versus malfunctioning elements paired with ignorance of key sustainability features.

Pedagogical infrastructure

- Paradox 9: A school staff with personal interest and engagement with sustainability as useful but not sufficient to ensure sustainability is imbued within the school-based curriculum.
- Paradox 10: EfS requires deep teacher PCK of sustainability concepts versus reduced professional learning favouring literacy and numeracy.

People (human) infrastructure

- Paradox 11: A school culture driven by change agents and professional sharing promoting EfS versus a lack of ownership and understanding by teachers.

These paradoxes largely provided the answer to the 'what', yet there still remained the 'how', the 'why', and the 'so what' that begged further exploration. In the next section of this chapter I address and explain not only how these now disparate elements represented in these paradoxical statements connect – how they 'speak' to one another – but also consider 'how' and 'why' they form part of a consciousness around EfS, and identify why this is of significance. As I continued to be immersed in my data presented through the previous two chapters, and as I remained engaged in a reflexive and iterative process of analysis, new sparks of insight, connections, similarities,

repetition of ideas and metaphors developed (Ryan & Bernard, cited in Bryman, 2012; Srivastava & Hopwood, 2009). Using Srivastava and Hopwood's (2009, p. 78) process of questioning – “What are the data telling me? What is it I want to know?” and “What is the dialectical relationship between what the data are telling me and what I want to know?” (see Chapter Four) – caused me to reframe the 11 paradoxes in light of my research questions, thereby enabling deeper explanations for my findings in relation to my overall research aim. Indeed, the development of the paradoxes from the participants' accounts and document analysis only represented the first level of conceptual abstraction of meaning. In seeking to pursue a more underlying, implicit meaning of this data, three themes also emerged that elicited the “essence of the participant's experiences” (Vaismoradi et al., 2016, p. 101) at Amity PS, thereby representing an even higher level of abstraction. The three thematic trends captured and expressed the central core of the issues underlying the paradoxes and were identified as fragmentation and disorientation, dislocation of affordances, and deep inertia. Further analysis of these enabled me to provide a more coherent interpretation and explanation of my findings.

In the next section of this chapter I address my research questions through a discussion of the three underlying themes drawn from the 11 paradoxes. I begin this section by examining the theme of fragmentation and disorientation. Following this, I consider the theme of dislocation of affordances, and I conclude with a presentation of the findings related to the theme of deep inertia.

Key themes from the paradoxes

Fragmentation and disorientation


In this section I analyse all of the 11 paradoxes in order to address my research questions through the thematic lens of fragmentation and disorientation. I use the term fragmentation to represent my interpretation of how sustainability and EfS were evidenced in the lifeworld of Amity PS teachers as either disparate elements that did not appear connected, or as elements that were only loosely connected in some way, and/or as elements that were having difficulty adhering together. The notion of fragment suggests the possibility of a whole. In this case, the whole may be considered to represent the holistic view of sustainability that I have defined in the literature review. This encompasses a whole-school approach to EfS, a holistic systemic view

of how the world works that eschews reductionist, atomistic thinking, and a wholesale emphasis on EfS in curriculum and pedagogy at all levels, from macro to micro. The term disorientation, as it suggests, is a disruption in the orientation, the desired direction. It suggests the GPS is in error. I am signifying with this that we do not seem to really know where this is actually taking us, nor what we are doing right now in schools. This fragmentation of understandings about sustainability and EfS has, I argue, caused actions in the school context to appear to be following a map that is written in two languages, spelling out contradictory pathways.

As an example, how teachers have understood and interpreted sustainability at Amity PS is, in my view, inextricably linked to influence of policy documents like the Australian Curriculum and to policy initiatives such as the AuSSI/SS-WA and the SAKGP. Paradoxes 2, 3, 4 and 5 commented on these policy drivers for sustainability at the school. In answering my first research question – What do teachers understand by, and how do they interpret, sustainability? – it is therefore necessary to begin with a response to the second question – What conceptualisation of sustainability is presented in EfS initiatives and policies?

In summary, the genesis of the fragmentation and disorientation of teachers in relation to sustainability and EfS, in my summation, can be found in three realms – temporal fragmentation, logistical fragmentation, and conceptual fragmentation.

Temporal fragmentation was evidenced in the way the Australian Curriculum was developed and implemented. Fragmentation of understanding about sustainability, I suggest, occurred as a result of both the incremental way the Australian Curriculum was devolved and implemented in each state and territory of Australia, and the fact that all eight learning areas of the Curriculum were not developed simultaneously from the outset to ensure coherence of the warp and weft of understandings, knowledge and skills within learning areas and also across the years of schooling. As a result, the development of the Curriculum was piecemeal, with teachers only being able to work with the four learning areas of history, science, English and mathematics in 2010, having to wait for the remainder of the learning areas to be ‘drip fed’ through the educational system all the way through to 2016. This, in my view, is one factor that prevented teachers from being able to gain a holistic, interdisciplinary overview and understanding of sustainability.

In terms of logistical fragmentation, there were issues again with the Curriculum; however, in this case, these were to do with the visibility and coherence of the Sustainability CCP (see Chapter 5, p. 148-154, and Paradox 3). Teachers at Amity PS expressed their lack of engagement with the Sustainability CCP for a number of reasons, a central one being that in effect sustainability as a ‘priority’ was relegated to relative obscurity and thereby became largely impotent. The findings indicated there were three main reasons for this – the sustainability tags, noted with the three pointed leaf icon, , were inaccurately mapped against content descriptors and elaborations; the online architecture prevented easy discernment and viewing of the sustainability tags; and there was limited detail evident in the text of the Sustainability CCP statements that could support and guide teachers’ interpretation and enactment of sustainability. In addition, as Paradox 2 identified, it was only the Curriculum content descriptors that were considered compulsory to teach and were subject to assessment and reporting, meaning that the tags connected to any of the elaborations could be totally ignored by teachers as they remained an ‘optional extra’. I therefore concluded that the way the Curriculum was designed, and the way the Sustainability CCP were presented to teachers on this online platform, acted as a deterrent to both teacher engagement and uptake in teaching through a lens of sustainability.

The third level of fragmentation I identified in the findings was that of conceptual, and it is at this level that evidence of disorientation also became evident. Within the Australian Curriculum, for example, the development of a conceptual understanding of sustainability was disrupted by not only those factors mentioned in the previous section of this chapter, but also due to the lack of meaningful connection between the tagged content descriptor or elaboration and the principles and concepts underpinning sustainability. Some of the tagging resulted in such obtuse connections (see Figure 5.1, p. 142) that it would have been very difficult for a teacher to understand the sustainability intentions. In addition, the lack of an explicit representation of a coherent, sequential developmental of content knowledge, skills and attributes related to the sustainability concepts through the year levels – due to ad hoc tagging in both disparate learning areas and year levels – I believe severely conspired against a holistic sense, and understanding, of sustainability. Thus a disorientation is evident from a view of sustainability as being a truly transdisciplinary force within the Curriculum to

one that has been presented as largely incoherent and incomplete, as identified in Paradox 3.

Moreover, Paradox 4 identified that fragmentation and disorientation was also evident in the policy documents and initiatives in relation to the understanding of sustainability as being premised on the four interdependent dimensions of sustainability – the environment, the economy, the social/cultural and the political. In the Australian Curriculum, for example, there were clear expressions in the introductory statements from ACARA of a holistic consideration of sustainability acknowledging the interdependence of all four of these dimensions of sustainability. Yet, within the bowels of the Curriculum itself, there was very little evidence of this multidimensional orientation. Instead, the Australian Curriculum – in concert with both the national and the WA AuSSI programs and the SAKGP – predicated a view of sustainability as largely being synonymous with physical, tangible aspects of the environment, such as recycling and growing your own food. I characterised this in Chapter Five as sustainability being constructed and interpreted as being ‘visible, tangible and green’ (p. 183) and explained this in Paradox 7. In addition, as I identified in Paradox 5 (p. 171), they promoted a view that limited the sphere of action in order to address unsustainability to the local, school level (micro), and in only in some cases acknowledged the possibility of extension to the local community surrounding the school. I address both of these findings in turn in the following sections.

The first point in relation to Paradox 7 – of EfS as equivalent to the environmental dimension of sustainability – has been a consistent finding across all the policy frameworks guiding teacher practice at Amity PS (see Chapter 5). The Australian policy context appears not to have fully adopted and operationalised the broader, inclusive and multidimensional understanding of sustainability as comprising the four abovementioned dimensions. This disorientation from the global policy frameworks, such as the *Bonn Declaration* (UNESCO, 2009a) and UNESCO’s report, the *Framework for the UNDESD International Implementation Scheme* (UNESCO, 2006), that clearly spelt out the difference between a purely environmental sustainability and a more holistic, encompassing view (see Chapter Two), has resulted in a pervasive discourse that reinforces this primarily environmental view. Other literature also supports the necessity for a concern with the environment but we are

reminded by a number of sustainability researchers and theorists such as Sterling (2018), Huckle (2006), Wals (2010b), Vare (2014), and Perey (2014) that the environment alone is not the only leverage point for change, nor the principle locus of action required.

In turn, understandings of sustainability as being primarily synonymous with the environment – as is manifested in these policy documents – were also evidenced in the physical, pedagogical and people (human) infrastructures of the school. There were a number of key illustrations of this view, addressed in Chapter 5 and codified in Paradox 7 and, to a lesser extent, in Paradoxes 8 and 10. Firstly, there was a lack of funding for the initial buildings themselves by the WA state government; this also included a lack of funding for ongoing maintenance both for the school itself and for other physical structures such as the kitchen garden, the purpose-built kitchen, the chicken coop and the rainwater tanks etc. Other pitfalls were seen in the kinds of professional development that teachers were funded – or not funded – to attend. Additionally, the engagement with the SAKGP was restricted to only the Year 3 and 4 classes. From this, my findings showed that the people (human) infrastructure was critical to enable both the sustainability program and the SAKGP to endure. For example, Adam ran the whole sustainability program across the school, in addition to managing the SAKGP and overseeing the kitchen garden chef, Audrey. Robert was coming on board in the upcoming year as the dual role of sustainability coordinator and manager for the SAKGP as this, alongside teaching his own Year 4 class was becoming unmanageable for Adam. It was becoming apparent that the environmental aspects were becoming a huge superstructure for sustainability at Amity Primary School.

Whilst there is no argument that physical infrastructure such as vegetable gardens, chicken coops, rainwater tanks and solar passive features within the building design is a clear and active enablement of sustainability practice at the school, I argue it is necessary but not sufficient. I consider one of the dangers of an over-reliance on such visible, tangible features is it may disorient us from developing an understanding of sustainability as a holistic, multidimensional concept. There was no evidence from my findings of teachers, other than Adam, being presented with any other views of sustainability to counteract those suggested above. I therefore argue that this narrow

view of sustainability has become a hegemonic one. In effect, it had disoriented Amity PS from pursuing a transformative, ecological view of sustainability. Such a view of sustainability is considered essential and features strongly in the works of Stephen Sterling (see Sterling 2003 and 2014 as an example) and others, including Fien (2001), Woolterton (2003), Jickling and Sterling (2017) and Jickling and Wals (2008).

This conceptual fragmentation and disorientation away from a multidimensional view of sustainability as supported by UNESCO (see Chapter 2, p. 30) was also reinforced by the inclusion of only a small proportion of the Sustainability CCP statements, in either the Australian Curriculum v3.0 or the more recent v8.3, that address the economic and political dimensions of sustainability. My findings also indicated that in the AuSSI schools program the political dimension of sustainability was completely omitted, despite the website suggesting it represented a holistic view of sustainability (DEWHA, 2010a). Where economic sustainability was mentioned, it was in relation to the economic resources of the school only. I suggest that presenting economic sustainability in such a benign way prevents students – and, perhaps more importantly, teachers – questioning, challenging and actioning change to the current structures of the economy that can be considered to be perpetuating inequity and widespread poverty. Instead, students are directed, as I identified in Paradox 5 to think no further than their own school boundaries by acts intended to save the school money such as turning off power switches and recycling paper.

The second point, arising from Paradox 5, that the emphasis is on the local sphere of action is, I believe, influenced by neoliberal views (see Chapter 3, p. 67). It has been suggested that a neoliberal mindset is where the individual is constructed as the actor with choice, and these choices are exercised in social conditions where the “collective conditions of experience are rendered into personal problems” (Vare, 2016, p. 5), thus creating a particular relationship between the individual and unsustainability. The stress on a local response and individual responsibility to counteract unsustainability has gained great traction as we are all extolled to ‘do our bit’ with actions such as taking personal responsibility for sustainability in putting our litter in the bin, recycling our disposable materials, and growing our own food. This is pervasive societal meme forms part of the Think Global, Act Local campaign and appears to drive much of what counts as EfS at Amity PS.

Perey (2014, p. 220), however, questions the logic for this “aphorism of change” which suggests all change starts with a small group of people that will, over time, inevitably expand to “higher order scales” through the cumulative effect of individual actions. Webster (2013, p. 298) also challenges this view, labelling it a “fallacy” and suggesting that it “speaks to habits of mind which are products of a worldview which is linear (looks to immediate causes and effects) and reductionist (looks at the parts in isolation and assumes the whole is merely an aggregation of such parts)”. My findings concur with Webster’s view that there is an exaggerated focus on the individual as the locus of change that diminishes the complexity of change. He argues that it is through small actions at the individual level, which Webster (2013) refers to as “gateway” actions or “baby steps”, that delude us into thinking we are dealing with unsustainability. One of the reasons put forward for this way of thinking being encouraged is that taking these small steps poses a threat to no one, that is, the world will continue operating in the mode of “business as usual”. Futurist Alex Steffens (cited in Webster, 2013, p. 299), furious about this proposition that these small actions that salve our conscience won’t change what is needed, warns:

They don’t depress sales of fashionable crap we don’t need. They don’t bring people into the streets or sweep corrupt politicians from office. They certainly don’t threaten the powerful, entrenched interests who are growing fantastically rich off keeping us locked in systems that make our lives such a burden on the planet and impoverish our brothers and sisters elsewhere... we *must* finally admit to ourselves that gestures are not enough. That to be focussed on lifestyle tweaks and attitudinal adjustments at this moment in history is like showing up with a teaspoon to help bail out a sinking ship.

The thinking that creates these views shifts the responsibility – from the corporation or business that produced the rubbish, or the system that formed our central identities as consumers, or the legislation that removes other possible ways of existing in society, to our own personal, individual responsibility (Webster, 2013) – has a neoliberal basis. Neoliberalism presupposes society as a market and everything and everyone in it as a commodity. This view rests on an assumption that every individual acts as an entrepreneur, seeking to maximise rewards for themselves, other than for the collective good. This way of thinking serves to support the current economic and political

structures that seek to serve the interests of an elite and wealthy few. As such, it is the antithesis of the mindset and worldview that sustainability theorists and researchers advocate.

However, the fragmentation and disorientation away from EfS towards neoliberal political influences appears to drive much of what occurs in the name of sustainability within Amity PS and, I would argue, in Australian schools more broadly. It may be no coincidence that the cessation of funding for sustainability programs, as I identified in Paradox 1, and the withdrawal of national sustainability policies from government websites coincided with the election of a conservative federal government (see Chapter Three, p. 66). In this review of the literature I drew attention to the escalation of a discourse of achievement and accountability in Australian schools that has emerged through a pervasive policy creep with its roots in neoliberal ideologies (Lingard, 2010). My findings suggest the policies and programs evident within Amity PS may have the effect of not only disorienting, but also re-routing teachers and schools away from EfS as a transformative force in the education system, to a view where the dominant practices within a school are associated with accountability and standardised testing – in particular NAPLAN – with a resultant narrowing of the Curriculum, ideas identified in Paradoxes 6 and 10.

The findings from Chapter 5, in relation to the policy infrastructure, and from Chapter Six, in relation to the pedagogical infrastructure, certainly show the effects of this accountability discourse. NAPLAN became a huge driver for all pedagogical practice at Amity PS. Illustrations from the findings of this were that the allocation of funding for professional learning was largely diverted to pay for attendance at literacy and numeracy training as this was thought to impact positively on NAPLAN scores (Paradox 10). Teachers were held personally accountable at the school level for their class's performance on NAPLAN, as this performance impacted the school performance, and this in turn impacted the school ranking on the publicly visible My School website. This surveillance and accountability created a negative relationship not only with NAPLAN but, I argue, with the notion of sustainability, as striving to improve NAPLAN scores took away resources of time, energy and money in all other fields.

However, it is understandable that the NAPLAN discourse was one that was hard to challenge – who would not want each child in Australia to have basic literacy and numeracy skills? As Gruenewald and Manteaw (2007) caution, referring to the *No Child Left Behind* policy in the USA, but one which I suggest can be equally applied to NAPLAN, “When the narratives of economic opportunity, global competition, and equity and social justice are conflated in one slick phrase – ‘no child left behind’ [or NAPLAN] – the policy environment and practices behind the rhetoric become increasingly difficult to challenge” (Gruenewald & Manteaw, 2007, p. 175).

