

**Transformative learning
for a shift towards sustainability
in Thailand's design education**

Treechada Chotiratanapinun

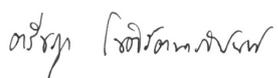
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Declaration of Authorship

I, Treechada Chotiratanapinun, hereby declare that this thesis and the work presented in it is entirely my own. Where I have consulted the work of others, this is always clearly stated.

Signed: 

Date: 28/09/17

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ABSTRACT

In Thailand, design for sustainability is still in its early days. This research explored the education aspect of this phenomenon by looking at its three nested levels of design education – the educational paradigm, organisation and management of the learning environment, and learning and pedagogy. These nested contexts lead to three key research questions. Is a paradigm shift towards sustainability in Thailand's design education plausible and able to be put into practice? Could education for sustainable development (ESD) be embedded into Thailand's design education through Bonnett's (2002) 'frame of mind' concept? And, can dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand? The study provided data concerning the current education paradigm, curriculum management, role of sustainable design pedagogy in higher education, and other insights into a broader picture of the relationship between design education and industries. At the heart of the research was the participatory action research (PAR) process, with curriculum interventions grounded in whole systems thinking and aiming to unfold if transformative learning can help in facilitating a shift in learners' perspective away from a mechanistic worldview. The interventions were designed and developed based on 'the inside-out approach', well linked to the Buddhist tradition and the concept of education for sustainability as a frame of mind. Focus group discussion with designers, classroom observations prior to the interventions, post-intervention student focus group discussions and interviews with policy-makers, educators with management responsibilities and sustainable design educators were also carried out. The key findings reveal the gap between sustainability-related rhetoric and practices at multiple levels, the lack of shared values on sustainability among stakeholders of Thai design education, the association between seniority and the Thai concept of change, and the practicality and effectiveness of transformative sustainability learning when implemented with various groups of Thai design students.

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LIST OF ABBREVIATIONS

AAM	Amicable Assessment Model , a user-friendly evaluation tool for education quality assessment developed by the Office for National Education Standards and Quality Assessment (ONESQA). The model was designed based on the Buddhist concepts of <i>madhyama-pratipad</i> or “the middle way” and <i>kalyanamitra</i> or “spiritual friends”.
EE	Environmental Education , a learning process that allows individuals to explore environmental issues, engage in problem solving and take action to improve the environment.
ESD	As defined by UNESCO, Education for Sustainable Development allows every human being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future. Interchangeable terms include Sustainability Education (SE), Education for Sustainability (EfS)
NIC	Newly Industrialised Country , a country not yet reached a developed country's status but have, in a macroeconomic sense, outpaced their developing counterparts.
OTOP	One Tambon One Product , a local entrepreneurship stimulus programme. It aimed to support locally made and marketed products of each sub-district in Thailand. The programme's name has been changed to Local and Community Products, but OTOP branding is still widely used.
PAR	Participatory Action Research , a research approach in which stakeholders are involved in the entire process as co-researchers. / a process in which knowledge collectively generated is used for the development of strategies for social change.
SEP	Sufficiency Economy Philosophy , an economic model developed by His Majesty King Bhumibol Adulyadej for sustainable development based on the Buddhist concept of “the middle way”. The model consists of three foundations: moderation, reasonableness, and self-immunity.

CHAPTER 1: INTRODUCTION

1.1 Background of the research

Thailand is a newly industrialised country (NIC). Thai design industries have been growing steadily and major drivers include increasing middle class and access to social media (Ipsos, 2017). However, Thailand's dramatic economic growth has caused numerous environmental issues (Grossman, 2015). Looking specifically at the design and manufacturing sector, Klinpikul and Srichandr (2010) pointed out a lack of understanding of the underlying philosophy as well as technical know-how of sustainability among key personnel in the industries. In businesses involving mass production, companies only see practices concerning environmental sustainability as a “must” for them to stay in business and keep market share (Lindahl, 2008). All research participants in the studies of Lindahl (2008) and Klinpikul and Srichandr (2010) asserted that they did not receive sustainability education from their programmes while studying design in universities. Pasupa, Evans and Lilley (2012) concluded that sustainable design has not been successfully integrated into Thai design industries because designers lack relevant expertise. For the Thai higher education sector, Lindahl (2008) indicated that implementation of education for sustainable development (ESD) has been only limited to programmes in the field of Environmental Science. A recent study by Pasupa (2016) identified that there are two root causes of barriers to implementing ESD into Thai design education. One is that sustainable design is considered a lower priority than other subjects in design, especially those concerning manufacturing processes, aesthetics, and functionality of products. Another is design educators' lack of comprehension in sustainable design. Krasae-in, Suppipat and Rojanathum (2016) reported that Thai design education should respond more to the factors that have already affected the industries, including sustainability. However, these studies have neither obtained insights on this matter at the level of learning and pedagogy nor addressed relevant issues from design students' point of view. Sustainable design education in Thailand appears to be an under-researched area as literature regarding the implementation of ESD in design education is still very limited.

With a background in communication arts and sustainable design, I have worked with many organisations, particularly those focusing on the question of the consequence of design. Since 2009, I have worked as a design educator. Apart from working in higher education, I have been engaged in promoting and educating sustainability to a broader audience, from professional designers, to entrepreneurs and to the general public. I have been interested in using all forms of feedback from learners regarding the effectiveness of my teaching and determining potential directions for improvement. I have aspired to develop a more effective sustainability pedagogy that suits the needs of both Thai design learners and design industries. My past experience and aspiration had evolved and integrated into this PhD thesis, with an ambition to handle the matter systematically, comprehensively and meaningfully. This research offered me an opportunity to

develop a sustainable design pedagogy that pragmatically and culturally suits the Thai context, alongside gaining an insight into the context of ESD in Thai design education. Therefore, the motivations for conducting this research emerged from my own epistemological beliefs and personal assumptions regarding the possibilities to facilitate a shift in Thai design learners' worldview toward sustainability. As a researcher, my ontological and epistemological position is located in the constructivist tradition. This research lies in the interpretive approach to social reality. Such reality is complex, subjective and constructed by various stakeholders of Thai design education. Hence, the use of qualitative research methods of data collection and analysis is crucial for this research.

1.2 Purpose of study

There are three research questions in connection with three different contextual levels of design education in Thailand. The diagram in Figure 1 illustrates the scope of the research where the three research questions are situated.

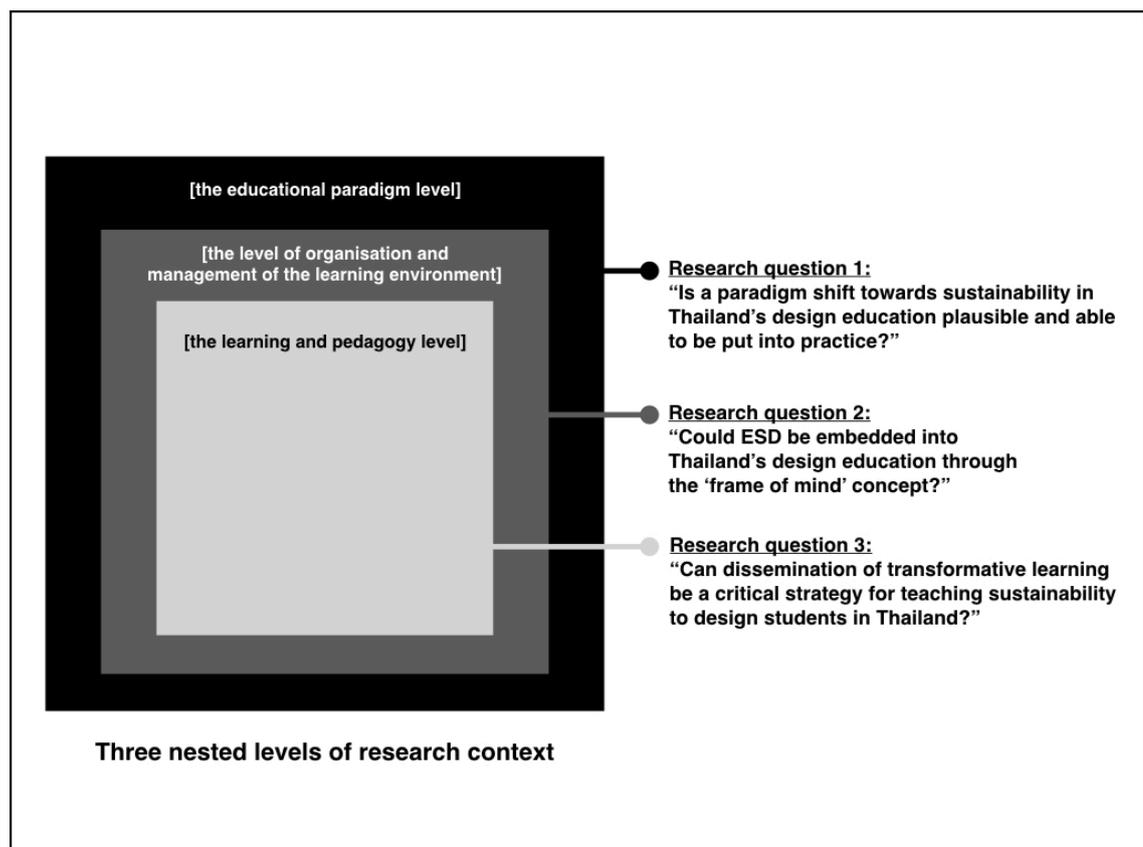


Figure 1: Three research questions nested together in three contextual levels

The first research question “**Is a paradigm shift towards sustainability in Thailand's design education plausible and able to be put into practice?**” is based on the educational paradigm level. The overarching aim of this research question is to explore the plausibility of a paradigm shift towards sustainability in Thailand’s design education. To achieve this aim, the objectives are:

- To investigate the core values, the worldview and the direction of Thai design education in relation to ESD.
- To identify factors that can contribute to a paradigm shift towards sustainability.

For this question, data from policy-makers and educators with management responsibilities are essential. However, the findings from the other two levels also contribute to, and complement, the answer to this first research question.

The second research question “**Could ESD be embedded into Thailand’s design education through the ‘frame of mind’ concept?**” concerns the level of organisation and management of the learning environment. Bonnett’s (2002) concept of education for sustainability as a frame of mind is central to this question. The overarching aim of this research question is to find out what design educators and educators with management responsibilities think of viewing sustainability as ‘a frame of mind’ rather than an aspect of policy. To achieve this aim, the objectives are:

- To explore the current practices concerning the embedding of ESD into curriculum.
- To identify how design educators who teach sustainability-related design courses consider their role, interpret sustainability and instruct design for sustainability.

The third research question, “**Can dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?**”, focuses on the learning and pedagogy level. This level is where the participatory action research (PAR) process takes place, where data from students are fundamental. This question aims to find out if transformative learning be a critical strategy for teaching sustainability to Thai design students. In order to achieve this aim, the objectives are:

- To recognise the current pedagogical practices in sustainable design.
- To identify factors that affect the learners’ view of learning, perception on sustainability and shift in perspective and behaviour towards sustainability.
- To develop and test an effective pedagogical model of sustainability learning for Thai design students.

1.3 Structure of thesis

The thesis has been structured in nine chapters. (See Table 1.)

Table 1: Structure of thesis

Chapter number	Chapter title	Type of content
Chapter 1	Introduction	Introduction of research
Chapter 2	Sustainability	Literature review
Chapter 3	Education	
Chapter 4	Design education	
Chapter 5	The context	Research context
Chapter 6	Research methodology	Research methodology and design
Chapter 7	Findings from data collected from non-student participants	Research findings
Chapter 8	Findings from data collected from student participants	
Chapter 9	Discussion and conclusion	Discussion, conclusion and contributions to new knowledge

Chapter 1: Introduction, the current chapter, introduces the research background, purpose and an overview of the structure of the thesis.

Chapter 2: Sustainability discusses sustainability in a broad sense and involves an extensive conceptual exploration of sustainability. For this research, sustainability concerns recognition of the dynamic and interdependent nature of all the parts of life on Earth as a whole. Therefore, the ethical and spiritual dimensions of sustainability are also examined. Whole systems thinking (Capra, 1996; Fry, 2008; Meadows, 2008), ecological literacy (Centre for Ecoliteracy, 2013), environmental worldviews and ethics (Devall & Sessions, 1985; Naess, 1973) and concepts relating to spiritual ecology (Vaughan-Lee, 2013) are explored. In the conclusion section, it asks a question about communicating sustainability to Thai people, if it will be more effective to employ the concept of nature through the lens of Buddhism rather than the typical Western-oriented perspective of sustainability.

Chapter 3: Education introduces a number of theoretical concepts concerning education. The chapter starts from a critique on education through the lens of critical theory (Gibson, 1986), to critical pedagogy (Freire, 1970), to transformative learning (Miller & Seller, 1990; Mezirow, 1996;

O'Sullivan, 2002), to ecopedagogy (Antunes & Gadotti, 2005; Kahn, 2010), to environmental education (EE) and education for sustainable development (ESD) (Bonnett, 2002; Kwong, 1997; Huckle, 1993; Tilbury and Wortman, 2004), the use of whole systems thinking in education and the link between higher education and sustainability (Sterling, 2001; Burns, 2011). The conclusion section discusses the rise of the sustainability agenda and global attempts to implement ESD into higher education, in relation to the context of Thailand.

Chapter 4: Design education first describes the nature of design education, especially design curriculum and pedagogy (Shreeve et al., 2010; Tovey, 2015), and then moves on to the area where sustainability, design and design education intersect. The integration of sustainability in design education is discussed by presenting three different models of sustainability employed in design education: the Hannover Principles (McDonough & Braungart, 1992), Design for Sustainability Approaches (Bhamra & Lofthouse, 2007) and the application of ecological literacy for design and design education (Boehnert, 2013). At the end of the chapter, it asks a question on the possibility of using whole systems thinking as a basis for paradigm change in design education.

Chapter 5: The context outlines five key areas as a background to the research context. It firstly looks at sustainable development in Thailand, which discusses mainly the late King of Thailand, His Majesty King Bhumibol Adulyadej's Sufficiency Economy Philosophy (Fusakul & Siridej, 2010; Grossman, 2015). The second area is Thai cultural values and educational culture, which explores four areas: Buddhism and the Thai worldview, Hofstede's (1997) analysis of Thai culture, Komin's (1990) nine clusters of cultural values and the role of teacher based on the late King's royal speech. The third area concerns the history and a variety of issues in Thai higher education. The relationship between the nation's economic development and design industries are explored in the fourth area. The last area is the link between sustainability and Thai design education, which outlines some research results of the recent study of Pasupa (2016) regarding the implementation of ESD in Thai design education.

Chapter 6: Research methodology describes the methodology carried out in this thesis, in conjunction with the research questions. The initial part outlines how the researcher-as-transformative-learner approach has informed the research design. As the research context concerns Thai culture, the chapter discusses matters around research ethics such as bias, validity and language issues. The chapter explores the research methodology used in the thesis, focusing on exploring why particular research methods and types of participants are employed in conjunction with the research questions. The iterative approach of participatory action research (PAR), which is the central part of the research methodology and consists of pilot study and main study phases, is highlighted. The chapter also presents how thematic data analysis and triangulation techniques were employed to make sense of the data from the qualitative research

process.

Chapter 7: Findings from data collected from non-student participants explores the results of the analysis of data from policy-makers, university executives, design educators with management responsibilities, design educators and design practitioners working in creative industries. The findings are presented in two parts. The first part involves the use of rhetoric at multiple levels. The second part concerns the current situation of Thai design education, which includes four dimensions: design curriculum and pedagogy in practice, the power structure within Thai design education, voices from the industries, and ESD in Thailand's design education. The conclusion section highlights the disconnection between rhetoric and practice regarding ESD in Thai higher education and design education.

Chapter 8: Findings from data collected from student participants explores the results of the analysis of data from students, collected via classroom observations, curriculum interventions and focus group discussions. The findings are presented in two parts: students' experiences in their design curricula and students' reflections on the curriculum interventions. The chapter reveals numerous issues, especially how Thai cultural values impacted students' learning experiences, factors described by students as resistance to change in curriculum, factors contributing to effective transformative learning, and suggestions from students regarding the implementation of ESD in Thai design education.

Chapter 9: Discussion and conclusion provides a summary of the results. It begins with an examination of the results in relation to existing literature, which look at two main areas: ESD and Thai design education and impact of Thai cultural values on design learning and pedagogy. To examine how the thesis has addressed the three research questions, the research results are discussed individually in connection with each research question. Towards the end of the chapter, it reports limitations of the study as well as implications or practical applications of the research.

CHAPTER 2: SUSTAINABILITY

This chapter provides theoretical ground for understanding the broad spectrum of concepts concerning sustainability through a lens of holism, from systems thinking, to ecological literacy, to environmental worldviews and ethics, to spiritual ecology and to the sustainable self. It confirms that current challenges in the world such as increases in globalisation, complexity, uncertainty, inequity, conflict, consumption, population, destabilisation of ecological systems and climate change, are all connected and each cannot be understood or addressed in isolation. Although a number of studies show growing awareness of these problematic issues among youth, there is often poor understanding of sustainability (Fien, 2000). At the same time, rapid social, economic and technological changes have become more and more aggressive, leading to anxiety, stress and loss of identity among people who are used to living with consumption and materialism. Sterling (2001) concluded based on Bateson's (1972) holistic concept of 'an ecology of mind' that the root of the planetary challenges previously mentioned lies in a crisis of perception; of the way that we see the world. This opens up spirituality as another dimension to look into. In the end, a reflection in conjunction with the context of the research is made and critiques and poses relevant questions.

2.1 Defining sustainability

The history of sustainability can be traced back to the earliest human development. But the most widely recognised definition of sustainable development is included in the United Nations World Commission on Environment and Development's (1987) *Our Common Future* or the Brundtland Report – "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 sustainability concept is often referred as *triple bottom line*, the term coined in 1994 by John Elkington. The three interconnected parts of the triple bottom line include people (social dimension), planet (environmental dimension), and profit (economic dimension). It is also called the three pillars of sustainability (Figure 2).

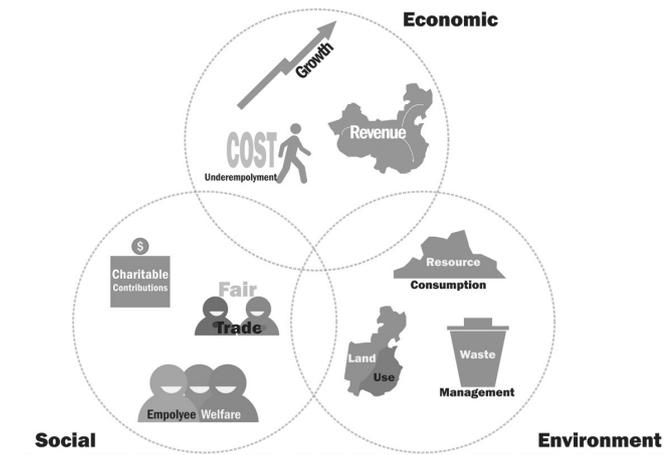


Figure 2: The triple bottom line diagram

However, I would argue that the concept of the triple bottom line is too reductionist because it considers environment, economy and society as three separate accounts. Therefore, the literature review aims to consider sustainability in a broad sense, extending beyond the concerns of the economy and human welfare. It also involves an extensive conceptual exploration of sustainability, especially the ethical and spiritual dimensions. In this research, sustainability is about recognising the dynamic and interdependent nature of all the parts of life on earth as a whole. Figure 3 presents Thich Nhat Hanh's calligraphy. The full circle has multiple significances: emptiness, full of the cosmos, space, and “everything inter-is with everything else.” It implies a whole, natural progression from one stage to the next and continuous flow from element to element.



Figure 3: Thich Nhat Hanh's circle calligraphy (Unified Buddhist Church, Inc., 2017)

2.2 Whole systems thinking

“At its core, the word sustainability refers to systems and processes that are able to operate and persist on their own over long periods of time” (Robertson, 2014, p. 3).

There are four aspects of whole systems thinking to explore. The first aspect is parts and whole. Capra (1996) defines a system as “an integrated whole whose essential properties arise from the relationships between its parts” (p. 27). Similarly, Meadows (2008) gives a definition of a system in an article written in 1993 but published posthumously in 2008 as “an interconnected set of elements that is coherently organized in a way that achieves something” (p. 188). The Earth itself is a complex system, made of numerous nested and interrelated systems. The planet has many challenges that are interconnected, including resource depletion, overpopulation, global warming, species extinction, economic instability and so on. As a result, we cannot fix a single problem in isolation. “Everything that exists is part of a whole system and depends on the health of the whole system for its own existence. It thrives only if the whole system thrives, and it cannot harm the whole system without harming itself” (Greer, 2012, p. 21).

The second aspect is cause and effect. The ecological problems we are currently facing are indeed a consequence of the way we have organised ourselves socially, politically and economically. At the same time, the Earth has systemic limits. The Earth's carrying capacity, which is the size of a population that can be supported indefinitely by the Earth's resources, is limited and our unsustainable actions continue to push the Earth's boundaries. Systems thinking is an essential approach that assists people to understand the complexity of the world around them as well as encourages them to think in terms of relationships, connectedness and context. It enables us to analyse systems through a holistic perspective (Wheeler, 2014), recognise system dynamics, cascading effects, feedback loops and system states (Meadows, 2008) and acknowledge patterns and fundamental relationships among problems and possible solutions (Grunwald, 2004). Systems thinking is non-linear. Cause and effect are not necessarily linked with simple step-by-step procedures. As sustainability involves thinking systematically about the future and future generations, it requires learning from the past, exploring the present, thinking about possible futures, and developing solutions that are adaptable and resilient.

The third aspect concerns futures. Systems thinking is the keystone of futures studies, which seeks to determine the likelihood of future events and trends via a systematic and pattern-based understanding of past and present. The challenge proposed by futures studies scholars is that human beings can shape their own futures. This is in line with one of Mahatma Gandhi's famous quotes – “The future depends on what you do today” (Alli, 2013). Fry (2008) introduces two opponent terms, ‘futuring’ and ‘defuturing’, based on the concept that the future is created according to our actions. Futuring means to bring proactive concrete responses to future issues

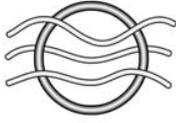
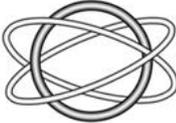
into present-day operation. In contrast, defuturing means to do something that takes a future away or prevents it from arriving. Thinking in system terms can enable us to redirect ourselves to serve futuring and move towards more sustainable modes of planetary habitation (Fry, 2008, p. 6).

The fourth aspect is paradigm shift. Thinking systemically requires several shifts in perception. These shifts should be seen as movements along a continuum. By shifting the focus from the parts to the whole, we can better grasp the interconnections between the different elements. Systems thinking implies a paradigm shift away from reductionist thinking to holistic thinking. The term paradigm refers to a distinct set of concepts or thought patterns, concerning assumptions of how people perceive the world. Kuhn (1962) uses the term paradigm to explain large-scale change in scientific outlook and culture. For Capra (1996), the paradigm is defined wider as “a constellation of concepts, values, perceptions and practices shared by a community, which forms a particular vision of reality that is the basis of the way the community organizes itself” (p.11). A paradigm shift occurs when our fundamental view of reality changes to a new, wider perspective. Social scientists often use the concept of paradigm shift to study the social behaviour in response to societal changes. The paradigmatic shift toward a systems worldview has been in the making for years (Capra, 1996). Much has been written about how systems thinking is slowly beginning to transform different areas, including Biomimicry (Benyus, 2002) and Cradle to Cradle (McDonough & Braungart, 2002), organisational development (Senge, 2006), to name a few. To conclude, whole systems thinking is important for a paradigm shift towards sustainability.

2.3 Ecological literacy

Ecological literacy, also referred to as ecoliteracy, is the ability to understand the natural systems by which nature sustains life. It plays a vital role in making a shift to more sustainable futures, as the development of ecological understanding is a fundamental change in the way we see the world. It has been developed into a new educational paradigm that creates a conceptual basis for integrated thinking about sustainability. The mission is to reconnect the learners to living systems because the ecological problems we are facing today are deeply rooted in a lack of understanding of our place in the web of life (Capra, 1996). Understanding that human beings are part of the natural world is the basis for the transition to sustainability. Table 2 presents the principles of living systems. As nature continuously changes, unfolds and develops through its dynamic relational patterns, structures and processes, the characteristics of living systems in nature are all expressions of relational patterns in community (Centre for Ecoliteracy, 2013).

Table 2: The ecological principles found in nature (Centre for Ecoliteracy, 2013)

Systems Principle	Definition
<p>Network</p> 	<p>All living things in an ecosystem are interconnected through networks of relationship. They depend on this web of life to survive.</p>
<p>Nested Systems</p> 	<p>Nature is made up of systems that are nested within systems. Each individual system is an integrated whole and – at the same time – part of larger systems. Changes within a system can affect the sustainability of the systems that are nested within it as well as the larger systems in which it exists.</p>
<p>Cycles</p> 	<p>Members of an ecological community depend on the exchange of resources in continual cycles. Cycles within an ecosystem intersect with larger regional and global cycles.</p>
<p>Flows</p> 	<p>Each organism needs a continual flow of energy to stay alive. The constant flow of energy from the sun to Earth sustains life and drives most ecological cycles.</p>
<p>Development</p> 	<p>All life – from individual organisms to species to ecosystems – changes over time. Individuals develop and learn, species adapt and evolve, and organisms in ecosystems coevolve.</p>
<p>Dynamic Balance</p> 	<p>Ecological communities act as feedback loops, so that the community maintains a relatively steady state that also has continual fluctuations. This dynamic balance provides resiliency in the face of ecosystem change.</p>

Beyond understanding these natural systems, ecological literacy is about applying such understanding for redesigning organisations, communities, businesses and societies to align with ecological principles. How significant ecological literacy is for today’s design education will be explored later on in this chapter.

2.4 Environmental worldviews and ethics

Sustainability is an ethical matter as well as a mindset that requires us to look at the world differently. This section sets out to provide ethical concepts related to the environmental philosophy. The term environmental worldview can be defined as collective beliefs and values that give people a sense of how the world works, their role in the environment, and justification of behaviour towards the environment. The environmental worldviews dictate how people perceive and interact with nature, as well as their attitude towards their consumption of natural resources. Part of an environmental worldview is determined by a person's environmental ethics. According to the Stanford Encyclopedia of Philosophy (1997), environmental ethics is the discipline in philosophy that studies the moral relationship of human beings to, and also the value and moral status of, the environment and its nonhuman contents.

Table 3 presents that there are three major environmental worldviews: planetary management, stewardship and environmental wisdom (Miller & Spoolman, 2011).

Table 3: A comparison of three major environmental worldviews

Environmental Worldviews	Planetary management	Stewardship	Environmental Wisdom
Values	Human-centred		Earth-centred
Environmental Ethics	Anthropocentrism		Non-anthropocentrism
Beliefs	Humans are set apart from nature. With the help of technology, we can manage our resources and not run out of those that are limited.	Humans have an ethical responsibility to be stewards of the Earth and its finite resources. With the right management strategies, we will not run out of resources.	Humans are all a part of and totally dependent on nature. All resources are limited. Economic practices that degrade the Earth should be discouraged.

2.4.1 Anthropocentrism versus non-anthropocentrism

Anthropocentrism denotes a human-centred ethical system. The anthropocentric belief is that human beings are the sole bearers of intrinsic value or possess greater intrinsic value than non-human nature; therefore, it is acceptable to employ the resources of the natural world for only human ends (The Concise Oxford Dictionary of Politics, 2009). Anthropocentrism holds a systematic bias in traditional Western attitudes to the non-human world, which leads to the

ecological crisis. There are two terms associated with anthropocentrism. First is egocentrism, which is grounded in the self and based on the assumption that what is good for the individual is good for society. Second is technocentrism, an environmental perspective that humans can control and manage resources by the use of technology. This type of view believes that it can provide solutions to all environmental problems. It connects directly with the planetary management worldview.