I contend that these neoliberal policy influences also fragment official school- and state-based documentation. As an example, it can be argued that the Curriculum disorients teachers and schools away from the broader purpose of education. In addition, their hegemonic effect serves to constrain what can be thought – and said – in schools and, as such, policy instruments can in effect be mechanisms of power and control. In addition, my findings demonstrated there was a schism between the stated purpose and intention of the policies and the practical guidance provided to teachers. This was evident in the Australian Curriculum and in the background information about the AuSSI program. For example, in Chapter Three, the explanation of the intention of the Sustainability CCP seemed to herald that students and teachers working with this Curriculum would literally be enabled to ‘transform’ society as we know it. The same could also be said of the sweeping intentions of the SOI (see Chapter 3, Table 3.4). However, once beyond these statements of intention, the language of the documents quickly retreated into a passive, unchallenging position that appeared to do little to change the status quo of society as is.

This conceptual fragmentation is also evident in relation to the SOI and the Sustainability CCP statements of the Australian Curriculum. The grand, holistic promise for EfS of the nine SOI premised on the conceptual framework of systems, worldviews and futures petered out within the Curriculum as there was no overt or detectable connection between these SOI to the Sustainability CCP statements. This had a twofold effect. Firstly of severing the transformative direction that the SOI promised for EfS from what was most salient to teachers, the mandated Curriculum content descriptors they needed to work with every day as part of their planning for teaching. Secondly of inducing a sense of passivity into the discourse surrounding

sustainability in the Australian Curriculum through privileging the Sustainability CCP that were not necessarily imbued with the need for connection and action as suggested by the SOI. I discuss this second point further in the discussion in this chapter about deep inertia.

In Chapter Five I argued that the findings from the policy infrastructure illuminated how these aforementioned policies and policy initiatives enabled or constrained teachers' understanding and interpretation of sustainability at Amity PS. Moreover, this policy infrastructure shaped and guided "shared understandings" and "practical agreement about what to do" (Kemmis et al., 2014b, p. 32) in terms of EfS. My view is that policy documents are vehicles that convey intentions of governments and those in other positions of power. They are the key stakeholders that shape such policies and, as such, 'speak' a version of beliefs and attitudes. In addition, curriculum, as a central policy platform, is an arbiter of the expression of any given society's beliefs and values, and is therefore central in constructing certain mindsets and encouraging the maintenance or displacement of particular worldviews. As such, I concluded that the policy infrastructure evident at Amity PS exerted a hegemonic influence on teachers' thinking and practices in relation to EfS through the conceptualisation of sustainability presented. Thus, I contend that the temporal, logistical and conceptual fragmentation evident in the findings actively constrained the understanding of EfS, and therefore also constrained the possibilities for EfS in Western Australia. Further, since the same policy frameworks applied nationally, by extension this also constrained Australian schools more generally.

I conclude this discussion of the practices which contributed to and resulted from fragmentation and disorientation by raising hope for future practice. Mayo (2017, p. 45), noting that Gramsci saw education as a means to overthrow the existing hegemonic structures, reminds us "Education can contribute to cementing, disrupting and/or renegotiation hegemony through the kinds of knowledge it promotes". The discussion in this section sought to provide some insight into what kind of education is required, as well as what infrastructures and practices enable or constrain such an education.

Dislocation of affordances

In my research I have consistently used the concept of *affordance* as an illustration of tensions and potentiality in relation to teachers' engagement with sustainability. If we consider affordances as the possibilities for use, for example, of an object, policy or program, this recognises that they may, or may not, be used in a particular way. It is a potentiality. To illustrate, a knife has the affordance of cutting bread but also can be used for murder. The 'thing' does not necessarily dictate its use – it is through the intra-action with the human and non-human world that determines the use. Similarly, in this study, there is an acknowledgement that any affordance can also provide constraint, even simultaneously. According to Hammond (2010, p. 206), "These are not opposites, rather they are complementary, so, for example, a sledgehammer affords the breaking of rocks but the user is constrained by its weight – the very thing that provides opportunity for rock breaking". I have illustrated these more directly as paradoxes throughout the thesis. In this section, I address the third research question that investigates how teachers are supported in their understanding and interpretation of EfS.


By the term dislocation of affordances I mean where the affordances of each of the infrastructural frameworks within Amity PS – as well as those beyond the school's remit such as macro level policies – have created conditions conducive to EfS, yet where, in the end, they have been displaced or disrupted by stymying progress. Examples of such dislocations in this study were evidenced in each of the infrastructures at Amity PS – the policy (e.g. Paradoxes 1, 2, 3 and 6), the physical (e.g. Paradox 8), the pedagogical (e.g. Paradox 9) and the people (human) (e.g. Paradox 11). Each of these paradoxes highlighted the existence of the provision of positive aspects within each of these infrastructures that could be utilised to bring EfS – in its broadest, most transformative sense – to fruition, not only at the school level but also to reverberate and impact beyond the school gates into wider society. However, these affordances were dislocated or stymied due to either an incongruity between the stated intention and the actual Curriculum and pedagogical guidance provided to teachers, or the full utilisation of the resource not being realised.

In terms of the policy infrastructure, a key dislocation was identified in Paradox 1. This cessation of funding and sustainability policy direction (see p. 66), I contend, has served to undermine the support for EfS in schools. In addition, the removal of past

policy papers that were supportive of environmental and sustainability education from government websites has effectively rendered even the historical sustainability discourse mute (Smith & Stevenson, 2017). Thus, it appears, what currently occurs in schools in the name of EfS has been excised from the previous positive policy discourse that was bundled together with political will and financial backing for EfS in schools. It can therefore be argued that, at a time where the world is facing unparalleled crises on all fronts as I discuss in Chapter 1, the Australian government's support for EfS has, ironically, diminished.

Other policy dislocations are evidenced in the findings through the promising, but unrealised, potential of the sustainability CCP in the Australian Curriculum, and the imprimatur of the wider policy framework such as the Sustainability Curriculum Framework, the SAKGP and the AuSSI/SS-WA in particular (as in Paradoxes 2, 3 and 4) which situate a school like Amity PS as a possible site of change and action (as in Paradox 6).

As I have identified in Chapters Two and Five, EfS is actively enabled in our schools through the inclusion of the SOI and the Sustainability CCP. The CCP are harbingers of transformative potential that appear to draw on the wider discourse present in the literature framing EfS as “nurturing transformative learning experiences that can heal, empower, energise, and liberate potential for the common good” (Sterling et al., 2018, p. 324). These broader discourses of sustainability appeared to be reflected in the nine SOI of the Australian Curriculum. These SOI mirrored the direction established by the Sustainability Curriculum Framework. Within these, the sustainability discourse for teachers was synthesised into the three concepts of systems, futures and worldviews, potentially heralding new ways of sustainability thinking and action for the system of schooling in Australia. However, as I have indicated in the previous section, this affordance was ‘dislocated’ as there was no discernible connection between the SOI and the Sustainability CCP, and thus the SOI were rendered inert.

Additionally, as I identified in Paradox 3, the affordance of having sustainability tagged with the three pointed leaf icon  throughout the Curriculum quickly disintegrated into a dislocation of affordances due to the temporal, logistical and conceptual fragmentation discussed in the previous section. That is, the great potentiality of having a Curriculum that explicitly included sustainability in its

conception and design would seem very great, yet it appeared not to have been a vigorous nor instrumental mechanism of support for teacher understanding and interpretation of EfS at Amity PS. For example, at the school level, the affordances of the Sustainability CCP remained unrealised as the teachers expressed their lack of ability to understand and navigate the Curriculum documents. In fact, it was effectively bypassed in favour of guidance from Adam who became a mediator of the Curriculum. Additionally, for small number of teachers, it was mainly their involvement with the SAKGP that seemed to provide some support with understanding at least the environmental dimension. In addition, the SOI, as identified in the previous section, did not even appear to enter Amity PS teachers' consciousness.

However, while it can be seen that the two policy initiatives and influences of the SAKGP and the AuSSi/SS-WA certainly enabled action to occur at the school level, these primarily focussed on only the visible, tangible and green aspects of sustainability that largely was associated with the physical infrastructure (see Paradox 4, p. 165 and Paradox 7, p. 180). My findings suggested, therefore, that the physical infrastructure of the school had become a proxy for sustainability. Furthermore, whereas the SAKGP did not have EfS as its primary goal, the AuSSI/SS-WA unquestionably did. My further analysis of the SS-WA (see p. 169 and Appendix P) also indicated a contradiction was evident in the overarching rhetoric of the program's goals in comparison to the practical guidance for implementation in schools. Consequently, on initial examination, SS-WA appeared to be drawn from, and was created to promote, a multidimensional, transformative view of sustainability; however, by teachers and schools following the guidelines for how to enact the program at the school level – for example through the guidance represented by the social handprint and ecological footprint – they were actually misdirected to a much more parochial approach. Thus the apparent multiple affordances of such a policy initiative – that there was a supportive overarching goal, that the program was backed and funded by government, that this support became the catalyst, in conjunction with the SAKGP, for the school to begin its sustainability journey – has, ultimately, instead had the effect of dislocating Amity PS from a broad transformative view of education.

Nevertheless, there are considerable affordances for EfS both within the school itself, the physical infrastructure, and amongst the staff, the people (human) infrastructure.

For example, the sustainable design elements of the school buildings, as discussed in the physical infrastructure section in Chapter Five (pp. 178-188), provided a rich source of potential learning. However, again, the lack of staff knowledge about the features and the fact that they were falling into disrepair and were now malfunctioning, resulted in this affordance also remaining unrealised (see Paradox 8, pp. 188). As such, the understanding of the environment, and in this case the built environment, as a “third teacher” (Merewether, 2017) was not a pedagogical concept that was evident at the school. Similarly, as I identified in Paradox 9, the ability of the school being able to select and hire staff with ‘outside of school’ interest and engagement with sustainability practices seemed a super affordance for EfS. Yet, the dislocation occurred due to the apparently untraversable chasm between Amity PS staff’s personal knowledge of sustainability and their ability to effectively teach according to the more defined principles, philosophy and PCK of EfS. I suggest that what occurred here was that Amity PS assumed, as many schools presumably would, that personal skills can easily translate into classroom teaching practice.

My findings also pointed to another factor that I suggest needs to be considered seriously by schools hoping to embrace EfS. Teacher interviews revealed a very simplistic, surface level of knowledge about sustainability that mainly focussed on environmental understandings and actions. I argue here that this personal, ‘out of school’ teacher knowledge, whilst useful, is apparently inadequate for two reasons. One is that their knowledge does not appear to represent a deep conceptual understanding of sustainability. The second is that there was little evidence to suggest that teachers were able to integrate even this surface level knowledge of sustainability into their classroom pedagogy. Indeed, the notion of sustainability teaching was characterised as being ‘over there’ by a number of teachers, meaning it was considered a separate, ‘add on’ to the existing Curriculum demands – for example, the lack of consideration for ongoing deep conceptual learning for teachers at Amity PS was evidenced through the lack of funding to attend professional learning and the dislocation of sustainability from the core Curriculum offerings that centred on upskilling teachers about literacy and numeracy. This speaks to the need for deep teacher knowledge of sustainability that I discussed in Paradox 10 (p. 205). Together, these aforementioned reasons reinforce the importance of teachers not only having deep conceptual knowledge of sustainability, but also an understanding of the

Curriculum content that they can artfully marry with their personal knowledge of sustainability as well as with the capacity, and pedagogical expertise, to teach students. Thus, the development of teacher PCK for EfS is of great importance. However, this is not just an issue at Amity PS. The development of this PCK has been identified as a critical element throughout the literature (Loughran, Berry, & Mulhall, 2012; Shulman, 1987).

Another outcome of this lack of PCK was the precipitation of a mindset across the school of a ‘lack of ownership’ of EfS, (see Paradox 11, p. 212). I suggest this phenomenon was connected to having the aforementioned sustainability coordinator who was deemed to be knowledgeable because of his environmental science degree background. Indeed, having someone like Adam at the school was certainly considered, by a number of teachers and the leadership team, as a substantial affordance to the promulgation and development of EfS in the school. The EfS in schools literature certainly does strongly support the need for individuals like Adam that take on the leadership for sustainability, to act as “change agents” (Lewis, 2013; Pepper, 2013). Yet, at the same time, having Adam at the school meant that teachers tended to defer both practical and Curriculum-based decisions, as well as the responsibility for any promotion of sustainability per se at the school, to Adam. The responsibility for EfS, rather than belonging to the whole school and being driven by the whole staff collectively, became dislocated, almost solely in favour of Adam. This can become a self-reinforcing cycle, where the more the responsibility for knowledge and action is deferred to Adam, the less and less knowledgeable and confident teachers would be. My findings showed that Adam did see his role as being one of engagement and empowerment of teachers in terms of sustainability. He understood that he should not be the “keeper of the knowledge”; however, he identified the current Australian policy environment as being a central cause of the difficulties in convincing teachers to engage with EfS.

Two other key issues I noted in the discussion about such policy influences in Paradox 6 and Paradox 10 were the lack of policy mandate to teach sustainability, and the dislocation of the affordance of sustainability within the Australian Curriculum as a prime example – mainly due to the interference of the agenda of audit and accountability, in particular NAPLAN – of the broader enterprise of education (see p.

69). I suggest that a way in which schools, like Amity PS, may choose to deal with such competing policy pressures in the interim – until the fundamental structure of the educational system changes – is to invest in their teachers through greater emphasis on developing a deep PCK, understanding and capacity of, and for, EfS. In this way, teachers would build confidence in their abilities and PCK and I suggest this may, in turn, elevate a sense of ownership of sustainability and facility in EfS. There are certainly a number of studies that strongly support such an approach to the successful integration of EfS in schools (see Evans, Whitehouse, & Gooch, 2012; Green & Somerville, 2015; Kennelly, Taylor, & Serow, 2012; McKeown, 2013; Nolet, 2009). Moreover, I contend that, by doing so, it may increase the capacity of teachers to reverse the priority. My idea being that, rather than teachers at Amity PS viewing literacy and numeracy as the primary goals of schooling and relegating sustainability to the background, the principles, concepts and practices of sustainability could become the primary target, and teachers could consider how literacy and numeracy could – and should – be employed to meet these targets instead. It is still accountability, but accountability of a different kind – accountability to all life on the planet, for now and hopefully for generations to come.

The paradoxes discussed within the body of this thesis alert us to the number of affordances – within the current policy environment in particular – that have been dislocated. Smith and Stevenson (Smith & Stevenson, 2017, p. 79) argue that the current policy environment is a hostile one for those educators who have a holistic, multidimensional understanding of sustainability. My findings from this study support this view of hostility and I argue that this policy milieu, especially over the last 2 decades, has seriously altered how the Australian education system has been enabled to foster sustainability. I propose in this thesis that this policy hostility has resulted in the fragmentation and disorientation, and dislocation of affordances as described in these previous two sections. In the following section I identify how the cumulative effects of both of these transmogrify into a deep inertia.

Deep inertia

In this section I draw together the findings from the previous two sections on fragmentation and disorientation, and dislocation of affordances, in order to address my overall research aim of how the current system of schooling in Australia affords EfS. I do this through the thematic lens of deep inertia as a metaphoric descriptor for

what I contend represents the relationship between the current Australian education system and EfS. I begin this section with an explanation of the theme of inertia. I follow this with a clarification of how my findings from Amity PS, viewed as a fractal, can be considered as indicative of the wider system of education in Australia. I then draw together the findings that exemplify how deep inertia is evident, both at the local, micro scale of Amity PS, and also at the macro, national scale of the Australian education system. Following this section, I draw together my findings and offer a summary in response to the research questions and them to the overall research aim.

By employing the term inertia I seek to denote a resistance to change. Deep inertia refers to the depth and the pervasiveness of the often imperceptible effects of underlying mindsets and worldviews that hold the existing structures in place, and thus either covertly or overtly resist change. As I have identified in the preceding sections of this chapter, and as I illustrate in Figure 7.1, deep inertia is nested and entangled with the assemblages of practices and ideas that have contributed to fragmentation and disorientation, and to dislocation of affordances. I consider that the inverse of this diagram is also true, where deep inertia can at once be a consequence, but also a cause, of the other two. This is represented by the two sided arrows that show the reciprocal relationship between the three themes.

Whilst in the discussion in this chapter I have argued from the point of view of the findings from Amity PS, I now make the assertion that there are similar characteristics evident in other schools across Australia. Whilst I am well aware that the qualitative, interpretive paradigm that guided my study makes no claim to transferability of the findings from this individual school to any others, in this section I point out the systemic parallels from which others may draw their own conclusions. I propose that what is happening to cause deep inertia at the micro scale of Amity PS is also evident at the macro scale of the Australian education system. Hence, in ascertaining my overall research aim of how the Australian education system affords EfS, I turn to the idea of Amity PS as a fractal.

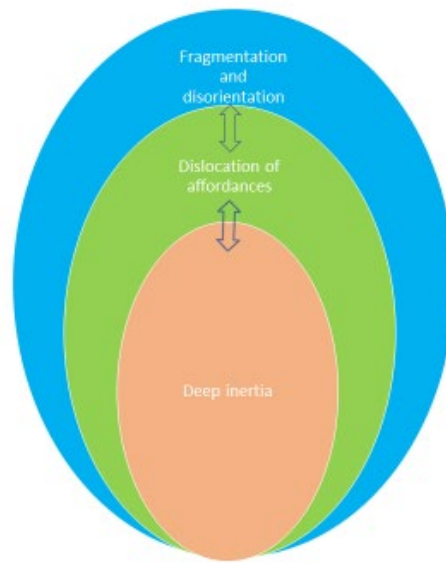


Figure 7.1: Nested elements of fragmentation and disorientation, dislocation of affordances, and deep inertia.