Non-anthropocentrism argues that the non-human world has value in and of itself, which is intrinsic or absolute value (Wenz, 2001). It is the view that human beings do not regard themselves as the central and most significant entities in the universe, or the assessment of reality not exclusively from a human perspective. Non-anthropocentrism involves three schools of thought: biocentrism, ecocentrism and holism. Biocentricism is a system that extends inherent value to all living things, often promoting the preservation of biodiversity, animal rights, and environmental protection. Ecocentrism is a nature-centred system of values which also recognises non-living things, set against to the human-centred, system of values. Ecocentrism goes beyond biocentrism with its fixation on organisms, meaning human beings are inseparable from the inorganic/organic nature that encapsulates them (Rowe, 1994). It respects the rights of nature and the dependence of humans on nature. Anthropocentrism and ecocentrism are regarded as “the opposing poles of a wide spectrum of differing orientations towards nature” (Eckersley, 1992, p. 33). Figure 4 helps illustrate such distinction. Lastly, holism involves a basic underlying concept of the unity and integral wholeness of all people and nature. It is the idea that natural systems and their properties should be viewed as wholes, not as collections of parts.

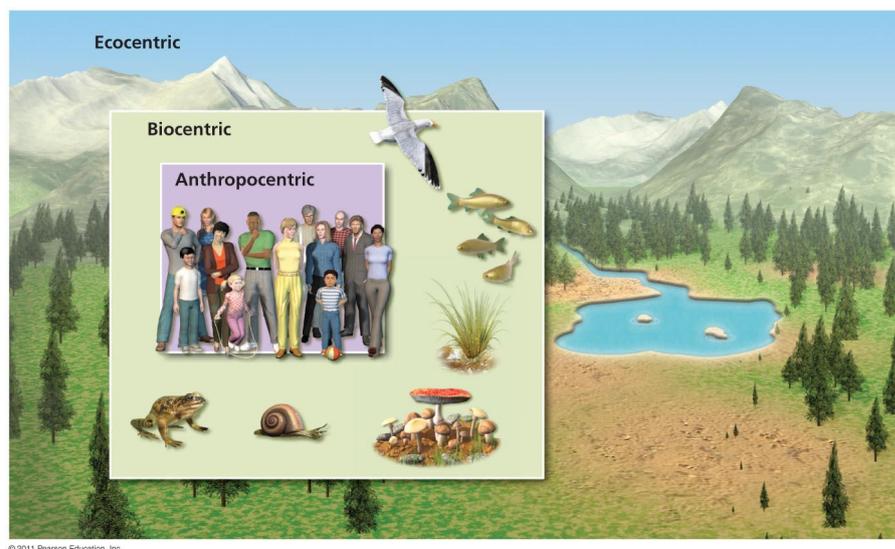


Figure 4: The distinction between anthropocentrism, biocentrism and ecocentrism

2.4.2 Shallow ecology versus deep ecology

Naess (1973) coined the terms 'shallow ecology' and 'deep ecology' to mark two radically different approaches to respond to ecological crises. Shallow ecology is human-centred and relies on quick, technical fixes and pursues business as usual without any deep value questioning of long-range changes in the system (Drengson, 2001, p.4). Proponents of shallow ecology worry about the environmental problems that affect humans. The reasons for conserving wilderness and preserving biodiversity are invariably tied to human welfare, and it prizes nonhuman nature mainly for its use-value (Nelson, 2008, p. 206). That means, the values assigned to nature reflect the concern for environment limited only to supporting the satisfaction of human wants and needs (Mathews 1994). In contrast, deep ecology is a social movement intending to call for a fundamental rethinking of environmental thought that would go far beyond anthropocentric and reform environmentalism that sought merely to adjust environmental policy. It brings together science, philosophy, spirituality and action. Arguably the most holistic philosophy of environmental ethics, deep ecology is an ecocentric process of ever-deeper questioning of ourselves, the assumptions of the dominant worldview in our culture, and the meaning and truth of our reality. We cannot change consciousness by only listening to others, we must involve ourselves by taking direct action (Devall & Sessions, 1985, p. 8-9). Critical thinking is very important for the process of self-realisation. In other words, through deep experience, deep questioning and deep commitment emerges deep ecology.

2.5 Spiritual ecology

"There is action to be taken in the outer world, but it must be action that comes from a reconnection with the sacred – otherwise we will just be reconstellating the patterns that have created this imbalance" (Vaughan-Lee, 2013, p. 256).

According to Vaughan-Lee, (2013), the term 'spiritual ecology' refers to a spiritual response to the ecological crisis, considering that the world is part of our own self and we are part of its suffering wholeness. Spiritual ecologists believe that ecological renewal and sustainability necessarily depends upon spiritual awareness and an attitude of responsibility. Spiritual ecology involves a range of different perspectives and indigenous wisdom derived from different cultural traditions. For example, Lovelock's (1979) *Gaia* hypothesis – the Earth is alive, behaves like a living system and is mother to all life forms (Harding, 2010), the environmental wisdom and spirituality of North American Indians – in Mother Earth's family each of us is connected to every single being, animate and inanimate, visible and invisible (Shapiro, 2006), the Sanskrit mantra *So hum* – you are; therefore, I am (Kumar, 2013), and the Southern African region's concept of *Ubuntu* – one cannot exist alone in isolation (Amster, 2015). The common ground they hold is the embrace of wholeness, interdependence and interconnectedness in nature.

Development of personal environmental ethics is essential for creating a paradigm shift to sustainability. All meaningful and lasting change starts from within. Working to create a sustainable self is the first step in the process of becoming an agent for sustainable change – a critical player engaged in trying to help change happen in the broad direction of greater sustainability.

“You must be the change you want to see in the world.” – Mahatma Gandhi (quoted in Shapiro & Shapiro, 2009, p. 10)

2.6 Buddhist perspectives on sustainability

The focus of this thesis will be particularly on the Buddhist perspective as it is widely discussed in the contemporary literature and most relevant to the context of the research. Therefore, this section aims to explore the close relationships between Buddhism and sustainability.

2.6.1 Dharma

The three Jewels, the foundation of all forms of Buddhism, include the *Buddha* (the awakened one or the teacher), the *Dharma* (the Buddha’s teaching), and the *Sangha* (the community of those who have realised the teaching and embodied it in their lives through practice). Dharma refers to the teaching of the Buddha as an exposition of the Natural Law applied to the problem of human suffering. The entire Buddhist tradition is well acquainted with the four fundamental aspirational prayers, which are designed to develop loving-kindness, compassion, empathetic joy and equanimity in respect of all sentient beings and the environment (Bodhi, 2000). Respect for Nature is inherent in Buddhism. One must understand the nature of things in order to attain wisdom. Buddhists believe that all beings share the suffering of birth, old age, sickness and death, and that every living thing is co-dependent. Ideally, Buddhists do not regard nature merely as a supply source for our material needs. The Earth is seen as a living entity, and therefore Nature has a dynamic role.

“We descend not just from our human ancestors, but from animal and plant ancestors, and even from the stuff of the Earth itself; its mineral components are our own” (Nhat Hanh, 2008, p. xiv).

2.6.2 Engaged Buddhism and deep ecology

Buddhism is fully compatible with the concept of holism. Ultimately there is no separation between what appears to be an individual creature and its environment. In many ways, deep ecology is considered to be a form of dharma (Kamalashila, 2005). The themes of community, selflessness, non-violence, and deep empathy are central in the writing and activism of the most prominent scholars and activists of deep ecology and Engaged Buddhism (Devall 1994; Macy 1994, 1996;

Nhat Hanh, 1967, 1996). Engaged Buddhism is a dharma practice founded on the belief that genuine spiritual practice requires an active involvement in society. The major overlaps in the ontological insights of both Buddhist practitioners and deep ecologists are (a) critiques of ego-driven, environmentally unsound cultures; (b) an understanding that to overcome these cultures – we must expand our senses of self beyond our ego-selves; and (c) a belief that this extension of self is contingent upon recognition of interconnectedness (Gregory and Sabra, 2008).

2.6.3 Pratityasamutpada

Buddhism teaches that all life is interrelated. In other words, interconnectedness is the true nature of all beings. The Buddhist theory of interdependence, mutual interdependence, interdependent co-arising, dependent co-arising or inter-arising is called *Pratityasamutpada*. It is the dharma of natural systems describing that everything arises in dependence upon multiple causes and conditions; nothing exists as a singular, independent entity (Dalai Lama XIV, 1992). Sharing the same characteristics of holism and systems thinking, *pratityasamutpada* is in line with a number of fundamental concepts in sustainability, such as ecological literacy (the principles of nature), deep ecology (ecocentrism) and futuring and defuturing (the causal relationship between past, present and future). Therefore, the concept of *pratityasamutpada* can be employed as an approach to understanding and practising systems thinking.

2.6.4 Madhyama-pratipad

Dalai Lama XIV (2009) asserts that the destruction of nature and natural resources results from ignorance, greed and lack of respect for the Earth's living things. In response to such crisis, the practice of *Madhyama-pratipad* or *the middle way* is greatly vital. *Madhyama-pratipad* is a path of moderation, between the extremes of sensual indulgence and self-mortification. It implies a balanced approach to life and the regulation of one's impulses and behaviour. This concept is central to Buddhist economics, which concerns the entire process of causes and conditions. Buddhist economics investigates how a given economic activity affects the three interconnected spheres of human existence: the individual, society, and nature or the environment (Payutto, 1994). It is suggested in E. F. Schumacher's (1973) *Small is Beautiful: A Study of Economics as if People Mattered* as a major alternative to the Western economic mindset. Conforming to the concept of sustainable development, the Buddhist perspective offers the middle way of development that aims to achieve maximum well-being with minimum consumption.

2.7 Conclusion and reflections

This chapter underpins a number of important areas, which contribute to the research questions, especially the importance of a paradigm shift towards sustainability. However, as a design

education researcher, I cannot help asking myself – *is it really possible to employ holistic thinking, seeing human beings as equal with non-humans on Earth, and still take the materials and use the processes that are essential to being a designer?*” Perhaps, the most challenging task any designer has to confront is that of working on the inner self, that of cultivating ecological consciousness and that of realising that everything is interconnected. Now it must be time for designers to question the socio-economic-environmental impact of every step of their designs. To follow a sustainable route to development, or *the middle way* in Buddhist tradition, is an absolute challenge for design practitioners, design educators and design students. Even for Thailand, which is a predominantly Theravada Buddhist nation, it is not simple. As it is actually practised by the majority of the people, Thai Buddhism has long been integrated with folk beliefs like animism and Brahmanical magic and divination. It is considered largely anthropocentric because it often concerns self-effort to overcome sufferings. The rise of consumer culture in Thailand has affected Buddhist virtues through the mass media too. Still, to speak about sustainability with Thais, it tends to be more empirical to begin from articulating the concept of nature through the lens of Buddhism than from the typical Western-oriented perspective of sustainability. And this is something that really needs to be taken into account when it comes to education for sustainability for Thailand. *Since there is a natural connection between deep ecology and Buddhism (Fossey et al., 1997), can this potentially open up a new kind of opportunity for design education in a country like Thailand where the majority of the population are Buddhist?*

CHAPTER 3: EDUCATION

Generally speaking, education is a form of learning in which the knowledge, skills, values, beliefs and habits of a group of people are transferred from one generation to the next through storytelling, discussion, teaching, training, or research. This chapter aims to explore contemporary concepts concerning education, for instance, critical pedagogy and education for sustainable development (ESD), as well as their intricate relationships with sustainable futures. With an emphasis on the holistic approach to education, it encompasses concepts from Bonnett (2002)'s concept of regarding sustainability education as a frame of mind rather than an aspect of policy, to how to integrate whole systems thinking into education. A reflection relating to the context of the research is included at the end of the chapter.

3.1 Critical theory and education

This section begins by providing an understanding of what education is as well as its role in the society. Gibson (1986) suggested the use of critical theory as an approach to analyse education. Gibson's critiques offer three theoretical points of discussion. The first point is built upon the social reproduction theory. Educational institutions have long been considered instrumental in the supplying of appropriate personnel into the economic system (Bowles & Gintis, 1976). Education is thus the reproduction of the unequal relationships of capitalism (Gramsci, 1971; Harris, 1979). It indicates the hierarchical division of labour at work, ensuring the appropriate work ethic is transmitted via the imposition of rules governing punctuality, conformity, attendance and a set of acceptable behaviours. The second point is rooted in cultural reproduction theory. Educational institutions are instrumental to transmit certain forms of culture, and thus reproduce not only that culture, but also its social class structure (Bourdieu, 1977; Bourdieu & Passeron, 1990). The education system merely places values on specific forms of cultural capital, only those defined and legitimated by the dominant group. Students inevitably fail at school if they are deprived of the requisite knowledge and skills with which to navigate successfully the parameters of dominant culture. The second point concerns resistance theory which regards the education system as a site of struggle between dominant and subordinate groups (Apple, 1982; Giroux, 1983). Emancipation is a key concept for resistance theory because it offers a process through which some subordinate groups in society are able to transform oppressive conditions that are imposed through dominant ideologies. Educational institutions have the ability in helping articulate ways that educators, who are concerned about social inequality, can support forms of opposition that challenge inequalities both in schools and society. As a result, this then leads to the development of critical pedagogy, a kind of educative praxis for emancipation (Freire, 1970).

3.2 Critical pedagogy

According to Giroux and Simon (1989), the term pedagogy refers to “the integration in practice of particular curriculum content and design, classroom strategies and techniques, a time and space for the practice of those strategies and techniques, and evaluation purposes and methods” (p. 239). Rooted in critical theory and based upon the work of Paulo Freire, whose most renowned book is *Pedagogy of the Oppressed* first published in Portuguese in 1968, critical pedagogy aims to encourage the development of a more democratic culture and active citizenry. It offers an articulation of the pedagogical practices of educators committed to the elimination of inequalities in society (Freire, 1970). As critical pedagogy attempts to dismantle the power structure within society, it stresses empowering learners to think and act critically with the aim of transforming the learner's life conditions.

3.2.1 The oppressor–oppressed distinction

Grounded on the concept of oppressor–oppressed distinction or dominant-dominated opposition, critical pedagogy is an attempt to transform oppressed individuals and save them from being just objects of education to becoming subjects of their own autonomy and emancipation. Teachers hold a vital role in working with others to create an educational environment that is free from social and political constraints.

The concept of the hidden curriculum is also pointed out in *Pedagogy of the Oppressed*. According to Oxford Dictionary of Sociology (2009), hidden curriculum refers to “the way in which cultural values and attitudes (such as obedience to authority, punctuality, and delayed gratification) are transmitted, through the structure of teaching and the organisation of schools” (p. 307-308). Hidden curriculum is embedded in the everyday experience of learning environment (classroom, lecture halls, laboratory and studio), the structure of the teaching/learning process, the routines of teachers and students, and the rules that govern the relationship between teachers and students. Hidden curriculum is equally as influential as the actual subject content, and it stems tacitly from the social relations of the learning setting. Hidden curriculum is seen as oppression because it holds the fundamental distinction between the powerful and the powerless (McLaren, 1998).

The concept of dominant–dominated distinction is recognised by me as a researcher since the research context involves mostly the teacher-centred approach which is culture-based. (See Chapter 5 for more detail.)

3.2.2 The banking approach to education

As stated by Freire (1970), banking education metaphorically considers students as empty accounts ready for educators to deposit knowledge into and the knowledge might be withdrawn and used later in life. Banking education, as opposed to critical pedagogy, follows the transmission model of education, highlighting teacher-centric learning and considering education as the process of transmitting a specific body of knowledge from the teacher to the students. It is the practice of domination fundamental to maintaining systems of oppression. Freire rejects this banking model of education since he claims that it culminates in the dehumanisation of both the students and the teachers. The goal of critically minded students will not be achieved if the teachers continue to deal with their students as empty recipients. Instead, he suggests there is a need for the educational approach that allows the students to be aware of their incompleteness so that they make an effort to be more fully human. Since the system of oppressive social relations brings about “a culture of silence” which instils a negative, suppressed self-image into the oppressed, the student must develop a critical consciousness in order to realise that the culture of silence is created for oppression. At the same time, the teachers need to learn how to facilitate dialogue that can provoke students’ reflection while maintaining a respectful learning environment.

3.2.3 Problem-posing education

Problem-posing education is proposed as an alternative to banking education. It seeks to transform society to rehumanise both the oppressed and their oppressors by emphasising critical thinking for the purpose of liberation. Through questioning problematic issues in the students’ lives and broadening of the students’ views of reality, the students develop an ability to critically reflect on the way they exist in the world. They "come to see the world not as a static reality, but as reality in process, in transformation" (Freire, 1970, p. 71). Henry Giroux (1988) suggests that education should make the learners critically thinking citizens who can lead a democratic life while the teachers are considered “transformative intellectuals” who have the knowledge and skills to critique and transform existing inequity in society.

3.2.4 Critical pedagogy and education in Thailand

When looking at the context of the research, Thai educational culture seems to clash with the concept of critical pedagogy. Atkinson (1997) asserts that critical thinking is culturally specific, a part of the social practices of the West. In his view, Asian cultures do not adopt such practices. I agree that some elements in Thai culture seem to prevent the full realisation of students’ critical thinking skills (see Chapter 5), but I would argue that the skills can be practised in any learning situation if the educator views himself or herself as a change agent. At present, the literature

concerning Thai educators' critical thinking skills and ability to teach critical thinking is very limited. The lack of insight into this area points out the need to explore in future studies.

3.3 Transformative learning

“Transformation is a process of learning that has a sense of adventure. It is learning embraced as a journey, less concerned with trying to find fixed facts and more concern with identifying what we need to learn to live well – ecologically, peacefully and justly” (O’Sullivan, 2012, p. 176).

A shift to transformative learning, which is a process of increasing an individual learner’s capacity for change, is vital for the person personally. The levels of learner involvement in the negotiation of knowledge range from *transmission* which is the previously mentioned teacher-centred approach, to *transaction* which focuses on mutual learning between teacher and learners, to *transformation* which is the student-centred approach to teaching and learning (Miller & Seller, 1990). (See Table 4.) Three factors crucial to advancing transformative learning include critical reflection, a liberating approach to teaching, and an equal horizontal student-teacher relationship (Freire & Macedo, 1995). Through engaging a systemic view of education, transformative learning manifests when the head (envisioning solutions), the heart (deepening environmental commitments) and the hands (practical skills) are in harmony. Transformative learning comprises an individual dimension as well as a collective dimension, including both individual and social transformation. It holds that “learning is understood as a process of using a prior interpretation to construe a new or revised interpretation of the meaning of one’s experience in order to guide future action” (Mezirow, 1996, p. 162). The process deals with experiencing a deep, structural shift that shapes thoughts, feelings and actions (O’Sullivan, 2002). It is a shift of consciousness that significantly and permanently alters each individual's way of being in the world. Transformative learning contributes to a reimagining of existing worldviews, including a reconsideration of the relationships between people and planet (Pavlova, 2013, p. 660). As it is a process that involves a deep shift in the learner’s perspective, the learner is able to embrace sustainability and take action for change.

Table 4: Comparison of Transmission, Transaction and Transformation Curricula (adapted from Miller & Sellers, 1990, cited in Thomas, 1998)

Transmission perspective	Transaction perspective	Transformative perspective
Learner as person	Learner as person and whole person	Learner as whole person
Educator control	Educator control and learner control (shared control)	Learner control (as much as possible)
Public knowledge	Personal knowledge (especially knowledge exploration and verification processes) and public knowledge	Personal knowledge and public knowledge (Personal knowledge as a filter through which public knowledge is viewed)
Knowledge as content	Knowledge as process	Knowledge as process (Knowledge is assumed to be fluid rather than static, interconnected, enriched by multiple perspectives.)
Extrinsic motivation	Intrinsic motivation	Intrinsic motivation
Learning is molecular.	Emphasis is on process and frameworks.	Learning is holistic.
Learners have shared characteristics.	Each learner is unique. Learners have shared characteristics.	Each learner is unique. Learners have shared characteristics.
Learning is individual.	Learning is social and learning is individual.	Learning is social and learning is individual. (Sometimes these are integrated. Sometimes both are present.)

About the third research question on transformative learning, Table 4 appears to be useful for developing a classroom observation framework for this research.

3.4 Ecopedagogy

"Classic pedagogies were anthropocentric. Ecopedagogy is based upon a planetary understanding of gender, species, kingdoms, formal, informal and non-formal education" (Antunes & Gadotti, 2005).

Ecopedagogy is a movement combining critical pedagogy with the urgency of an environmental education dedicated to alleviating the global ecological crisis. The advocates of ecopedagogy assert that the transformation of human's political and social structures, which is central to critical pedagogy, can only take place within a concurrent transformation within the ecological domain (Kahn, 2010). For such transformation, it would require a profound change in the relationship between human beings and all other non-human creatures as well as all forces of nature on this planet. Ecopedagogy fundamentally employs the critical pedagogy discourses of oppression and power in application to ecology, grounded in the belief that the planet and its ecosystems need to be liberated from human oppression. It suggests a prominent concept that real political, social and environmental transformations are impossible to separate and they must happen as a whole within the Earth's ecology.

However, it seems that scholars have two different views on ecopedagogy, concerning ecological education. One is that ecopedagogy is not opposed to environmental pedagogy because environmental education is its premise. Ecopedagogy enables environmental pedagogy with strategies, guidelines, and means to make it a reality (Antunes & Gadotti, 2009, p. 136). Another view is that ecopedagogy has been used as a lens to critique environmental education, which is often reduced to forms of experiential and outdoor pedagogy (Kahn, 2008). Therefore, the next section will further explore issues around environmental education and the shift to education for sustainable development.

3.5 From environmental education (EE) to education for sustainable development (ESD)

The link between environmental education (EE) and education for sustainable development (ESD) is explored in this section.

3.5.1 Environmental education (EE)

Environmental education (EE) is a process that allows individuals to gain awareness and knowledge of their environment as well as acquire skills that will enable them to act in order to solve present and future environmental problems. In 1972, EE was officially stated in the Declaration of the United Nations Conference on the Human Environment, which articulates the need for EE from elementary school to adulthood. Tbilisi Declaration in 1978 was the first declaration to take an international and holistic approach to the environment within the higher education context. EE was further clarified in Glossary of Environmental Education Terms, International Environmental Education Programme (1983) as the education process that deals with the human interrelationships with the environment and that utilises an interdisciplinary problem-solving approach with value clarification. However, as Kwong (1997) argued, the efforts

of EE are often perceived as doomsday-oriented and fear-generating, geared towards activism or devoid of science teaching. The impact of EE in practice is also questionable, as it did not present clear links with the root causes of environmental problems in the global economic system. Thus, appropriate forms of education informed by critical theory can assist the political struggle to adopt more sustainable forms of development (Huckle, 1993, p. 25).

3.5.2 Education for sustainable development (ESD)

The term education for sustainable development (ESD) emerged primarily out of the Rio Summit in 1992. ESD is the process of equipping students with knowledge and understanding, skills and attributes needed to work and live in a way that safeguards environmental, social and economic wellbeing, both in the present and for future generations (Tilbury and Wortman, 2004). The Decade of Education for Sustainable Development or DESD (2005-2014) was declared in 2002 by the United Nations General Assembly, following the Johannesburg Plan of Implementation, emphasising that education is an indispensable element for achieving sustainable development. ESD cultivates in learners the habit of systems thinking, interconnections and multiple perspectives. Pavlova (2011) argues that human-environment relationships are central for both EE and ESD. However, whereas the focus of EE is on environmental problems and how they could be resolved for a better future, ESD focuses on a human condition and works through the social development towards a desirable future. With the inclusion of social and economic issues, the ESD discourse maintains an instrumental and anthropocentric worldview and excludes consideration of an ecocentric perspective (Spring, 2004). Since the framework of ESD appears to have a rather anthropocentric position, it means sustainability requires of us more than just a kind attitude towards the environment and an openness to nature. Accordingly, Bonnett (2002) introduces the importance of *sustainability as a frame of mind*.

“ESD that fosters sustainability as a frame of mind encourages ways of relating to nature that allow the continuing co-evolution of human and non-human nature” (Huckle, 2006).

Even though all the international declarations and charters regard that both EE and ESD provide the commitment to encourage progress, they are not sufficient to change institutional and disciplinary practices in higher education (Bekessy et al., 2007). In response to the challenge, Bonnett (2002) proposes that, rather than viewing sustainability as policy designed to achieve a certain state of affairs, we should conceive of sustainability as a frame of mind or way of relating to nature guided by such values and principles as those outlined in the Earth Charter. This is because part of the task of education for sustainability is to reconnect people to their origins, what sustains them and their love of themselves. It seems that hidden curriculum can play a significant part as well. So, it is imperative for education to play a transformative role, challenging the assumptions and beliefs within our societies that have led to current social, environmental and

economic crises. Stevenson (2006) suggested that ESD requires a radical, transformative pedagogy, focused on the process of learning to live within ecological limits without human suffering. Therefore, skills that are essential to ESD include 1) envisioning, 2) critical thinking and reflection, 3) systemic thinking, 4) building partnerships and 5) participation in decision-making (Tilbury and Wortman, 2004).

3.6 Whole systems thinking in education

“At present, most universities are too often still advancing the kind of thinking, teaching and research that leads to unsustainability, and ignoring alternative ways of knowing and being that are not rooted in Western (scientific) traditions” (Wals & Blewitt, 2010, p. 70).

Concerning a paradigm shift towards sustainability, this section focuses on how whole systems thinking can be employed in education. Schumacher (1973) stated that the problems of education are merely reflections of the deepest problems of our age. The task of all education is to understand the present world, the world we live and make our choices (p. 79). Sterling (2001) coined the term sustainable education as a systemic change of educational culture towards the realisation of human potential and the interdependence of social, economic and ecological wellbeing. He claims that sustainable education is only likely to emerge if it can connect with and draw strength from positive cultural change in the wider social context (Sterling, 2001, p. 23). Sterling proposes to call for systems thinking or whole systems thinking in education, which is opposite to the mechanistic way of thinking rooted deeply in the dominant educational paradigm. A systemic or connected view of sustainability across institutions is required to transform the educational experience of students and lead social change for sustainability. Table 5 clarifies the idea of how various worldviews relate to different education approaches and practices (Miller, 1998). It also indicates how systems thinking is linked to transformative learning.

Table 5: The relationships between different worldviews and teaching and learning approaches and aims (adapted from Miller, 1998, cited in Webster & Johnson, 2008)

Worldview	Fragmentalism (mechanistic thinking)	Pragmatism (modern scientific)	Holism (systems thinking)
	Humankind is divorced from nature and can, therefore, exploit the environment.	Humankind can improve the environment through the use of rational planning.	All life on the planet is interconnected and interdependent. Living in harmony is key. Human's environmental impacts should be taken into consideration when making actions.
Theory of change	Traditional / Conservative	Intervention	Organicism
	Traditions must be maintained; change needs to be checked and controlled.	Change needs to be introduced and managed in a rational and scientific manner.	Change is an inevitable and natural function of a system. Change should be embraced.
Curriculum and instruction position	Transmission	Transaction	Transformation
	Education is a one-way top downward movement of certain knowledge, skills and values.	Education is a dialogue between the student and the curriculum.	Education is a process of personal and social development which involves the dynamic flow of dialogue between student and the curriculum as well as student's critical reflection on knowledge, skills and values.

Whole systems thinking offers the potential both to critique current educational theory and practice and to provide a basis by which it may be both transformed and transcended (Sterling, 2001, p. 17). In Sterling's view, it is required to make the shift of education culture, creating a more humanistic and ecological educational paradigm.

3.6.1 The nested systems of education

To understand the possibility of and barriers to the sustainable education paradigm, educators must understand 'the ecology of education' regarding system levels and relationships (Sterling, 2001, p.31). This idea is grounded on the principle of nested systems – multi-levelled structures of systems nesting within systems. Environmental education and education for sustainable development can be seen as subsystems of the larger or mainstream formal education system. In turn, the formal educational system can be seen as a subsystem of the larger socio-economic and cultural systems, which also directly 'educate' people (Sterling, 2001, p. 32). Accordingly, because of this concept, the thesis concerns the three nested levels of education: 1) the educational paradigm level, 2) The organisation and management of the learning environment level, and 3) the learning and pedagogy level.

3.6.2 The two contrasting views of education

How whole systems thinking advocates a transformative approach to learning through all the three nested levels of education is clarified in Table 6.