Looking at the micro level of Amity PS, as an individual school, my findings showed there were patterns of activity and ideas that were also evident at the macro level, the Australian education system. This can be explained through the device of the concept of a fractal. Fractals are described as “structures that display self-similarity regardless of scale” where “each fractal structure represents a whole within a whole” (Perey, 2014, p. 216). In this thesis, I suggest that the rules and principles that organised the education system within Amity PS were repeated again at the macro level of Australia-wide EfS policies and initiatives – I argue that the rules that were evident at the micro level represented the rules that were inherent in the whole system. As such, through the successive magnification of small scale features at Amity PS (Pavlovich, 2009) – in particular the elements of the policy, the physical and the pedagogical infrastructures – it became evident that these were very similar to what was occurring at the larger scale. What thinking with fractals enables is the demonstration of self-similarity of practices and mindsets at the micro and macro level, thus making clear the “patterns of interconnection” (Pavlovich, 2009, p. 49). In this way, I propose that my findings from Amity PS can indeed have a voice in understanding how the wider Australian system of education affords EfS.

The overwhelming tone of my findings therefore suggests teachers at Amity PS engage in a Sisyphus-like struggle of reaching for sustainability in order to establish a new set

of practices that form EfS. As in the story of Sisyphus of ancient Greek mythology – who was condemned to an eternity of rolling a boulder uphill, only to have it roll down again – where small gains were made, further progress is reigned in. The 11 paradoxes arising from each of the policy, pedagogy, physical and people (human) infrastructures evidenced these struggles. The root of these struggles, in my view, is a deep inertia within the education system as a whole. This deep inertia, I believe, can be due to two main factors – a deep-seated expectation of retention of the status quo and a lack of systemic thinking.

Firstly, deep inertia arises when there is an overwhelming propensity of systems which have arisen from dominant and traditional discourses, discourses that impede changes to the status quo. In my view, Amity PS evidences the practices and traditions of schooling in Australia that have caused a deep inertia in relation to EfS. The sediments and layers that contribute to deep inertia, suggests Kemmis (2009), are ongoing individual or collective practice traditions that become a sedimented encumbrance of “living and consciously remembered traditions of thought and action justifying them”, where “some stay the same over time merely by habit; some are kept in their course by coercion or ideology; some are kept in place by rules and sanctions, by regulation and compliance mechanisms” (p. 34). What occurs in schools, as fractals, and in education systems as a whole, as a fractal, is as a result of a sedimented history, rooted in specific cultural and political formations. Certain practices are legitimated to the exclusion, or diminution, of others, and become dominant educational discourses.

I therefore contend that the dominant influence of the policy framework surrounding Amity PS, despite a number that had declared EfS as a priority, actually serves to preserve the status quo. The macro level policy influences, identified in Paradoxes 1, 2, 3, 4, 5 and 6, showed how knowledge and an understanding of EfS was fragmented and how there was a subsequent disorientation away from a holistic, transformative, interdisciplinary view of EfS. I argue that as well as this being in evidence at Amity PS, as many of these policies are in place across Australian schools, in effect this was also the case across our whole education system. What was evident from my findings was that there were two competing paradigms of educational thinking evident at all scales of the system, from macro to micro – one having EfS as a desirable goal, the other reflecting the neoliberalist tenets of audit and accountability.

Taking this further, whilst affordances for EfS were present in the policy frameworks, especially the Australian Curriculum, ultimately these affordances were dislocated in favour of a more normative, traditional view of education. Consequently, the decisions made at the school level in terms of the policy, pedagogy, physical and people (human) infrastructures ultimately framed teaching and learning that focussed on the teaching and assessment of basic skills as the norm. I argue that the weak, diffuse and passive inclusion of sustainability within the Australian Curriculum did not provide a robust guide for teacher practice. Instead, the inclusion of sustainability within teaching and learning practices relied on individual teachers' awareness, knowledge and belief in the need for a commitment to action. Indeed, my findings suggest a cursory and uncommitted approach to sustainability by the Curriculum developers – and ergo ACARA, the government body in charge of its development – and also, by logical conclusion, by the Australian federal government who bore the ultimate responsibility for the Curriculum. Even with the coupling of the Australian Curriculum, AuSSI-WA, the SAKGP and the Sustainability Curriculum Framework together with the micro level school documents, there was not a strong imprimatur for action in terms of EfS for teachers. The policy climate could even be characterised as hostile to EfS (Smith & Stevenson, 2017). Furthermore, collectively they presented no clear discernible imperative to suggest to teachers that EfS involved anything other than a tinkering with ideas around the edges of a largely green, individual and localised conception of sustainability. In fact, the findings from this thesis cause us to question whether the policies and programs that supposedly have sustainability as their central principle are in fact guiding teachers toward a holistic understanding of sustainability where the transformation of society is the goal.

At Amity PS, sustainability was clearly a concept that was difficult to grapple with as it represented something outside of the regular expectations of Curriculum and pedagogy. Indeed, the fact that there was very little support provided to staff to develop their conceptual understanding and skills, their PCK, indicated its relative lack of importance in the scheme of the school. In addition, whilst Amity PS tinkered at the edges of sustainability with the visible, green aspects, there was very little evidence of any transformation in terms of Curriculum, school organisation nor professional learning. That this, there was a chasm evident between the kinds of directions, or ways to think about sustainability, provided to teachers within the school, and the notion of

EfS as a transformative goal that requires a different set of practice traditions that will upend the way we currently operate in schools today.

The irony and dilemma of expecting schools to engage and lead with EfS is captured by Stevenson (2007a) who points out, “Historically... schools were not intended to develop critical thinkers, social inquirers and problem solvers, or active participants in environmental and political (or even educational) decision making. Put simply, their intended function was not to promote social change or reconstruction” (p. 144). So, when a new way of thinking, relating and organising, such as the new practice architecture of EfS, comes to life in the discourses of education, the old order experiences a challenge to the existing status quo. That is, EfS represents a paradigm shift; however, at this stage, it remains a minor perturbation that has not yet substantially challenged the equilibrium.

What the findings of this inquiry suggest is that even with a strong ethos of sustainability that the principal and the deputies suggested permeated the school, Amity PS was unable to break free from the shackles of conformity that has been wrought by a normative view of education. This conformity is engendered through commonly accepted practices and traditions that have become a ‘grammar of schooling’ (Tyack, 1995). The monolithic enterprise of education has been shaped by this notion which describes and defines what we conceive of as the purpose and organisation of schooling, a notion that has been sedimented into our consciousness since mass schooling began. So, while Kemmis et al. (2014), Robinson (2010) and numerous others continue to point out that the world has changed markedly since industrialisation, our system of education has, for the most part, changed little – it is an anachronist relic. That is, the original primary goal or purpose of schooling, especially in the format of mass education – to prepare students with just enough information to enable them to function effectively in the workplace, and thus contribute to the economy of their country – has remained unaltered. As such, the concept of deep inertia is concerned with such practice traditions that preserve the status quo, knowingly or unknowingly, and therefore inhibit change.

Systemic thinking – changing worldviews

If we return to the notion of Amity PS as a fractal we see the self-similarity of mindsets and worldviews represented both at the school and in wider society. This is hardly

surprising as the educational system itself – as well as the Curriculum as a central thread of this system – is informed by the worldview of the society that enfolds it. As I have identified in previous sections of this thesis, neoliberal thought has permeated the Australian education system. This neoliberalist influence has had a number of impacts on education, one of which is the engendering of a mechanistic, reductionist view of the world and also of teaching and learning. At Amity PS, and beyond, this has resulted in a view of education that privileges the acquisition of basic literacy and numeracy skills, where students, teachers and schools are surveilled through a panoptical regime of audit and accountability. The issue here is that this mechanistic mindset is fallow ground for a sustainable future.

In Chapter Three I identified the kinds of mindsets and worldviews that are needed to ensure a sustainable future. Examining both Table 3.2, where Sterling (2001) has delineated the mechanistic and ecological worldview, and the discussion of the findings in the previous sections, it can be seen that a number of factors evidence a predominantly mechanistic worldview within Amity PS and, I would argue, within Australia as a whole. For example, in the core values of the educational paradigm there is a sense of efficient and effective learning that helps prepare students as contributors to the economy. This is driven by a view of learning as competitive, with high levels of accountability for the student, teachers and schools. In terms of the organisation and management of the learning environment, these are subject to a mandated prescriptive curriculum (e.g. the Australian Curriculum), a focus on learning in subject area ‘silos’, external indicators of quality learning imposed in the form of tests such as NAPLAN, a dislocation of the architecture, energy, resource use and school grounds from being part of the educational experience, few links with the local community, and a largely top-down control of sustainability and EfS in the school context. For learning and pedagogy, again there is a prevailing trend at the school where teaching, even in terms of sustainability, is about what can be produced, for example the produce to sell from the SAKGP, the Wakakirri performances, the artwork that was displayed as part of the AIR program etc. From my observations at the school, education was seen to be primarily to ensure children had the functional skills of literacy and numeracy and, in this mode of thinking, teachers were the technicians that imparted this learning through a process of transition. The school, however, was making some inroads into an ecological worldview with the Triple S committee in terms of cooperation and

collaboration. Through this they evidenced the beginning of an understanding for the need to consider EfS as being transdisciplinary.

However, to enable progressive change requires a shift to an ecological worldview. Such a view, as I discussed in Chapter 3 (under sustainability mindsets and worldviews), is predicated on the ability to consider the whole system and understand that everything and everyone is connected. What this means for assisting schools to move towards EfS is to appreciate that a leverage point for change is not necessarily in the obvious visible aspects, such as actions and practices at the school. Thus, if we consider again the four infrastructures that I deemed essential in order to engender EfS in the school, it could be argued that some simple changes could be made. For example, within the pedagogical infrastructure a solution might be to offer more effective professional learning, or within the policy infrastructure, to download the Australian Curriculum complete with Sustainability CCP icons to help guide teachers with planning, or perhaps within the people (human) infrastructure to have more meetings to share ownership.

However, whilst these are really important, they do not address the causes of the unsustainable actions evident in the world. Ultimately the changes that need to be made to support EfS in schools are ones that bring about transformation with the structures of education, curriculum and pedagogy and this transformation only comes about through a deep conceptual understanding of sustainability. An effective leverage point of the system would be one that enables wholesale simultaneous cascading changes, and this is strongly suggested in the EfS literature as being at the level of mindset and worldview. It is suggested that sustainability “requires deep attention to *education* itself – its paradigms, policies, purposes and practices – and its adequacy for the age we find ourselves in” (Sterling, Dawson, & Warwick, 2018, p. 326). Donatella Meadows, a systems theorist, suggests, as we know through our discussion here on deep inertia, that “the higher the leverage point, the more the system will resist changing it” (Wright & Meadows, 2012, p. 165). All of this reinforces the reason for the many challenges that EfS had in gaining traction at Amity PS, mainly due to the fact that EfS represents such a markedly different way of thinking and operating from the prevailing paradigm the school was operating from.

In summary, my view was that the sustainability ethos within Amity PS was not enabled to flourish in the impoverished neoliberal, ‘mechanistic mindscape’ that appears to persist in the Australian education system. There were certainly some ‘buds’ that tried to break through the hostile policy ground, but they were sporadically tended, and were largely over trodden with competing policy demands.

Response to the research questions

My conclusions from the findings have been discussed in great detail in the preceding section of this chapter, in particular in relation to the 11 paradoxes identified during the course of my study and the three key themes which emerged from these. In the section below, I provide more of an ‘executive summary’ that identifies the salient and critical points of these. I have structured the conclusions in order of, and in response to, the research questions that have guided this study. I follow on from this section with a summation of my overall research aim – how the current system of schooling affords EfS.

Research question 1: What do teachers understand by, and how do they interpret, sustainability?

Teachers at Amity PS view sustainability as largely associated with the environment. This finding parallels the findings for question two that identify the conceptualisation of sustainability presented in EfS initiatives and policies. In the school grounds, the environmental view is interpreted through engagement with both the AuSSI schools program, that encourages simple, micro level responses focused on individual actions such as recycling, composting, reducing waste etc., and the SAKGP that focuses on growing your own food. There is a primacy placed on sustainability as being limited to actions within the school grounds, with only some consideration of the wider community, for example the wetlands surrounding the school.

However, the school was in the early stages, at the time of this study, of developing a curriculum plan for use by teachers across the whole school that attempted to identify how sustainability fits with the learning areas of science and social studies. Sustainability was not seen as integrated across the curriculum and was considered an ‘add on’ that was competing with other mandatory and assessed Australian curriculum requirements, thus it tended to be neglected in classroom practice. The reliance on, and

deference to, Adam the sustainability coordinator, due to his degree in environmental science, in 'carrying the cognitive load' in terms of sustainability, exacerbated the lack of ownership or knowledge of sustainability within a number of teachers' practices. As such, despite the publicly expressed sustainability ethos of the school, coupled with a strong physical infrastructure reflecting valuable sustainable principles, sustainability was not the central organising principle, nor primary concern of the teachers nor the leadership of Amity PS.

Research question 2: What conceptualisation of sustainability is presented in EfS initiatives and policies?

Sustainability is presented in the EfS initiatives and policies under consideration in this inquiry in a number of different ways, namely as:

- Being primarily concerned with the environment.
- Placing primacy on individual reactions and responses to counteract sustainability.
- Only requiring action to be taken within the local school or community context.
- Only connecting to key areas of the Curriculum, suggesting transdisciplinarity is not necessary.
- Being more relevant to some year levels, and therefore as not necessary to be developed in a sequential, coherent way throughout all the years of schooling.
- Not being an essential concern of schools and teachers because other aspects, such as literacy and numeracy and academic achievement, are afforded greater priority.

Research question 3: How are teachers supported in their understanding and interpretation of EfS?

There is a fragmentation and disorientation evident in not only policy documents but also in corresponding practices at the school level. The key policy frameworks that are directly utilised by teachers at Amity PS – the Australian Curriculum, the AuSSI-WA and the SAKGP – appear to be promote a partial, largely environmental view of sustainability. The resultant environmental practices within the school grounds have largely become a proxy for sustainability per se, thus, in effect obstructing a holistic understanding and engagement with EfS as a transformative force.

In addition, there is a great chasm between what minimal guidance these policy frameworks offer and what teachers would require to integrate a holistic, systemic approach to EfS. Consequently, a void in the pedagogical space for teachers is apparent, as they are largely left to their own devices and therefore rely only on their own interest and enthusiasm to pursue EfS within their teaching practice.

Response to the overall research aim

This final section summarises the main conclusions I have drawn regarding my overall research aim – how the current system of schooling affords EfS.

The current system of schooling in Australia shows evidence of a dominant mechanistic, reductionist worldview still holding sway. NAPLAN and other regimes of accountability and audit – including teacher standards, assessment and reporting requirements built into the Australian Curriculum and public ranking of school performance – are channelling teachers' time and energy into a focus on a narrow set of skills that are observable and assessable. This ambiguous policy framework reflects fragmentation at the temporal, logistical and conceptual level, thus disorienting teachers in their journey towards understanding the concept of sustainability.

These are symptomatic of neoliberal influences on schooling in WA, as evidenced at Amity PS, that “pose a significant threat” to EfS (Cachelin, Rose, & Paisley, 2015, p. 1127). That is, this disorientation ensures the practice traditions of traditional schooling remain in place. The system of education in WA, and I suggest Australia, is therefore in a state of deep inertia. This neoliberal regime has become the norm, dictating the nature of what occurs in schools. It is in this neoliberal performative environment that we can see the distinction between ‘schooling’ and ‘education’. Schooling sees the purpose of education as primarily being associated with creation of workers and consumers to increase economic productivity and Australia’s standing in the globalised economy. Lingard and McGregor (2013) argue that in contemporary Australia this definition has displaced, and even subjugated, a broader, more transformative approach to the project of ‘education’. In other words, whilst EfS beckons to a progressive, transformative set of practices that merit the label of ‘education’, the current system that holds sway can only be described as ‘schooling’. There is therefore still a great chasm between where we are now with education, in

relation to knowledge and actions required to move society to a sustainable future, and where we need to be.

Given that there is a growing consensus that things as we know it – and, in particular, education – need to change, we need to consider what the leverage points for transformation are. Donella Meadows, an educator and systems thinker, considers no less a transformation is needed than a complete shift in the very purpose of education (Wright & Meadows, 2012). Goals, determines Meadows, are the most powerful leverage point of a system, second only to a paradigm shift. Arguably, a change in paradigm is the preferred option as this would immediately transform how, and what, we do, but this of course is much harder to achieve. There is hope, however, as, according to Jickling and Sterling (2017), if there is a willingness to change the goals or purpose of educational policy and associated practice(s), then such a paradigm shift “is possible at micro, meso and macro levels and can be a harbinger of a deeper cultural shift, especially when aligned with and connected to growing progressive and reconstructive movements in civil society” (p. 47). It is through the illustration of paradoxes throughout the thesis that I have sought to draw attention the disparate goals of education versus schooling that faced teachers at Amity PS.