Table 6: Two contrasting views: the mechanistic view of transmissive education and the ecological view of transformative education (Sterling, 2001)

Mechanistic View (Mechanism)	Ecological View (Holism)
Level 1: Educational Paradigm	
Core Values	
Preparation for economic life	Participation in all dimensions of the sustainability transition – social, economic, environmental
Selection or exclusion	Inclusion and valuing of all people
Formal education	Learning throughout life
Knowing as instrumental value	Being/becoming (intrinsic/instrumental values)
Competition	Cooperation, collaboration
Specialisation	Integrative understanding
Socialisation, integrating to fit	Autonomy-in-relation
Developing institutional profiles	Developing learning communities
Effective learning	Transformative learning
Standardisation	Diversity with coherence
Accountability	Responsibility
Faith in the 'system'	Faith in people
Modernity	Ecological Sustainability
Mechanistic View	Ecological View
Level 2: Organisation and Management of the Learning Environment	
Curriculum	
Prescription	Negotiation and consent
Detailed and largely closed	Indicative, open, responsive
Discursive knowledge	Non-discursive knowledge also valued
Decontextualised & abstract knowledge	More emphasis on local, personal, applied and first-hand knowledge
Fixed knowledge and 'truth'	Provisional knowledge recognising uncertainty and approximation

Mechanistic View (Mechanism)	Ecological View (Holism)
Confusion of 'data', 'information' and 'knowledge'	Ultimate concern with wisdom
Disciplines and defence of borders	Greater transdisciplinary/domains of interest
Specialism	Generalism and flexibility
Evaluation and Assessment	
External inspection External indicators, narrowly prescribed Quantitative measures	Self-evaluation, plus critical support Self-generated indicators, broadly drawn Qualitative as well as quantitative measures
Management	
Synergies & emergence not considered	Positive synergies sought
Architecture, energy and resource use, and institutional grounds neither managed ecologically nor seen as part of the educational experience	Ecological management, linked to educational curriculum and experience
Scale not considered	Human-scale structures and learning situations
Curriculum control and prescription	Curriculum empowerment and determination
Top-down control	Democratic and participative
Community	
Few or nominal links	Fuzzy borders: local community increasingly part of the learning community
Level 3: Learning and Pedagogy	
View of Teaching and Learning	
Transmission	Transformation
Product-oriented	Process, development and action oriented
Emphasis on teaching	Integrative view: teachers also learners, learners also teachers
Functional competence	Functional, critical and creative competencies valued
View of Learner	
As a cognitive being	As a whole person with full range of needs

Mechanistic View (Mechanism)	Ecological View (Holism)
	and capacities
Deficiency model	Existing knowledge, beliefs and feelings valued
Learners largely undifferentiated	Differentiated needs recognised
Valuing intellect	Intellect, intuition and capability valued
Logical and linguistic intelligence	Multiple intelligences
Teachers as technicians	Teachers as reflective practitioners and change agents
Learners as individuals	Groups, organisations and communities also learn
Teaching and Learning Styles	
Cognitive experience	Also affective, spiritual, manual and physical experience
Passive Instruction	Active learning styles
Non-critical inquiry	Critical and creative inquiry
Analytical and individual inquiry	Appreciative and cooperative inquiry
Restricted range of methods	Wide range of methods and tools
View of Learning	
Simple learning (first order)	Also critical and epistemic (second/third order)
Non-reflexive, casual	Reflexive, iterative
Meaning is given	Meaning is constructed and negotiated
Needs to be effective	Needs to be meaningful first
No sense of emergence in the learning environment/system	Strong sense of emergence in the learning environment/system

Table 6 is particularly useful for educators to consider – “*which paradigm are you and your institution serving?*” It can be utilised as a framework for any institution to advance to a more holistic educational paradigm. However, what happens in reality can be a lot more complex, compared to the elements neatly listed in the two columns. It would be more appropriate in the form of a continuum, from the mechanistic view of transmissive education to the ecological view of transformative education. The concept of continuum contributes greatly to the design of classroom observation sheet used in this research.

3.6.3 Model of sustainability pedagogy

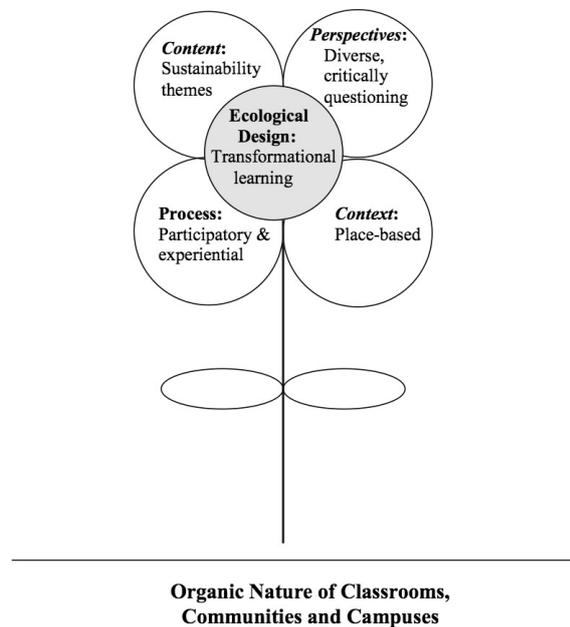


Figure 5: The Burns model of sustainability pedagogy, providing a practical model for course design that is rooted in ecological principles (Burns, 2011)

Burns (2011) proposes the model of sustainability pedagogy, which embraces the concept of cycle in ecological literacy. It regards teaching as action research, contributing to continuous development and sustainability. The model is comprised of five key dimensions: 1) content, 2) perspectives, 3) process, 4) context and 5) ecological design. (See Figure 5.) Each has its own goal. (See Table 7.) This pedagogical model reflects education as sustainability, a transformative learning process through which learners' values and perspectives change so that they can embrace sustainability and take action for change.

Table 7: Model of sustainability pedagogy (Burns, 2011)

Element	Goal	Execution
1) Content	To increase learners' systemic understanding of complex sustainability issues.	To understand what learners already know and believe about sustainability and help them build a stronger understanding of sustainability issues.
		To address sustainability multi-dimensionally through information, issues, beliefs, skills and values.
		To help learners construct relationships with other learners.
2) Perspectives	To provide learners with opportunities to think critically about dominant paradigms, practices and power relationships and consider complex ecological and social issues from diverse perspectives.	To provide multiple ways of understanding a sustainability issue.
		To help learners recognise, question and reflect on dominant ways of seeing the world.
		To offer learners with alternatives to the dominant practices.
3) Process	To enhance learners' civic responsibility and intentions to work toward sustainability through active participation and experience.	To emphasise active, experiential, and participatory learning.
		To help learners build the capacity and power to confront sustainability problems through creative thinking and problem-solving in small groups.
		To provide learners the opportunity to engage in the issues, and actively participate in transforming their world.
		To give learners direct interaction with the issues they are learning about.
		To offer the opportunity for learners to participate in sustainable practices in local communities, in their own lives, and on campuses.
4) Context	To increase learners' understanding of and connection with the	To connect learners to the local community through direct observation, investigation or experimentation.

Element	Goal	Execution
	geographical place and the community in which they live.	To provide learners a way to explore and question economic, ecological, social and political relationships through the lens of local places.
5) Ecological Design	To utilise an ecological course design to create transformative learning.	Observation: To thoughtfully observe the educational institution and its people to design the course based on the needs and the resources available.
		Visioning: To consider the learning goals and envision opportunities for relationship building between learners.
		Planning: To consider what texts, community resources, field visits, speakers, class activities and assignments can be incorporated into the course.
		Development: To write a syllabus that reflects the ecological design of the course and the chosen sustainability themes.
		Implementation: To teach and get feedbacks.

3.7 Sustainability and higher education

There is a critical call for a transformation of the education sector, especially higher education, for a shift of culture and a redesign of organisational purpose towards sustainability, involving whole institutional change (Sterling 2004; The Higher Education Treaty Circle, 2012; Wals, 2012). But at present, sustainability is often only seen as a special interest and misinterpreted as an add-on area of theory and practice among the academic community (Sterling et al., 2013). Sterling (2004) gave a critique based on Bateson's levels of learning (1972) that higher education is currently not engaged in the provision of deep learning to students, but in first-order learning which is inevitably inappropriate to advance change for sustainability. Second-order learning is more challenging for the learners and learning organisations because it involves reflecting critically on learning and change that takes place at the first-order level. A second-order learning response is a 'built in' process whereby questioning and reformulating some policies and programmes, and revising some guiding institutional norms in line with sustainability ideas and principles, leads to quite significant institutional change. Lastly, the third-order learning is transformative. It is epistemic learning for a paradigm change. A third-order learning response involves a deep questioning of educational paradigms, and therefore also purposes, policies and

programmes, and a transformative redesign process that involves learning as change throughout the educational community (Sterling et al., 2013, p. 36).

So, to move towards sustainable futures, two interlinked arenas of learning must be taken into consideration: *designed learning* (the concern of all educational programmes: it is planned, resourced and provided for different groups) and *institutional learning* (the social and organisational learning that the policy-makers and providers may themselves undergo or experience). The critical point is that sufficient change towards sustainability in designed learning, including aims, curricula, methods, assessment, reward structures and so on, is directly dependent on sufficient institutional learning – which can, in turn, facilitate re-design. Without this, inserting sustainability into educational policy and practices that otherwise remain largely unchanged may have value but is insufficient (Sterling et al., 2013, p. 7). This research aims to take into account both arenas to respond to the research questions.

3.8 Conclusion and reflections

“The intentions of education must be the inner transformation and liberation of the human being and, from that, society would be transformed” (Krishnamurti, 1953).

This section articulates a number of education concepts such as critical pedagogy, transformative learning and sustainability as a frame of mind, in order to confirm that whole systems thinking is truly needed in education, critical thinking is necessary to sustainability education, and effective transformation must be an inside-out process. In a big picture, the current dominant education paradigm is centred on values and priorities that threaten sustainable development (Higher Education Treaty Circle, 2012). Higher education worldwide has seen funding cuts and increasing regulation from governments, resulting in the dilemma to balance growth with quality and reputation (Sterling et al., 2013). Especially as the economic factor plays a significant role in this situation, the leaders and key agencies responsible for higher education have struggled to prioritise the reorientation of higher education towards sustainability. On a positive note, as David Orr (2002) stresses that no institutions in modern society are better situated and none more obliged to facilitate the transition to a sustainable future than colleges and universities (p. 96), now there are stories of progress from universities in various regions across the globe. However, based on an international report, changes for sustainability in higher education have not been deep or systemic (Tilbury, 2011). For this reason, radical and critical educators, particularly in the global education for sustainability community, should see the coming years as an opportunity rather than a threat. This is because there are more and more examples of education for sustainability projects and curriculum developments documented in a variety of media, that can help open up the cracks within the existing capitalist system (Jones et al., 2010). All of the experiments in sustainability, large and small, must be examined, and we must learn from their successes and failures. We must also see how they interact and form a whole (Forrant & Silka,

2006, p. 27). Each institution needs to move forward with a customised and multipronged approach that is adapted to its own challenges and opportunities while remaining connected to any larger systemic shifts (Rowe & Winslade, 2012, p. 48). Given the context of the thesis, a paradigm shift towards sustainability seems to be urgently required in Thailand's education. This is not because it needs to catch up with the trend, but it is essential for its own sake. Literature explored in this chapter is particularly helpful for responding to the second research question on implementation of ESD.

CHAPTER 4: DESIGN EDUCATION

This chapter articulates the intricate connections between sustainability and design education. Design education is the teaching of theory and application in the design of products, services and environments (Vanscooder, 2012). It encompasses a variety of design disciplines. Design education was traditionally object-oriented and today a large number of design programmes still resemble the Bauhaus, whereas the focus was on the development of students' craft (Kolko, 2005). Some scholars defined design education specifically based on the making tradition of design. For example, Muramatsu and Wangmo (2017) stated "design education is a process of teaching, training, and learning in the design of objects such as products, clothes and buildings, important at technical universities and colleges" (p. 159). But this object-oriented view has been critiqued widely too. In many ways, design is considered a problem-solving activity – the learning process of how to apply practical methods and prior knowledge to tackle new challenges. Trimble (2016) commented from a designer's point of view, "design education is for learning to solve problems. End of. Yes—it might touch upon art and branding, but design education is fundamentally about problem solving." To put it more broadly, Cezzar (2015) explained "the purpose of design education is to develop and practice habits of learning that a designer will use and hone for the next forty or fifty years." However, there are more and more scholars critiquing the role of design education in relation to sustainability issues. For instance:

"For too long, the design community has viewed political, social and environmental concerns as being beyond its remit. This status quo has been upheld by a design education system primarily concerned with training future designers for the business of designing and selling 'stuff'" (Chamberlin, 2016).

In this chapter, the link between the role of design education and ESD will be explored. Due to the nature of this research, it primarily concerns design education in higher education without pinpointing any single discipline to look at. But the focus tends to orient towards industrial and product design because it is highly relevant to the research context and my experience as an educator. A reflection in relation to the context of the research is included at the end of the chapter.

4.1 Design curriculum and pedagogy

Design in higher education is characterised by the need to prepare students in particular design areas. According to Tovey (2015), it can be described as "a passport to design practice". This section gives an overview of essential elements of design curriculum and design pedagogy.

4.1.1 Student-centred curriculum

“Designing is about choice making and weighting up competing variables. It is values-rich, not values-neutral (as some argue technologies to be.) It is about uncertainties and working with inadequate information and there is never a ‘right answer’, rather, there are only ‘best defensible compromises’. Designing is a form of knowledge creation. Design, as noun or verb, is open to advocacy, defence and contestation” (Keirl, 2015, p. 168-169).

The term curriculum is broadly defined as the totality of student experiences that occur in the educational process (Kelly, 1977). It also refers to all the discursive practices which affect what and how students learn, and what and how teachers teach (Reid & Johnson, 1999, p. ix). When looking at design curriculum, it resists much orthodox education since the learner is key and developed through the pedagogies of uncertainty, discomfort, critique and scepticism (Keirl, 2015). Design educators may see themselves as facilitating the development of individuals, enabling them to become critical and independent practitioners (Shreeve et al., 2010). In other words, design teaching and learning is about the transformation of the individual design learner from aspiring designer to being one that is professionally ready. It requires the integration of both holistic and linear ways of thinking through practice (Bull, 2015, p. 113). Therefore, effective curriculum design is crucial to provide safe spaces that allow students to iteratively struggle, fail and succeed if they are to progress successfully in their studies (Osmond, 2015).

4.1.2 Signature pedagogies for design

According to Salama (2007), for many decades design pedagogy continued to be un-debatable and untouchable and only in the late 1970s a small number of scholars in the States started to discuss design education. Shulman (2005) asserted that now there are forms of instruction that are common to specific disciplines, areas of study or professions. The pedagogies must be directly linked to the professional practices. Hence, Shulman (2005, p. 52) defines *signature pedagogies* as “the types of teaching that organise the fundamental ways in which future practitioners are educated for their new professions.” According to Shreeve, Sims and Trowler (2010), the key nature of the pedagogical practices in art and design education is “a kind of exchange” as the students’ experience is central to teachers’ concerns and learning is seen as a partnership. To illustrate the signature pedagogies in design education, Shreeve (2015) listed common pedagogical practices in design as follows:

The studio, as both site of learning and signature pedagogy, constructs particular ways of teaching that lead to student-centred approach (Prosser & Trigwell, 1991). Typical of a community of practice where designers work together, it is a peer-to-peer learning environment which engages students in dialogue.

Projects and the brief together refer to one of the main approaches in design education. The aim of project-based, experiential learning is to develop students' creative response. Students are expected to find their way through the brief to explore and provide their own answer.

Materiality of doing and making concerns experiential knowledge, whether the activity is a hands-on approach or a computer-based approach.

The dialogue could be between teacher and students or students and students, as design teaching may sound like a conversation. There are many ways to enable dialogues, such as through peer learning, small group activity, live or collaborative projects, or internships.

The crit provides feedback to students on performance and shares alternative perspectives on design possibilities. It also models the thought processes, critical analysis and language needed to become a designer.

Research for undergraduate students concerns exploring the context of the brief, their own response to it, and the possible factors that might influence their decision-making.

Concerning the mentioned pedagogical practices, design education concerns experiential learning – the process of learning through experience or learning through reflection on doing. The experiential learning in design education extends into the realm where education overlaps work and seeks to replicate the experience of being a practitioner – like an induction into a community of practice (Wenger 1998). In a broad picture, the signature pedagogies for design will continuously evolve and ideally the concept of learning and teaching practices that can support students to become creative professionals should be at the core of every educator's intentions when preparing learning activities for students (Shreeve, 2015). Gornick (2004) argued that the integration of contextual studies in academic design curricula is also fundamental. Contextual studies refer to a regular and often compulsory feature in art and design education, which can take many forms and be located in various relationships with the practical elements of such courses (Rintoul & James, 2016). In Gornick's view, as design now covers a wide domain, contextual studies can enable students to understand much more about their future potential in the working world and give it a new sense of purpose. Therefore, traditional pedagogies used in contextual studies, including lecture, discussion, and questioning, are relevant to design education as well.

However, Dutton (1984) points out that the hidden curriculum in both education institution and design studio practice is questionable as it may encompass a number of issues such as studio

knowledge (dominant and subordinate forms of knowledge) and social relations (the structure of the studio that mirrors the structure of most contemporary workplaces, especially systems of hierarchy and competition). Furthermore, given the context of the thesis where the cultural values are different and the teacher-centred approach is dominant, the pedagogical practices can be dissimilar. However, literature on design curriculum and pedagogy from international contexts where there is a high level of rote-learning or a large power-distance relationship between the teacher and the students is scarce. Consequently, the fieldwork in this research will be conducted to find out the pedagogical practices in the research context, especially in the aspect that it involves the implementation of ESD.

4.2 The intersection between sustainability, design and design education

“Design education needs to be part of the solution and not part of the problem” (Giard & Schneiderman, 2013, p.134).

Since design directly involves production and consumption, the design practice is a subset of a bigger panorama encompassing a large number of stakeholders as well as environmental, economic, and social impacts. It is fundamental that designers are aware of this circumstance. Sustainability is essential in design practice, and therefore, in design education. Although sustainability in design finds much attention in the literature and in practice, the education of sustainability in design programmes worldwide still lacks discussion regarding curricula and importance (Casais et al., 2012; Ramirez, 2007). Opportunities such as economic viability and environmental regeneration are slowly and awkwardly finding their way into the mainstream of design education thinking, while the inclusion of socially responsible design varies from school to school and from studio to studio (Fleming, 2013, p.3). The critical question that needs to be raised seems to be *“How does design education prepare students for future design careers in a globally challenging environment?”* It appears that, within university curricula, it is necessary to ensure that future designers, like other future professionals, are educated as interdisciplinary thinkers, leaders and problem solvers with the knowledge to address social and environmental concerns. Focusing on learning, Vernon (2013) suggested that transformative learning must be recognised through the enhancement of long-term, life and professional skills. But, to implement ESD in design education, transformative learning, which emphasises the transformation of learners, has not been made explicit.

So far, the integration of sustainability in design education, mainly in the first world countries, is taking place in various ways. There are three common models (Giard & Schneiderman, 2013, p. 128). First is stand-alone schools or programmes of sustainability that offer courses in sustainability made available to the institution at large including students in design. Second is notions of sustainability integrated into the studio experience common in design education. Third

is courses in sustainability offered in schools or programmes of design. Accordingly, when considering education for sustainable design agenda, the main direction is found to be adding sustainability as courses or studio projects into the existing curricula. Still, it is questionable if this direction is the most appropriate and effective model. At least, the efforts contributing to such model, or even in the form of hidden curriculum, should be considered revolutions. Regarding the place of sustainability in design education, there appear to be two directions: one is that sustainability is regarded as an add-on in the curriculum and another is that sustainability values are lived and breathed throughout the curriculum. However, the literature on the models practised in the non-first world countries is still limited and Deniz (2016) suggests that creating environmental awareness in design education and industries is a new approach for developing countries.

4.3 Models of sustainability in design education

Three clusters of models of sustainability in design education can be discerned from the literature. The first involves models focusing on technical aspects. The second looks at models aiming at facilitating new ways of thinking and creating new forms of collaborative design. The third concerns models providing practical application of the principles of nature for design.

4.3.1 Models with technical tools for sustainable design

Models in this cluster are associated with strategies to tackle waste issues and tools for assessing environmental impacts of designed products. Classic references include McDonough and Braungart's (1992) Hannover Principles and Cradle-to-cradle concept, and Bhamra and Lofthouse's (2007) Design for Sustainability Approaches.

The Hannover Principles were among the first to comprehensively address the fundamental ideas of sustainability and the built environment. They include:

1. Insist on the right of humanity and nature to co-exist in a healthy, supportive, diverse and sustainable condition.
2. Recognize interdependence.
3. Respect relationships between spirit and matter.
4. Accept responsibility for the consequences of design decisions upon human well-being, the viability of natural systems and their right to co-exist.
5. Create safe objects of long-term value.
6. Eliminate the concept of waste.
7. Rely on natural energy flows.

8. Understand the limitations of design.
9. Seek constant improvement by the sharing of knowledge. (McDonough & Braungart, 1992)

These principles have initiated the cradle-to-cradle concept (C2C), a biomimetic approach to the design of products and systems built upon three key propositions: “waste is food”, “use of current solar income” and “celebrate diversity” (McDonough & Braungart, 2002). The term is linked with life cycle analysis (LCA), a tool to assess environmental impacts associated with all the stages of a product's life (e.g. van Hemel, 1998; Bhamra & Lofthouse, 2007).

Design for sustainability can be described as a journey, broken into different stages from incremental design to radical innovations (Brezet et al., 1997). According to Bhamra, Hernandez and Mawle (2013), there are four approaches to embarking on design for sustainability. (See Figure 6.)

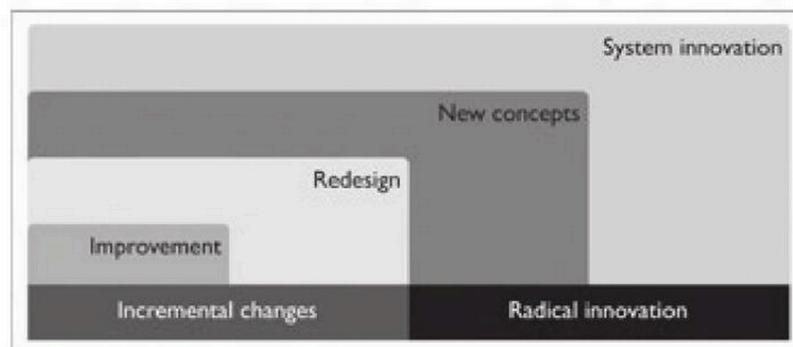


Figure 6: Different approaches to embark on design for sustainability

1. **Improvement** concerns making small modifications to the outputs of design. It involves an understanding of the waste hierarchy, which includes disposal, energy recovery, recycling, reuse, minimization and waste prevention.
2. **Redesign** considers the impact of a design over an entire life cycle by using life cycle analysis (LCA) to examine the whole life cycle of the existing product, service or system. (See Figure 7.) Then the points in the life cycle that have the greatest impact can be identified, and redesign strategies can be more easily singled out (van Hemel, 1998).



Figure 7: Product life cycle phases

3. **Developing new concepts** involves considering innovative ways to achieve the same function(s) which can result in more sustainable solutions. The key guiding principles include dematerialisation, shared use of the product, package, service or visual communications, integration of functions and functional optimisation.
4. **System innovation** concerns the participation of different stakeholders. Possible actions include creating a lasting attachment between product, service or system and the user, ensuring design ethics, encouraging the fostering of resilient communities and designing to increase the quality of life for all.

4.3.2 Models offering new ways of thinking and forms of collaborative design

Models in this cluster largely concern the socio-cultural dimension of sustainable design by rethinking the role of design in relation to sustainability. Manzini (2015), who founded the DESIS Network, an international network of forty-eight design labs based in design-oriented institutions, proposed that design experts can trigger and support meaningful social changes, focusing on emerging forms of collaboration. Therefore, a designer can be a social change agent. Similarly, Metadesign, a framework that helps designers to change paradigms and emphasises team-based practices with an aim to bring about a more synergistic global society (Wood, 2017), offers tools that are particularly suited to dealing with complex problems and enabling knowledge sharing to encourage social creativity (Fuad-Luke, 2009). There are four categories of Metadesign tools: Languageing, Tetrahedral, Synergy and Team (Metadesigners Network, 2017). These tools can be used for various purposes, from refreshing ideas by shifting perspective, to facilitating team building, to making systems work together, to showing synergies within unexplained coincidence,

and so on. Metadesign has been at the core of the teaching of MA Design Futures at Goldsmiths, University of London, since 1995 (Jones, 2012). Likewise, Transition Design provides a framework for design-led societal transition toward more sustainable futures (Irwin, 2015). One of its core areas focuses on designer's openness, mindfulness and willingness to collaborate with others. Transition Design was conceived in 2012 at Carnegie Mellon University and integrated into new curricula launched in 2014 (Irwin, Tonkinwise, & Kossoff, 2015). These three exemplary models share key concepts of collaboration, interdisciplinarity and designer as change agent.

Many scholars have contributed to this cluster by addressing diverse issues concerning the ever-changing role of design, such as design activism (Fuad-Luke, 2009), emotionally durable design for sustainable consumption (Chapman, 2005), design for sustainable behaviour (Lilley, 2007; Lockton, 2013) and design for the base of the pyramid (Prahalad, 2004).

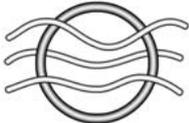
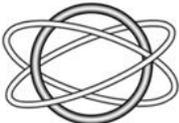
4.3.3 Models that echo the use of ecoliteracy in design

This cluster looks at the philosophical aspect of sustainable design. Considering that human beings are part of nature, this cluster focuses on how designers can put ecoliteracy into practice. When ecological literate, design becomes a powerful tool for the work of addressing contemporary social and environmental and economic problems (Boehnert, 2013). Centre for Ecoliteracy (2013) calls this approach "ecological design". Biomimicry, an approach to innovation that seeks sustainable solutions to human challenges by emulating nature's time-tested patterns and strategies (Benyus, 2002), initially appears to fit in this cluster. However, scholars critique that biomimicry design only employs a technologically-optimistic, product-focused engineering perspective (Ceschin & Gaziulusoy, 2016) and argue that a holistic perspective is a necessary supplement to biomimicry (Klein, 2009).

Boehnert (2013) suggests that ecological literacy must be embedded into design education at all levels but the struggle to embed ecological literacy into professional design practice is situated at universities. In her view, the task of future designers to make a positive difference to our world will only be possible when supported by ecological literacy. Schumacher College's new Ecological Design Thinking courses have been built upon the ecological design approach but with an interdisciplinary perspective (Schumacher College, 2016).

According to the system patterns found in nature (Centre for Ecoliteracy, 2013), each of these principles is linked to a concept in systems design. (See Table 8.)

Table 8: How ecological principles can inform design education (Boehnert, 2013), built upon the ecological principles found in nature (Centre for Ecoliteracy, 2013)

Systems Principle (Centre for Ecoliteracy, 2013)	Concepts in Systems Design (Boehnert, 2013)
<p>Network</p> 	<p>Resilience: In nature, interconnected complex networks are resilient to shocks and failure. Resilience is the ability to deal with change, to adapt to adversity. Nature’s designs are resilient, totally contrast to design in industrial systems that are often optimised for maximum efficiency and short-term profitability.</p>
<p>Nested Systems</p> 	<p>Epistemological Awareness: The lack of awareness that the economic system is a subsystem of the larger ecological system has resulted in the conditions of deep unsustainability. Systems design requires an ability to distinguish between different types of premises for different levels of systems.</p>
<p>Cycles</p> 	<p>Circular Design: In nature’s cycles, there is no waste as all elements are endlessly reused. But our economy is linear, extractive and wasteful. Designers must learn how we can support the development and design of a circular economy in order to eliminate the concept of waste.</p>
<p>Flows</p> 	<p>Energy Literacy: The availability and flow of natural resources will become increasingly important for designers in an age of increasing resource scarcity. Designers must recognise the challenge of meeting energy needs with significantly fewer fossil fuels.</p>
<p>Development</p> 	<p>Emergence: The phenomenon of emergence implies that systems will exhibit unpredictable behaviour. As individuals develop a relational understanding of networks and complex levels of causality, our collective capacity to attend to sustainability challenges is enhanced.</p>
<p>Dynamic Balance</p> 	<p>The Ecological Footprint: The ecological footprint is a metric that allows us to calculate human pressure on the planet by measuring how much “land and water area a human population requires to produce the resources it consumes and to absorb its carbon dioxide emissions, using prevailing technology” (Global Footprint Network, 2011). The understanding of ecological footprints and planetary boundaries must be an important part of a design education curriculum.</p>

The principal concepts in this cluster can be used as a theoretical framework for sustainable design. But, as it involves philosophical terms, its practicality for a broader audience is still in question. For example, to use this framework with a Thai audience, direct translation can be abstract and tend to strengthen a false perception that sustainability is a new set of knowledge from the West. The application of ecoliteracy for design education may be considered less established, but helpful for this research as an overarching framework based on whole systems thinking. Concepts and tools in the first and second clusters appear to be complementary when used together. This is because radical change for sustainability requires not only technological interventions but also social, cultural and institutional change (Geels, 2005; Loorbach, 2010; Ceschin & Gaziulusoy, 2016).

These three clusters demonstrate that sustainable design has evolved from a narrow technical, product and process-centric focus towards large-scale system level changes. Ceschin and Gaziulusoy (2016) categorise design for sustainability approaches developed in the past decades under four levels: Product, Product-Service System, Spatio-Social and Socio-Technical System. While the relationship between design and sustainability seems to be forever evolving, the role of design education appears to be in transformation as well.

4.4 Conclusion and reflections

Making the transition to sustainability requires a redefinition of the concepts of product, production and consumption. It calls for looking at design education too. It is undeniable that design education concerns materialism. The making of products is a fundamental activity, but it associates with environmentally damaging as well. *So, in the pursuit of sustainable futures, is it possible to move design education away from the product paradigm?* Approaches like new concept development and creating system innovation have been explored previously. Likewise, Findeli (2001) suggests that the product-centred attitude could be replaced by a new one if design is to survive and evolve according to the conditions of the new paradigm. The process of dematerialisation could begin with the systematic questioning of the design brief. Then the methodologies developed for the design of material products could be transferred to the world of immaterial services, provided adequate epistemological care is taken. Correspondingly, Walker and Nielsen (1998) propose a pedagogical model for addressing product design in the context of sustainability which also involves moving from product-oriented to more issues-oriented and placing greater attention to the phenomenon of community-based enterprises. “A shift in design curricula, to recognise and encompass ideas such as interdisciplinary studies, scenario building, economics (particularly local scale economics), sociology, and sustainable development will help to provide the foundations for addressing new approaches to product design. This is, perhaps, the necessary first step in the process of change” (Walker & Nielsen, 1998, p.17). The shift can be seen as a move of design education from the industrialisation-based model originally initiated

by the Bauhaus to the post-industrial one. However, taking into account the context of this thesis, as Thailand is a newly industrialised country, which its economic challenge seems to be even more intense.

Current education models can be characterised exclusive, competitive, formalistic and isolated, and do not reflect the emerging sensibilities of the spirit of the age – collaboration, cooperation and integration (Fleming, 2013, p. 4). At the same time, sustainability imposes a serious change to the existing operational model in design, which is based predominantly on industrialisation. *Is it possible for design as a discipline to evolve with less focus on producing objects and accumulating wastes, and more emphasis on creating socially and ecologically responsible solutions to the crises we are all facing as the global citizen?* How to move design beyond competition and industrialisation remains an ever critical question to all stakeholders of design education. The role of design institution must be an active agent of sustainable change (Manzini, 2011). This also means that the role of design educator is more challenging than ever. Design educators should hold the promise of a sustainable future in the hearts and minds of the students they teach (Fleming, 2013). Design educators also need to be proactive in the research aspect of sustainability theory and its applicability to design, because reacting to the research of others is insufficient if sustainability is to be relevant to design education (Giard & Schneiderman, 2013). Moreover, the sustainability challenge can never be met by mere adjustments to a design curriculum. As with all aspects of a critical curriculum for sustainable global futures, teachers and students must be co-learners, co-constructing and designing the curriculum through negotiation (Keirl, 2015, p. 167). Sustainability has to be integrated seamlessly and implemented in such a way that it would be totally unimaginable to teach design as we have done in the past (Giard & Schneiderman, 2013). This echoes one Albert Einstein's famous quote – “we cannot solve our problems with the same thinking we used when we created them” (Gharajedaghi, 2011, p. 135). When looking at history, there are many patterns in human development along with worldviews that drive change in design and by association changes in design education. Therefore, Fleming (2013) proposes the statement of *form follows worldview* to ask design practitioners and educator to examine their intentions, personal values and behaviours in pursuit of sustainability. There can be no responsible design without a responsible designer, so education should be directed to the development of an individualistic ethics (Findeli, 2001). Starting from personal ethics, how one sees oneself and determines what one experiences in the manifest world, this can be seen as an inside-out process. As provoked by Orr (1994), “poor design results from poorly equipped minds. Good design can only be done by people who understand harmony, patterns, and systems” (p. 106). In conclusion, the paradigm shift to sustainability is utmost necessary for both design industries and design education, and it must be done only via adopting a holistic approach of systems thinking. “If ever there was a time for a real paradigmatic change in society and in the academy, it is now” (Sterling et al., 2013, p. 64). As proposed by Sterling (2003) that whole systems thinking can be used as a basis for paradigm change in education, this research

highlights the practice of whole systems thinking in relation to implicating ESD into Thai design education. The Chapter 5 on context will assist in comprehending the complexity of the cultural dimension of the Thai context and the Chapter 6 on research methodology will facilitate further understanding of how whole systems thinking can be employed.

CHAPTER 5: THE CONTEXT

This chapter provides a background to the research context for understanding five key areas. First is sustainable development in Thailand, especially the economic model coined ‘Sufficiency Economy Philosophy’ (SEP) and developed by His Majesty King Bhumibol Adulyadej. The second area concerns the link between Thai cultural values and educational culture. Two main theoretical frames are drawn from Hofstede’s (1997) cultural dimensions theory and Komin’s (1990) nine clusters of Thai cultural values. The third area explores critical issues in Thai higher education. The fourth area investigates the relationships between economic development and design industries. The fifth looks specifically into the interplay between sustainability and Thai design education. At the end of the chapter, key ideas are drawn out, concluded and reflected.

5.1 Sustainable development in Thailand

His Majesty King Bhumibol Adulyadej of Thailand, considered by the public as Thailand’s guiding light, bestowed annual royal speech every 4th of December since the late 1960s until 2013. The royal speeches often contain rhetoric from ideas, concepts and philosophy that the late King conceived and developed. On December 4, 1997, the late King officially introduced Sufficiency Economy as an economic approach to the Thai people as a way recover after the Asian Financial Crisis emerged in the same year. Since then, the King’s Sufficiency Economy Philosophy (SEP) has been adopted by the Royal Thai Government as one of its major development policies. At the core of SEP, it promotes the Buddhist concept of *madhyama-pratipad* or “the middle way”, in relation to the nation’s economic development for keeping up in the era of globalisation (Fusakul & Siridej, 2010; Grossman, 2015). As illustrated in Figure 8, SEP emerges from integration of three sustainability-related concepts, which are moderation, reasonableness and resilience (Grossman, 2015).

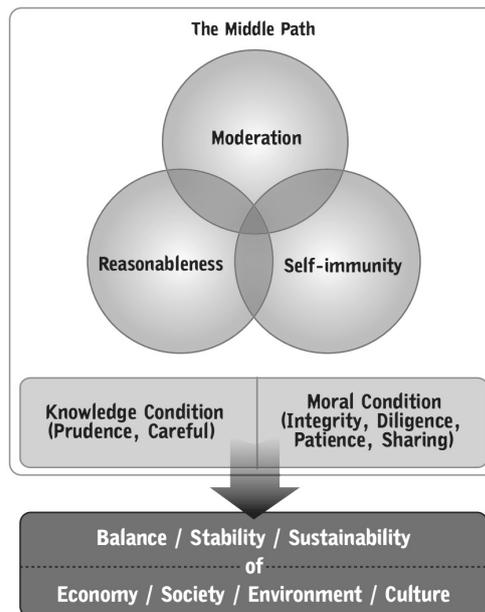


Figure 8: The Sufficiency Economy Model (Wibulswasdi et al., 2010)

A synthesis of the philosophy, with royal approval, presents that:

“Sufficiency Economy is a philosophy that stresses the middle path as an overriding principle for appropriate conduct by the populace at all levels. This applies to conduct starting from the level of families to communities and to the nation in terms of development and administration, so as to modernize in line with the forces of globalization. 'Sufficiency' means moderation, reasonableness, and the need for self-immunity to protect from impacts arising from internal and external change. To achieve sufficiency, an application of knowledge with due consideration and prudence is essential. In particular, great care is needed in the utilization of theories and methodologies for planning and implementation in every step. At the same time, it is essential to strengthen the moral fiber of the nation, so that everyone, particularly public officials, academics, and business people at all levels, adhere first and foremost to the principles of honesty and integrity. In addition, a way of life based on patience, perseverance, diligence, wisdom and prudence is indispensable in creating balance and in coping appropriately with critical challenges arising from extensive and rapid socioeconomic, environmental, and cultural changes in the world” (Office of the National Economic and Social Development Board, 2012).

The King’s rhetorical vision of the sufficiency economy has been highly praised in domestic media. Thailand Sustainable Development Foundation (2016) has claimed SEP as an approach to sustainable development and in line with the United Nations Millennium Development Goals (MDGs), which include the eight international development goals for the year 2015 established following the Millennium Summit of the United Nations in 2000. Thai Economics Scholar, Prasopchoke Mongsawad, affirmed that SEP is in line with the concept of sustainable development described in the Brundtland report in 1987 as both emphasise responsible consumption of the current generation (Mongsawad, 2010, p. 139). However, a great challenge

for the nation is to truly pursue sustainable development based on the late King's vision (Kongrut, 2016).

It is fairly understandable that there are limited and conforming resources regarding SEP compared to other economic models developed through a broad spectrum of open academic debates. As SEP is perceived as the late King's will (The Economist, 2016) and the Thai royal family are protected by the *lèse-majesté* law (Liow & Leifer, 2015), debating SEP can be a complicated matter. That means it can be against the law to expose the King's role as philosopher or theorist to the same criticism as all other academics. While many international critics of SEP disapprove the monarchy's perceived political outlook (Unger, 2009; Hewison, 1999a), there have been an increasing number of scholars advocating SEP and working on implications of SEP in various areas, such as sustainable small and medium enterprises (Puntasen et al., 2003), corporate leadership (Kantabutra, 2010, 2011; Kantabutra et al., 2010), product-service system (Fusakul & Siridej, 2010). Still, SEP is often considered a kind of fussy rhetoric among the public (Sasin Graduate Institute of Business Administration of Chulalongkorn University, 2010). One misleading factor seems to be that SEP is often linked to the late King's New Theory Agriculture which has helped Thai farmers to become self-reliant at different levels. Seeing the twentieth-first century Thailand as an agricultural-based nation is far from correct. At its peak, agriculture supplied seventy percent of employment during the 1980s (Leturque & Wiggins, 2011). Currently Thailand is a newly industrialised country which the industrial, service and agricultural sectors contribute to forty-two, forty-six and twelve percent of GDP respectively (Grossman, 2015).

Intravisit (2005) argued that the King's annual speech ritual demonstrates a lot more than just the content. This correlates with the Thai cultural value of respecting seniority. From his analysis, it represents the late King as a mindful, Buddhist speaker and a teacher, bringing up either the Buddhist philosophy or his experiential statements and using only encouraging words and giving moral support to the Thai citizens. As Intravisit concluded, SEP in the royal speech was used to ask Thai citizens to realise and respect the law of cause and effect, as well as the context of the situation in every act they do. At the same time, the act of being mindful, being aware of and living in the present moment, offers great potential support to sustainable development. In his opinion, a mindful act is powerful for one who is a teacher. From the Buddhist point of view, it makes sense that being a role model or a real-life example for students is drawn from the concept of 'spiritual teacher'. Accordingly, with an aim to develop a moderation mindset in future generations of Thais, SEP has been included in school curricula nationwide (Grossman, 2015, p. 35).

5.2 Thai cultural values and educational culture

Education in Thailand is strongly guided by the deep cultural values in the Thai heritage (Matthew, 1959, p. 442). This section looks at Thai culture in four areas. The first area explores Thai

education in relation to Buddhism. Second is connected to Hofstede's (1997) cultural dimensions theory. Third is Komin's (1990) nine clusters of Thai cultural values. And fourth is the role of teacher.

5.2.1 Buddhism and the Thai worldview

Since ninety-four percent of the population are Thai-speaking Buddhists, Buddhism plays a vital role in Thai daily life. Theravada Buddhism is the main religion practised in Thailand (Grossman, 2015). It is the school of Buddhism that draws its scriptural inspiration from the Pali canon, which scholars generally agree contains the earliest surviving record of the Buddha's teachings (Robinson et al., 2005). To demonstrate the relationship between Buddhism and the Thai worldview, there are three areas to look at. The first aspect is the monarchy in relation to Buddhism. Traditionally, the idea of kingship had been developed over centuries from the Buddhist concept of *dhammaraja*, a righteous ruler who act in accordance with the *dharma* virtues and the Hindu concept of an all-powerful god-king (Hoare, 2004). The previous section on SEP has exemplified this aspect. The second aspect is Thai education in relation to Buddhism. Tracing back to history, Buddhism played a vital role in Thai education as temples were centres of learning and monks were teachers. The highest-order goal of traditional education was to conserve and pass on ideas, practices and activities. Therefore, Thai education culture has long relied heavily on the teacher-centred approach. At present, the educational value of Buddhism does not much exist, but the status of teachers remains prestigious. Academic staff in Thai universities are often called teachers (*ajahn*), instead of scholars. The term *ajahn* is derived from the Pali word *ācariya*, and used for the honorific title "venerable monk" as *phra ajahn* (Thanissaro Bhikkhu, 2005). The term *ajahn* signifies that teacher holds a high status in the Thai society. The third aspect is sustainable development in relation to Buddhism. A strong link between spirituality and sustainability has been explored in Chapter 2 and the correlation between sustainable economic development and Buddhism has been presented when exploring SEP. Sivaraksa (2009, p.12) asserted that, among Thais, "consumer culture, through the mass media, has replaced Buddhist virtues. To overcome these false values promoted in the name of economic development, we need to turn to our spiritual roots."

5.2.2 Hofstede's analysis of Thai culture

Hofstede's (1997) cultural dimensions theory describes the effects of a society's culture on the values of its members and how these values relate to behaviour. The first dimension is power distance, the extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed unequally. Thailand is a hierarchical society in which inequalities are accepted (The Hofstede Centre, 2014). The status of a person is often determined by general appearance, job, education level, social status and even family name

(Komin, 1990). Starting from childhood, people learn respect for seniority by recognising who is superior, equal, or inferior to them. Consequently, young people seldom disagree with older people, opinions are rarely expressed, and quietness is usually considered a virtue (Prpic & Kanjanapanyakom, 2004). As inequalities are accepted through formal and informal education, the social process happens so naturally that people are not aware of oppression.

The second dimension is individualism versus collectivism, which refers to the degree to which individuals are integrated into groups (1991, 1997). Thailand is a highly collectivist country (The Hofstede Centre, 2014). Collectivism in Thai culture is explicitly reflected through a close long-term commitment to the member group, such as a family, an extended family or other extended relationships. Loyalty to the in-group in a collectivist culture is paramount, and over-rides most other societal rules and regulations (Hofstede, 2001). Thus, making effort to achieve social harmony at all times, Thais are not confrontational. Thai people tend to be aware of face, avoid criticism and restrain self-desire to create good relationships between parties (Prpic & Kanjanapanyakom, 2004).

Third, Thai is considered a feminine society, where the quality of life is achieved through placing greater emphasis on the importance of relationships, feelings and harmony (Hofstede, 1997). A Feminine society is one where standing out from the crowd is not admirable (The Hofstede Centre, 2014). Therefore, Thais exhibit some feminine qualities, including politeness, quietness, modesty and caring for others, avoiding conflicts with one another. In addition, since the majority of Thais are Buddhists, their religious belief plays a crucial role to form the basis for the genuine care and concern they have for others (Knuston, 1994).

Forth, Thai is a culture with high uncertainty avoidance which means people tend to be more emotional and prefer strong social norms (Hofstede, 1997). As the society is very conservative and does not readily accept change, Thai society prefers to control everything to eliminate or avoid the unexpected (The Hofstede Centre, 2014). The individual must know his or her place and behave accordingly to maintain smooth and pleasant interaction. Therefore, in education, teachers are viewed as having all the answers and learning is structured and not open minded (Barker, 1997). Thai students tend to feel threatened by ambiguous situations and try to avoid challenging experiences (Gunawan, 2016).

Fifth, Thailand is a society with a short-term orientation, meaning that Thais are normative in their thinking, exhibit great respect for traditions and have a strong concern with establishing the absolute Truth (Hofstede, 1997). Values promoted are related to the past and the present, including steadiness, preservation of one's face, reciprocation and fulfilling social obligations (The Hofstede Centre, 2014). As Thais tend to focus on achieving quick results, there may be a

risk of using window-dressing methods to resolve problems at the surface level.

Since Hofstede's model has been criticised as stereotypical (Bourges-Waldegg & Scrivener, 1998) or inflexible (Jagne et al., 2004), the framework on Thai cultural values studied and developed by Komin who is a Thai scholar is also provided here.

5.2.3 Komin's nine clusters of cultural values

Komin's (1990) investigation of empirical studies on Thai values indicates that the most important cultural characteristics relate to nine value clusters. To make sense of how these cultural values affect Thai education culture as a whole, this section aims to articulate Komin's value clusters in connection with other literature on Thai education.

The first cluster is ego orientation. Thais have a very high value of self-esteem and the preservation of others' egos is the major rule of Thai social interactions. There are three key characteristics in this cluster: face-saving, criticism avoidance and *kreng jai*. The term *kreng jai* can be translated as to be considerate, to feel reluctant to impose upon another person, to take another person's feelings into account, or to take every measure not to cause discomfort or inconvenience for another person. The ego orientation value appears to underpin the transmissive learning approach used in Thai education system. Thai students will give answers or feedback only if asked for (Laopongharn & Sercombe, 2009; Mounier & Tangchuang, 2010). Besides, in Raktham's (2012) classroom observation study, there was a noticeable absence of *kreng jai* among observed students, interrupting the teaching and learning process to some degree. This is interesting and useful for the analysis of this research because it appears to be a feature of Thai values that young people are not abiding by. The absence of *kreng jai* will be discussed again when examining research results.

The second cluster is grateful relationship orientation, based on the concept that a person must remember the goodness done to him or her by another and remember to reciprocate it. It incorporates the principle of *bunghun* (indebted goodness). Being a Thai person, one should be grateful to persons who render goodness, help or favours to them. In this aspect, a teacher is a *bunghun* provider, in the form of knowledge giver, whereas students are inexperienced and must be grateful for the teachings. Hence, students are seen as not in a position to share, express or propose ideas (Laopongharn & Sercombe, 2009). Asking questions is considered an act of questioning somebody's knowledge and his or her social status. Questions are barely part of the teaching-learning process in Thailand because it is inappropriate to question those who render *bunghun* (Mounier & Tangchuang, 2010). Based on the concept of *bunghun*, there is a Thai ritual called *wai khru* in which students pay respects to their teachers in order to express their gratitude and formalise the student-teacher relationship (Segaller, 2005). The ceremonies

usually take place shortly after the beginning of the first term semester in most institutions at all education levels nationwide. The ceremony involves paying respect and homage to both their teachers and the deities who patronise their arts. There is also the National Teachers' Day on the 16th of January of every year, a special day for the appreciation of teachers. Most education institutions close for the day.

The third cluster is smooth interpersonal relationship orientation, focusing on conflict-free and pleasant interactions and maintenance of surface harmony. Thais highly value maintaining other-directed social values. This results in a preference for courtesy and humility and relaxed and pleasant interactions. Thais tend to be polite and remain smiling at all times, even in tense negotiations. This polite and humble approach is very important as it soothes one another's ego. Traditionally, students are neither taught to question nor be critical about what the teachers say. These days, students still often avoid conflicts of ideas with the teachers by obeying all the comments and tend to smile and nod even though they do not understand the teachers (Laopongharn & Sercombe, 2009).

The fourth cluster is flexibility and adjustment orientation. It involves the present-oriented mindset. Thais are situation-orientated rather than ideologically or system orientated, meaning that they place a higher emphasis on flexibility of approach than to honesty. In practical terms, this means that Thais are not law-orientated, especially when it comes to special requests from those with higher status or seniority. Acknowledging higher and lower status or 'senior/junior' relationship can be viewed as a fundamental part of Thai social interaction (O'Sullivan and Tajaroensuk, 1997), respect for seniority, whether in terms of age, status or wealth, can lead to flexibility and adjustment orientation. This is because a senior is someone to be respected and not be challenged. Furthermore, this value orientation is somehow correlated with the laxness in principle, and consequently reflected in certain behavioural patterns like, decision-shifting behavioural patterns and corruptions. Punctuality is not an absolute must in the Thai society.

The fifth cluster is religio-physical orientation. The value for religious and spiritual life is important in the cognition of Thai people in general. Thais are constantly engaged in merit-making and many other religious ceremonies. While the original concept of *kam* or *karma* principally conveys the law of cause and effect, which also provides a basis for deep ecological thinking, Thais tend to only think of it as bad karma. So, believing in *kam* associates with learned helplessness – a condition in which a person feels unable to change their circumstances. This also appears to link with the characteristics of passive learning.

The sixth cluster is education and competence orientation. Thais tend to perceive education as a means to climb up the social ladder as the knowledge-for-knowledge sake value does not receive high value. The effect on education is to emphasise form over content. It means that

Thais regard education as a "means" of climbing up the social ladder of being higher prestige and higher salary, rather than an end value in itself (Komin, 1990, p. 11).

The seventh cluster is interdependence orientation, which expresses the values of interdependence and mutual help. This is the community collaboration spirit that values the spirit of co-existence. This value allows ethnic groups such as the Chinese and the Thai Muslims in the south to coexist peacefully with the Thai Buddhist majority. Concerning learning, this makes Thais tend to pick up from other cultures very easily, especially from tourists and media. However, it can be superficial. Thais tend to adopt policies and practices from other cultures mostly at the surface level. Higher education in Thailand can exemplify this value as it has often adopted Western models. This issue will be discussed in 5.3 on Thai higher education.

The eighth cluster is fun-pleasure orientation, which is characterised by the attitude of *sanuk* – to enjoy oneself and have a good time. Thais use *sanuk* to help maintain social relationships and to guarantee that one has time to relax. Therefore, Thais are easily bored and often lack serious commitments. In daily life, Thais in general do not like discussing serious issues because the conversation may falter. Moreover, because of the climate and rooted in the agricultural background, Thais regard time as cyclical. Expecting Thais to perform to tight deadlines will cause distress. In relation to teaching and learning, Thai students tend to avoid serious discussions and often use humour and jokes to reduce tension (Gunawan, 2016). One teacher wrote clearly “If students don't consider something to be fun, you will lose their attention, and they will entertain themselves by doing something else” (Kuehn, 2016). It is challenging to make Thai students feel engaged with critical topics. A learning while having fun approach can be effective for most Thai students (Holmes & Tangtongtav, 1995). Moreover, Young (2013) discussed academic dishonesty by pointing to the deep-set traits of *sanuk*, laxness in principle and the present-oriented frame of mind as a major potential factor for shaping a student's decision to cheat on examinations and commit intentional plagiarism.

The ninth cluster is achievement-task orientation. Thais consider ambition and hard-work as less important than social relationships (McClelland, 1961). Komin (1990) stated clearly that for Thais, education is regarded as a social ladder. *Rab nong*, the tradition of new undergraduate student orientation is closely linked with this concept, as it is considered socially important and can even last for months for some institutions. University newcomers are required to have respect, not only for the lecturers, but also for the senior students. The concept is similar to the hazing tradition in the United States. *Rab nong* is usually tied to the concept of SOTUS, which stands for seniority, order, tradition, unity and spirit (Sivaraksa, 1996). Newcomers are often forced to behave in a certain way, and are sometimes ordered by their seniors to humiliate themselves (Phakdeewanich, 2017a). SOTUS can be seen in the university society as a normal thing for seniors to exercise a capacity to earn the freshmen's respect and to achieve harmony

among bullied freshmen (Saengpassa, 2011). Over the recent years, scholars and the media have indicated that SOTUS tradition in Thai universities breeds authoritarianism (Winichakul, 2015; Yimprasert, 2016; Ekachai, 2017).

These nine clusters of cultural values have been discussed in other aspects as well, especially the cultural notion of hierarchy in the workplace (Taylor, 2014). Some studies indicated convergent trends where there is less practice of the traditional Thai values in the workplace (Niratpattanasai, 2002). Educated young Thais appear to shift towards a more participatory style of working (Komin, 2000). This aspect can be useful for looking at the relationships between senior and junior teachers.

5.2.4 Role of teacher

In the big picture, as suggested by Komin 1990, Thai society places great value on its hierarchical structure and that affects the education culture as a whole. Looking specifically at the role of teacher, the ideal teacher as a responsible moral parent is an integral part of the Thai cultural legacy (Wallace 2003). The late King of Thailand, His Majesty King Bhumibol Adulyadej, (1980) pronounced that teachers are pillars of morality.

“Teachers do the right thing. They are diligent, persistent, hospitable, idealistic strong and patient. They are disciplined and avoid illicit activities like smoking and drinking. They are also honest, sincere and kind to others. They take the middle way. They are unbiased. They are wise, reasonable and knowledgeable” (His Majesty King Bhumibol Adulyadej, 1980, p. 23).

Prpic and Kanjanapanyakom (2004) conducted a study through a survey of participants in twenty universities. All academics agreed on what constituted a good teacher and a good student. Based on the results:

“a 'good' teacher is an expert and has all the answers (or they lose face), organises the content into appropriate learnable units, presents the content clearly via lectures, ensures that the students acquire and retain the knowledge, and is kind and nice to their students. A 'good' student acknowledges that the teacher is senior and has greater knowledge, pays close attention and carries out all instructions given by the teacher, is quiet in class, retains all the knowledge given by the teacher, and is respectful and loyal to the teacher” (Prpic & Kanjanapanyakom, 2004, p.7).

Wallace (2003) pointed out the inconsistency between the moral parent model of the good teacher, which is clearly influenced by Buddhism, and one of the key messages in the educational reform that teachers are expected to teach critical thinking. According to a study by Naruemon (2013), the term child-centred or learner-centred approach was included in the 1999 National Education Act and based on the 1997 Constitution but has been interpreted and put into practice differently. Naruemon revealed that the transition from the teacher-centred approach to the

student-centred approach has been difficult because Thai teachers misunderstand the concept of student-centred approach. Being a principle, it has been interpreted merely as a tool. The use of the student-centred approach in Thailand has not succeeded very well “as it seemed to go against the rote learning tradition that was ingrained in both the educational and religious traditions of Thai culture” (Foley, 2005, p.224). Hence, critical pedagogy is uncommon in Thailand. A number of scholars discussed Thai students’ inability to think critically in relation to culture. Atkinson (1997) claimed that critical thinking is a part of the social practices of the West, whereas Asian cultures do not adopt such practices. According to Wallace (2003), critical thinking is problematic when it is envisioned as accompanying traditional Thai culture which discourages critical thinking and disagreement by encouraging conformity, conservativeness, going with the flow and not making waves. A recent study by Katja Rangsvivek, whose research interest focuses on society and culture of modern Southeast Asia, claimed that Thai lecturers have an authoritarian personality (Kanparit, 2017). The study indicated that, given the oppressive culture in Thai universities, it is unlikely that students are encouraged to embrace critical thinking or even democratic values.

5.3 Thai higher education

The development of Thailand’s education system has been shaped by two main factors: political and economic (Michel, 2010). The modern education system was founded only in response to threats of colonisation from the United Kingdom and France at the end of the 19th century. The attempt to save Thailand from the powerful tides of Western colonialism was made by King Rama V (1853-1910) through skillful diplomacy and selective modernisation. Consequently, the country saw the first comprehensive higher education institution, Chulalongkorn University, in 1917. Initially, higher education aimed to prepare graduates for working in civil services (Mounier & Tangchuang, 2010; Lao, 2015). Higher education was elitist at the beginning but it was extended to the masses within a few decades. Still, the Thai educational system is over-centralised and bureaucratized (Fry, 2002; Lao, 2015). Tremendous expansion and change in Thailand’s higher education system have continued since the late 1960s. Now higher education providers are expanding at a rapid rate, offering a wide range of programmes. The increase in quantity has affected the overall quality of Thai higher education (Mounier & Tangchuang, 2010; Lao, 2015). Nowadays the aim of Thai higher education still appears to focus on teaching and training for professional development, not new knowledge creation through research (Lao, 2015).