EfS represents a complete upheaval of education as we know it. It has the intended consequences of a radical restructuring of social, political, economic and environmental spheres of society towards a fairer, peaceful, more just and sustainable world. This encompasses historical, political, social and economic forces that intersect with worldviews, values, attitudes and disposition to cause coherence and/or competition and conflict and which shape the processes of change. Freire (1985) re-balances the prevailing emphasis on education as a means of leading the change, and I see this as particularly relevant for EfS, when he states “It is not education that molds society to certain standards, but society that transforms itself by its own standards and molds education to conform with those values to sustain it... any radical and profound transformation of an educational system can only take place when society is also radically transformed” (p. 170).

However, as the findings demonstrate, this global progressive view of sustainability that is evident in much of the EfS literature is invisible in the Curriculum documents and policy initiatives, except perhaps in relation to tiny green shoots that focus

primarily on an environmental dimension. These seeds are sparsely planted and only suggest individualistic responses to sustainable practice – examples of these are reflected in localised practices such as recycling schemes, energy conservation and organic food growing. For example, the Curriculum documents and sustainability programs that have guided the practice of teachers at Amity PS, at least in terms of EfS, only capture a partial view of the holistic perspective of sustainability. They do not invite teachers to develop a deep understanding of the breadth of EfS. It is therefore possibly no coincidence that the economic and political dimensions of sustainability have an almost negligible presence in the policy frameworks used by teachers at Amity PS. The neoliberal regimes of accountability and audit have become a hegemonic force in the school, and I would argue across education in Australia, drowning out any other conception of how the economic and political systems, for example, can be framed. I suggest this omission, or neglect of these two aforementioned dimensions of sustainability works to constrain the development of EfS.

However, to achieve the kind of transformation that accompanies a deep engagement with EfS in schools would require a change in where – and, crucially, with whom – power and money is currently vested. At present, the construction of a national curriculum, like the Australian Curriculum, and the allocation of resources through government-funded programs such as the AuSSI and the SAKGP, serve to perpetuate the kinds of views and interests of those who have the power and resources in our society. I cannot imagine it would be in their interest to educate a populace that would seek to question and challenge the existing power and economic structures.

In addition, a more interdisciplinary approach to the understanding and provision of EfS practices is needed at the ground level in Australian schools and within its informing policies. At present, the privileging of, and adherence to, separate subject silos or learning areas of the Australian Curriculum negates a transdisciplinary conceptualisation of EfS. For example, where the Sustainability CCP is embedded, it is mostly within subject domains such as science where it is overtly connected – for example through its predominantly environmental aspects – and therefore offers only a subordinated view of nature, that is, not a systemic, ecologic worldview. In addition, there is a passivity and inaction that has been fostered in the way the Sustainability CCP have been expressed – as such, it remains silent on how teachers could translate

this into developing students as active change makers addressing our current unsustainable systems.

Collectively, the EfS policy framework demonstrates a propensity for maintaining a deep inertia to change, thereby maintaining the status quo. And therein lies the rub. Whilst on the one hand these policy frameworks appear to include transformative potentialities, in reality it is tokenism, as the prevailing discourse and accountability frameworks prevent such views from gaining real traction. Contemporary schooling, as we know it in WA and, I would suggest, across Australia, is a political act and, as such, the curriculum and educational policies can no longer be considered to be benign, neutral influences. Nevertheless, this inertia towards encouraging a change in actions – for example within policy frameworks – has made us all complicit in serving to perpetuate these unsustainable, often politically-motivated, practices. As such, laying these practices and ideologies bare in this thesis is a first step to admitting, as the traditional folk tale goes, the that Emperor actually has no clothes.

So it is at this point, after the analysis is done and the trail of cause and effect has been identified, that the question becomes – What can we do to change where we are heading? It seems where we are currently heading does not appear to be moving fast enough. It seems that changing our mindset and worldviews to one that favours a holistic view of sustainability and a willingness to change the way education currently works in order to progress EfS is a long way off. Utilising the frame of the four infrastructures of policy, physical, pedagogy and people (human) to examine what occurred within Amity PS in relation to EfS has made clear that a systemic strategy is needed, not at a single point in the whole complex system of schooling, but at multiple points. So, while some research seeks to precipitate change in schools by focusing on the teachers themselves, I suggest that this is only one facet. I concur with conclusions of Hopwood (2013, p. 208) who advocates change at multiple levels and suggests the value of a change process that is:

...much more than investment in training: cultural discursive, material-economic and social-political features at a range of scales must also be addressed. Such an analysis points to important limitations in approaches to change that focus on professional knowledge and skills without also addressing the architectures that shape the work of these professionals.

In this thesis I have established the importance, and interdependence, of four essential infrastructures – policy, physical, pedagogical and people (human) – as a framework for analysing the way sustainability is engaged with in a school. I suggest these infrastructures can be used as an essential framework for any school to employ, to both identify their own development in relation to EfS and as tool of analysis in order to identify the next steps in their development. In using the framework I encourage schools to defy and reject the simple, linear, neoliberal business models that are increasingly imposed on them, as schools are complex institutions. In addition, by laying bare the contradictory messages in relation to EfS in the policies designed to guide teacher practice in this study, my hope is that teachers may have a renewed confidence to challenge these narrow orientations for education.

Personal reflections on my learning journey

My own journey through the research process, which resulted in the writing of this thesis, was peppered with various difficulties over the years of study. Part of these difficulties and great sadness was the loss of both of my dear parents. This road to a PhD has been well trodden, and I know my own troubles and detours were not unique. Working full-time, raising a family of four children and three crazy cats, as well as researching and writing in any spare time I had, was definitely a challenge. Like other PhD students, I have emerged from this process with a great deal more knowledge and wisdom in relation to conducting and writing about research. My respect, admiration and empathy for teachers in our WA schools has also deepened immensely through this process.

It has been a great privilege being part of a school as committed and dedicated to sustainability, as Amity PS was, for my research. As a teacher myself, I did know something of the travails facing teachers; however, I could see that since I had been in the classroom the pressures on teachers has intensified.

Sustainability is political, and schools are political spaces. This political dominance in our schools is the elephant in the room in many articles, book chapters and theses about EfS that I have read so far. What I have learned or, perhaps more correctly, what has been reinforced for me in writing this thesis, is the effect of political will, through the conduit of macro level policy, on the work of teachers and schools. It is, as I hope I have shown in the thesis, a paradoxical existence for teachers in trying to navigate

what seem like contradictory policy demands. On the one hand teachers are being extolled to be the champions for the planet through teaching with EfS, but on the other hand these grand aspirations are curtailed by the more mundane concerns of the acquisition of basic, traditional ‘schooling’ skills.

Instead, rather than constructing teachers as pawns in this policy process, my view has always been that teachers need to be respected for their knowledge and capacity to effect change. In saying that, my strong belief is that teachers also need much more support to enable them to action EfS in their schools. Indeed, I am becoming quite weary of how little regard our media, members of the public and some politicians have for the crucial role that teachers have in our society.

I truly believe that there is no time to waste for all of us, in whatever capacity we have, or whatever position we hold, to work together in learning and understanding what sustainability means. I see the completion of this thesis as the beginning of my journey and my advocacy for teachers in the sustainably space. What I feel is my role now is to find ways to provide guidance and support for all educators to continue this important endeavour. One way I do this is through designing and teaching a unit about sustainability and EfS to postgraduate education students, many of whom are practicing teachers. My aim, in the immediate future, is to find ways to also embed these concepts and principles into our undergraduate teacher education courses so that our graduates come out of university with the PCK, skills and, hopefully, ecological worldviews, to be ready to support their own students. At the community level, I am working with the United Nations Association of WA to create a Regional Centre of Expertise so that we can connect all these endeavours in the name of sustainability occurring in our state. By doing these things, I hope to further the impact of the learning that I have undertaken in the research and writing of this thesis. Together, collectively, we can, and we will, effect change.

Considerations and limitations of the study

There are a number of considerations for this research that I recognise and acknowledge, including scope of the study, sample size, and the research context. These considerations are traditionally considered limitations.

The method of data collection allows thick descriptions of practice and seeks to present a multilayered account of the school context. However, whilst this produced rich data, there are limitations due to time available for me to spend in the school and for teachers to be available for further interviews. The scope of this research was also limited in that only one teacher agreed to classroom observations and therefore this may have not provided a representative picture of what may have occurred throughout the whole school. Ultimately, the participant sample represents school staff that were prepared to participate. Therefore, the data presented here reflects a ‘slice of life’ at a certain point in time of the evolution of ideas about sustainability within the research context.

In addition, given that most participants only agreed to a single interview, with only two accommodating a second interview, there was limited opportunity to explore the research questions more fully. It is acknowledged that a greater number of interviews may have enriched the data. Modification to the interview process may also have included a preliminary email or visual activity – such as a mind map or concept map – that would have enabled teachers to relay more background information about their interest in, and own personal values of, sustainability. This may have addressed the impact of teachers’ own philosophical and value frameworks in relation to pedagogy and sustainability on their acceptance and enactment of sustainability policy initiatives. This is an area that remains under-explored and is to be the subject of further research.

The research context was a school built and operating ostensibly on the premise of EfS as a strong curricular and pedagogical influence. It was a flagship school for the WA schooling system and could be considered as a site for exemplary sustainable practice. As such, Amity PS featured certain characteristics and values that may not necessarily be found in other educational settings. Therefore, although the research examined how EfS was understood and enacted by teachers within this school, the findings may not represent what may be occurring in other schools. However, it must also be acknowledged that although other schools may not be designated as ‘sustainable schools’, this research does not presume that they are less knowledgeable and may therefore strive to emulate what has been found at Amity PS. The research, therefore, does not seek to extrapolate from this school to other schools, although some parallels may be found.

Recommendations

This study has drawn out a number of aspects that warrant further attention if we are to progress a holistic understanding of sustainability in WA schools. I present these as recommendations to three stakeholders – for schools wishing to engage more in the EfS journey, including Amity PS, for policy makers and curriculum developers, and for those who may wish to conduct further research in this area.

For schools

These recommendations are most applicable to Amity PS; however, other readers may recognise similar circumstances and may consider these ideas useful to apply in their own school context.

- Utilise the potential spaces for learning within the affordances of the SAKGP and AuSSI-WA as way to meld the development of literacy and numeracy skills. In this way, the development of skills to meet NAPLAN testing requirements is considered, but does not become a primary driving force. Instead, sustainability becomes the organising principle of instruction, and literacy and numeracy become a ‘servant’ to the development of holistic and transformative education.
- Value and honour the important mission that Amity PS has been created to achieve. Recalibrate the mission and vision of the school to align with the view and desires of staff, as these are highly compatible with EfS.
- Encourage deeper understanding of EfS principles through key personnel. Given the fragmented and disorienting support provided by the Australian Curriculum and the AuSSI schools program for developing a more holistic, systemic, transformative EfS, it appears that, at the moment, the school has no choice but to forge ahead to further develop their own understanding from key personnel such as Adam and Robert – the sustainability coordinators with specialist knowledge and interest in EfS. Ensure that staff are given time and support to learn from these key change agents and to embrace ownership of furthering sustainability in the school. In addition, ensuring that a priority for professional learning for EfS is research based, rather than promoting particular programs and policies.

- Using the EfS literature, rather than relying on the guidance provided solely by policy documentation to develop a holistic, interdisciplinary transformative understanding of EfS. This would assist schools to move from a mostly environment oriented approach to sustainability to one that reflects the economic, social/cultural and political dimensions that are imperative to precipitate the change that is required in society.
- Consider the importance of all four infrastructures in tandem to pursue the development of EfS within the school. As some guidance, illustrated in Figure 7.2, are the key learnings of the essential elements from each of the policy, physical, pedagogical, and people (human) infrastructures drawn from the findings in this study that may be useful for other schools.



Figure 7.2: The essential elements from each of the policy, physical, pedagogical, and people (human) infrastructures

For policy makers and curriculum developers

- Review, re-evaluate and recalibrate the key policy influences that are meant to support Australian teachers in their understanding and interpretation of sustainability. The Sustainability CCP of the Australian Curriculum and the key programs that teachers appear to be using in WA, for example the AuSSI-WA and the SAKGP, provide only a partial and sometimes fragmented and incoherent view of sustainability, and largely only from an environmental perspective. Such a process must also involve wide teacher engagement, not rely on cursory consultation.
- In particular, it is important to establish EfS as a central idea in the Australian Curriculum. EfS speaks to the broader purpose of ‘education’, that is, to make the world a better place for all. The current Australian Curriculum and EfS programs serve to disorient teachers and schools from the required direction. At present our Australian education system is focused on a narrow, instrumentalist approach influenced by a neoliberal worldview. This acts in direct contradiction to the directions and intentions of EfS and of education as sustainability (see Sterling, 2011). Sustainability should not merely be a CCP, it needs to be THE priority.
- Corral funding to enable teachers themselves, in consultation with universities and other agencies that support sustainability, to develop teaching and learning resources that convey a holistic, systemic and transformative understanding of EfS.
- Develop an Australian Sustainability Network for Educators (ASNE) across all states and territories that will act as a resource and support for educators at all stages of the EfS journey. This will transcend the disparate and piecemeal approaches to EfS that are currently in evidence in schools and will also provide a contemporary, progressive and transformative perspective on education with a purpose to achieve a sustainable future.
- Work with teacher educators in universities to ensure pre-service teachers are provided early career support with EfS throughout their teaching degree. In this way, beginning teachers will be able to actively contribute to a sustainability ethos in schools and may be considered a valuable resource in developing the sustainability practices of colleagues.

- Reconsider the accountability and compliance requirements that drive much of contemporary schooling in Australia. The evidence from successive NAPLAN and PISA testing points to a plateauing of achievement at best, and at worst, serves to further disenchant and disenfranchise both learners and teachers from education. Robust debate needs to be engaged in, as well as frank and fearless advice, provided by teachers, teacher educators and educational researchers as these are the experts in education, ought to be listened to.

For researchers

- Facilitate more in-depth research into classroom practices regarding EfS. Although the Australian Curriculum and other sustainability-focused programs have been shown to have some influence on the EfS practices of the school, there is a wide understanding in educational research, in particular in educational policy literature, that these ideas are not necessarily directly transmitted into practice. Something very different may be occurring in individual teacher's classrooms than the content the policies and programs are promoting. Research into what occurs in the classrooms of those teachers who are au fait with the principles of EfS in order to document 'leading' practice would therefore be very helpful for other schools and teachers. This is particularly so as it is distinct to the kind of evaluations of particular programs that have already been conducted, for example by Lewis (2013) and Salter (2013). My own research, although perhaps more classroom-focused, was not able to access these kinds of practitioners for such close or in-depth observation.
- My findings contributed, in a small way, to the evidence of the impact of standardised and high stakes testing and assessment practices on the implementation of EfS in schools. An area of further research may be to investigate the impact on student learning in relation to EfS in a policy environment where the demands of these testing practices – in particular those with a narrow focus on literacy and numeracy – have prevented teachers and schools from fully engaging with these ideas.

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Appendices

Appendix A: An amalgamated set of sustainability issues for each dimension of sustainability

Environmental dimension	
<p>Natural heritage and resources</p> <ul style="list-style-type: none"> ▪ Life cycles, growth and change ▪ Ecosystems and local environment – relationship between species in ecosystems and food chains ▪ Water ▪ Evolution of life – long-term trends in species change and major events in Earth’s history ▪ Change in living systems – monitoring trends in health of ecosystems and reasons for change ▪ Solar system and energy ▪ Biodiversity ▪ Carrying capacity ▪ Conservation ▪ Environmental quality ▪ Natural resource management ▪ Extinction ▪ Habitats ▪ Interdependence ▪ Wildlife corridors ▪ Natural resources (water, energy, agriculture, biodiversity) ▪ Ecology ▪ Recognising culturally specific views of nature 	<p>Climate change</p> <ul style="list-style-type: none"> ▪ Effects of weather and climate ▪ Seasons – impact on ways of living and environment ▪ Pollution ▪ Ecological dysfunction ▪ Effects of human activity ▪ Sustainable management of development/ urbanisation ▪ Energy – ways of saving/conserving energy ▪ Built environments – energy and resource use; minimising environmental impacts and costs; services such as communication, energy, waste and transport; designing buildings to minimise environmental costs and impacts; urban and regional waste ▪ Materials and production – systems for waste avoidance, minimisation, reduce and recycling local; remote impacts of processing and use of materials ▪ Methods of assessing ecological sustainability – health of ecosystems, conservation of natural resources and wellbeing of community; recognising different values – economic, spiritual, sentimental, historical etc. ▪ Transport – sustainable use of resources at personal and community level; social and environmental impacts of common power sources for transport ▪ Agriculture and food – costs and benefits of large scale food production; nutrition and local and global equity; agricultural and land use practices ▪ Sustainable urbanisation ▪ Ecological footprint ▪ Disaster prevention and mitigation ▪ Rural development ▪ Consider environment in socio–economic policy