Incompatible with its traditional education values, Thailand's higher education has chosen to adopt various foreign models for its higher education to promote the country’s overall socioeconomic advancement (Mounier & Tangchuang, 2010; Sinlarat, 2004; Lao, 2015). Mounier and Tangchuang (2010) pronounced that “blindly implemented by imported and

fashionable ideas, Thai education has not been built with a profound knowledge of realities” (p. 315). Despite the industry-oriented focus in higher education, the senior economist at the World Bank, Kirida Bhaopichitr stated from an economic point of view that “the country is troubled by a shortage of highly skilled workers whereas most of the highly trained workers it does have are wrongly allocated (Parpart, 2013). "The mindset is from the nation-building and Cold War period to produce obedient and nationalistic citizens, which does not fit the 21st-century needs," said Thitinan Pongsudhirak, a political scientist at Chulalongkorn University. "It is hierarchical, top-down, with a systematic lack of critical thinking" (Ahuja, 2011). Among higher education teachers, there appears to be little awareness of, or incentive to, develop alternate and student-centred learning teaching methodologies (Prpic & Kanjanapanyakom, 2004). Because of the prominence of teacher-centred approach, the lack of a research culture is problematic (Lao, 2015). The outcome is that the production of knowledge is not deeply rooted in higher education. Research funding is also scarce and difficult to obtain, particularly in the Arts, Humanities and Social Sciences fields. As a result, a large proportion of university teachers hold the rank of lecturer or assistant professor because the key condition for promotion to associate professor and full professor is to do research and to publish (Sinlarat, 2004). It seems that, as the production of present-day knowledge through research seldom takes place, higher educational training available in Thailand continually mismatches the skill sets needed to succeed in today's more dynamic labour market. Inoerb Regel, a World Bank education specialist, said: “Thai universities offer narrow fields of study, making it difficult for students to adapt to the global economy” (Ahuja, 2011). Michel (2010) concludes that Thai education is too often inspired by Western ideas and global trends, instead of building on firm philosophical and political foundations coupled with a profound knowledge of realities.

Scholars indicated that the current dilemmas in Thailand's education include the equity hindrance, which the gaps exist between better public and private schools in big cities and those in rural areas affect the entire education system (Suwanwela, 2006), the over-centralised and bureaucratised nature of education system (Fry, 2002; Lao, 2015), poor teacher recruitment and training (Ahuja, 2011), being a system that prioritises obedience over thinking (Ekachai, 2017; Phakdeewanich, 2017b), poor research culture (Sinlarat, 2004; Lao, 2015), academic dishonesty and intentional plagiarism (Young, 2013) and *rab nong* activities, tied with SOTUS, as part of freshmen orientation traditions in higher education institutions (Saengpassa, 2011; Phakdeewanich, 2013; Winichakul, 2015; Yimprasert, 2016; Ekachai, 2017) In addition, Thailand has had eight governments and twenty-one education ministers since 1999 (The Nation, 2017). Over the recent years, political power, through reforms, has affected Thai education greatly. The military junta government, officially known as the National Council for Peace and Order (NCPO), has issued the order under the Article 44 of the Interim Constitution for a number of occasions for resolving the nation's education matters. According to Constitution of the Kingdom of Thailand (Interim) (2014), Section 44 empowers the NCPO leader to issue any order "for the

sake of the reforms in any field, the promotion of love and harmony amongst the people in the nation, or the prevention, abatement or suppression of any act detrimental to national order or security, royal throne, national economy or public administration, whether the act occurs inside or outside the kingdom". Key changes include Ministry of Education reform and the appointment of a new Education Minister (Limsamarnphun, 2017), suspending the director of the Office for National Education Standards and Quality Assessment (ONESQA) (Mala, 2016), reformation of the national research and innovation system and establishment of a new national research body (International Commission of Jurists, 2016), and allowing foreign universities to establish campuses in Thailand to help develop the country's human resources (Rujivanarom, 2017).

5.4 Economic development and design industries

As stated by Margolin (1989) there is very little writing in design literature on the issues of design, especially industrial design, in developing countries. Bonsiepe (1977) suggested looking at the role of design in developing countries based on dependency theory which indicates that underdevelopment in peripheral countries is a consequence of development in the central countries. While the central countries are dominant capitalist countries, the periphery countries are those that exist on the outer edges of global trade and usually receive a disproportionately small share of global wealth. Thailand is a periphery country in this regard. The condition of industrial design in the periphery can be considered being dependent, technologically and financially. Industrial design in the peripheral countries acquires a mainstream Western image oriented towards sales promotion targeting an affluent minority while ignoring basic needs of the poor and the disadvantaged. Bonsiepe pointed out that while designers in the industrialised economies work to differentiate products and stimulate consumption in markets with access to advanced technical information and knowledge, the less industrialised economies lack qualified labour and technical information. So, in peripheral countries, it is common that designers must be involved in the production stages, which limits concentration on design activity (Guimaraes, 1995, p. 45). The dependency theory in relation to the role of design in the developing countries proposed by Bonsiepe is in accordance with Thailand's reality. It reflects the vocational nature of Thailand's design education.

Tangsantikul and Power (2010) discussed the historical period between the late 1950s and the early 1970s when Thailand went through multiple dramatic changes in its political, economic and socio-cultural dimensions. Thailand's industrial revolution was born of a military-inspired political revolution. Field Marshal Sarit Thanarat came to power following twin coups in 1957 and 1958 and initiated a dictatorship that lasted for more than a decade. During that time, to promote particular narratives of tradition, values and culture numerous campaigns were launched. The key campaigns were those for the reorganisation of Thai capitalism and the reordering of Thai society. At the heart of *samai phatthana*, Sarit's so-called era of development,

was a heavy emphasis on economic growth through the rapid expansion of a capitalist economy. Tangsantikul and Power (2010) pointed out that design emerged as a significant social and cultural force in the early years of *samai phatthana* and continued to develop in tandem with the expansion of the Thai economy and the myriad changes in society. Establishing an authoritarian political system, Sarit's government, with World Bank and US support, decided to make Thailand progressive and 'civilised' by fostering industrialisation and free-market capitalism, developing infrastructure through public spending programmes, and creating incentives to stimulate foreign investment (Hewison, 1989). This attempt later led to Thailand's first Economic Development Plan of 1961, stressing the extension of the internationalised capitalist economy, the infrastructure modernisation and the growth of the domestic market. Manufacturing expanded through incentives for foreign and local investment. Tangsantikul and Power (2010) concluded that design made a great contribution to the consumer capitalism which took root among its growing urban middle classes and elites. The drive towards new more Western forms of living rooted in mass consumption was evidently visible in the mid-1960s. The naturalisation of consumption had become a supreme aspect of design's role.

Through extensive, complex socio-economic-political changes with the emergence of a significant domestic capitalist class, the late 80's saw Thailand's economy burgeon with liberalised industrial and financial sectors. Thailand had become an industrially oriented capitalist economy by the mid-1990s (Hewison, 1999b). But every evolutionary development has its price, especially this unsustainable one. Due to the 1997 Asian financial crisis which started in Thailand, the booming economy came to a halt and the nation had acquired a burden of foreign debt that made the country effectively bankrupt even before the collapse of its currency (Khan, 2004). Thailand finally regained its NIC status several years later. What has happened in Thailand is in line with Er's (1997) narration of the history of industrial design in the developing world, which visualises economic development strategies of NIC governments. The government's design policy was described as "actions taken to integrate industrial design within industrial development strategy, promotion programmes, and in the finance of design events" (Er, 1997, p. 300). For this reason, echoing Bonsiepe's dependency theory, design in the NICs undeniably has long been an activity with an ultimate economic purpose. Naksorn (2015) argues that, although industrialisation has impacted dramatically on the nation's economic development, historically Thais have been rooted in the craft tradition of folklore. Based on his study, the history of industrial design in Thailand is not as clear as the traditional craft culture. Therefore, Naksorn suggested to consider what he coined 'industrial crafts design' – design that derives from a combination of craft tradition and industrial production – as part of Thai design history. According to Naksorn, industrial crafts design has been a sub-discipline in Thai design education for more than a decade.

The contemporary craft sector stepped up to the spotlight in 2001. It was the time when the Thai

government decided to model after Japan's One-Village-One-Product or OVOP, a successful regional programme encouraging each village to create a regionally distinctive product from local resources that meets the international market requirements (Natsuda et al., 2012). It was named One-Tambon-One-Product or OTOP, as *tambon* means sub-district. The programme was initially introduced to small and medium-sized cultural enterprises (SMCEs) and later included small and medium-sized enterprises (SMEs). A numbers of Thai SMEs have begun to integrate eco-design into their product development processes, thanks to business opportunities arising from export, advertising and reduction of production costs (Klinpikul & Srichandr, 2010). As indicated by Naksorn (2015), through the lens of localism, OTOP has been the movement with potential to assist in highlighting the close connection between industrial crafts design and sustainable development. The availability of raw materials and the sustainment of the skills of local artisans are key to the concept. According to a study by Chudasri, Walker and Evans (2013), for contemporary craft enterprises in Thailand, a strong connection between crafts with design and sustainability has not been made explicit. Based on their analysis, furniture, handwoven textiles and jewellery appear to have the highest potential for development. Pasupa (2016) pointed out that, although the aim of OTOP is to contribute to rural development in terms of both economic support and human resources, most of the OTOP directions have predominantly focused on economic issues.

5.5 Sustainability and design education

Thai design education is only about five-decade old, beginning from industrial design before branching out to include various sub-disciplines (Naksorn, 2015). Unlike many countries in the West, design education in Thailand begins at the higher education level, where in students are offered practical, skill-based training during their first years. Although most focus on practicality, undergraduate design curricula in Thailand are diverse (Pasupa, 2016). They may be art-oriented, provided in a technical or vocational way or taught in architecture schools. The period of study is usually four to five years. Strengths, uniqueness, specialism and history of each institution plays a vital part in directing its educational orientation. There is no literature discussing exclusively the model of design education in Thailand, but there are two main traditions evident. One tradition is labelled Industrial Design, which is academic and industrial-oriented and its pioneer programmes received funding for machinery and equipment from the United States (Department of Industrial Design, 2014) and Japan (King Mongkut's Institute of Technology Ladkrabang, 2017). Another tradition is placed under the overarching umbrella of Decorative Arts and Applied Arts and is more art-based and vocational-focused. The foundation was laid by Thailand's first School of Arts, which is now Silpakorn University (Faculty of Decorative Arts, 2017).

But knowledge and skills offered under both traditions often overlap due to historical and cultural

factors. For instance, sub-disciplines that are relevant to local artisanal cultures like Textile Design and Ceramic Design can be found in both traditions. The first Industrial Design programme at Chulalongkorn University was initially part of the Department of Fine Arts in the Faculty of Architecture and early-year students were required to enrol in Architectural courses (Department of Industrial Design, 2014). Some Industrial Design programmes, at Khon Kaen University and Walailak University for example, do not restrict themselves to techniques of mass production. Regarding themselves as regional universities, they have embraced their local wisdom and craft heritage in their curricula (ARCH KKU, 2016; Walailak University, 2017). The Faculty of Decorative Arts at Silpakorn University currently offer courses in Digital Design, which are not compatible with the classic definition of decorative arts as known in the West. However, intimately tied with economic development, Thailand's design education, in general, reflects the dominant design paradigm that remains deeply grounded in the mechanistic worldview, gearing mainly for production and consumption.

The research area concerning ESD in Thai design education appears to be under-researched. So far, the only extensive research into this area was carried out by Pasupa (2016). In Thailand, sustainability-related design courses are currently available in a limited number of higher education institutions and are usually elective courses. Pasupa pointed out five common barriers obstructing sustainable design learning in Thai higher education. These barriers include perceived irrelevance by academic staff, lack of staff awareness and expertise, crowded curricula, lack of institutional drive and commitment, and the complexity of social sustainability. As Pasupa concluded, there are two root causes of these barriers. One is that sustainable design is considered a lower priority than other more conventional design subjects such as manufacturing processes, aesthetics and functionality. Another is design educators' lack of insight into sustainable design. Most of the educator participants in his study could not clearly explain the principle of sustainable design and the relationships between the triple bottom lines - the social, economic and environmental dimensions of sustainable development. Pasupa also pronounced that, due to the lack of drive from government and business sectors, design educators are key change agents to integrate ESD into Thai design education. In his view, new materials to enable design educators to identify ESD learning outcomes in their modules are urgently needed.

When looking specifically at sustainable design pedagogy, there are only a limited number of small studies carried out in some institutions. Design pedagogy research appears to be uncommon in Thai higher education. Boonla-or and Chuenrudeemol (2010) asserted that ESD could be cultivated through localism and a transdisciplinary, holistic approach. In their practice, the concept of localism was highlighted by co-learning with a craft community, which enables students and local craftspeople to learn from each other in an iterative process. Moreover, with an aim to make students recognise environmental impact problems created through design,

Suppipat (2016) introduced the use of life cycle analysis (LCA) tools for sustainable product design activities in classroom. Working in groups, students were asked to disassemble a chosen home appliance to find out the environmental impacts of its entire product life cycle and propose a redesign concept to reduce those impacts. Suppipat discovered an advantage of the application of LCA-based tools for design students, which is to assist them in indicating the problem areas that they might have normally ignored. Both studies, as examples, do not only demonstrate pedagogical practices of sustainable design, but also pointed that the student-centred learning approach has already been employed at a small scale for ESD in Thai design education.

5.6 Conclusion and reflections

Even though Thailand has achieved rapid economic growth, it has encountered numerous social and environmental problems caused by unsustainable development. The United Nation's concept of sustainable development – the development that meets the needs of the present without compromising the ability of future generations to meet their own needs (UNWCED, 1987, p. 43) – is still relatively new to Thai people. However, Thais are more familiar with the Sufficiency Economy Philosophy, bestowed by the late King Bhumibol Adulyadej and based on the Buddhist concept of *madhyama-pratipad* or The Middle Path. Therefore, the cultural dimension to sustainability is crucial for this research and Thai cultural values are need to take into consideration. Hofstede's analysis of Thai culture and Komin's nine clusters of cultural values provide useful insight into Thai educational culture, which is deeply grounded in the teacher-centred approach. Thai higher education also supports this practice of knowledge and skills transmission, as its key aim is to produce graduates for employment, not new knowledge creation. There are a number of challenges for making a shift in pedagogy to the student-centred approach, such as the lack of critical thinking in students, the proficiency in the teacher-centred approach in teachers, as well as many other characteristics of both teachers and students that contribute to the passive learning process. But, some cultural values, like fun-pleasure orientation and interdependence orientation, can be advantageous for carrying out student-centred learning activities. When looking at Thai design education specifically, Pasupa (2016) indicated that the ESD movement has already begun but only been in its initial phase. According to his study, there are two root causes of the barriers: sustainable design being considered a lower priority than other more conventional design subjects and design educators' lack of insight into sustainable design. In his view, design educators should fundamentally be change agents to implement ESD in Thai design education. The takeaways from this chapter, especially those culture-related, are of great assistance for approaching the research questions.

CHAPTER 6: RESEARCH METHODOLOGY

This chapter looks at the research methodology employed in this thesis. It elaborates on the research design, types of research participants, the research methods and data collection tools in relation to Participatory Action Research (PAR) which is the key approach used in the study, as well as the analysis of data.

6.1 Research design and the nested contexts of research

Dealing with three different contextual levels of design education in Thailand, this study comprises three main parts to address the key research questions arising from the contexts and the literature. All research findings in this thesis, big or small, are instrumental in drawing conclusions regarding a paradigm shift towards sustainability in Thailand's design education. Each part employs different data collection methods for different groups of participants. First, I look at **the education paradigm**, which involves the first research question “**Is a paradigm shift towards sustainability in Thailand's design education plausible and able to be put into practice?**” The data collection and analysis process at this paradigmatic level aims at examining the core values, the worldview and the direction of design education. Data from policy-makers and educators with management responsibilities are hence essential. Additionally, to understand the correlation between the practice of design education and the design sector in Thailand, data from the stakeholders who work in design industries are collected too. Data from these participants also provide sustainability-related insights into a larger picture of the close relationship between design education and industries. However, the findings from the other two levels also contribute to, and complement, the answer of this first research question. The second part, focusing on **design educators and their practices**, concerns the second research question “**Could ESD be embedded into Thailand's design education through the ‘frame of mind’ concept?**” To explore the role of design educator concerning ESD, this part involves data collected from full-time academic staff in Design from a wide range of higher education institutions. Issues regarding their practices, for example, how curriculum and learning environment are managed, the barriers and opportunities for curriculum and pedagogical improvement and how their organisational culture affects the way they work, are also taken into account. Interviews with educators who teach sustainability-related design courses help contribute to the understanding of the current design education paradigm as well as the direction of sustainable design in Thailand's design education. The data concern how these educators consider their role, how they interpret sustainability and how they teach sustainability. Lastly, the third part is **the learning sphere**, which is the heart of the thesis. It lies in the learning and pedagogy level, where the participatory action research process takes place, to tackle this under-researched area of sustainable design education in Thailand. The focus is on the learners. It examines the third research question “**Can dissemination of transformative learning be a critical strategy for teaching sustainability**

to design students in Thailand?” This classroom-level part looks closely at multiple relevant dimensions, from the link between cultural values and education in Thailand, to critical pedagogy, to environmental ethics and worldviews, to spiritual philosophies like Buddhism and deep ecology, to ecological literacy, and to whole systems thinking. With crucial factors affecting the learners’ view of sustainability and their ability to think critically taken into consideration, the initial investigation looks at the current practices of sustainable design pedagogy by using classroom observation. Then, a series of curriculum interventions seek to answer if transformative pedagogy can help facilitate a shift in perspective in the learners – away from a mechanistic paradigm and anthropocentric worldview. To increase depth and richness of data collected from classroom observation and the curriculum interventions, the pre-test activity, the post-test activity, and post-intervention focus group discussion with students are carried out. It is anticipated that the findings from this particular part of the research will make a great contribution to design education in higher education, especially the emerging debates on sustainable design education in the non-Western context. Besides, it attempts to open up discussion around **the development of an effective pedagogical model of sustainability learning for Thai design students.**

6.2 Research participants representing stakeholders of the nested contexts

The nested contexts of the study determine the types of research participants for each research question. There are two relevant categories of stakeholders appropriate to be selected as research participants. The first includes design and design-related professionals working in the creative industries. The second category, which is larger, is composed of those associated themselves predominantly in the higher education realm, including policy-makers, university management staff, design educators and students. Table 9 presents the research methods and data collection tools employed for each group of research participants. While interview was used primarily with non-student participants, there are multiple research tools for collecting data from the student participants through observations and the curriculum interventions.

Table 9: The research methods and data collection tools used for each group of research participants

Research method	Research tool	Type of participants	Number of participants
Focus group discussion	Semi-structure interview	Professional practitioners working in design industries	Seven participants from various disciplines
Interview	Semi-structure interview	Policy-makers	Two participants
		University staff with management responsibilities	Five participants from five institutions
		Full-time design educators	Sixteen participants from thirteen institutions
Classroom observation	Observation sheet	Design educators and students	Five groups in five institutions
Curriculum intervention	Reflective diary	Design students	Ten groups from eight institutions participated in the curriculum interventions but numbers of sessions for each group vary. All groups did the pre-tests, only two did the post-tests and volunteers from eight groups participated in the post-intervention focus group discussion.
	Pre-test activity		
	Post-test activity		
	Semi-structure interview for the post-intervention focus group discussion with students		

It is crucial to comment on one specific issue concerning the recruitment of research participants. As I noticed from a great number of academic design research projects in the Thai Journals Online Database (www.tci-thaijo.org) and as of my experience while working in Thai design education, the tradition of academic design research in Thailand is largely quantitative. It concerns primarily market-oriented research, based on the practice of new product development and customer satisfaction surveys. Among Thai design scholars, there seemed to be a lack of awareness of design education research. So, when recruiting research participants, it was important to clarify that this research is both quantitative and qualitative, and the focus is on education, not designing. Furthermore, opinions, comments and remarks from design educators and students are rarely presented in the form of research. It is more common that the opinion leaders and key figures in art or design, mostly senior, appear in the media to express their views on education-related

topics. For instance, Saranont Limpananont, the design director and founder of an award-winning interdisciplinary design studio based in Bangkok, gave a stimulating interview on education and design in *Creative Thailand* magazine, published by Thailand Creative and Design Centre (Kosolkarn, 2017). He discussed the lack of critical thinking in Thai learners, as a result of transmissive pedagogy, in connection with the lack of design and technology education in Thai basic education curriculum. In his view, Thai art education alone does not encourage students to understand others and society because it usually focuses on the training of practical skills like drawing and painting to produce physical works rather than the learning which aims at a broad understanding of a body of knowledge and theoretical concepts in art and humanities.

Moreover, public posts on Facebook written by opinion leaders are often influential. Newspapers sometimes use provocative quotes from scholars to capture the public's attention on particular topics. A public Facebook post by Thasnai Sethaseree, a short critique on Thai art and design education which became a controversy in a newspaper in 2017, is an example to illustrate this phenomenon. Sethaseree is a faculty member of the Department of Media Arts and Design at Chiang Mai University. The post is a personal response to the news that art and design students in one reputable university organised a series of freshmen events and gave positive opinions on the hazing tradition disregarding the human rights of their newcomers (News Monitor - Matichon Online, 2017). Hazing refers to the practice of rituals and activities involving harassment, abuse or humiliation used as a way of initiating an individual into a new fraternity, sorority or club. For Thailand, hazing has long been part of initiation ceremonies for freshmen in universities. Sethaseree argues that Thai art and design education has been grounded in Neoplatonism, the Western philosophy which has harmonised perfectly with the indigenous craft and Theravada Buddhist traditions of the people. As he has studied, the key Western influence on Thai art and design education is Italian Renaissance, as the first art college in Thailand was established by an Italian sculptor. However, the teaching and learning process mainly emphasises on the style of art and design pieces rather than the humanist philosophy. And design in Thailand, like other countries in Asia, is considered a branch of Applied Arts. Hence, in his view, this is the reason that prominent art and design schools focus largely on vocational training and a predominantly aesthetic appreciation, often overlooking the social contribution which could be made through the art and design practices. He links this with his observation that Thai art and design students tend to be egoistic and lack self-discipline and social responsibilities.

However, these two examples are non-academic, non-peer reviewed sources. In Thailand, mass and social media always play a vital role in communicating messages from opinion leaders. But the voice of the majority of stakeholders of Thai design education on critical issues has neither been heard formally nor put on show systematically via research. Accordingly, this research recruited a large number of participants from the stakeholders who usually keep themselves low-profile or see themselves at the bottom of the hierarchy in educational decision making.

6.3 Research ethics: bias, validity and language issues

For this thesis, the cultural factor plays a dominant role in the realm of research ethics. The general ethical principles of voluntary participation, informed consent, confidentiality and anonymity were adhered to throughout the research process. I signed the ethical statement from Goldsmiths and the consent forms were signed by all participants. (See Appendix A.) As a Thai person, I am conscious of the face-saving or the criticism avoidance value, which plays a critical part in Thai culture. Confidentiality and anonymity are vital to ensure that the participants feel safe in revealing data concerning their personal and institutional information. The sensitivity of data is important in determining the level of protection and privacy required. The validity and reliability of data collected have also been taken into consideration. According to the cultural value of ego orientation, Thai people do not want to be embarrassed during any interpersonal communication process. I have been aware that the research participants have a tendency to please me as the researcher by answering the question positively or go so far as to reply “yes” to any interview question when they actually mean “no”. As a result, I avoided technical terms that are not widely known in Thailand or do not have direct translation in Thai. For example, I re-appropriated all interview questions that contain the term ESD. I refrained from asking the educators if they know what ESD means because it might have affected their ego and self-image. Instead of communicating the term ESD bluntly which might have intimidated or confused the interviewees, I used the phrase “the practice of direct and indirect teaching and learning for sustainable development” and elaborated further the features of ESD.

The research design aimed to enhance research validity by studying a comprehensive range of participants and settings. Concerning the honesty and genuineness of the research data, the research took into consideration a variety of factors conditioning the current practices of design teaching and learning. These factors are especially the attributes of the institutions that support or facilitate the execution of the curricula, whether they are public/private universities, urban/non-urban learning environments, Thai/International programmes and so on. I managed to cover the whole range of attributes across the participant clusters. However, some aspects of Thai cultural values were incompatible with research validity enhancement in some aspects of diversity of the participants. Throughout the research process, I was aware of the unequal power relationship between stakeholders within the overarching context of the research as an issue relevant to this study, especially teachers and students and senior teachers and junior teachers. Due to the cultural characteristics of prospective participants in the close-knit Thai society, the topic of this study is likely to raise issues among various stakeholders who feel concerned more about the research implications than the positive contribution of the research. It is also important to note that Thais recognise one's place in the hierarchical structure during every social interaction. Hence, the researcher could be classed instinctively by any prospective participant as superior or inferior to themselves, based on the researcher's age, status, background and personality. The

participants' first impressions and perceptions unavoidably affected the way they interacted with the researcher, as well as what they gave as data.

The cultural values of prospective participants, especially seniority and ego-orientation, were particularly an outstanding factor during the participant recruitment process. As a result, it was challenging to acquire a truly across-the-board range of participants in term of age and status. It was difficult to successfully approach not only prospective participants who are high-profile and senior but also prospective participants working in less well-known or less-established universities. Only participants who felt comfortable with the topic and talking to me (as a less senior academic) were willing to take part in the study. This resulted in a large proportion of educator participants being in the similar and close age range with me. On top of that, since design education has not a long history in Thailand, all potential participants are in a small community. Therefore, it is inevitable that I had heard of or known some of the research participants before the study took place. The situation may seem tricky to justify in term of research ethics. Regarding the Thai cultural dimension, research participants who felt familiar with me expressed more willingness to give interviews than others. All interviews with these participants are longer than half an hour and the content is rich. The research participants who were unfamiliar with me only gave precise interviews, approximately less than fifteen minutes. This appears to be a matter of trust, something that is interpersonal and culturally sensitive. Characteristics of Thai cultural values like seniority, face-saving and flexibility-orientation affected the data collection process throughout.

All field data were collected from Thai participants in Thai language. I have been aware that there might be a lost-in-translation issue when moving from one language to another. As data were transcribed and translated into English only for the purpose of reporting and communication, I worked on the analysis in Thai. In addition, there are a number of Thai vocabularies and slangs that cannot be translated exactly to English. Sometimes narratives and comments were used instead of direct translation, making it more practical for analysis.

6.4 Researcher as transformative learner: a personal approach

I believe that I would not have been able to work fruitfully on a research topic that concerns the process of transformative learning for sustainability without having a transformational experience first. Taking the transformative learner role was my inside-out approach, concerning the transformation of self as well as the holistic balance of head, hand and heart. To comprehend the essence of transformative learning for sustainability by experiencing the interconnectedness of self with others and the world, I set myself two significant tasks. These tasks were relevant to this research and built on both the Literature Review and my existing personal spiritual belief systems based on Buddhism and contributing to sustainability. The first task was the mindfulness practice

at Wat Pa Sukato Forest Monastery in Thailand and the second task was Deep Ecology learning at Schumacher College in the UK. Further details about these two events are included in Appendix B.

From my experience, the two events helped in activating the process of self-actualisation. While self-actualisation is the highest need of Maslow's hierarchy of needs, Buddhism and deep ecology consider it more modestly without emphasising personal needs or desires. The process of self-actualisation in deep ecology takes place when the egoic self is transcended and one arrives at a position of "an ecological self", the narrower concept of self which concerns seeing oneself being part of nature. In Buddhism, The Buddha's teaching on Law of Nature leads the way to self-actualisation and mindfulness is the vehicle for empowerment. The learning experiences I gained from these two events also reminded me of the importance of care and collaboration values among teachers and learners. The realisation of my ecological self has prompted me to practise whole systems thinking naturally. Combined with my Buddhist belief, it strengthens my consideration of how an action one makes can impact others in various ways. In short, my personal, spiritual journey has assisted in framing the methodology of this research, from the holistic approach used in data collection to the lesson planning of the curriculum interventions.

6.5 Participatory action research (PAR)

The methodology of this thesis involves Participatory Action Research (PAR), the approach that facilitates understanding of the context by trying to transform it, collaboratively and following reflection. PAR concerns a cyclical process of data finding, action and reflection, leading to further inquiry and action for change. This spiraling dynamic ensures that both the researcher and the participants remain partners throughout the research process. According to Brydon-Miller (2001), PAR emerged in the 1970s in the work of scholars from the global south: Marja Liisa Swantz in Tanzania, Orlando Fals-Borda in Columbia and Rajesh Tandon in India. McTaggart (1991) defines PAR as a systematic and collaborative project between the academic and marginalised or oppressed members in collecting evidence on which to base group reflection and in planning change. Elliot (1991) asserted that PAR has played a pivotal role in educational change, particularly in the development of teachers and teaching. As asserted by Latapi (1988), PAR can be used as a foundation for the development of critical pedagogy. As stated in Freire's *Pedagogy of the Oppressed* (1970), most political, educational and communication interventions fail because they are designed by technocrats based on their personal views of reality. The oppressors rarely take into consideration the perspectives of the oppressed. Freire proposed that the concept of "teacher as learner" is fundamental when students and the teacher learn from each other in a mutually transforming process. Participation is the key. In line with Freire, whose work regards critical reflection as essential for individual and social change, educators use PAR to examine and reflect upon their own practice and evaluate strategies to improve practice.

Accordingly, at multiple stages in this study, I had three different roles: researcher, teacher and learner.

PAR is variously termed as a dynamic educative process, an approach to social investigation and an approach to take action to address or tackle a socio-political challenge (Marshall & Rossman, 2006; McTaggart, 1991). Lange (2009) suggested that using PAR in the context of sustainability education can lead to deeper levels of change reaching the emotions, body, and spirit and creates an ecological consciousness in addition to transformed cognitive and political understandings. Therefore, PAR is appropriate for this type of project as the research is profoundly based on the idea of critical pedagogy with a focus on dialogical reflection of the students (Chevalier & Buckles, 2013). PAR responds directly to the third research question of this thesis “Can dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?” and assists in initiating discussion around the development of an effective pedagogical model for teaching sustainability to Thai design students. I regard PAR as an approach to research in communities that emphasises participation and action through empowerment. Empowerment is a psychological process in which individuals think positively about their ability to make change and gain mastery over issues at individual and social levels.

The iterative process of PAR methodology in this research contains two phases: the pilot study phase and the main study phase. (See Figure 9.) The time frames of both phases are based on to the academic term times in Thailand. There are two semesters in the Thai academic year with an optional summer semester. The fieldworks of this research were scheduled for the first semesters of two academic years. Although different in detail, both pilot and main phases employed the same methods of data collection, including classroom-based fieldwork, interview and focus group discussion. The pilot studies were conducted in Thailand from July to September 2014 (approximately half term) by imitating the research methodological structure of the major fieldwork, which was carried out from August to December 2015 (full term). With an aim to trial how well the larger study is likely to turn out, the pilot study provides an opportunity to get a first-hand glimpse of how participants tend to respond to the research questions (van Teijlingen & Hundley, 2001). It is also the pre-testing of particular research instruments (Baker, 1994, p. 182-3). All participants remain anonymous throughout the process of collecting data.

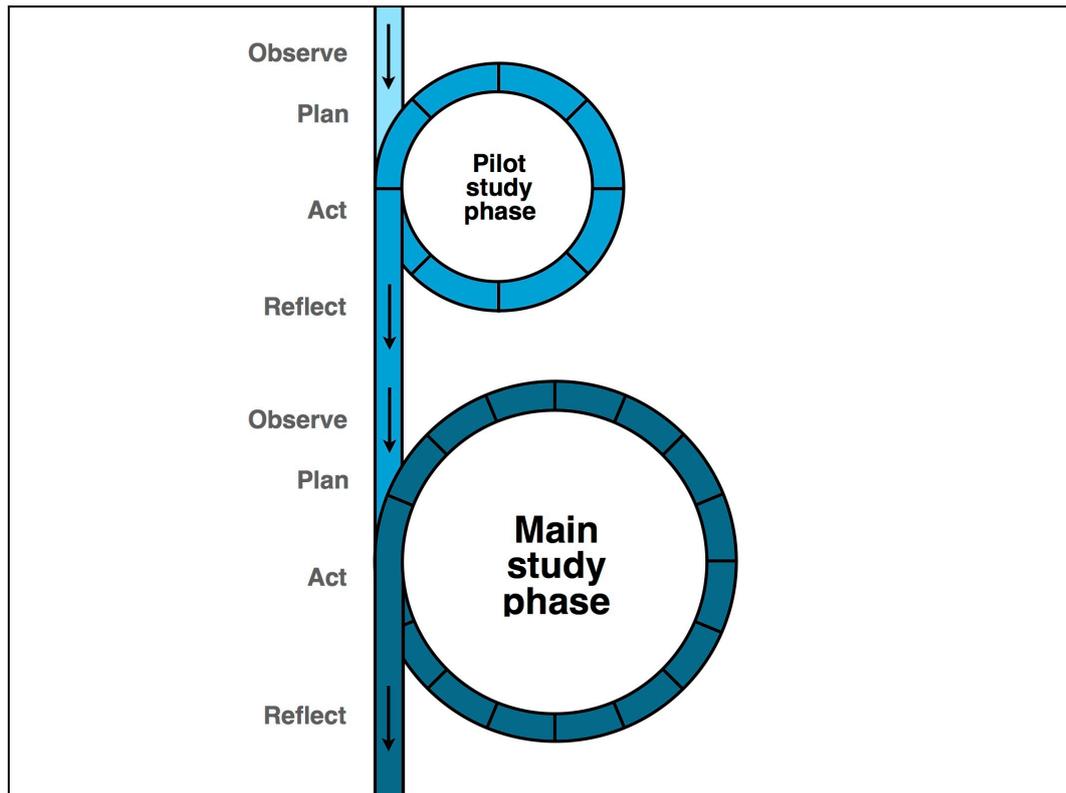


Figure 9: The iterative process of PAR methodology in this research

McIntyre (2000) outlines three major components of PAR. First is the collective investigation of a problem. Second is the reliance on indigenous knowledge to understand that problem better. And third is the desire to take individual and/or collective action to deal with the stated problem. Moreover, focus groups, participant observation and field notes, interviews, diary and personal logs, questionnaires, and surveys are effective methods of data generation employed in PAR (Greenwood & Levin, 1998). Consequently, these components are embedded in the study as shown in Table 10. According to UNESCO, 'indigenous knowledge' refers to the local knowledge that is unique to a culture or society. Other names for it include: 'local knowledge', 'folk knowledge', 'people's knowledge', 'traditional wisdom' or 'traditional science'. The term 'indigenous knowledge' is also used to describe the knowledge systems developed by a community as opposed to the scientific knowledge generally referred to as 'modern knowledge' (Ajibade, 2003). In this research, I aim to recognise knowledge and practices underpinned by the Thai cultural values and characteristics via multiple research methods. For example, the late King's Sufficiency Economy Philosophy affects greatly how Thais deal with sustainable development at different levels.

Table 10: Major components of PAR in the research methodology of this thesis

Major components of PAR (McIntyre, 2000)	Research methods in this thesis
The collective investigation of a problem	Classroom observation
The reliance on indigenous knowledge to better understand that problem	Focus group discussion with stakeholders working in design industries The pre-test activity included in the first sessions of the curriculum interventions Reflective diary Focus group discussion with students (Supported by interview with educators and policy-makers and educators with management responsibilities.)
The desire to take individual and/or collective action to deal with the stated problem	The classroom-based fieldwork, including all of the activities in the curriculum interventions and the post-intervention focus group discussion with students

6.6 From the pilot study phase to the main study phase

To further clarify the PAR iterative process, it is necessary to explain how the research progressed from the pilot study phase to the main study phase. The pilot studies were carried out as a preliminary work before committing to the main study. As the initial fieldwork imitates the research methodological structure of the major fieldwork, it was a trial to see how well the larger study was likely to turn out. The pilot study phase proved that the research methods and tools employed were practical and reasonable. The trials not only offered more understanding of the situation but also facilitated the planning for the next steps.

During the pilot study phase, due to the time limit, data were collected from participants based in Bangkok Metropolitan Region only. The way to approach and recruit potential participants, as mentioned previously, was significant too. Considering the pilot phase as a testbed, the research participants initially recruited were those I got to know through networking. Data from participants based outside Bangkok Metropolitan Region and participants who are more senior were later collected during the main study phase.

The focus group discussion with stakeholders working in design industries was conducted first thing of the pilot study phase and provided valuable insights. The discussion aimed to understand the big picture of the direction of design businesses and what the industries expect

from the newer generations of designers. It was also beneficial for affirming the research assumptions and for planning out other stages of the data collection process. For **the interviews with policy-makers and educators with management responsibilities**, during the pilot study phase, I recruited only three design educators who have departmental-level management responsibilities. Beginning with this group of participants was especially helpful in term of understanding the management aspect of the curriculum and learning environments. I later expanded the scope of this category of participants by including two national-level policy-makers and two university executives in the main study phase. For **the interviews with design educators**, I recruited only educators from institutions located in Bangkok Metropolitan Region during the initial phase. I later interviewed educators from universities in other provinces in the main study phase. Eight out of sixteen educators work at the institutions that I conducted the classroom-based fieldwork. I also carried out **the classroom-based fieldwork**, which includes classroom observation and curriculum interventions. The curriculum interventions were equipped with the pre-test activity, the post-test activity and the post-intervention focus group discussion. However, the length of observation and the number of curriculum interventions depend on a negotiation between the educators and myself. This mix of research methods is designed to obtain the classroom-level data, especially from design students during their sustainability learning. The longest curriculum intervention series during the pilot study phase contains eight sessions and were then extended to a full version of sixteen sessions in the main study. The design and development of the full version are grounded in the feedback and suggestions from the student focus group discussions during the pilot phase. Smaller studies carried out in various institutions as mini versions are useful for crosschecking the findings and seeking patterns emerging from different groups. The participants in the pilot and main study phases are students from different year groups.

6.7 The research methods and data collection tools

There are multiple research methods and data collection tools employed in this research.

6.7.1 Focus group discussion with the stakeholders of design education working in design industries

Focus group is a form of qualitative research in which a small group of participants gathers to discuss a specified topic. It can provide insights about how people in the group perceive a situation. This method is used when insights are needed into a new area of research, when the purpose is to investigate topics where opinions or attitudes are conditional and when a researcher needs additional information to prepare for a larger scale study. Hence, focus group discussion was chosen and conducted early on during the pilot study phase. The recruited research participants were various stakeholders in Thailand's design education apart from full-time

educators, students and policy-makers. The focus group discussion contributes mainly to the first research assumption, “A paradigm shift towards sustainability in Thailand's design education is plausible and able to be put into practice.” It aims to seek insights regarding the dominant paradigm of Thailand’s design industries as well as design education, and the possibilities for a shift to sustainability.

6.7.1.1 Participant recruitment and group size

The ideal size of a focus group for most non-commercial topics is five to eight participants (Krueger & Casey 2000). In this study, there were seven participants in total. The group was composed of people who did not know one another. The composition of the group was determined by their design-related occupations and education qualifications. They were from a variety of backgrounds, with a combination of different ages and genders. Each of them held at least one Design degree. None of them was directly involved with education institutions. The group was small enough to give every participant the opportunity to express their opinions and large enough to provide a diversity of opinions.

Table 11: Detail of seven focus group participants who are practitioners working in design industries

Participant	Occupation	Age range				
		20-25	26-30	31-35	36-40	41-45
Stakeholder 1	Communication design company owner, design activist, design podcast host, part-time design educator			✓		
Stakeholder 2	Independent woodworker, recent design graduate	✓				
Stakeholder 3	Motorcycle styling designer, design R&D staff, part-time design educator		✓			
Stakeholder 4	Senior interior designer					✓
Stakeholder 5	Junior interactive designer		✓			
Stakeholder 6	Illustrator, In-house designer working in publishing company		✓			
Stakeholder 7	Senior industrial product designer (glass)				✓	

6.7.1.2 Focus group design and implementation

The setting for a focus group discussion can be critical because the physical environment of the group can influence the nature of the interaction among group members and the types and amount of information obtained. Therefore, the meeting was set on a Saturday at a private studio as a small gathering for drinks and snacks in the manner that the participants felt welcome and relaxed. It was operated within cultural norms, keeping a balance between research culture and Thai culture. Usually, there are several roles of people in a focus group: a moderator, a note-taker or assistant moderator, participants and transcriptionist. In this study, my main role was a moderator, but I also did note-taking and transcribing. The focus group discussion was video recorded to facilitate later transcription.

All of the focus group questions had been sent to all participants via email before the conduct of focus group discussion. These questions are included in Appendix C. I used a non-directive approach with open-ended questions and a structured topic guide. The non-directive approach allowed the participants to answer questions from a variety of dimensions. The focus group discussion contained three parts. It first began with an ice-breaking conversation including an introduction of each participant. The participants were asked to tell others their backgrounds and encouraged to share their current design practices. They later discussed the aspects of their careers in relation to sustainability. Then the conversation moved on to design education, with an opening question “Do you think the higher education should empower the future generation of designers with knowledge, skills and values towards sustainability and why?” Finally, the third part was a discussion concerning their desirable scenarios of the direction of design education in Thailand. It was planned to entail a conversation of what design education could do to assist the shift to sustainability.

6.7.2 Interviews with policy-makers, educators with management responsibilities and design educators

Interviews with policy-makers and academic staff with management responsibilities primarily concern issues around the aspect of management and ESD. There were two policy-makers taking part in this research and both of them are from an education background. Interviews with design educators provided insights into curriculum and pedagogy practices. Table 12 shows the number of design educators and educators with management responsibilities recruited from thirteen higher education institutions. In order to embrace the diversity of higher education institutions in Thailand, these sampled universities were from different backgrounds, ranging from state-funded to private, from more urban to more rural locations, and from Thai to international programmes, and from having sustainability as a compulsory subject to regarding sustainability as an add-on in the curriculum.

Table 12: Educator participants drawn from thirteen higher education institutions

	Institution												
	A	B	C	D	E	G	H	I	J	K	L	M	N
Number of Design educators	1	2	1	2	1	1	1	1	2	1	1	1	1
Number of educators with management responsibilities	1	1	1	0	1	1	0	0	0	0	0	0	0

6.7.2.1 Face-to-face interview

Interview is a far more personal form of research than questionnaires and suitable when the questions are open-ended. Face-to-face interviews are recommended where the research aims mainly require insights and understanding (Gillham, 2000). Face-to-face interview is flexible and helps in evaluating responses through non-verbal communication. For this research, face-to-face interviews were preferred to telephone interviews as they provided the opportunity to meet the participants in person, which is crucial for Thais to express respect for and stress the importance of the interviewees.

6.7.2.2 Participant recruitment

It was very challenging during the process of recruiting participants working in management due to a strong sense of social hierarchy in Thai culture. Hence, I began with interviewing three participants who are design educators with departmental-level management responsibilities. Two of them work at the institutions in which the curriculum interventions were carried out during the pilot study phase. Then in the main study phase, when I had gained a lot more understanding of the research context, I interviewed two university executives. Towards the end of the fieldwork in Thailand, I approached two high-profile policy-makers who provided the infrastructure-level data regarding rhetorical concepts and direction of higher education policy. Furthermore, the criteria for recruiting the participants who are design educators for interviews are based on the following two criteria. First is their status as full-time educators in higher education institutions. Second is their experiences in teaching sustainability-related design courses or their research interests in design for sustainability.

6.7.2.3 Interview design and semi-structured interview method

The interview questions were designed based on the research questions and findings from the literature review. The questions used in the interviews start from something more general before moving on to more complex questions. The research questions were redeveloped into some more casual questions. I also refrained from using unfamiliar terms like paradigm and worldview. For example, the research question on a paradigm shift towards sustainability in Thailand's design education was articulated through a range of redeveloped questions. When interviewing design educators, I used a series of simple questions like "Can you tell me about your teaching experience?", "How do you see the direction of Thailand's design education?", "Have you noticed any shift around the issues of sustainability?", "Do they think a shift towards sustainability is needed in Thailand's design education? And why?" and so on. The interview questions were prepared and sent in advance to the interviewees via email.

I chose to conduct semi-structured interviews because it allowed interviewees freedom to discuss their opinions about the set questions and it would feel more natural compared to the structured method. Semi-structured interview is a qualitative method of inquiry combining a pre-determined set of open questions with the opportunity for the interviewer to explore particular themes and responses further. In other words, semi-structured interviews have a sequence of themes to be covered as well as some prepared questions, with an openness to change either the sequence or the form of questions to allow for follow up of answers given (Kvale and Brinkman, 2009). The semi-structured nature of questioning risks potential bias as questions may seem to be leading, especially when examples are given by the researcher as interviewer. Therefore, when interviewing, I tried to make interviewees feel comfortable in asserting their opinions and disagreeing with particular questions. I also let the conversation flow as much as possible. However, some prepared questions were skipped when it was clear that the questions were inappropriate or had been answered in the previous dialogue. The duration of each interview depends largely on the interviewee's personality, availability and how comfortable they felt when being interviewed by me.

Interview questions for the policy-makers, educators with management responsibilities, and design educators are included in Appendix D.

6.7.3 Classroom-based fieldwork

The classroom-based fieldwork was designed in response to the third research assumption that the dissemination of transformative learning can be a critical strategy for teaching sustainability to design students in Thailand. It included three elements. First is classroom observations; second is curriculum interventions (with the pre-test activity, the post-test activity and reflective diary);

and third is focus group discussions with students. The classroom-based fieldwork employed PAR predominantly as a pedagogical process to trial the new approaches in design education via curriculum interventions which aim at creating a scenario where teacher and students jointly develop meaningful learning.

Table 13: The classroom-based fieldwork conducted in eight institutions

	Institution							
	A	B	C	E	F	G	H	I
Classroom Observation	0	1	2	0	0	1	1	1
Number of sessions of curriculum interventions	8 (pilot), 16 (main)	3 (pilot), 3 (main)	3	1	1	3	4	3
Number of student focus groups	2	2	1	0	0	1	1	1

Classroom observation was carried out at the beginning of the classroom-based fieldwork. It gave insights into the current teaching and learning practices of the sustainability-related design courses in different institutions. After that, at the heart of the fieldwork was a range of curriculum interventions developed using transformative learning and PAR as guidelines. Since PAR involves critical reflection as essential for individual and social change (Freire, 1970), the curriculum interventions attempted to raise students' critical consciousness of their role as design practitioner in relation to their sustainable futures. As PAR involves direct participation of the community being studied and aimed to work for change in ways that are critical and collaborative, a shift in perspective of the learners through their learning experience over time was also examined. Following the curriculum interventions, focus group discussions with eight groups of students were carried out. The purpose was to obtain the students' opinions concerning their current curricular practices as well as their transformative learning experience of ESD. The debate looks particularly at the challenges and obstacles of using transformative pedagogy in sustainable design education from the students' perspective.

6.7.3.1 Classroom observation

An interview study by Pasupa, Evans and Lilley (2012) provided a preliminary understanding that lecturing is the main pedagogical approach employed in sustainable design courses in Thailand. In spite of that, this research explored further the teaching and learning practices in the actual circumstances. This is because to recognise the present through practice is the first step to perceive the dominant educational paradigm. The study primarily pays attention to the higher

education institutions' offering within their Design Departments' sustainability-related courses, in order to gain insights into their current practices. In this research, classroom observation was used to collect data concerning teaching and learning in the actual environments. The aim was to obtain insights of the education worldviews, approaches, as well as a number of key concepts and tools currently employed in teaching and learning of sustainability-related design courses. According to Wragg (1999), classroom observation usually involves making notes about classroom events and extensive analysis of lesson is often required. Classroom observation was taken as the first approach in the classroom-based fieldwork because it helped to recognise the patterns of behavior of teachers and students in teaching and learning environments in this specific context.

A data collection tool for classroom observation is an observation sheet, as shown in Figure 10. An observation sheet is a tool employed by researchers in various disciplines. For this study, it was a tool to help record situations about the lessons observed and assist in the capturing of the teaching and learning patterns, teacher-student interactions and students' participation in their classroom activities. It can also be used to compare the data collected from educator interviews. The observation sheet used was based on an original version developed by Kimbell and Stables for examining student learning activity in technology education (Stables, 2008). The observation sheet used in this research followed its basic pattern but also was developed further for use specifically in the sustainable design learning context. It was made up of two parts; a space for open-ended narrative; and checklists for marking key concepts captured during observation. The narrative space simply allowed writing and drawing for recording the teaching and learning situation. In order to design the checklists, the observation framework was formulated from a number of theories and designed systematically to observe classroom activities. It proved best to make use of the observation sheet to examine each activity, instead of each session. This was because one session may consist of a variety of activities. The design of the observation framework followed the structure of the sustainability pedagogy model (Burns, 2011), introduced in the literature review chapter. The model comprises five key elements: course design, content, perspectives, process and context, which were used as a guideline for the observation sheet design. This sustainability pedagogy model reflects education as sustainability, a transformative learning process through which learners' values and perspectives change so that they can embrace sustainability and take action for change. The checklist part of observation framework contained four aspects concerning sustainable design education. First is the general view of education. Second is the environmental ethics and the environmental education approach. Third is the perspectives of design. And fourth is the context of the teaching and learning drawn from the sustainability pedagogy model. There was a collection of analysis tools in the form of the checklist allocated for each aspect. Details on the design and development of this observation sheet are included in Appendix E.

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Figure 10: The observation sheet with the space for open-ended narrative in the middle of the template

Many design educators I approached with the classroom observation proposal were sceptical to take part at first. It took quite some time to negotiate, confirming that all data collected through observations would remain anonymous and confidential. Characteristics of Thai cultural values presented throughout the process. Because of the flexibility-oriented values in Thai culture, there were many times that sessions were delayed because of students' late attendance. There were a few times that classroom observation plans were cancelled at the last minute by the course leaders and had to be rescheduled. Further, the ego-oriented values also affected the plan. The first part of the classroom observation plan was document analysis of the course syllabus, but most educator participants refrained from providing such documents. Instead, to reduce awkwardness, I asked them to provide a short description of their course in their own words. This only gave a glimpse of what these courses cover, rather than the rationale of the courses.

During most sessions, while most students seemed unaffected by being observed, some educators responded clearly in the way that they were aware that they were monitored by a researcher. Although I clarified that I would have a passive role in the learning environments, a couple of them also asked me to comment and share ideas in the classroom activities. Scholars like Medley, Coker and Soar (1984) assert that observer effects are not serious concerns but the possibility that this threatens the validity and reliability of data collected exists. Accordingly, interviews with teachers and focus group discussion students were also employed to help justify the findings from data collected through classroom observation.

6.7.3.2 Curriculum interventions, the pre-test and the post-test, and reflective diaries

Central to the PAR process of the research, the curriculum intervention series was designed as a pedagogical process to trial new, different lessons and methods. The aim was to understand how a transformative pedagogy would work in the real context, especially how students would respond to the new approach. The curriculum intervention series included several research instruments and all activities were recorded in various formats such as images, notes and videos, as situations allowed.

During the pilot and main study phases in Thailand, the curriculum interventions were conducted with ten groups of design students in eight institutions. At four institutions, the participants were volunteers whereas the curriculum interventions at other four institutions were slotted in their compulsory courses, which either include some aspects of sustainability or are clearly entitled Sustainable Design. Table 14 presents the number of students participating in the curriculum interventions.

Table 14: The number of students taking part in the curriculum interventions

Institution	A		B		C	E	F	G	H	I
	Pilot (A1)	Main (A2)	Pilot (B1)	Main (B2)						
Number of students	22	16	7	5	18	13	8	56	22	26

Due to limitations of time and the nature of curricula in different institutions, the curriculum interventions in each institution varied in number of sessions and focus of the content. To obtain permission to trial curriculum interventions from prospective universities was quite tricky. I could only conduct the fieldwork in situ by being categorised as “a guest lecturer”, not “a design education researcher”. According to common institution regulations at many institutions in this research, a guest lecturer is defined as an external specialist who is invited to lecture on no more than three sessions per course per semester. Therefore, I was unable to conduct more than three sessions for the courses in most institutions. Since sustainability-related courses in many institutions are elective, they are all allocated on Wednesday, a common day for elective courses in higher education in Thailand. Overlap of sessions was problematic. This issue also results in a restricted number of interventions to be carried out.

The curriculum intervention series was designed by using Buddhism as a lens. For this specific context, the interrelationships between Buddhism, sustainability and design for sustainability are essential. Table 15 presents the parallel conception of these domains, from spiritual wisdom, to foundational concepts in sustainability, to methods and tools for design for sustainability. The understanding of nature is meaningfully central and it is pragmatic enough to be used as the content structure for the teaching and learning of Design for Sustainability in the context where Buddhist culture plays a vital role. The content structure is built upon two key concepts in Buddhism. One is *Pratityasamutpada* (interdependent co-arising) and another is *Madhyama-pratipad* (the middle way). The details on design and development of the curriculum intervention structure are included in Appendix F.

Table 15: The content structure of the curriculum interventions based on the interrelationships between Buddhism, sustainability and design for sustainability

Sessions based on the Buddhist concept of	Colour codes	Sustainability concepts	Key topics in design for sustainability
<i>Pratityasamutpada</i> (Interdependent co-arising) ‘All things arise in dependence upon multiple causes and conditions.’	Orange	Environmental Ethics (Naess, 1973; (Devall & Sessions, 1985; Wenz, 2001)	Designer’s role as part of the system
			Design Ethics
	Yellow	Whole Systems Thinking (Bateson, 1972; Capra, 1996; Sterling, 2001)	Life Cycle Thinking (McDonough & Braungart, 2002) Stakeholder Analysis
<i>Madhyama-pratipad</i> (The Middle Way) ‘The path of moderation / Practising or living with moderation’	Green	Futuring and Defuturing (Fry, 2009)	Design Futuring (Designing against unsustainability)
			Design for the Real World (Papanek, 1983) Design for Sufficiency Economy (Fusakul & Siridej, 2010)

Time limits and different curriculum traditions in different universities led to a variety of versions of curriculum interventions with interlinked lesson plans. Whereas the complete versions of the pilot study phase (eight sessions) and the main study phase (sixteen sessions) were conducted in one institution, other smaller studies carried out at other institutions were mini versions. These smaller studies followed a number of topics in the full versions. These lesson plans were designed based on the negotiation with the course leaders. Table 16 presents the five different themes in the curriculum interventions which different groups of students took part in. Each theme is colour-coded using the system in Table 15.

Table 16: The five themes of the curriculum interventions conducted with different student groups

Key concepts	Themes	A		B		C	E	F	G	H	I
		Pilot	Main	Pilot	Main						
First impressions and breaking the ice	The pre-test activity and introduction to sustainability	/	/	/	/	/	/	/	/	/	/
<i>Pratityasamutpada</i> (Interdependent co-arising) All things arise in dependence upon multiple causes and conditions.	Environmental Ethics	/	/					/	/	/	/
	Whole Systems Thinking	/	/	/	/	/	/	/	/	/	/
	Futuring and Defuturing	/	/			/		/			/
<i>Madhyama-pratipad</i> (The Middle Way) The path of moderation / Practising or living with moderation	“Small is Beautiful.” and Buddhist Economics	/	/	/	/						

Figures 11 - 14 present visual summaries of the curriculum interventions conducted during the pilot and main study phases. Details of the sessions and topics of the curriculum interventions conducted with ten groups of students from eight different institutions are included in Appendix G.