Social/cultural dimension	
<p>Diversity</p> <ul style="list-style-type: none"> ▪ Social systems and culture ▪ Cultural diversity ▪ Cultural heritage ▪ Indigenous cultures, knowledge and wisdom ▪ Religious faith diversity ▪ Gender equality ▪ Intercultural understanding <p>Ethics and values</p> <ul style="list-style-type: none"> ▪ Developing an ethic of care- empathising with others with different views. ▪ Reflection on: need wants and values of self, family, other people and cultures; needs of other species/ and of natural systems ▪ Reflecting on own and other's values and ethical principles ▪ Spirituality ▪ Sustainability values and principles ▪ Social justice ▪ Sharing own and other's perceptions of feelings toward living things and natural environments ▪ Intergenerational equity ▪ Worldviews ▪ Values 	<p>Human rights</p> <ul style="list-style-type: none"> ▪ Health ▪ Social quality ▪ Quality of life ▪ Respect and dignity ▪ Poverty ▪ Equity ▪ Social justice ▪ HIV/AIDS <p>Peace</p> <ul style="list-style-type: none"> ▪ Intercultural harmony ▪ Peace and human security ▪ Forging consensus <p>Community decision making and engagement</p> <ul style="list-style-type: none"> ▪ Cooperation & collaboration ▪ Governance ▪ Sustainable practices ▪ Institutional change ▪ Open debate and dialogue ▪ Understanding social institutions and their role in change and development ▪ Democratic and participatory systems that enable expression of opinion

Political dimension	
<p>Participatory decision making and governance</p> <ul style="list-style-type: none"> ▪ Civics and citizenship – taking sustainable action through social, economic and democratic institutions and processes; ▪ intergenerational responsibility for the environment ▪ Advocacy ▪ Conflict resolution ▪ Democracy ▪ Power ▪ Democratic and participatory systems that enable expression of opinion and selection of governments ▪ Transparent and ethical governance ▪ Forging consensus ▪ Policy formulation ▪ Minimise impacts of economic growth ▪ Corporate responsibility rather than greenwashing ▪ Sustainability values & principles 	<p>Human rights and dignity as 'bottom line' for decision making</p> <ul style="list-style-type: none"> ▪ Human rights ▪ Intergenerational equity ▪ Interspecies equity ▪ Empathy ▪ Tolerance ▪ Understanding and respect ▪ Quality of life ▪ Resilience

Economic dimension	
<p>Civics and citizenship</p> <ul style="list-style-type: none"> ▪ Taking sustainable action through social, economic and democratic institutions and processes ▪ Intergenerational responsibility for the environment ▪ Social systems and subsystems (e.g. groups and organisations that need to take sustainability into account). ▪ Processes of historical change – two way relationship between community and natural environments <p>Corporate responsibility and accountability</p> <ul style="list-style-type: none"> ▪ Closed cycle economy ▪ Ecosystem services ▪ Energy efficiency ▪ Life cycle analysis ▪ Poverty reduction ▪ Market economy/regulation ▪ Socio-economic justice ▪ Equitable distribution of income ▪ Equal employment opportunity ▪ Ecological footprint ▪ Precautionary principle 	<p>Economic systems and costs</p> <ul style="list-style-type: none"> ▪ Relationship between lifestyle decisions, consumption, wealth and economic and environmental costs ▪ Agriculture and food – costs and benefits of large scale food production ▪ Globalisation ▪ Over consumption & advertising ▪ Standard of living ▪ Sustainable consumption ▪ Sustainable development ▪ Triple bottom line ▪ Natural capital & renewable resources ▪ Assessment of personal and societal levels of consumption ▪ Sensitivity to limits and potential of economic growth ▪ Impact of economic growth on society ▪ Resource recovery ▪ Waste hierarchy ▪ Waste minimisation ▪ Ownership and value – decision making as consumers in relation to economic and environmental cost ▪ Ownership and property rights – shaped by social, cultural and economic institutions and shaping people’s interaction with the environment

Appendix B: Interview guide

1. How would you describe the work that you do in educating for sustainability within your classes?
2. From where or whom do you seek information about sustainability for your teaching?
3. Why have you adopted education for sustainability initiatives in your school/classroom?
4. Are you guided by policy documents in your implementation of education for sustainability? If so, how? If not, why not?
5. Describe how you and/or your school developed your own plans and policies for education for sustainability.
6. What sustainability concepts do you teach students about? Why are these your focus?
7. How do you see these concepts impacting on your students?
8. What impact does education for sustainability policy initiatives/ imperatives have on your curriculum?
9. In what way do you approach teaching about sustainability? Describe how you might plan your teaching.
10. What motivation do you have to teach about education for sustainability?
11. What do you see as your role as a teacher being in educating students about sustainability?
12. Describe any ways your teaching (your pedagogy) may have changed (if at all) as a result of your involvement and commitment to education for sustainability.
13. Does the concept of sustainability also relate to your life outside of the school? If so, how?
14. How do other policy initiatives that have been implemented in your school/classroom compare to policies/ imperatives/initiatives related to education for sustainability?

Appendix C: Information sheet and disclosure statement for teachers

Information Letter for Teachers

Dear Teachers,

‘Education for sustainability [EfS]: An interpretive inquiry into teacher engagement with sustainability policy imperatives in a Western Australian Primary School’

My name is Sonja Kuzich and I am writing to you on behalf of Curtin University. I am conducting a research project that aims to investigate how teachers engage with and implement sustainability policy imperatives. Although the Department of Education has no official sustainability policy there are other overarching sustainability documents that may influence teachers’ understanding and interpretation of sustainability with a school context (such as the National Action Plan for Education for Sustainability [2009] and Sustainability Curriculum Framework [2010]). I am interested in finding out if, and how, teachers understand and interpret such documents and what impact these have on the development of curricula in schools. The way I will do is by using a qualitative research method known as interpretive ethnography. This enables me as a researcher to interweave my personal reflections to form a rich picture of the research findings. The project is being conducted with my supervisors Associate Professor Peter Taylor and Dr Elisabeth Taylor from the Science and Mathematics Education Centre (SMEC) within the Faculty of Science and Engineering, as part of a Doctor of Philosophy at Curtin University.

I would like to invite you to take part in the project. I have chosen this school because it was the first school built using sustainable principles and the staff is involved in implementing curriculum that may reflect education for sustainability.

What does participating in the research involve?

You are invited to participate in an interview, and then if you agree, a further period of in class observation. Details of these are below:

- **Interview:** I will ask you five open-ended questions related to your understanding and experience of these initiatives within your school context (see attachment). The interview process will take approximately 45 to 60 minutes and will take place at a time and location of your choice. Interview transcripts will be shared with you for confirmation.
- **In class observation:** in agreement with you I would like to arrange suitable times to observe education for sustainability. This may involve observation two to three times a week for a period of a term. Any timeframe will be negotiated with you.

Do I have to take part?

No. Participating in this research project is entirely voluntary. This decision should always be made completely freely. All decisions made will be respected by members of the research team without question.

What if I wanted to change my initial decision?

If any member of a participant group decides to participate and then later changes their mind, they are able to withdraw their participation at any time. Data can be withdrawn at any time from the study.

There will be no consequences relating to any decision by an individual or Amity Primary School regarding participation. Decisions made will not affect the relationship with anyone at your school, nor the research team or Curtin University.

What will happen to the information collected, and is privacy and confidentiality assured?

Information that identifies anyone will be removed from the data collected. The data is then stored securely in a locked cabinet in the office of Associate Professor Peter Taylor at SMEC (Curtin) and any electronic data stored on a computer will be protected by passwords and can only be accessed by the researcher and the supervisors. The data will be stored for a period of 5 years, after which it will be destroyed. This will be achieved by deleting any electronic data on computers, destroy external hard disk drives, thumbdrives, and any such backup devices and physically shredding any hard copy (i.e. notes, researcher diaries etc.) data into a secure document disposal bin.

The identity of participants and the school will not be disclosed at any time, except in circumstances that require reporting under the Department of Education *Child Protection* policy, or where the research team is legally required to disclose that information. Participant privacy, and the confidentiality of information disclosed by participants, is assured at all other times.

The data will be used only for this project, and will not be used in any extended or future research without first obtaining explicit written consent from you.

It is intended that the findings of this study will be used in the completion of a Doctor of Philosophy thesis, and may also be published in research journals and presented at conferences. A summary of the research findings will also be made available upon completion of the project on request.

Is this research approved?

The research has been approved by Curtin University Human Research Ethics Committee, approval number SMEC-87-11 and has met the policy requirements of the Department of Education.

Who do I contact if I wish to discuss the project further?

If you would like to discuss any aspect of this study with a member of the research team, please contact me on the number provided below. If you wish to speak with an independent person about the conduct of the project, please contact the Curtin University Human Research Ethics Committee Officer, Pamela Lee, c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth, 6845 or by telephoning 92661855 or by emailing hrec@curtin.edu.au

How do I become involved?

If you have had all questions about the project answered to your satisfaction, and are willing to become involved, please complete the **Consent Form** on the following page.

This information letter is for you to keep.

Kind regards

Sonja Kuzich
Lecturer
School of Education
Curtin University

Assoc. Prof. Peter Taylor
SMEC
Curtin University

Dr. Elisabeth Taylor
SMEC
Curtin University

Appendix D: Consent form for teachers



Curtin University

Consent Form for Teachers

- I have read and understood the information letter about the project, or have had it explained to me in language I can understand.
- I have taken up the invitation to ask any questions I may have had, and I am satisfied with the answers I received.
- I understand that participation in the project is entirely voluntary.
- I am willing to become involved in the project as described.
- I understand that I am free to withdraw that participation at any time, without affecting my relationship with the research team or Curtin University.
- Data can be withdrawn from the study at any time.
- I give permission for my contribution to this research to be published in journal articles and presented at conferences, provided that I or the school are not identified in any way.
- I understand that I can request a summary of the research findings once the study has been completed.

Name of Teacher (printed):

Signature:

Date: / /

Appendix E: Categories developed through NVIVO coding

To make it apparent how I arrived at these broad themes or categories, I itemised the elements that comprised each of them in the following (Figures A1-6).

The code grouping Blockers and Enablers of Sustainability in Figure A1 incorporated ideas of the various ways that the very same influence could act as a ‘blocker’ or ‘enabler’. An example of this was the coding under ‘staff infrastructure’. Here the way that staff were appointed and allocated could contribute positively to the development of EfS at the school; that is, this could become an ‘enabler’. Conversely, as identified in within the interview data to be discussing in this chapter, the actions of some staff that prevented engagement with the kitchen garden by staff and students and the privileging of other professional learning other than sustainability education acted as a ‘blocker’.

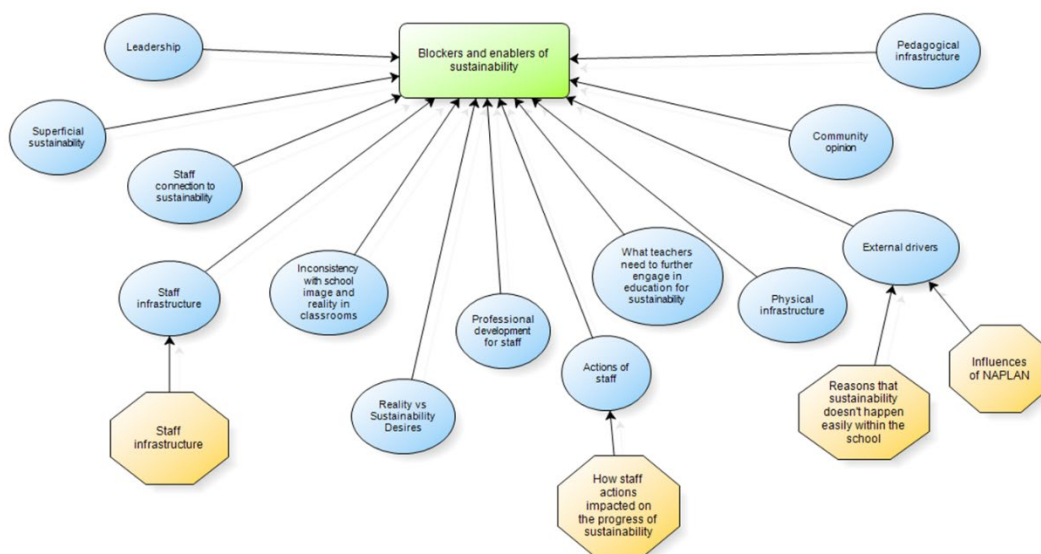


Figure A1: Codes that were subsumed under the ‘parent’ node of Blockers and Enablers of Sustainability

The code grouping Knowledge, Development and Implementation of Policy in Figure A2 captured the effect of aspects of local or micro policy decision-making and enactment and also the impact of macro level policy influences from outside the school such as the Australian Curriculum and other external sustainability policy influences including the AuSSI schools program and the SAKGP. This parent node assisted in determining what the policy influences were that may have an influence in how

teachers' conceptualised sustainability and what imperatives there were to embrace and incorporate sustainability within the school curriculum.

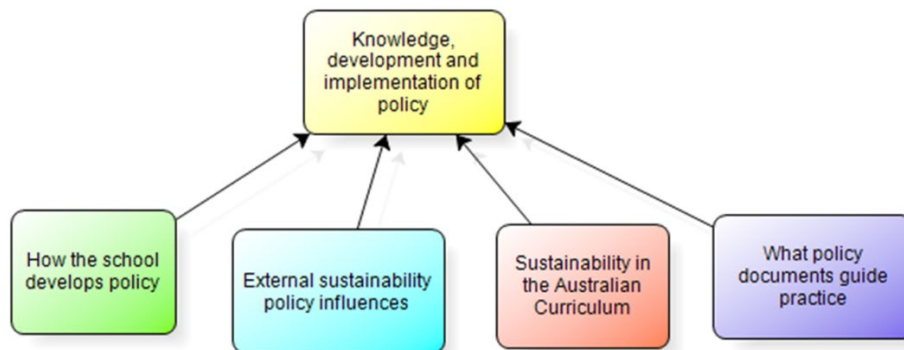


Figure A2: Codes that were subsumed under the 'parent' node Knowledge, Development and Implementation of Policy.

The parent node Pedagogy and Curriculum represented in Figure A3 sought to interpret what actually occurred within the school in the name of sustainability or EfS. Most of the information sourced from interviews and observations was related to teacher practices rather than that of students.

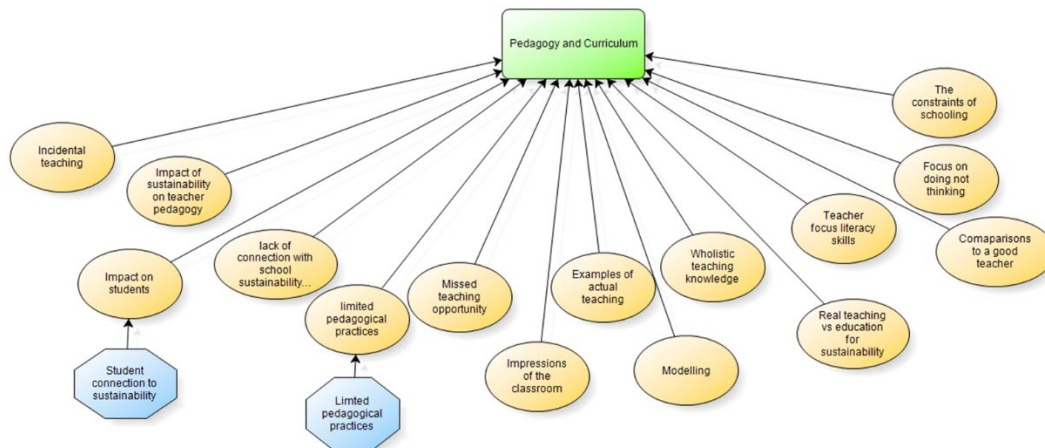


Figure A3: Codes that were subsumed under the 'parent' node Pedagogy and Curriculum

To gain a sense of what the school was already doing in terms of sustainability, I gathered together interview and field note references to current practices under the parent node 'Sustainability Within the School', represented in Figure A4. These were loosely grouped into staffing actions and roles, resources and sustainability practices.

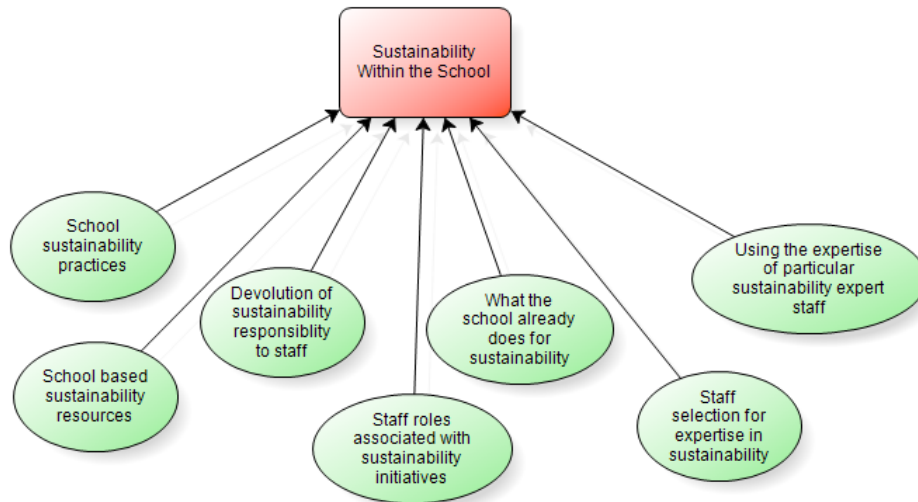


Figure A4: Codes that were subsumed under the ‘parent’ node Sustainability Within the School

In trying to understand how and why sustainability was conceptualised the way it was at the school I also examined Teachers’ Personal Reactions to Sustainability as represented in Figure A5. I noted that many teachers had personal values, beliefs and practices that were congruent with a sustainable ethos. When examining these it was possible to draw together some elements that teachers had reported as being of central concern to them in terms of sustainability – these I grouped loosely into ‘definition of sustainability’. Thus, by categorising these elements presented in Figures A1-5 patterns emerged from my initial sweep of the data.

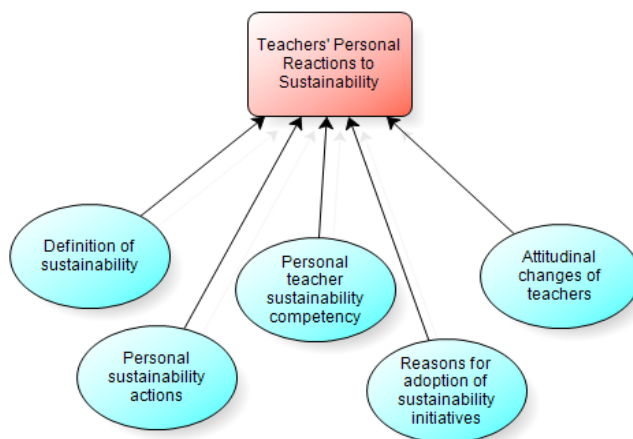


Figure A5: Codes that were subsumed under the ‘parent’ node Teachers’ Personal Reactions to Sustainability

Part of my responsibility as a researcher was to convey a faithful narrative of the data and to do so required me to “sit and ponder” with the data, “re-turning” it in the sense that Karen Barad (2014, p. 132) uses the word. Barad provides the metaphor for this kind of pondering likening re-turning to what an earthworm does when making compost –“turning the soil over and over-ingesting and excreting it, tunnelling through it, burrowing, all means of aerating the soil, allowing oxygen in, opening it up and breathing new life into it” (2014, p. 168). In this way, Barad suggests, re-turning is not about reflecting on, but instead is an iterative re-reconfiguring of patterns to create new diffraction patterns. Nothing is abandoned, but a new way of thinking and seeing results.

Appendix F: Key elements of sustainability principles

Adapted from Waas et al. (2011, p. 1645)

Principle	Foundational idea	Elaboration
Normativity principle	Sustainability is socially constructed and normative	<ul style="list-style-type: none"> ▪ Based on values ▪ Values vary between cultures and across the globe, over time (see global values in Millennium Declaration and Earth Charter) ▪ Values frame our attitudes and views therefore guide our actions ▪ A basis of judgement of human behaviour ▪ Objective vs subjective dichotomy (e.g. objective: measurements informed by scientific measurement; subjective: societal preferences/coexistence of different, societally determined opinions)
Equity principle	Justice or fairness Subdivisible into: <ul style="list-style-type: none"> ▪ Inter-generational equity ▪ Intra-generational equity ▪ Geographical equity ▪ Procedural equity ▪ Interspecies equity 	<ul style="list-style-type: none"> ▪ Inter-generational equity: includes rights and needs of both present and future generations; therefore imperative to keep within environmental limits of the Earth ▪ Intra-generational equity: social equity within the present generation, right to decent quality of life for all ▪ Geographical equity- global responsibility – act locally /think globally; shared but differentiated responsibility for tackling sustainability issues ▪ Procedural equity: democratic and participatory governance systems for decision makers; all views need to be heard/represented ▪ Interspecies equity: environmental stewardship where all species are equal and have an intrinsic right to survive; not only utilitarian view of species
Integration principle	<ul style="list-style-type: none"> ▪ Whole systems thinking (holism) ▪ Integration of socio-economic and institutional plus environmental development objectives to achieve mutual benefit 	<ul style="list-style-type: none"> ▪ Integration contrasts with the idea of ‘balancing’ or ‘trading-off’ ▪ No sacrificing any objectives as they are inherently linked and interdependent –failure to achieve one undermines the success of the other

Dynamism principle	Continual directed – sustainability oriented change-not an end state	<ul style="list-style-type: none">▪ Sustainability is an ongoing evolutionary process▪ Not a final destination but a ‘destiny-oriented long voyage’▪ Sustainability needs political and societal will – continuous search for ‘delicate equilibrium in a dynamic setting’▪ Implies precautionary principle (e.g. ‘willingness to act on incomplete but suggestive information where social and environmental systems are at risk’)
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Appendix G: Amity PS Sustainability Charter

Core Belief

As a school we are committed to creating a collective belief that small changes can make a big difference to sustain the resources of our planet.

Supporting Beliefs

Students are given the opportunity to develop a sound understanding of how to actively participate in sustainable practices in the wider community.

We commit to modelling and promoting sustainable practices to each other and the wider community.

Children are the force behind future change.

Teachers and staff commit to integrating sustainable principles through a range of opportunities in the learning program and to ensure all students leave Harmony Primary School with a sound understanding of sustainable practices and behaviours.

Expectations

Students

- Demonstrate an understanding of sustainable practices within the school and the wider community at an age appropriate level.
- Engage in learned sustainable practices within the school that they continue to use outside the school, at home, in the wider community and into the future.
- Develop the embedded belief and confidence to initiate and model to others especially when given leadership opportunities.

Teachers

- Demonstrate commitment to the values of sustainability by modelling sustainable practices inside and outside the classroom
- Embed sustainability in planning and teaching and encourage students to participate in daily classroom practices
- Promote sustainable values to students' families
- Support whole school sustainability initiatives

Non Teaching Staff

- Work in collaboration with teachers to create a sustainable environment
- Support the teaching of the sustainable program
- Model, support and apply school sustainable practices
- Actively promote our sustainable profile at Harmony Primary School

Parents

- Embrace school sustainability policies and practices
- Embed sustainability in current parent forums: P&C, School Council
- Take responsibility to affect a responsible, sustainable 'attitude' in their children
- Model sustainable practices to their child
- Become involved/informed about sustainability programs in the school
- Reinforce sustainable practices through furthering their own knowledge

Analysis of the Amity PS Sustainability Charter

The Core Belief states “As a school we are committed to creating a collective belief that small changes can make a big difference to sustain the resources of our planet”. This statement holds three key ideas about the school’s sustainability intentions: (i) that the school is focused on small, local actions that can involve the wider community; (ii) the idea behind sustainability is one of conservation of resources. However, there is no specification of what type these may be: environmental, human or other; and (iii) the expression of ‘creating a collective belief’ suggests that central to the creation of action is the need to perhaps change current beliefs and guide the school community to a new way of thinking.

However, in trying to determine what the school understood and valued as the idea of sustainability was quite difficult to discern from the Sustainability Charter. One reason for this was the lack of explicitness and precision of the document. As an example, nowhere in the document is there any explanation or definition offered for what sustainability may mean. The Sustainability Charter relies on a common sense understanding of what sustainability is, as if there is already an agreed upon definition. There was no evidence of any such established and agreed upon definition that I could glean from any of the school documents I perused, or through examination of the school website. The terms ‘sustainable practices’, ‘sustainable principles’, ‘sustainable practices and behaviours’, ‘values of sustainability/sustainable values’, ‘whole school sustainability initiatives’ and ‘sustainable programs’ and ‘sustainability’ were peppered throughout the document, yet there was no accompanying documentation that could describe, explain and clarify what these terms might mean or entail in practice. The wording of the Sustainability Charter was constructed in such a generic way that these terms could have been easily replaced by any other term.

Due to this non- specific use of ‘sustainability’ as well as those of the associated terms noted above I found it very difficult to identify whether there was any orientation towards any of the four dimensions of sustainability. The only suggestion in the entire document of an orientation could have been construed from the phrase within the Core Belief – ‘resources of our planet’. This could be interpreted as most probably a reference to the physical environmental elements. Thus, there is no definitive embracing of a holistic definition of sustainability that identifies the four

interdependent dimensions of sustainability, the environmental, the social/cultural, the economic and the political, as referred to in much of the EfS literature.

What could be identified within the document was the repetition of 'wider community'. There was a clear emphasis that the school was endeavouring to promote student's understanding of how to participate in sustainable actions not only at school, but at home and also into the 'wider community'. There was no suggestion that this meant anything beyond 'community' in the sense of their geographical suburb and state locale. Therefore, it can be surmised that the intended sphere of focus is limited to local (micro), community (micro/meso) and does not extend into actions that impact the wider society (macro -national, international or global).

Amity PS sees themselves as advocates of sustainability practices and understandings that they are capable of modelling and teaching to their students and the parent body. The role of education in this endeavour is reaffirmed with "Children are the force behind future change" (Amity Sustainability Charter, line 8). The intention is to create future change yet what this change might be is not clearly articulated in this document.

The lack of explicitness and detail is perhaps not unexpected given that charters generally serve as an overview. According to the Collins dictionary charters are "... a formal document describing the rights, aims, or principles of an organization or group of people". In this sense such brief and nebulous sets of statements act merely as placeholders in the suite of policy documents that schools are obliged to create. They often serve a ceremonial and perfunctory purpose and once created are not every actively referred to or sought out for guidance. This appeared to be the case at Amity PS, as Annette explained that the school "*have not probably used that as well as we could with new staff members... we had so much to do initially... it's there but I'm not sure that we deliberately refer to it within our school processes*" (T1: L480, 8/9).

In summary, the Amity PS Sustainability Charter provides no definitive guidance as to what sustainability means within the context of the school. In addition, the charter offers no clear orientation in terms of the four dimensions of sustainability, except perhaps a reference to the environmental dimension and espouses the intended sphere of action as being at the micro/local and community/meso level.

Appendix H: Screenshot of Australian Curriculum v8.3 (Year 4 science)

➤ Curriculum filter 🔗 🖨️

Subjects	Year Level	General Capabilities	Cross Curriculum Priorities
Science ✕	Year 4 ▼	Literacy ✕ Information and Communication Technology (ICT) Capability ✕ Critical and Creative Thinking ✕ Personal and Social Capability ✕ Ethical Understanding ✕ Intercultural Understanding ✕	Aboriginal and Torres Strait Islander Histories and Cultures ✕ Asia and Australia's Engagement with Asia ✕ Sustainability ✕

Submit **Reset**

Earth and space sciences
 Earth's surface changes over time as a result of natural processes and human activity ([ACSSU075 - Scootle](#))

ScOT Terms + Elaborations -

- collecting evidence of change from local landforms, rocks or fossils
- exploring a local area that has changed as a result of natural processes, such as an eroded gully, sand dunes or river banks
- investigating the characteristics of soils
- considering how different human activities cause erosion of the Earth's surface
- considering the effect of events such as floods and extreme weather on the landscape, both in Australia and in the Asia region

Screen view using the Curriculum filter facility for Australian Curriculum v8.3

Appendix I: Analysis of the Amity PS Triple S Plan

The *Triple S Committee National Curriculum Planning Overview* was constructed to provide an overview of learning across the learning areas of science and S&E overlaid with an emphasis on Sustainability – hence the label Triple S. The Triple S Committee, comprised of one teacher at each year level from Kindergarten to Year 6, along with the sustainability coordinator, Adam, developed the plan. At the time of its creation, the new Australian (National) Curriculum was still being fully developed and Western Australian schools were effectively operating within a hybridised curriculum. That is, as only four learning areas of science, English, mathematics and history of the Australian Curriculum were developed and being implemented in schools, teachers drew on those but also on the existing Western Australian Curriculum Framework for the other learning areas. The Australian Curriculum in the history learning area represented only one element of the existing WA Curriculum Framework learning area of SOSE (Studies of Society and Environment), therefore this group of teachers preferred to include the latter, broader learning area content and descriptors within the plan. The two areas of S&E under consideration were those of history and geography.

The plan indicated for each year level the science understandings and skills, ideas for sustainability, history content, geography content, and the accompanying history and geography skills. The intent of the plan was to assist teachers to interpret and identify how sustainability as a concept is related to the content and skills of the aforementioned learning areas. Adam, the sustainability coordinator, reported that he felt it was necessary to design this so teachers would be more willing to engage with sustainability in their own teaching as they would be provided with a ready-made curriculum plan where the connections to sustainability were already drawn.

I approached the analysis of the plan in the same way that I examined the external documents in the preceding section of this chapter. In order to determine the school's orientation in terms of sustainability I coded each statement in the plan against the four dimensions of sustainability: environmental; economic; social/cultural and political. Where a statement aligned with more than one dimension of sustainability, this was recorded. So, for example a single statement could simultaneously have elements of a number of dimensions of sustainability. The results of this analysis were a majority of statements related to the environmental dimension (74); slightly fewer to the

social/cultural dimension (69); and very few to economic (6) and political dimensions (4). This overwhelming orientation to environmental and social/cultural dimensions of sustainability is represented visually in Figure 5.5 (see Chapter Five).

This finding indicates that the teachers at Amity PS largely considered sustainability as related to those areas of the Australian Curriculum that dealt with the environment and social/cultural factors. This appeared to be consistent with the messages delivered through the AuSSI-WA program discussed previously.

I decided to delve further into the *Triple S Committee National Curriculum Planning Overview* examining the intended spheres of action as I had conducted in relation to the AuSSI-WA program. For each of the statements in the Triple S plan, I identified whether the action is suggested to occur within the school itself (school-focused), the local community, or wider society (national or international/global); and (b) which dimension of sustainability is associated with this activity. This analysis is presented in Table A1.

Table A1: Analysis of sphere of action associated with each of the four dimensions of sustainability in the Triple S Committee National Curriculum Planning Overview

	Indeter- minate	Local	Comm- unity	National	Inter- national/ global	Total
Economic	2	0	0	2	2	6
Environmental	37	6	20	9	3	75
Social/cultural	27	1	12	21	8	69
Political	0	0	1	2	2	5
TOTAL	66	7	33	34	15	

What I found were numerous statements that had no clearly specified sphere of action. For example, “Living things have basic needs”. Other statements appeared to suggest possible action at either the local, community or national level, yet there was no way this could be determined from the statement itself. For example: “How did Aboriginal people support the eco/biological systems?” The focus of engagement may have been looking at the local Aboriginal community, but it also may be interpreted at a national level. There were sixty six of these statements that I considered as indeterminate markers of possible spheres of action. Other than those labelled indeterminate, the greatest number of statements were associated with the *national* sphere of action for the social/cultural dimension, the *community* for the Environmental dimension, and

both Political and Economic dimension had their strongest emphasis on *national* and *international/global*. Overall, there appeared to be more of an emphasis on both the community and national level. This can be attributed in part to the emphasis the plan had on engagement with the Aboriginal and Torres Strait Islander culture. A teacher at the school, of Aboriginal descent, was on the Triple S Committee and her role was to ensure the perspectives of people of Australian Indigenous heritage were represented within the learning Amity PS was offering. Therefore, for many of the statements of content, for example “weather and seasons” the plan included explanatory comments such as “*incorporate Noongar seasons/names onto weather charts; identify characteristics of the season – e.g. native bushes are blooming identify what foods they provide*”. The reference to Noongar identified for teachers the name of the Indigenous clan upon whose land the school stood, and therefore, that the focus of the teaching needed to be centred on the community. Similarly, the statement on “environmental management” had an explanatory note for teachers that directed them to consider the contribution to the landscape of the various Aboriginal peoples across the nation: “*How did Aboriginal people for around 4 500 000 years manage the environment in their country?*”

However, these could hardly been labelled ‘spheres of action’ but more ‘spheres of interest’ as there was no implied action. A great number of the statements were not suggesting ‘action’ at all, but were stated in a matter-of-fact passive manner. The potential for action lay with how the teacher interpreted the statement and what materials and which lens they chose to adopt to explore and engage with the ideas.

The Triple S Plan provided suggestions for curriculum content and accompanying skills, but no more in terms of guidance with EfS. Even the suggestions for skills development were open to numerous interpretations from literal, neutral readings to the revolutionary and subversive. A teacher had wide latitude with how they dealt with statements such as the skills “Pose questions about place, space and environment” or “Develop a narrative about the past”. There was a clear gap evident between what the Triple S curriculum plan stated and what pedagogical action may ensue. It made me question – How will teachers gain an understanding of EfS as having action oriented and transformative goals if the documents teachers use to guide them, and that they create for themselves, such as the Triple S Plan, do not reflect such an approach?

To summarise, the Triple S plan, reflected the same orientation towards the Environmental dimension of sustainability, with a marginally lesser focus on the Social/Cultural, as was evident across the Australian Curriculum Sustainability CCP statement, AuSSI-WA program, SAKGP, and the Sustainability Curriculum Framework. In terms of where the sphere of activity for sustainability was located, the Triple S plan differed from previous findings since rather than the majority of the statements referring to the local, there was a greater emphasis on the community and national level. However, an explanation for this could be: a) that a large number of statements were 'indeterminate'. That is the sphere of action could not be discerned at either the local, community, national or international/global level. These statements were open to teacher interpretation and teacher judgement; and b) a number of statements that were seemingly indeterminate at first blush were accompanied by a qualifying statement developed by a teacher of Aboriginal heritage at the school. These statements clearly then related the statement to either examining the Aboriginal perspective within their local community or how Aboriginal peoples contributed across the national Australian landscape. Furthermore, even when the national was identified, as was the case with reference to Aboriginal peoples and migrants within the Triple S Plan, the statements were not necessarily worded in such a way to instigate change but rather emphasised a knowledge or appreciation of the contribution of these groups. In this way there was a 'passivity' within the wording of the plan that relied upon the interpretation of the teacher for any possibility of active engagement with a view to questioning and challenging the status quo.