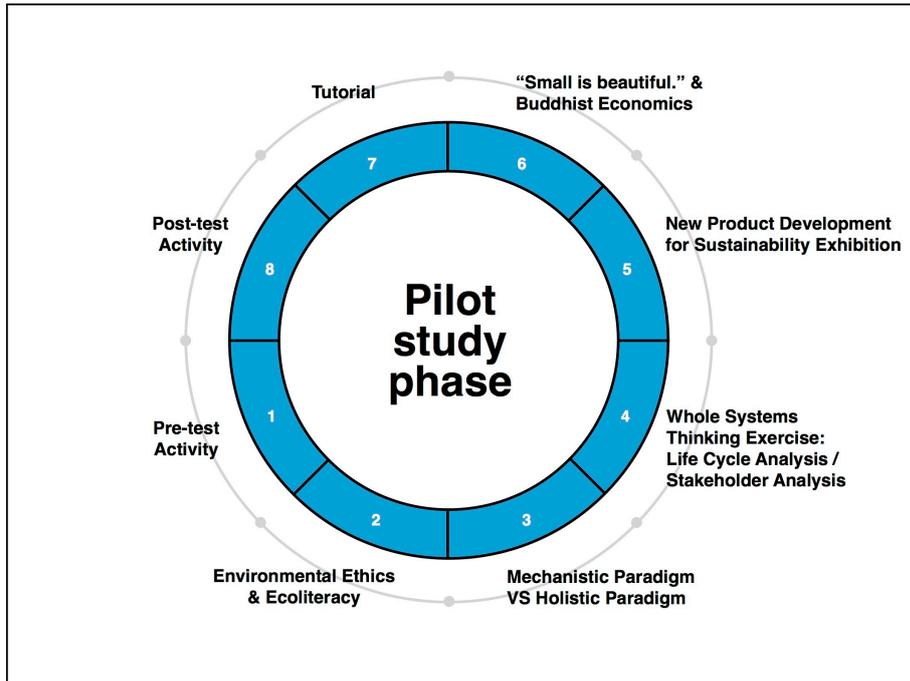


Figure 11: The full version of the curriculum interventions in the pilot study phase, containing eight sessions

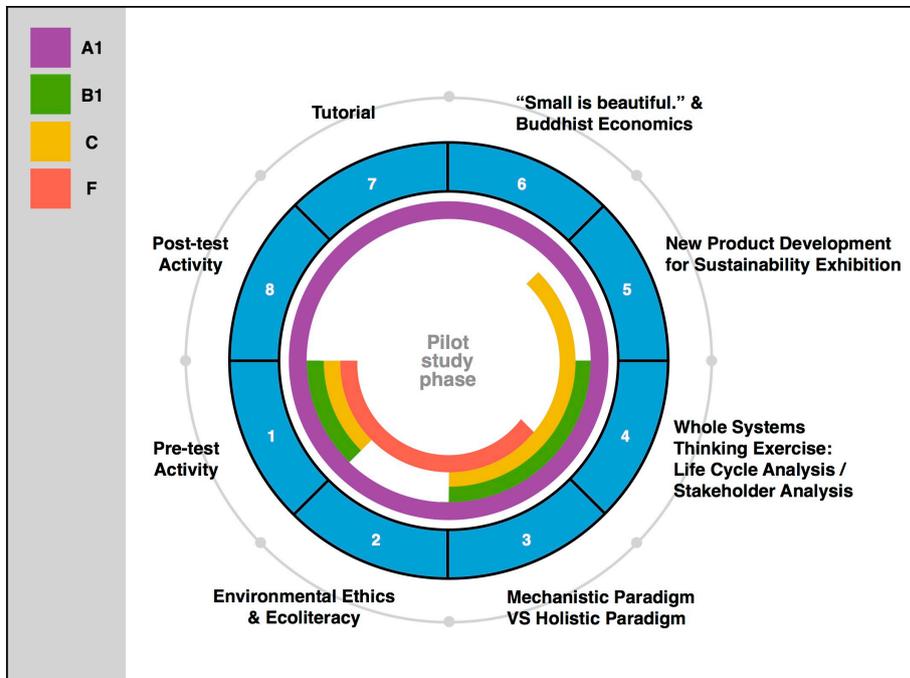


Figure 12: A diagram presenting the curriculum interventions conducted during the pilot study phase, visualising how the mini versions were carried out at three institutions alongside the full eight-session version at one institution

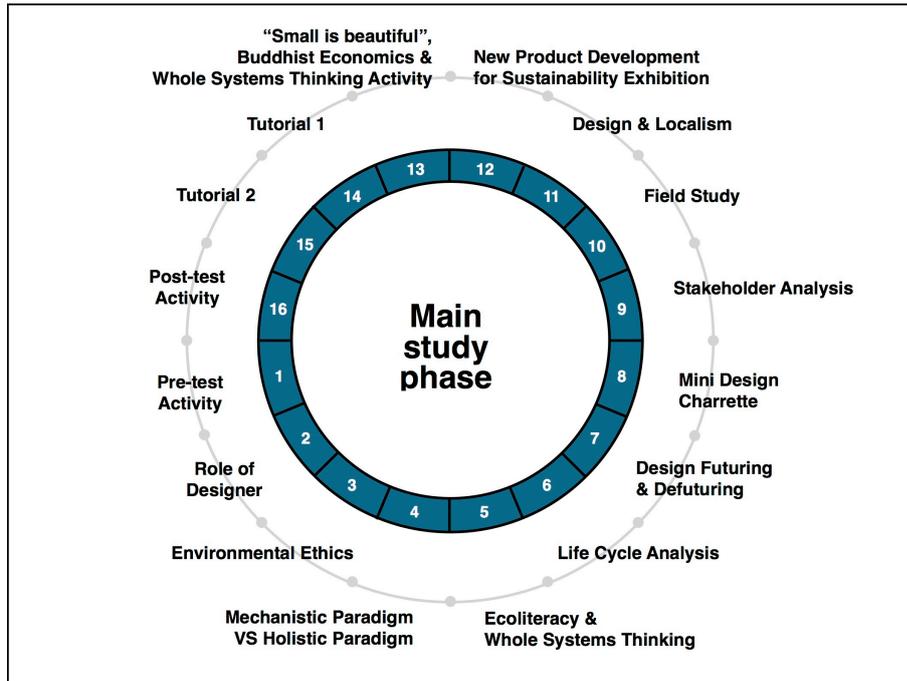


Figure 13: The full version of the curriculum intervention series in the main study phase, containing sixteen sessions in total.

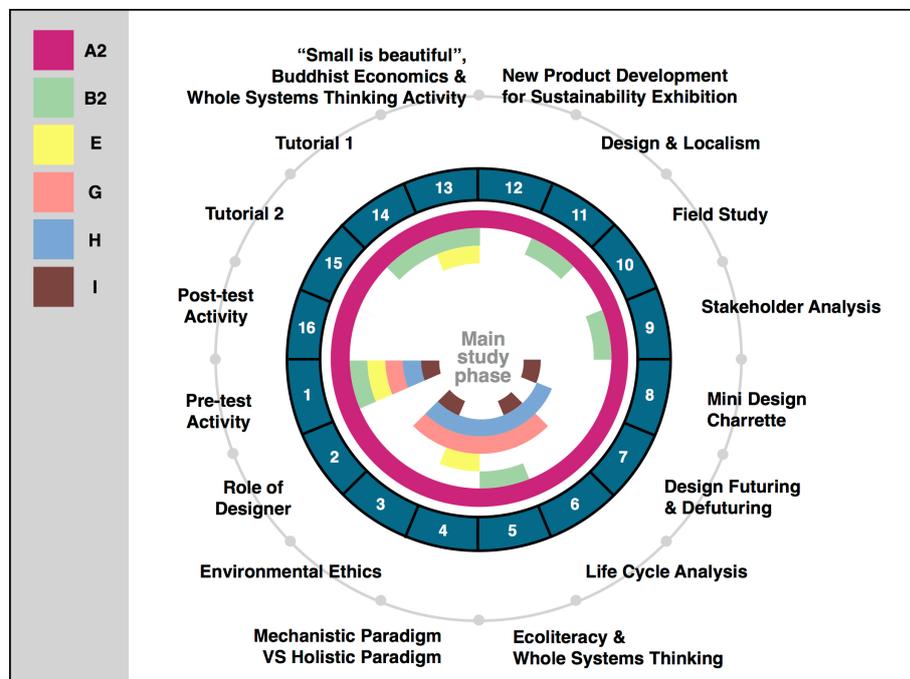


Figure 14: A diagram presenting the curriculum interventions conducted during the pilot study phase, visualising how the mini versions were carried out at five institutions alongside the full sixteen-session version at one institution

There are three data collection tools employed during the curriculum interventions.

6.7.3.2.1 The student reflective diary

Following the concept of critical reflection in the PAR process, the student reflective diary (Figure 15) was the key research instrument that facilitated the collection of data from students regarding curriculum interventions, in both critical and psychological terms. Reflective diary writing, or reflective journal writing, is a strategy to support students' reflective thinking and learning (Conner-Greene, 2000; Fahsl & McAndrews, 2012; Patton, Wood & Agarenzo, 1997; Riley-Doucet, 1997; Shaarawy, 2014; Woodward, 1998). Reflective diary also enhances critical thinking of students (Sinclair & Woodward, 1997; Shaarawy, 2014). So, as students were required to write the reflection of their learning at the end of each intervention session, this instrument deals directly with the Thai cultural values affecting students' ability to think critically. At the same time, it is important to look at the students' feelings towards each activity. Hence, with the reflective diary, they could reflect on lessons, interactions, debates and other things about the curriculum interventions that had a significant impact on their thinking. The reflective diary was designed as an A5 sheet which, at the end of each session, a student can fill in with reflections and rate his/her levels of participation, challenge and understanding through a Likert scale style survey. Each student chose a preferred alias or code name so that they remained anonymous and felt free to write their comments and reflections. Along with some written elements, a set of emoticons was used for visual communication. There was a checklist section containing a range of emoticons for students to choose to express what they thought of a particular activity. The emoticons were developed from an intention to maintain an unbiased approach by balancing checklist choices of positive and negative responses. The final decision came to having two positives (fresh and fun), two negatives (boring and difficult), one neutral (thought-provoking) and one blank space for participants to fill in their own emoticon if they wished. Next to the emoticon choices was another blank space for them to explain why they felt so. The reflective diary was particularly beneficial for the eight-session and sixteen-session groups, who took part in the research for longest periods of time among all student groups. This was because, at the end of the curriculum intervention series, the sheets from all sessions were bound together for each student, as a proper reflective diary where one could read notes compiled throughout the journey. Besides, it was useful for their final written assignment, which was a form of post-test.

Reflective Diary				Session:				Date:				Code name:				
Activity:	thought provoking				fresh				fun				Because:			
	boring				difficult											
Activity:	thought provoking				fresh				fun				Because:			
	boring				difficult											
Activity:	thought provoking				fresh				fun				Because:			
	boring				difficult											
How much do you feel participated in this session?				How much do you feel challenged in this session?				How much do you think you understand this session?								
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	

Figure 15: The reflective diary sheet

6.7.3.2.2 The pre-test and the post-test activities

Following the concept of environmental ethics, the pre-test activity was designed to find out the original worldviews towards nature held by the design students at the beginning of the studies. All the first sessions of curriculum interventions contain the pre-test activity. The intention was that it should not be a typical pre-test questionnaire. Instead, it must be blended in with a student-centred approach. As a result, it was developed to be a constructive learning experience and reframed as a group discussion for sharing thoughts and ideas. Students were asked to bring in their favourite designs or cultural props to the session to discuss the values that they saw in these designs. Cultural prop is a Metadesign tool – the use of physical objects to spur personal narratives on a particular theme, assist team bonding or introduce stakeholders to each other (Tham & Jones 2008). The tool was also useful for breaking the ice at the start of the intervention process.

The post-test activity was designed to examine the worldview shift in the students, exploring if the curriculum interventions help in shifting the students' worldviews to a more holistic direction. The post-test was conducted in the form of two-part assignment. However, it could only be conducted

with the eight-session and sixteen-session groups at Institution A, which were the most comprehensive cases among all. See Appendix H for details.

6.7.3.2.3 The semi-structured interview in the post-intervention focus group discussion with students

In comparison to face-to-face personal interview, focus group discussion can make participants who share common interests feel less intimidated by the researcher. The focus group discussion method was selected to collect in-depth data from students. During discussions, it allowed students to express their thoughts and attitudes openly while stimulating each other to recall various issues and express different views. This was particularly important for the context of this research where a strong sense of hierarchy is displayed, in relation to seniority and social status. Regarding the availability of the participants, it was most convenient for the students for the focus group discussion to be carried out on the same day after the last session of the curriculum intervention series.

The participant recruitment was on a voluntary basis. Table 17 presents the number of participants of each focus group discussion.

Table 17: Number of student participants of each post-intervention focus group discussion

Institution	A		B		C	G	H	I
	Pilot (A1)	Main (A2)	Pilot (B1)	Main (B2)				
Number of volunteers	8	8	7	4	6	6	6	7

Most focus group participants agreed to reveal their code names used in the reflective diary notes. This is particularly useful for further examining the worldview shift of each identifiable student. In most occasions, the process of keeping students anonymous during the studies appeared to help elevate trust between me, as the researcher, and the participants. However, there are eight participants from the main study group who refused to reveal their code names used in the reflective diary notes. As they took part for sixteen sessions, they gave a reason that they did not feel comfortable to do so because the researcher was also involved in the process of marking their work. There were not any major consequences from their decision apart from lacking data to track each student's development and link it with their data in the focus group discussion.

The meetings for discussion were carried out an hour after the last session of the curriculum intervention series. The specific timing was important. It facilitated the students to feel comfortable enough to be themselves in the discussion because they had been familiar with me, as the

researcher, from the curriculum interventions. The focus group discussion contained two sets of questions. The first set responded to the concept of embedding ESD into the curriculum. It looked at students' view towards learning based on their general experience of design education. The second set mainly involved students' opinions of the curriculum interventions. The questions for student focus groups are included in Appendix I.

6.8 Analysis of data

The analysis of empirical data was undertaken using the qualitative research software NVivo. However, to a certain extent, the research findings are also quantified to make clear the significant patterns found in the studies. As a result, the findings are presented in both descriptive and statistical forms.

The data analysis was divided into two parts: the analysis of data from non-student participants and the analysis of data from student participants. The rationale of the division is to highlight the similarities and contrasts between the findings deriving from the groups that are design students, who are at the bottom of the power structure, and the cluster that includes more senior stakeholders of design education including design practitioners, design educators, university executives and policy-makers. The data from the non-student participants were obtained by a mix of interview methods, from face-to-face interviews, to phone interviews, and to a focus group discussion. In contrast, the data from student participants were collected mainly in the learning environments via observation, curriculum interventions and focus group interviews. The students' data came in various forms.

6.8.1 Thematic analysis

Thematic analysis is a type of qualitative analysis which provides the opportunity to code and categorise data into themes. It illustrates the data in great detail and deals with diverse subjects via interpretations (Boyatzis, 1998). According to Marshall and Rossman (2006), thematic analysis involves six phases. First is to organise the data, second is to generate categories or themes, third is to code the data, fourth is to test emergent understandings of the data, fifth is to search for alternative explanations of the data and sixth to write-up the data analysis. Qualitative data analysis software helps facilitate coding of transcripts by themes, which can be both related directly to the questions prepared and freshly emerged out of the conversations. Flick (1998) states that coding is the most prominent method of analysing data originated in interviews. Miles and Huberman (1994) described coding as clear categories or codes, organised into an explicit structure embodied in a thesaurus or codebook and paired with appropriate statements or findings, which can be analytical or descriptive in style and can be comprehensive or precise in outlook. Saldaña (2009) asserted that a theme is an outcome of coding, categorisation, and

analytic reflection, not something that is, in itself, coded (p. 13). Coding is a cyclical act. As stated by Punch (2009) coding is a process of labelling tags or descriptions with the data that are pulled out from the raw data. The coding process usually contains two cycles which perform different functions (Miles and Huberman, 1994; Punch, 2009; Saldaña, 2009). The first cycle involves attaching labels to groups of phrases, long sentences or even whole paragraphs, that are related to the research questions. Then the tags emerged from the first cycle were used to build the basis for coding in the second cycle, which the sets of data obtained initially were then categorised into thematic units that are more meaningful. In other words, a datum is initially and, when needed, secondarily coded to discern and label its content and meaning according to the needs of the inquiry (Saldaña, 2009, p. 13).

Data from educator interviews, a design practitioner focus group, student focus groups and student reflective diaries were fully transcribed in Thai language. Direct translation was used as much as possible when dealing with written data from reflective diaries while interview data sets were provided with English translation of directly relevant comments. This depended largely on the length and richness of the data contents. However, both Thai and English transcripts were then imported into NVivo for thematic analysis. I did the analysis in Thai but, at the same time, I was aware of the need to communicate the findings in English. I always referred back to the original data in Thai during the analysis process because English was being used only for the purpose of reporting and communication. Moreover, for data from classroom observation, the observation sheet itself allows thematic analysis as the keywords in the observation framework facilitate the coding process. The patterns of teaching and learning behaviour can be identified through the frequency of key concepts captured during observation and recording of data. As the analysis progressed, themes emerged in connection with the research questions. In many cases, the data obtained were rich and lengthy, providing valuable insights. These themes were more like factors influential or significant to particular groups of participants or the context of research. Furthermore, data from the checklists and the Likert scales in reflective diaries were quantified to determine various behaviour and attitude patterns in percentages, especially on how students felt towards particular activities. Apart from the text-based data, the visual data captured by photography and videotaping during the curriculum interventions, like students' behaviours and interactions within the learning environments, as well as data in the form of students' assignments were used as supporting data. To make it more convenient to analyse these visual data, images and video clips were narrated and contextualised. As visual data were converted to text, it allowed the coding process to continue like working with transcripts. There were additional data from some activities taking place in a group on a social network site. These data were used to enhance understanding of existing themes or facilitate further discussion.

6.8.2 Triangulation

Qualitative research is inherently multimethod in focus (Brewer and Hunter, 1989). Triangulation is a necessary tool to validate qualitative research as it facilitates gaining good understanding from different perspectives of the investigated phenomenon. It is a concept derived from navigational and land surveying techniques which determine a single point in space with the convergence of measurements taken from two other distinct points (p. 892). Triangulation can help to minimise researcher's subjectivity in thematic analysis (Jonsen & Jehn, 2009). It helps to offset researcher biases, decrease process distortions (Greene & McClintock, 1991) and increase validity and depth of the findings (Scandura & Williams, 2000) in the analysis of qualitative studies.

In qualitative inquiry, researchers tend to use triangulation as a strategy that allows them to identify, explore, and understand different dimensions of the units of study, thereby strengthening their findings and enriching their interpretations (Given, 2008, p. 892). For this research, my intention to employ triangulation techniques was not only to render a fuller picture of research phenomena but also to validate the consistency and integrity of research findings. When looking at the research context of the thesis, triangulation was particularly useful for this research since data were gathered from multiple groups of participants who are situated in a context where face-saving is a common practice. Based on Table 9, the diagram in Figure 16 presents two triangulation approaches used in this research.

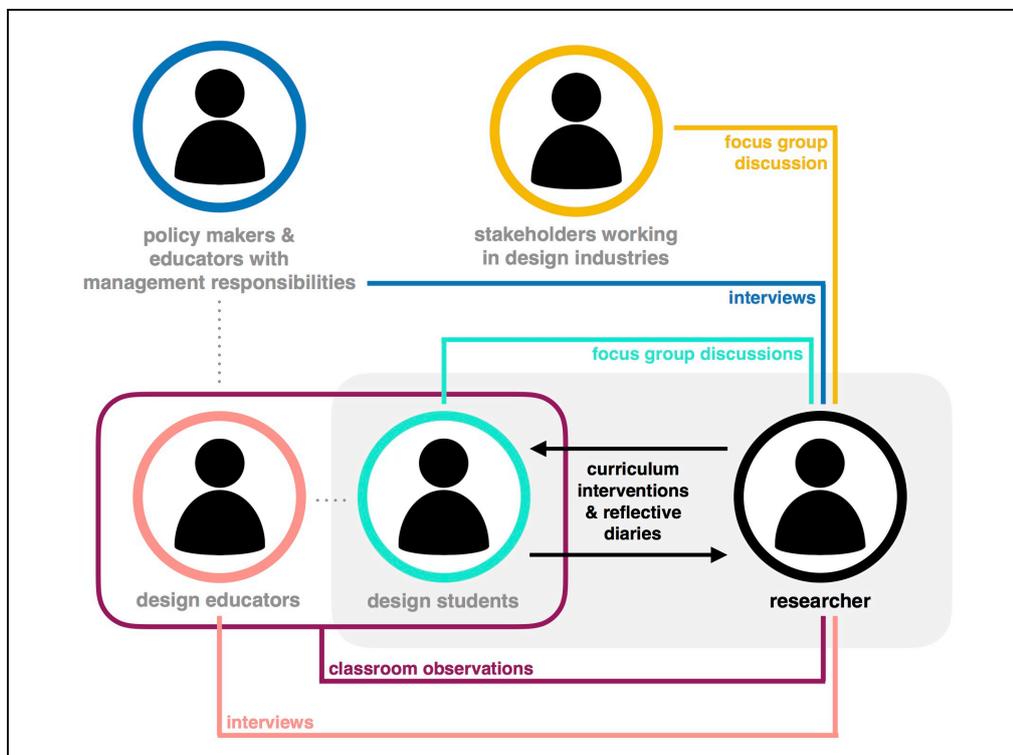


Figure 16: How methodological and data source triangulation employed in this research

First is methodological triangulation – combining multiple methods to gather data. When designing and conducting research, qualitative researchers frequently combine methods across variable times and in different places in order to collect data about their research phenomena from multiple perspectives (Given, 2008, p. 893). Researchers may vary their methods within each type of approach. I employed a combination of methods to collect data from different groups of participants and from the same people but at different times and in different places. For instance, I used a variety of methods to gain a more complete picture of student participants' perspective. In order to bring out dissimilar but complementary data from students across eight groups from ten institutions in two research phases, the methods include classroom observations, curriculum interventions and focus group discussions. Second is data source triangulation – using evidence from different types of data sources. According to Given (2008), qualitative researchers may increase the credibility of their research findings by drawing from evidence taken from a variety of data sources and each type of source of data will yield different evidence that in turns provides different insights regarding the phenomena under study (p. 893). For example, I asked the same questions regarding the embedding of ESD into curriculum to policy-makers, educators with management responsibilities and design educators in interviews and to students in focus group discussions. Data sets in this research complement one another as they were collected from multiple sources, including interview transcripts, focus group discussion transcripts, classroom observation sheets, students' reflective diaries, students' assignments, photographs, video clips, curriculum documents and researcher's notes. Moreover, relying on multiple sources for data collection increases the construct validity of the research (Hartley, 2004; Yin, 2003). Triangulation contributes directly to the construct validity of the curriculum interventions in relation to the frame of mind concept, which is abstract and hard to measure. The ten intervention groups can be regarded as multiple case studies and data collection over the course of each interventions produced what Yin (2003) called "a chain of evidence" and reflected levels of transformative experience in learners. Comparison of data collected from the pre-test and post-test activities, reflective diaries and the post-intervention focus group discussions assisted in elaborating if personal transformation of participants with regard to sustainability mindset had taken place during the interventions based on the frame of mind concept and how.

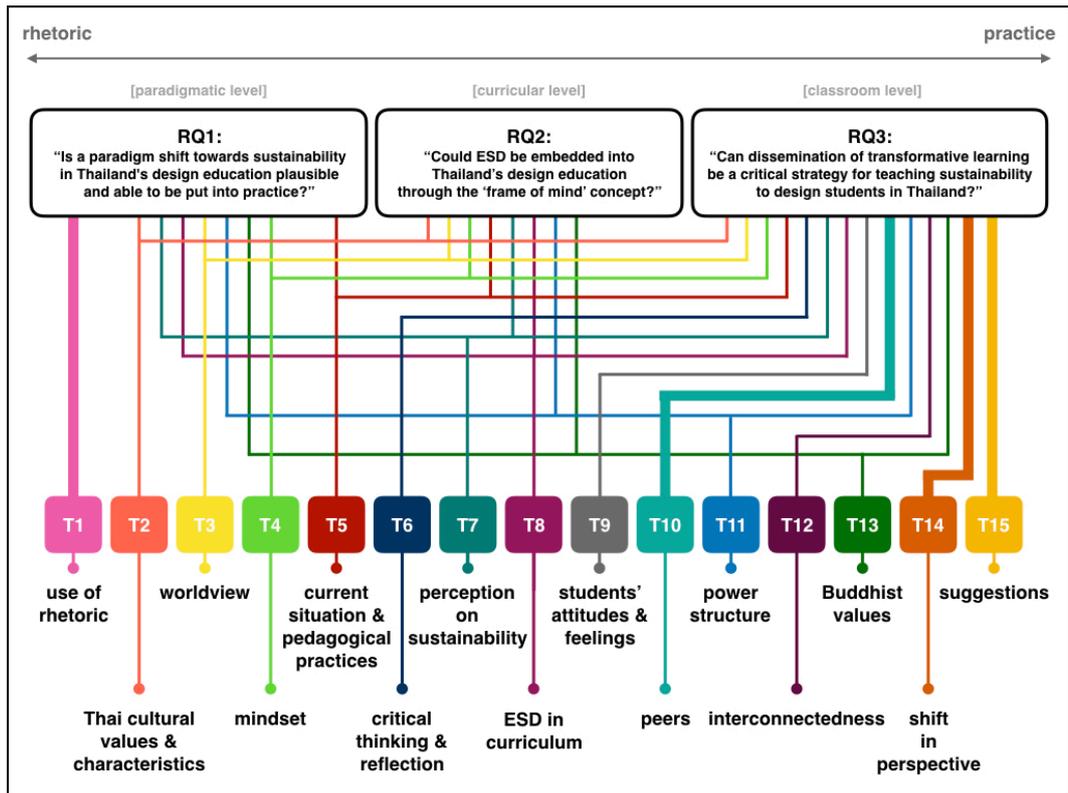


Figure 17: The relationships between the research questions and the fifteen key themes emerging from data analysis (The thick lines represent the themes that are outstanding to particular research questions.)

As a result, triangulation enabled me to deepen my understanding of how different stakeholders of Thailand's design education see the issues highlighted in this research – a paradigm shift to sustainability, ESD and transformative learning, from different angles. Figure 17 presents fifteen themes of findings that were derived from thematic analysis and triangulation, structured to fit into the three research questions. Methodological and data triangulation brought about the thread of "rhetoric versus practice", found through encompassing findings from all groups. This thread is a significant lens to articulate and critique the findings from different groups of stakeholders within the power structure. It helps make comparisons between participants and clarify the whole picture of the findings, reflecting the phenomenon of Thai design education in connection with sustainable development.

Appendix K shows a further example how themes emerged from data analysis of each session of curriculum interventions.

6.9 Conclusion and reflections

This chapter justified the methodology used in this research and outlined how different methods and tools employed had been developed. The methodology was designed to capture the multifaceted dimensions of the phenomenon. Thai cultural values, especially ego-orientation and seniority, play a critical role throughout the process. Concerning the research ethics, permission from participants was systematically obtained before the conduct of the studies. The names of participants and their affiliated institutions or organisations remain anonymous.

Participatory action research (PAR) was the approach at the heart of this research. Data from students were mainly collected through the iterative process of PAR embedded in the classroom-based fieldworks. As PAR aims at creating change, students' data respond directly to the third research question regarding the dissemination of transformative learning. A classroom observation sheet and reflective diary were designed and developed specifically for (but not limited to) this research. The PAR process started off with a series of classroom observations in five institutions, with the observation sheet designed and developed based on Burns' model of sustainability pedagogy. Ten groups of students from eight institutions took part in the curriculum interventions. The structure of curriculum interventions had been tested during the pilot study phase and was later refined in a cyclical process in the main study phase. Data concerning students' experiences of curriculum interventions were collected via reflective diaries. Apart from the two most robust studies (the eight-session and the sixteen-session versions), other smaller studies carried out as mini versions in various institutions were beneficial for verifying the research findings and seeking patterns emerging from all diverse groups of students. In the end, there were eight groups of students from six institutions participating in focus group discussions. The discussions concerned the students' experiences of their curricula and the curriculum interventions, in respect to ESD.

In addition to PAR, interviews and focus group discussions were used with non-students participants. The use of interview assisted in grasping design educators' views on their role and pedagogy, experiences of sustainability teaching, and opinions on ESD. Data collected from thirteen full-time academic staff in Design from sixteen universities are particularly relevant to the second research question on the embedding of ESD in design curriculum. Furthermore, data from participants at the higher positions in the education hierarchy and participants working in design industries responded to the first research question on a paradigm shift towards sustainability in Thailand's design education. While the interviews with two policy-makers and five educators with management responsibilities help contribute to the understanding of the current education paradigm in conjunction with ESD, a focus group discussion with seven practitioners from various disciplines in design industries assists in recognising the current design paradigm in Thailand.

Thematic analysis was the primary analytical method. The analysis process involved two coding cycles in constructing the fifteen key themes that fit into the three research questions. Codes generated in the first cycle of coding were later reorganised and restructured to form subthemes and themes in the second coding cycle. In addition, triangulation techniques were used to reduce any potential bias effects. This research used both methodological and data source triangulation techniques.