Appendix J: Analysis of the Amity PS Business Plan

The Amity PS Business Plan from 2011-2013 was developed in conjunction with the School Board, the Parents' and Citizens' Association and the staff at the school. This plan identified to the community the school's vision for the future, directions and strategies, and their commitment to achieving these objectives. The document stated the school Vision, the Values and the Objectives. In each of these three sections there was a notable absence of any mention of sustainability directly. Yet, indirectly there was the incorporation of some of the critical skills, attitudes and behaviours that could be seen as desirable for EfS. In the text of the Vision below we can see that there is an emphasis on: interpersonal skills; problem solving; critical analysis; and being prepared for a constantly changing future.

For all students at Amity Primary School to have highly developed interpersonal skills and be able to problem solve through critical analysis so that they are equipped for a future in which the only constant is change. For all students to be motivated and engaged in learning, in safe and supportive learning environments, so they can achieve the highest standards of learning possible (Amity PS Business Plan, 2011-2103, p. 2).

Similarly, in the Values there was no direct mention of sustainability as such but an oblique reference was expressed as an expectation that every member of the school community “works together for the good of everyone” (*Amity PS Business Plan, 2011-2103, p. 2*). The objectives for the plan were more focused on literacy and numeracy attainment, motivation and engagement of students, staff members who exhibit “best teaching practice”, to meet the “learning physical, emotional and behavioural needs of students”. There was no mention of sustainability, per se, at all as an objective.

The Business Plan also identified the source of the student achievement data that informed the decision to identify the three key focus areas of Achieving Academic Excellence, Excellence in Teaching and Sustainability. This student achievement data noted in the section of the document labelled School Self Assessment only referred to the results for standardised assessments. For example, the plan listed the Year 3 and Year 5 literacy and numeracy NAPLAN performance over the previous 2 years and also the WAMSE for science and S&E for Year 5.

The Achieving Academic Excellence section, which focused on student performance, and the Excellence in Teaching section, that focused on teacher expertise and performance, of the Business Plan were dominated by lists of items under Achievement Targets and Milestones related to statistical measures of desirable future literacy and numeracy performance. The Strategies under each of these listed ways the school intended to achieve these. Of the two Milestones listed under Achieving Academic Excellence one made an only an oblique reference to sustainability as it referred to the need for Year 3 and 4 teachers to make links between the SAKGP, one of the features of the school sustainability program, and the English National Curriculum. The Achievement Targets and Strategies identified by Amity PS as a way of Achieving Academic Excellence and Excellence in Teaching was dominated by the language of standardisation and accountability.

There were numerous references to the need to perform equal to or above “statistically similar schools” which reflected the way the school’s ranking in the NAPLAN scores were made publicly available through the My School website. My School ranking was a focus of teachers, schools and the education system as it is taken as a strong proxy measure of the quality of the school itself. There were also a number of references to the development of a whole school approach to explicit teaching, and in particular for Kindergarten to Year 2 teachers to use a synthetic phonics approach to teaching reading, and Kindergarten to Year 6 teachers explicitly teaching phonemic awareness and phonics. In addition, the plan advised a daily literacy teaching block for a minimum of one and a half hours along with a daily numeracy block. Whilst there was some mention of implementing Kagan teaching strategies with its emphasis on cooperative learning, and also Higher Order Thinking Strategies (HOTS), that suggested a sensitivity to the kind of education required to engender sustainability, these suggestions were dwarfed by the number of references to the more didactic, reductionist modes of pedagogy. The effect of the goals of the Business Plan under these two strategic areas was for students to excel across all curriculum areas, but particularly in literacy and numeracy and for teachers to develop their expertise to ensure this kind of intended learning occurred.

The final page of the document stated the aims for Sustainability: “As a school we are committed to creating a collective belief that small changes can make a big difference

to sustain the resources of our planet” (*Amity PS Business Plan, 2011-2103, p3*). This statement came directly from the Sustainability Charter. In short, the statement suggests a possible focus on environmental dimensions of sustainability within the context of the school and/or local community. The next statement confirms the focus on the environment but also introduces the idea of an additional emphasis on the social dimension of sustainability, “We aim to reduce our environmental footprint and increase our social handprint” (*Amity PS Business Plan, 2011-2103, p3*). The reference to the environmental footprint and social handprint directly references the central elements of the AuSSI-WA schools program as discussed previously in this chapter. The school has aligned its strategic plan with a conceptualisation of sustainability consistent with that of the one presented within the AuSSI-WA schools program.

The lynchpin for sustainability at Amity appears to be the SAKGP as the Milestones for Sustainability are centred on Year 3 and 4. As I have noted earlier, the SAKGP provides limited funding only enabling Year 3 and 4 students at Amity PS to use the garden and the kitchen facilities. In an effort to extend the impact of the SAKGP further the document suggests an enrichment program for those Year 5 and 6 students who excelled when they were part of the program in previous years. This was for them to both develop greater skills and knowledge in the garden and kitchen arena and to develop them as leaders, and peer tutors for the current Year 3s and 4s.

The Milestones also dictated a greater linking of literacy (the English learning area), numeracy (the mathematics learning area), science, history, geography and the health learning areas to the activities associated with the SAKGP. Additionally, a Level 3 teacher, one who had been certified as a highly skilled practitioner, was to work with the staff to incorporate Aboriginal perspectives within the SAKGP.

These aforementioned initiatives were targeted to only a small section of the school population, the Year 3 and 4 classes. The evidence from the literature indicates that whole school sustainability initiatives are essential; however, at Amity PS only three were proposed. The first was the employment of a sustainability coordinator who “had extensive knowledge of science conservation and restoration practices to support teachers and the S&E Committee to develop their knowledge in this area to ensure students are active and informed citizens” (*Amity PS Business Plan, 2011-2103, p3*). This new appointee was Adam who certainly did have a degree in environmental

science. The second related dot point under Strategies was an elaboration of the first. It identified that as each member of the S&E Committee (that was later to become the Triple S) represented the different year levels they could disseminate the information from the S&E meetings to their year level colleagues. In this way, the school reasoned, all teachers would be involved in the decision-making process, and by doing so, this would constitute a whole school approach. I noted that the emphasis on science and the environmental aspects of sustainability, and the alignment to S&E learning area was consistent with the emphasis of the Australian Curriculum v3.0 and largely with the SS-WA.

The second whole school initiative was for all classes in the school to participate in educational programs focused on Reduce, Recycle and Reuse. This was the slogan of The Waste Wise Schools Program run by the Waste Authority of Western Australia, of which Amity PS was an accredited member (<https://www.wasteauthority.wa.gov.au/media/files/wws/reduce-reuse-recycle-fact-sheet.pdf>), and the program in turn was part of SS-WA (<http://www.wasteauthority.wa.gov.au/programs/wws/aussi/>). The third initiative was to encourage all students to bring waste free lunches to school every Tuesday and Thursday. These lunches were to have disposable wrapping or packaging, everything was either loose in the lunchbox, or in individual reusable containers. An extension of this was also for the School and the on-site School Canteen that provides recess and lunch food for students and staff to purchase, to work together to find ways to reduce waste.

In summary, the Amity PS Business Plan (2011-2013) had as its primary foci: the environmental dimension of sustainability with a lesser emphasis on the social dimension; strong emphasis on engagement with sustainability through the Year 3 and 4 SAKGP; a limited whole school approach targeting environmental behaviours; and, strategies suggested as actions for sustainability were confined to the context of the school and did not extend to the community or beyond.

Appendix K: Analysis of the Amity PS Annual Report

As part of their responsibility to report to parents and the community, schools in Western Australia prepare annual reports to identify their achievements over the previous year. The principal Annette, in her introduction, noted that the 2012 Amity PS Annual Report outlined the progress in the focus areas identified in the School Business Plan of Achieving Academic Excellence, Excellence in Teaching and Sustainability as well as the other learning areas. Immediately, from looking at the contents page, I noted the prominence of numeracy, literacy and NAPLAN in comparison to sustainability. In order of appearance numeracy was the sixth heading, literacy was the seventh, NAPLAN the tenth, with sustainability being the eighteenth in a list of nineteen. Corroborating this emphasis on literacy and numeracy, the third heading Professional Learning, listed as its foci for money and time allocated for teacher professional learning as: numeracy; literacy; special needs; classroom management strategies; and John Fleming Strategies (an explicit instruction program). Of note also, was the separation of the Health and Wellbeing from Sustainability. The former focused on social skills, cooperation, conflict resolution, resilience, bullying and communication styles with a view to assist students at Amity PS with social and emotional regulation. The aim of the programs listed under Health and Wellbeing appeared to be to assist teachers with the more immediate concerns of behaviour management in classrooms rather than intentionally making an impact beyond the class and into the future.

Sustainability was considered a separate category, set apart from all the other learning areas and concerns of the school. Under the heading of Sustainability the key aspects noted were the development of the Triple S Planning Overview that was now being used by staff to plan classroom practice. The Triple S document and sustainability practices were showcased externally to the Western Australian Primary Principals (WAPPA) conference, a local network meeting of schools in the locality, and to the Amity School Board and Parents and Citizens association.

The connection to the environmental dimension of sustainability was strongly evident with the central activities identified in the Annual Report being the SAKGP and Water Wise activities. For the SAKGP, the only items noted were two professional learning sessions held at the school plus commentary about this year being the first time ever

the program received only positive feedback from parents. Under the recommendations for sustainability the school intended to separate the portfolios of the SAKGP and Sustainability and to appoint a leader for each. Robert, the Year 6 teacher was to take on the role of sustainability coordinator, leaving Adam to manage the SAKGP. Robert confirmed the need for this saying, “...*a lot of our focus in sustainability has been around the kitchen garden... it’s becoming a bit unmanageable with the size of it* [referring to Adams’ portfolio of being sustainability coordinator as well as teaching his own class and managing the SAKGP activities] (T1: L15; 20/11).

School engagement with sustainability at the macro level was evident with the partnership they had developed with Samaritan’s Purse, “a non-profit, Christian organisation providing emergency relief and development assistance to suffering people around the world. ...meeting the physical needs of victims of war, famine, natural disaster, poverty and disease” (<https://www.samaritanspurse.org.au/>). This was established through the personal connection that one of the teachers at the school had developed and a part of the school’s fundraising was donated to the cause.

Other recommendations listed under the Sustainability section of the report were practical infrastructure decisions relating to the kitchen such as adding a pizza oven and creating an alfresco area, adding more powerpoints (power outlets) and utilising the kitchen for catering on parent nights. Of those that pertained to sustainability per se, these were related to the environmental aspects – “completion and introduction of the school energy monitoring kit and program” and “train one teacher to ethically harvest fish from the aquaponics setup” (Amity PS Annual Report, 2012, p. 18; (Yeatman et al.). This reference to energy monitoring is consistent with the Economic dimension encouraged as part of the Ecological Footprint indicators of the SS-WA program (see the section on AuSSI-WA Schools program previously in this chapter). What this represents is a very narrow, local oriented view of the Economic dimension of sustainability as it is only about cost saving for the school budget, rather than wider considerations about societal use and misuse of energy. In a furthering of cross-curriculum integration, a final recommendation was to involve the arts learning area with the kitchen garden.

In summary, the Annual Report (2012) demonstrated that Amity PS:

- Did not consider sustainability a stronger priority than literacy and numeracy;
- Despite its espoused sustainability ethos, did not view education through a lens of sustainability, nor was sustainability an organising principle of all the occurred within the school.
- Placed an emphasis on the environmental dimensions of sustainability when naming activities connected to sustainability and formulating recommendations for the future;
- Considered the central spoke of sustainability activities at the school as the SAKGP; and
- Placed an emphasis on reporting on visible, tangible demonstrations of practice reflecting sustainability, e.g. Wakakirri, SAKGP, AIR Program etc.

Appendix L: SOI mapped against the four dimensions of sustainability

In examining how the Sustainability CCP related to the four dimensions of sustainability, I categorised each of the Sustainability CCP statements according to the indicators suggested in Appendix A. I began with the SOIs of the Sustainability CCP and examined the statements about systems, worldviews and futures.

Systems					
Code	SOI	Environmental	Social/Cultural	Economic	Political
OI.1	The biosphere is a dynamic system providing conditions that sustain life on Earth.				
OI.2	All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing and survival.				
OI.3	Sustainable patterns of living rely on the interdependence of healthy social, economic and ecological systems.				

Worldviews					
Code	SOI	Environmental	Social/Cultural	Economic	Political
OI.4	Worldviews that recognise the dependence of living things on healthy ecosystems, and value diversity and social justice are essential for achieving sustainability.				
OI.5	Worldviews are formed by experiences at personal, local, national and global levels, and are linked to individual and community actions for sustainability.				

Futures					
Code	SOI				
OI.6	The sustainability of ecological, social and economic systems is achieved through informed individual and community action that values local and global equity and fairness across generations into the future.				
OI.7	Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments.				
OI.8	Designing action for sustainability requires an evaluation of past practices, the assessment of scientific and technological developments and balanced judgements based on projected future economic, social and environmental impacts.				
OI.9	Sustainable futures result from actions designed to preserve and/or restore the quality and uniqueness of environments.				

Appendix M: Wordle – Australian Curriculum Sustainability CCP

The Wordles represented below are from the Australian Curriculum v3.0 and v8.3. Wordle is a tool increasingly being used in a number of disciplines as a means of documentary analysis (Cidell, 2010). Being cognisant of Ahearn’s (2014) cautioning that visual interpretations of the same information can be interpreted in various ways dependent upon the use of font style, colour, background and text direction(s), I constructed all Wordles using the Web 2.0 tool found on Wordle.com with ‘Kenyan Coffee’ font, the ‘Moss’ colour range, and a text direction of ‘mostly horizontal’.

The words emphasised in the Sustainability CCP statements of the Australian Curriculum v3.0 were materials, knowledge, environment, information and people, as shown in Figure A6 below:



Figure A6: Most frequent words created by Wordle within the Sustainability CCP statements of the Australian Curriculum (v3.0)

In the Australian Curriculum v8.3 (Figure A7) the words that received more emphasis, as seen in the diagram above, were environment/environmental; people; local; sustainability; resources. This indicated that the guidance provided to teachers within the Sustainability CCP was clearly more centred on these key ideas.

Appendix N: An analysis of the four dimensions of sustainability across content descriptors and elaborations in the Australian Curriculum v3.0

Even if the content descriptors were looked at alone, the orientation towards the environmental dimension of sustainability still holds as Figure A9 depicts.

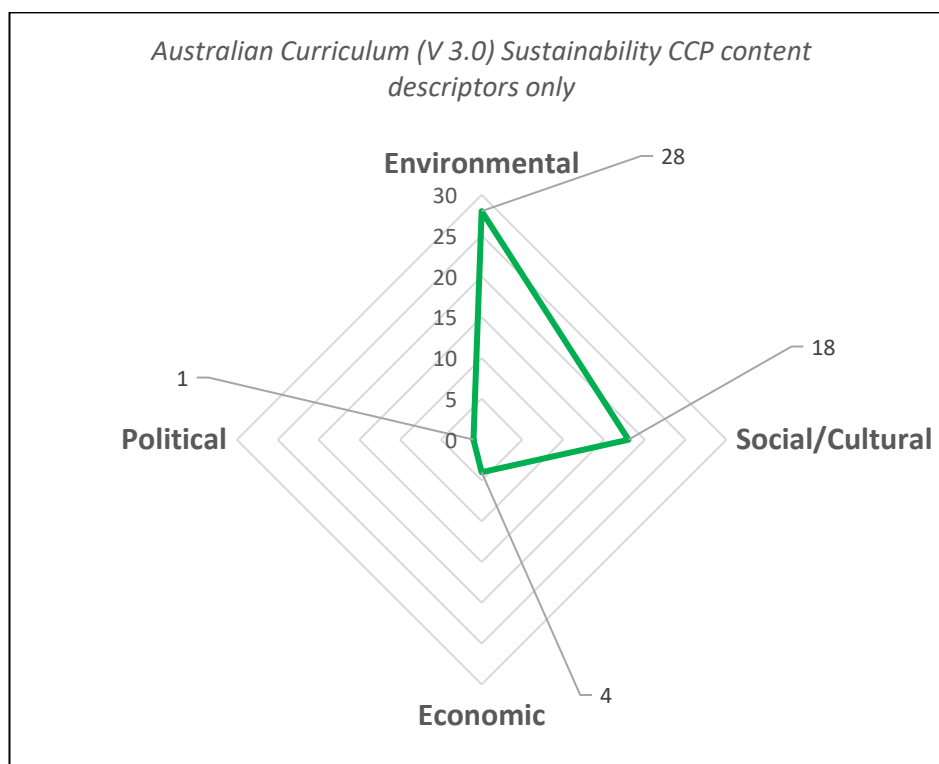


Figure A9: Orientation of Sustainability CCP statements [content descriptors only] (v3.0) to the four dimensions of sustainability across English, mathematics, science and history

Table A2: Number of references to each dimension of sustainability across content descriptors and elaborations (Australian Curriculum K-6, v3.0)

	Content descriptors	Elaborations	Combined content descriptor and elaborations
Environmental	28 (35%)	118 (47.2%)	146 (44%)
Social/cultural	18 (22%)	60 (24%)	78 (24%)
Economic	4 (5%)	15 (6%)	19 (6%)
Political	1 (1%)	6 (2.4%)	7 (2%)
Neutral	30 (37%)	51 (20.4%)	81 (24%)

Appendix O: An analysis of the four dimensions of sustainability in the Australian Curriculum v8.3

From *Figure A10* it can be seen that the primary orientation of the Australian Curriculum Sustainability CCP statements from Foundation/Kindergarten to Year 6 of v8.3 is skewed towards the environmental dimension of sustainability (with 175 direct references). In many cases where the environmental dimension was referenced within the statement, there was a concurrent reference to the social/cultural dimension. In comparison to the environmental and social/cultural dimensions (106 references) there were very few references to economic (43 references) and even fewer to political (32 references).

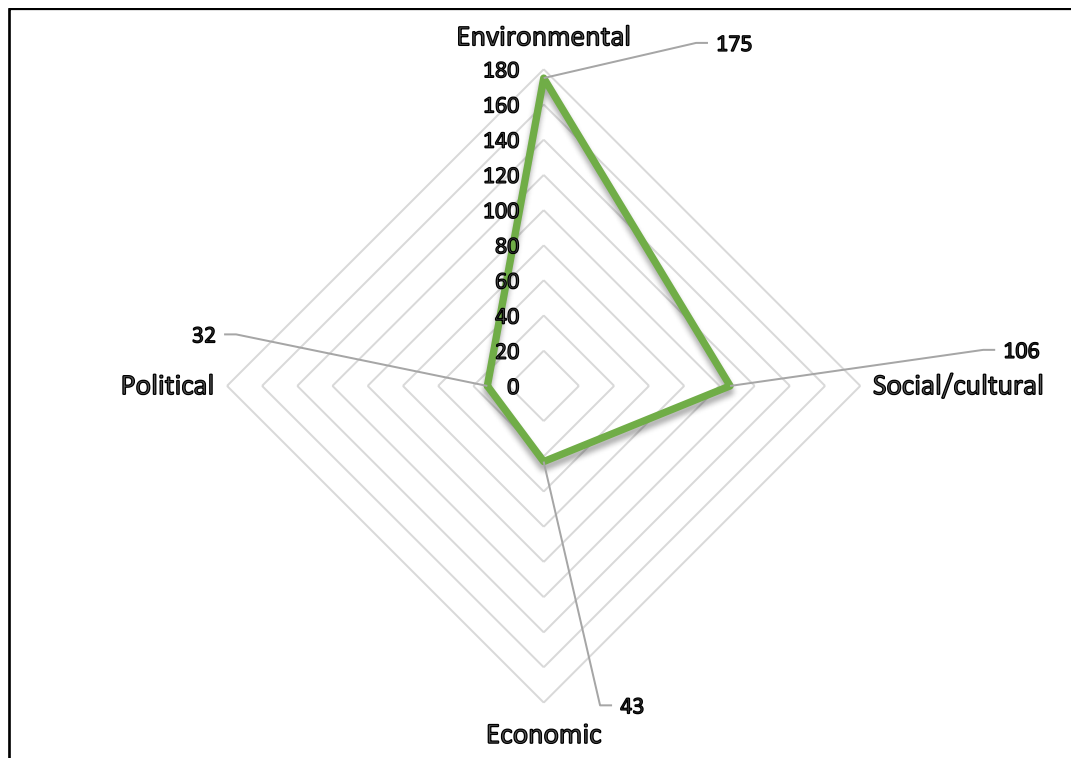


Figure A10: Emphases of the Sustainability CCP statements (v8.3) against the four dimensions of sustainability

Appendix P: AuSSI Goals mapped against outcome domains

	AuSSI outcome domains			
	Education	Environ- ment	Economic	Social
1. Learning and teaching for sustainability as an integral component of school curricula.	✓	✓		
2. Schools actively engaged in a continuous cycle of planning, implementing and reviewing their approach to sustainability as part of their everyday operations.	✓	✓		
3. Schools using natural resources, including energy, water, waste and biodiversity in more sustainable ways.	✓	✓	✓	
4. Schools and school authorities reporting on changes towards sustainability.		✓	✓	
5. Young people sharing ownership of sustainability initiatives and decision making.	✓	✓		✓
6. Schools working towards sustainability in partnership with their local communities.		✓	✓	✓
7. Schools and school authorities implementing governance practices that support effective EE for sustainability.	✓			
8. Individuals supported to make effective sustainability decisions and choices.	✓			✓
9. Schools and communities developing values that support a sustainability ethos.	✓	✓		✓

Analysis of the AuSSI schools aims

Consequently, in one fell swoop, literally in the same paragraph, EfS ideas were corralled into thinking at the macro level but only acting and exerting any influence at the micro level. This mindset resonates throughout the AuSSI school program.

This can be seen from the information presented in *Figure A11, Extract from AuSSI schools website*. Paragraph 1 identifies and foregrounds that the focus is at the school

level, in particular management of its resources and grounds. There is, however, some attempt to cascade the impact of the program beyond school grounds by involving parents, the community, local government and local industry. In this way, EfS has some outreach beyond school boundaries, but not in the expansive transformative sense that much of the literature advocates.

1. The **Australian Sustainable Schools Initiative** (AuSSI) involves a holistic approach to education for sustainability with measurable environmental, financial, educational and social outcomes. It implements improvements in a school's management of resources and grounds and integrates this approach into the existing curriculum and daily running of the school. Students participate in an action learning – or learning by doing – process. AuSSI also involves a school's local community through parents, local government and local industry.
 2. Following pilots run in New South Wales and Victoria, AuSSI is being implemented in all States and Territories, in partnership with State and Territory education and environment agencies.
- At the national level, AuSSI supports the *National Action Plan for Environmental Education* (2000) and gives effect to the concepts and actions identified in *Educating for a Sustainable Future – a National Environmental Education Statement for Australian Schools* (2005).
3. AuSSI does not replace other environmental education activities in schools; rather it links to and complements existing programmes such as Energy Smart Schools, WasteWise, Waterwatch, Waterwise, Landcare and the Reef Guardian Schools Programme. As part of the Initiative, teachers can receive much needed access to professional development in education for sustainability, delivered through supporting agencies and environmental education centres.

Figure A11: Extract from AuSSI schools website

<http://webarchive.nla.gov.au/gov/20120317004937/http://www.environment.gov.au/education/aussi/publications/aussi-factsheet.html>

Appendix Q: Emphases of the national AuSSI schools program action areas

<i>Action area</i>	<i>Environmental</i>	<i>Social/cultural</i>	<i>Economic</i>	<i>Political</i>	<i>School-focused</i>	<i>Local community</i>	<i>Wider society (national and international/global)</i>
Energy					+		
Waste					+	+	
Water					+	+	
Biodiversity					+	+	
Climate change					+		
Transport					+	+	
Health and wellbeing					+	+	
Spirituality and values					+		
Indigenous knowledge					+	+	
Teaching and learning				(implied)	+		
Community						+	
Sustainable purchasing					+		

Appendix R: Emphases of the AuSSI-WA schools program action areas

<i>Action area</i>	<i>Environmental</i>	<i>Social/cultural</i>	<i>Economic</i>	<i>Political</i>	<i>School-focused</i>	<i>Local community</i>	<i>Wider society (national and international/global)</i>
Built environment					+		
Community partnerships					+	+	
Economics					+	+	+
Indigenous cultures					+	+	
Student wellbeing					+		
Waste					+	+	
Biodiversity					+	+	
Cultural and social diversity					+		+
Energy					+	+	
Purchasing					+		
Transport and air					+	+	
Water					+	+	

Appendix S: Action areas from case studies on the AuSSI-WA website

	Case Studies *	Key Resources *
Built environment	<ul style="list-style-type: none"> ▪ Albany Primary School (PS) (solar power systems) ▪ Dandaragan PS (Biomax toilet system) ▪ Harmony PS (permaculture and kitchen garden) ▪ Swan Valley Anglican Community School (raised vegetable beds) ▪ Ashburton Drive PS (Sustainability – school grounds support). 	<ul style="list-style-type: none"> ▪ Piney Lakes Environmental Education Centre ▪ SAKGP
Community partnerships	<ul style="list-style-type: none"> ▪ Bannister Creek PS (whole-school community approach) ▪ Baldivis Primary (Baldivis Children’s Forest) ▪ Shelley Primary (recycling electronics) ▪ Singleton Primary (adopt a beach project) 	<ul style="list-style-type: none"> ▪ Bush Rangers ▪ Canning River Eco Education Centre ▪ Tidy Towns – sustainable communities ▪ Conservation volunteers – Earth assist ▪ Millennium kids
Economics	<ul style="list-style-type: none"> ▪ Amaroo Primary (co-mingled recycling bins) ▪ West Leeming PS (wheelchairs for kids) ▪ Wirrabirra PS (Enterprise Education Program) ▪ Coolbinia PS (10 tonne plan) 	<ul style="list-style-type: none"> ▪ None identified
Indigenous cultures / Aboriginal and TSI histories and cultures	<ul style="list-style-type: none"> ▪ Moerlina School (PALS awards) ▪ Baldivis PS (Sustainability and Nyoongar culture) 	<ul style="list-style-type: none"> ▪ Department of Education: Aboriginal Perspectives Across the Curriculum ▪ Herdsman Lake Wildlife Centre ▪ Indigenous weather knowledge ▪ Remote Indigenous Gardens Network
Student wellbeing	<ul style="list-style-type: none"> ▪ Churchlands SHS (The ‘Earth Avengers’) ▪ East Narrogin PS (Engaging students in sustainability) ▪ St Emilie’s Catholic PS (Harmony Leaf Virtues) ▪ Swan Valley Anglican School (school kitchen garden) 	<ul style="list-style-type: none"> ▪ Physical activity (Department of Education) ▪ Millenium Kids (youth voice and engagement) ▪ School Drug Education & Road Aware ▪ Best Programs 4 Kids
Purchasing	<ul style="list-style-type: none"> ▪ Sacred Heart Catholic PS (water bottle initiative) ▪ Riverside PS (reducing paper consumption) 	<ul style="list-style-type: none"> ▪ REmida Creative Reuse Centre ▪ One World Centre ▪ The Story of Stuff

Energy	<ul style="list-style-type: none"> ▪ Coolbinia PS (10 tonne plan) ▪ Albany PS (solar power) ▪ Chrysalis Montessori (ChrySOLARIS Project) ▪ East Narrogin PS (Green Power) 	<ul style="list-style-type: none"> ▪ Western Power
Waste	<ul style="list-style-type: none"> ▪ Mt Manypeaks PS (Waste Warriors) ▪ Bridgetown HS (Worm farming) ▪ Bluegum Montessori (Aluminium can recycling and the Waste Wise Shed) ▪ Churchlands PS (Zero waste lunches) 	<ul style="list-style-type: none"> ▪ Waste Wise Schools Program ▪ REmida Creative Re-use Centre ▪ Keep Australia Beautiful ▪ East Metropolitan Regional Council ▪ Millenium Kids' 'World Without Waste' (video) ▪ The Story of Stuff
Biodiversity	<ul style="list-style-type: none"> ▪ Mundaring PS (Mardo Reserve) ▪ Baldivis PS (Baldivis Children's Forest) ▪ Glen Forrest PS (Revegetating Nyaania Creek) ▪ Singleton PS (Adopt a Beach project) 	<ul style="list-style-type: none"> ▪ Butterflies in My Backyard ▪ Canning River Eco Education Centre ▪ Australian Association for Environmental Education (Turtle Watch) ▪ Perth Zoo ▪ Department of Fisheries ▪ One World Centre
Cultural and social diversity	<ul style="list-style-type: none"> ▪ Mount Claremont Primary (cultural exchange) ▪ West Leeming Primary (Wheelchairs for Kids) ▪ Spearwood Alternative School (Uthando doll project) 	<ul style="list-style-type: none"> ▪ One World Centre ▪ Global Education ▪ Asia Literacy (Department of Education)
Transport and air	<ul style="list-style-type: none"> ▪ Campbell PS (TravelSmart to School) ▪ Gibbs St PS (Airwatch) ▪ Coolbinia PS (Fume Free Friday) ▪ Kyilla PS (Walking School Bus) 	<ul style="list-style-type: none"> ▪ Your Move (Department of Transport) ▪ Millenium Kids
Water	<ul style="list-style-type: none"> ▪ Dandaragan PS (Biomax toilet system) ▪ Parkfield PS (Leschnault Catchment Learning) 	<ul style="list-style-type: none"> ▪ Waterwise Schools Program ▪ Phosphorous Awareness Project ▪ Canning River Eco Education Centre ▪ Herdsman Lake Wildlife Centre

*N.B. these are just some key examples selected from the website

Appendix T: Four dimensions of sustainability in the Sustainability Curriculum Framework: K-2 and 3-6

Dimension	K-2	3-6
Environmental sustainability	<ul style="list-style-type: none"> ▪ Life cycles, growth and change ▪ Ecosystems and local environment – relationship between species in ecosystems and foodchains ▪ Monitoring of health of environments ▪ Effects of weather and climate ▪ Seasons – impact on ways of living and environment ▪ Water ▪ Agriculture and food ▪ Energy – ways of saving/conserving energy ▪ Materials and waste – waste avoidance, minimisation; and systems for managing and recycling waste ▪ Built environments – energy and resource use; minimising environmental impacts and costs; services such as communication, energy, waste and transport. 	<ul style="list-style-type: none"> ▪ Life cycles, growth and change ▪ Ecosystems and local environments – relationship between species in ecosystems and food chains ▪ Evolution of life – long-term trends in species change and major events in Earth’s history ▪ Change in living systems – Monitoring trends in health of ecosystems and reasons for change ▪ Materials and production – waste avoidance, minimisation, reduce and recycling local; remote impacts of processing and use of materials ▪ Built environment – design to minimise environmental costs, impacts, urban and regional waste ▪ Weather and climate ▪ Methods of assessing ecological sustainability – health of ecosystems, conservation of natural resources and wellbeing of community; recognising different values – economic, spiritual, sentimental, historical etc. ▪ Transport – sustainable use of resources at personal and community level; social and environmental impacts of common power sources for transport ▪ Agriculture and food – costs and benefits of large scale food production; nutrition and local and global equity; agricultural and land use practices ▪ Solar system and energy ▪ Water

Social/cultural sustainability	<ul style="list-style-type: none"> ▪ Social systems and culture ▪ Sharing own and other's perceptions of feelings toward living things and natural environments ▪ Reflection on – need wants and values of self, family, other people and cultures; needs of other species and of natural systems ▪ Developing an ethic of care 	<ul style="list-style-type: none"> ▪ Sharing own and other's perceptions of feelings toward living things and natural environments ▪ Developing an ethic of care ▪ Reflecting on own and other's values and ethical principles ▪ Negotiating common ground by recognising and accommodating difference of belief and values ▪ Using a variety of aggregated information regarding human needs, wants, happiness, health and wellbeing
Economic sustainability	<ul style="list-style-type: none"> ▪ Civics and citizenship – caring for the environment and linking with others around the world to do so ▪ Ownership and value – decision making as consumers in relation to economic and environmental cost 	<ul style="list-style-type: none"> ▪ Social systems and subsystems e.g. groups and organisations that need to take sustainability into account. ▪ Processes of historical change – two way relationship between community and natural environments ▪ Civics and citizenship – taking sustainable action through social, economic and democratic institutions and processes; intergenerational responsibility for the environment ▪ Agriculture and food – costs and benefits of large scale food production ▪ Ownership and property rights – shaped by social, cultural and economic institutions and shaping people's interaction with the environment ▪ Economic systems and costs – relationship between lifestyle decisions, consumption, wealth and economic and environmental costs
Political sustainability		<ul style="list-style-type: none"> ▪ Civics and citizenship – taking sustainable action through social, economic and democratic institutions and processes; intergenerational responsibility for the environment

Appendix U: Focus areas for professional learning expenditure

2012	<ul style="list-style-type: none"> ▪ Numeracy ▪ Literacy ▪ Specials needs ▪ Classroom management strategies ▪ John Fleming strategies
2013	<ul style="list-style-type: none"> ▪ Literacy, numeracy, science & history ▪ Explicit teaching ▪ Special needs ▪ ICT in the classroom ▪ Developing professional learning communities ▪ Moderation of grades when reporting to parents
2015	<ul style="list-style-type: none"> ▪ Supporting teaching and learning strategies, and the health and well-being of students. ▪ Visible learning – feedback that makes learning visible ▪ Explicit teaching – John Fleming ▪ Working in professional learning communities ▪ Teacher registration ▪ Using e-journals to support professional practice ▪ Using iPads and Macs to support learning ▪ Numeracy – learning progressions ▪ Observational skills for EAs ▪ Familiarisation with the HaSS WA Curriculum. ▪ Moderating grades in literacy, numeracy, science and history
2016	<ul style="list-style-type: none"> ▪ Multiplicative thinking –research-based professional learning through Curtin and Notre Dame Universities ▪ Working in professional learning communities ▪ Visible learning ▪ Skills and insights for managing conflict ▪ HaSS ▪ Analysing data ▪ Spelling ▪ Health curriculum ▪ Digital technologies ▪ Social and emotional development
2017	<ul style="list-style-type: none"> ▪ Using data to inform teaching and learning; ▪ Technologies ▪ Visible learning ▪ Leadership ▪ Literacy – spelling and writing ▪ Numeracy – multiplicative thinking ▪ HaSS ▪ Health curriculum ▪ Technologies ▪ Social and emotional development ▪ Communicating through connect ▪ NQS and play-based activities ▪ Protective behaviours ▪ Documented plans