I have regarded this research methodology as an extensive practice of whole systems thinking, complementing the research questions on transformative learning, ESD and a paradigm shift to sustainability. This is because the central elements in this research assisted me in understanding the big picture of the interconnectedness of stakeholders in Thailand's design education along with their perspectives on ESD. These elements include the iterative process of PAR, the dynamic interplay of data collection and analysis, and the similarities and contrasts of views between different groups of participants on the same issues emerged via triangulation techniques. At the same time, this research methodology assisted me to be more aware of a number of cultural-specific issues and how to deal with them as a researcher. For a close-knit, hierarchical society like Thailand, where the ego-orientation value is dominant and Thais tend to make every effort to maintain harmony in social interactions, the cultural factor plays a vital role in this research. However, this also has led to some shortfalls and missed opportunities, such as the deficiency of data from more senior educators and the lack of some student data to investigate further students' development across the sixteen sessions of curriculum interventions.

CHAPTER 7: FINDINGS FROM DATA COLLECTED FROM NON-STUDENT PARTICIPANTS

The previous chapter on research methodology indicated the use of thematic analysis and the fifteen key themes emerging from the analysis process. These themes are linked to the three research questions in various ways. This chapter and the next chapter explore the findings based on these themes. For this chapter specifically, it presents the key findings in nine themes from policy-makers, educators and other stakeholders working in design industries, in response to the research questions. Figure 18 shows how the small themes are linked and nested together within the major theme of Thai cultural values and characteristics and grounded in an overarching worldview of Thai design education.

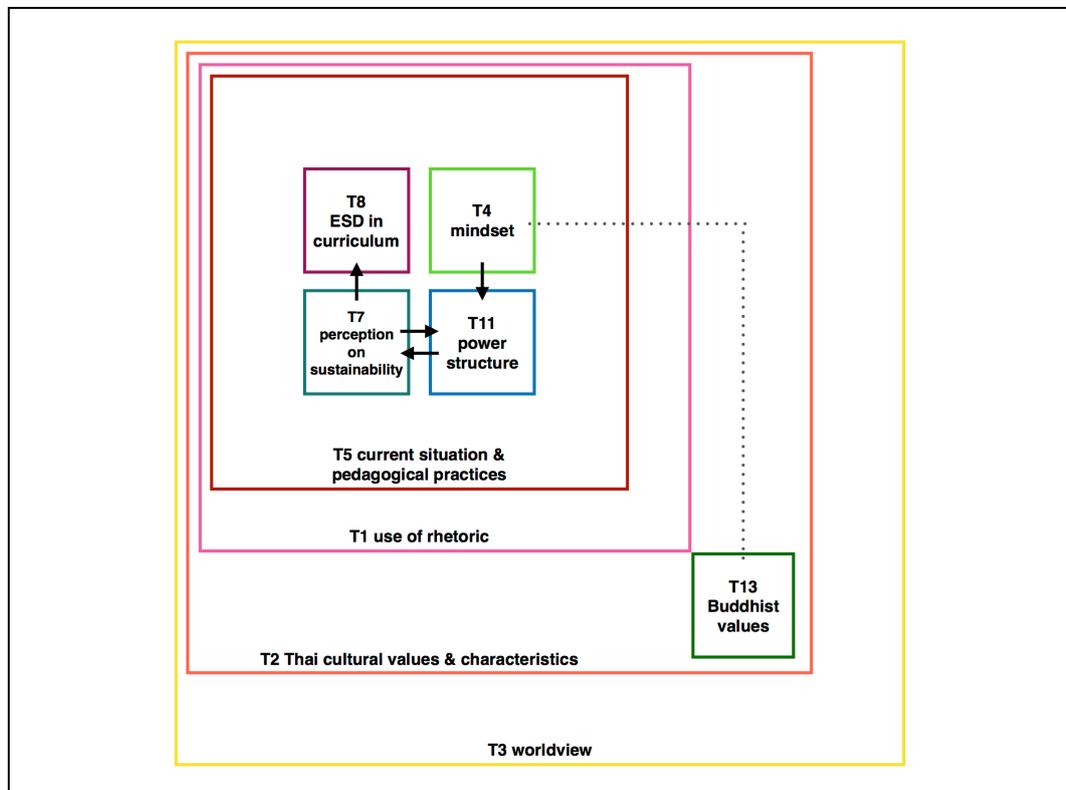


Figure 18: A diagram presenting the relations between the nine key themes explored

As this chapter aims to introduce the big picture of the theory-versus-practice debate, it contains two main parts based on two associated yet contradictory themes: “use of rhetoric” (section 7.1) and “the current situation and pedagogical practices” (section 7.2). Drawing the findings mainly from policy-makers and educators with management responsibilities, the first part focuses on the “use of rhetoric” theme in relation to the larger themes of “worldview” and “Thai cultural values and characteristics”. Other smaller themes: “mindset”, “Buddhist values”, “perception on sustainability” and “power structure” are also explored. (See the Figure 19.)

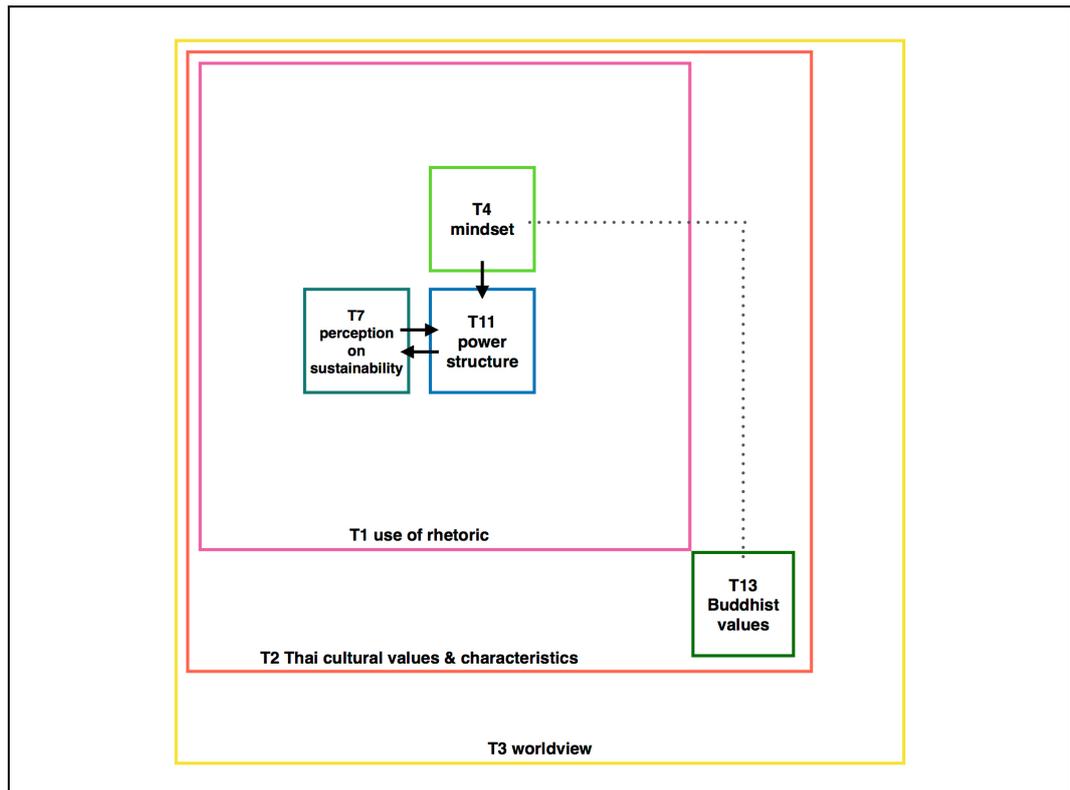


Figure 19: A diagram illustrating the first part of this chapter (section 7.1), presenting how the “use of rhetoric” theme is linked and nested together within other key themes

The second part, looking predominantly at the findings from design educators, pivots on “the current situation and pedagogical practices”. Figure 20 reflects the complexity of the findings to be looked at. While the main theme is “the current situation and pedagogical practices”, it contains four smaller themes: “mindset”, “power structure”, “perception on sustainability” and “ESD in curriculum” and is nested by the larger, overarching themes: “worldview” and “Thai cultural values and characteristics”. At the same time, the “Buddhist values” theme is particularly outstanding when looking at the spiritual dimension of design educators who advocate sustainability. The theme “use of rhetoric” is implicit here.

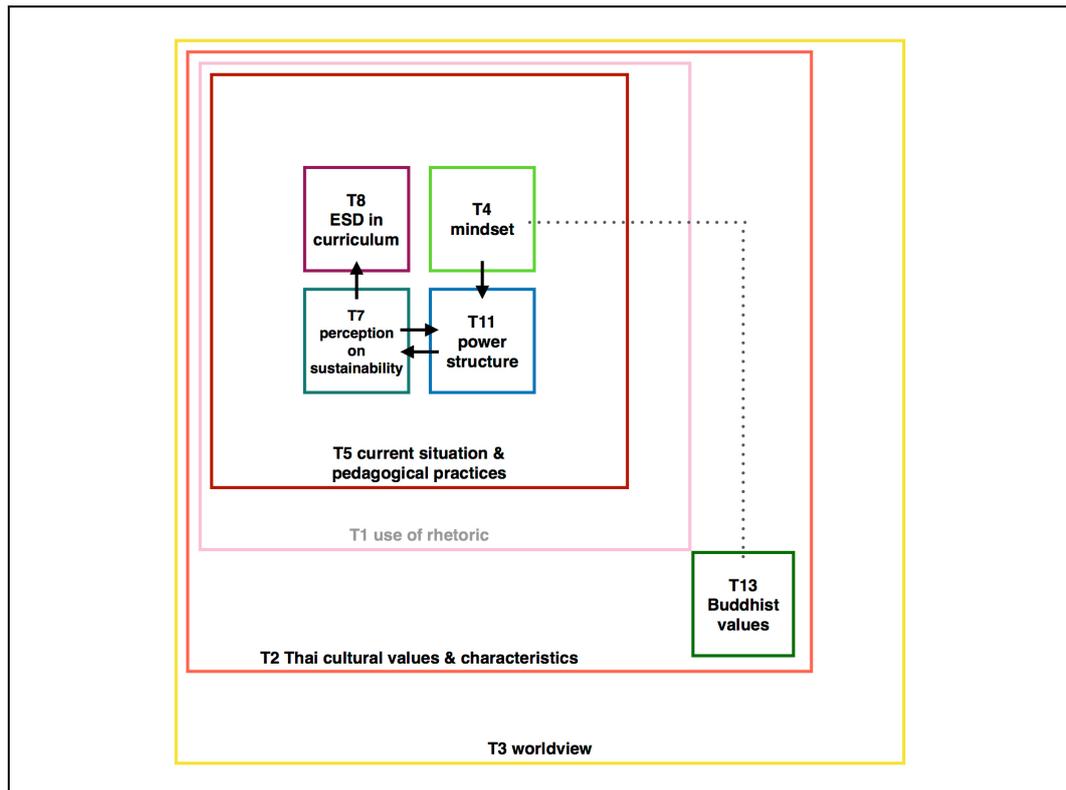


Figure 20: A diagram illustrating the second part of this chapter (section 7.2), presenting how “the current situation and pedagogical practices” theme is linked and nested together within other key themes

Both parts, 7.1 and 7.2, collectively contribute to the first research question – “Is a paradigm shift towards sustainability in Thailand's design education plausible and able to be put into practice?” There are a number of sub-sections that contributes directly to the second question – “Could ESD be embedded into Thailand’s design education through the ‘frame of mind’ concept?” too. These include several sustainability-related rhetorical labels discussed in the first part (7.1) and the whole sub-section of ESD in Thailand’s design education in the second part.

7.1 Use of rhetoric

In Thailand, it is common to see rhetorical concepts and terms used in the area of education, especially as part of the communication of the government policy. Rhetorical terms found in the research data collected are those either based on the Buddhist virtues or borrowed from the West. The findings from policy-makers, educators and stakeholders working in design industries highlight that there is a significant gap between rhetoric and practice at multiple levels. There are four key themes, linked and nested together, to explore: the use of rhetoric, Thai cultural values and characteristics, worldview, the mindset of an individual participant, and Buddhist values. (See Figure 19) This section aims to explore the findings within these themes, in order to lay the ground

for understanding the rationale of these rhetorical labels in the research context, before moving to the next section on the current situation and pedagogical practices.

How rhetoric is used in the research context is to be explored at four different levels, from the national level, to the higher education level, to the institutional level and to the departmental level. These levels demonstrate how rhetoric is practised based on both the hierarchy in administration as well as seniority, which is a dominant part of the Thai cultural values and characteristics. The findings discussed in this section derive from data collected from interviews with the national-level senior policy-maker, the ESD expert and personnel in thirteen institutions, including university executive-level policy-makers, Heads of Department in Design, and members of teaching staff.

7.1.1 The national level: “Sufficiency Economy Philosophy” versus “Sustainable Development”

The research findings do not only suggest that the term “sustainable development” in Thailand seriously lacks clarity, but also explain why a large gap between rhetoric and practice of sustainability has occurred. All key findings explored in this topic derive from two participants from different generations and perspectives; a national-level senior policy-maker in education and an expert on ESD. The different perceptions on sustainability of both participants are interesting to look at too because they offered contrasting views of sustainability.

In Thailand, the perception of sustainability is usually linked to King Bhumibol Adulyadej’s Sufficiency Economy Philosophy (SEP) that has long been developed and cultivated in a large number of royal projects dealing with the livelihood of his people. Despite numerous success stories of small communities employing SEP circulating in the media, it has become apparent to the public that there are many inconsistencies and conflicts of interests regarding putting SEP into practice at the national scale. One senior policy-maker reflected on such failure. First, in his/her opinion, SEP has not been employed as much as it should by the past governments. Many of previous populist policies associating with capitalism and materialism are incompatible with SEP. Second, the implementation of SEP has not been considered as a shared responsibility among people working in the government and in civil services, and even Thai citizens in general. In his/her view, Thais do not take accountability seriously and tend to give advantages to friends or trusted colleagues, especially between supportive individuals or organisations, as personal benefit usually comes before that of others. The backbone of the whole problem, in his/her opinion, lies in the Thai cultural values and characteristics.

The interviewee stressed that the decade-long political turmoil greatly affected the progress of sustainable development in Thailand. The nation has been through a number of governments and has developed a reputation for coups. (S)he pointed out that one of the results is the high

cost of the lack of continuity of education policy. Based on a personal political view, (s)he believes that consistency of governance is vital.

“From my point of view, sustainability requires a longterm commitment. But democratic parliaments and governments come and go every four years or so, or much less. And Ministers are sometimes rotated or removed. I personally believe that it is not necessary for Thailand to have democracy as long as the development work can continue and is not interrupted by conflicts of interests of politicians.”

(Interview, 10 January 2016)

This statement reflects two things. First, this policy-maker highly values the top-down approach. Second, (s)he perceives sustainability as permanence. It is interesting to see this emphasis on the idea of maintaining continuity of work over the constructive relationship between democracy and sustainable development. In contrast, another interviewee, an ESD expert with an interest in democratic citizenship education, strongly argued that the world is dynamic and every system is characterised more by instability than by permanence. (S)he indicated that there is a close relationship between sustainable development and democracy which, common to both, is the participation of people. The most recent military junta, since they came into power in 2014, has declared on many occasions that SEP should be employed for sustainable development, especially in the dimension of human resource development with an emphasis on education. (S)he is one of the scholars who have doubts on whether sustainable development can be accurately defined and achieved under the current military regime. Besides, according to the ESD expert, the concept of sustainability has been distorted by other rhetorical terms coined by key players in the Thai society.

“Sustainability has never been widely debated in Thailand. The term sustainability has long been overshadowed by other big words, especially Sufficiency Economy Philosophy which is endorsed by His Majesty the (late) King. There are some aspects that both terms are relevant, but they are definitely not the same. People can be misled very easily though. And it has a significant impact on the limitation of knowledge development and creation in conjunction with sustainability debate.”

(Interview, 12 January 2016)

As stated by the interviewee, since sustainability is perceived to be somehow associated with SEP and the late King, the *lèse-majesté* law inevitably plays a vital role in limiting public debate and criticism on sustainable development. (The law is part of Thailand’s Criminal Code that gives protection to the rights or reputations of the King, the Queen, the Heir-apparent or the Regent to uphold national security and public order. The punishment is imprisonment of three to fifteen years.) The ESD expert asserted that, as SEP has long been promoted by many government agencies through various media, the situation has led to a huge diversity of sustainability interpretations among Thais as well as the underdevelopment of ESD.

To conclude, in the context of Thailand which is a society with a well-established, top-down power structure, those who are at the top of hierarchy play an extremely significant role in policy formulation. Whereas their political rhetorical terms are extensively communicated, policy adoption and implementation are not pragmatic due to the lack of shared value among people at the bottom of the pyramid. In this case, the revered late King's SEP is an ultimate local rhetoric. The instability of the political situation and Thai cultural characteristics, like laxness in principle and lack of accountability, are pointed out by the senior policy-maker interviewee as key factors for the failure to implement SEP in reality. Moreover, as repeatedly promoted in the media that SEP is utilised as a perfect guideline for government policy-making, people perceive SEP as one ideal form of sustainable development. Consequently, as indicated by the ESD expert, SEP casts a shadow over the internationally recognised concept of sustainability, limits opportunities for sustainability debates and slows down the emergence of ESD. Furthermore, the dissimilar political viewpoints of the two interviewees offer an intriguing scene of how two influential figures in education from two different generations acknowledge sustainability. For Thailand to achieve sustainable development, the more senior interviewee believes in the conservative top-down governance with an uninterrupted direction of control from the top level downward. On the other hand, the less senior one takes a much more liberal stance and holds that a democratic approach is necessary for moving toward a more sustainable future.

7.1.2 The higher education level

There are three rhetorical labels relevant to the higher education level emerging from the research findings. The first label concerns the teacher's role. It looks at the moral dimension of education and the role of teacher, based on the late King's concept of "teacher as moral agent for students". Second is Quality Assurance in higher education (QA), one of the current policy priorities in Thai education. The last but not least is Education for Sustainable Development (ESD), which contributes directly to the three research questions of the thesis.

7.1.2.1 The moral dimension of education and the role of teacher

The late King's vision for sustainable development in connection with education was admired and mentioned by the senior policy-maker throughout his/her interview. The late King's concept of "teacher as moral agent for students" suggests that education must be equipped with ethics and mindfulness in order to develop ethical behaviour in the learners, together with the knowledge that can be used in ways that benefit both the learners themselves as well as the society. Accordingly, the comparison between the ideal role of the teacher and what it is in reality is one of the most critical issues raised by a large number of participants from higher education taking part in this research.

Despite the grand rhetoric of “teacher as moral agent for students”, the ESD expert pronounced that Thailand’s higher education has long neglected its mission of fostering good citizenship for the society. In his/her view, the majority of academic staff in universities neither construct new knowledge nor see themselves as guiding lights for their students and the society. (S)he added that Thai higher education has long been trapped solely in the idea of producing graduates to only meet current labour market requirements. As a result, it fails to see the potentiality of producing human capital with critical thinking and for new, alternative job opportunities. For example, in his/her view, design programmes in Thailand usually aim mainly at producing conventional designers, not practitioners who see design as a transferable skill to other current or emerging areas of creative industries.

“The result is that Thai universities have lost their power to make positive changes in society, and turned themselves to be mere factories for graduate production. However, the most worrying thing of all is that higher education is producing graduates for the past and present, not for the future. The focus is only on current labour market demands. At present universities don’t develop real capability and competency of the students. It’s a real shame that they can’t keep up with the speed of social change, whereas it is supposed to be a gateway to the future. In this way, I don’t see that Thailand’s higher education can contribute its full potential to support the nation’s sustainable development.”

(Interview, 12 January 2016)

Moreover, the interviewee perceives neoliberalism in Thai higher education as a hindrance to the flourishing of education and opposed to the overall well-being of society. (S)he clarified further that the link between the current curricula and a market-oriented system is firmly supported by the higher education stakeholders working in universities. There are a large number of findings from research participants at multiple levels that are relevant to this conclusion. The findings will be unpacked under the section 7.2 on the current situation and pedagogical practices.

7.1.2.2 Quality assurance in higher education

According to Lao (2015), Thai policy elites always use selective borrowing of education policy from various global sources for local adaptation. At the higher education level, one of the latest and most problematic imported practices is Quality Assurance (QA). This is the practice that requires each higher education institution to be responsible for ensuring the quality and standards of its provision, that students are achieving appropriate standards and that a good quality education is being offered. However, one national-level policy-maker asserted that the majority of Presidents, Deans and academic staff in universities nationwide do not correctly understand such theoretical rationale. Since the comprehensive concept of QA has been largely misinterpreted, the current practice is far from contributing to education quality improvement. As indicated by the interviewee, the whole QA process has been misunderstood and conducted

falsely by Thai academics while Thai cultural characteristics like face-saving and lack of accountability are a hindrance to the implementation of QA.

“The core of QA lies the quality cycle of plan, do, check and act, or PDCA. The cycle repeats itself annually. That means the results of the performance evaluation provide the reference for the resource or budget allocation plan for the forthcoming year. However, since each unit in each institution must submit a Self-Assessment Report or SAR, they are so cautious that they avoid presenting any reflection that is negative or disadvantageous. Whereas the P part (plan) in the PDCA cycle should be most fundamental in order to proceed to implementation, they tend to focus heavily on the C part (check).”

(Interview, 10 January 2016)

The interviewee concluded that stakeholders working in education think of QA solely as a kind of quality evaluation. Since the introduction of QA, universities are strict with the use of quantitative tools, especially key performance indicators (KPIs), for monitoring their staff. At the same time, people working in universities fear to be pointed out as “not good enough”. One university executive also stated that QA is employed as one of the major mechanisms in the top-down policy that all staff must comply with. At his/her institution, the executive board places utmost importance on regulating parameters and benchmarks. His/her interview presented a view of QA as a rigid tool. Likewise, an educator in another institution commented that his/her university is strict with QA, especially the quantitative dimension of evidence gathering.

Two policy-makers and five educators taking part in this research pointed out that the QA process has become a burden for some particular groups in higher education. Paperwork is usually assigned to young academic staff and the newcomers – people at the bottom of the power structure. Commonly, younger academics handle QA tasks, from coordinating to attending meetings to typing paperwork. Young educator interviewees from three institutions reported that they are QA administrators alongside their teaching workloads and that the QA tasks are “never-ending”. As a result, they have less time to prepare teaching materials and put off other academic activities. Moreover, two more experienced educators perceived QA as “alien” and “nearly completely useless” and that the current mechanism and process cannot contribute to actual quality improvement. A large number of educator interviewees stated that QA involves producing fake evidence to gain good marks from the assessment activities. Furthermore, the Head of Department at one institution explained that, as QA is new to Thailand’s higher education, it is challenging and time-consuming for one to fully understand the principles and implications. When (s)he was handling QA work, it was difficult to communicate procedures and implications to other members of staff who were all unsupportive.

Accordingly, a national-level, senior policy-maker interviewee further explained that the Amicable Assessment Model (AAM) was developed by the Office for National Education Standards and Quality Assessment (ONESQA) as a user-friendly evaluation tool for quality assessment. The

model was designed based on the Buddhist concepts of *madhyama-pratipad* or “the middle way” and *kalyanamitra* or “spiritual friends”. In theory, the Buddhist concept of *kalyanamitra* illustrates the spiritual friendship within Buddhist community life and refers to a supportive relationship based on shared ethical values and the pursuit of enlightenment. Even though *kalyanamitra* is a Sanskrit word for friendship with spiritual connection, Thais sometimes bluntly used this word to describe admirable friendship of peers who are completely sincere and helpful to each other. This kind of friendship is all about learning constructive behaviour (Lao, 2015). In this way, the process of evaluation can be positive and more suitable for the context of Thailand. However, the interviewee expressed his/her concern that the assessment process in many institutions is still conducted carelessly and superficially. In his/her view, bribery is also involved in many cases. Apart from documents and journal papers published by or in conjunction with ONESQA and a book on Thailand's Higher Education Reforms (Lao, 2015) which explain AAM in a normative tone, it seems that it has yet to appear for a wider audience. AAM is a fairly new rhetoric and it is too soon to critique its practicality.

When looking back at the research questions which concerns a paradigm shift to sustainability, it is useful to mention the link between QA and ESD. Both are global phenomena, seen by Thai academics as unfamiliar, external forces. Even though QA is a recognised internationally as having an important role to play in strengthening education quality and raising the academic standards, the findings suggest a number of issues to explain why QA is still far from successful in Thailand's higher education. The top-down approach appears to be rigorous, but the cultural dimension contributes greatly to the unproductive outcome. In this way, QA can be considered an instrument that challenges an existing education paradigm. Unfortunately, since QA is often ignored and/or overtaken by the priorities of QA administration, it appears that Thai academics completely fail to see an opportunity to situate ESD in the institutional QA system.

7.1.2.3 Education for sustainable development (ESD)

The research findings strongly suggest that the majority of Thai educators fail to recognise the ESD rhetoric. According to the ESD expert, since ESD has come to exist by an external driving force like UNESCO, there is not a key player in Thailand to work officially on promoting or implementing ESD. As a result, Thailand lacks a platform for creating national debates, a master plan, strategies and action plans for ESD. Without an official agent, it is extremely tough to create a massive change. In order to promote sustainability education in Thailand, (s)he believes that there are a lot of struggles and negotiations to come. The UN Decade of Education for Sustainable Development (2005-2014) has passed and today there are only a small number of Thai educators working on ESD. Furthermore, at the level of teaching and learning, the ESD expert noticed two things. First, sustainability is usually taught as an add-on or a plug-in in the curriculum. Second, sustainability is interpreted diversely by individual educators in different fields. In the context of

Thai design education, the findings from other groups of participants also indicate the same issues. These findings will be discussed in the section 7.2.4 ESD in Thailand's design education.

The interviewee admitted that things are progressing very slowly – the possibility to move beyond the SEP rhetoric and pursue a path of ESD is still questionable. In his/her view, it is also because SEP outshines the concept of sustainability. To clarify this issue, a design curriculum at one institution, which is one of a handful of design curricula advocating SEP, can be used to exemplify the situation. One educator from that programme explained that, firmly rooted in SEP and sustainability, place-based pedagogy is employed in several courses. Students are trained to be practical and able to work for the community. In the Department's QA Self-Assessment Report documents, there are four key points to describe the desirable characteristics of graduates. Terms like appropriate technology and professional ethics are included. However, the comprehensive essence of SEP is toned down and devalued to a mere notion of design for the local economy – “Graduates must be able to apply their knowledge for design and development of community products along with value creation and keeping up the local wisdom.” It presents a storyline of a limited career path, attached with an object-oriented view and the dominant economic aspect. This example is also correlated with the critique on the role of Thai design teachers made by the ESD expert.

“Thai design educators think of design in the way that it is object-oriented. Besides, they are unable to think holistically, to visualise the whole life cycle of a designed product. This is something that needs to be changed in our design education. Design instructors should not get stuck in their own discipline. They don't need to know everything. Instead, they must be broad-minded and position themselves as interdisciplinary practitioners.”

(Interview, 12 January 2016)

At the outset, ESD seems to be a failed rhetoric in Thai higher education. Further issues and examples concerning sustainability teaching and learning in design education will be examined more in detail in the section 7.2.4 ESD in Thailand's design education.

7.1.3 The institution level

This sub-section looks at rhetorical terms used for institutional positioning alongside their institutional management practices. The findings suggest that the rhetoric used at the institutional level either derives from the tradition of the universities or establishes a new organisational direction. Whereas rhetoric employed in policies of public universities is usually associated with national policies, such as SEP, Sustainable Development and QA, private universities are a lot more relaxed and stick with their own traditions when it comes to using rhetoric for policy making. Among all, there are three rhetorical labels which are relevant to the research questions and impact ESD directly.

7.1.3.1 “Research-intensive university”

Six institutions represented by participants in this research labelled themselves as research-intensive universities. Regarding the research questions, the creation of new knowledge through research is crucial for ESD. And this rhetorical term seems to provide a landscape of knowledge creation at these Thai universities. It is intriguing to look at this rhetoric because the literature review suggests that knowledge creation has not been the mission of Thailand’s higher education as a whole and research has never fully become an integrated part of working in Thai academia. The first university in Thailand was founded to produce graduates to work in government offices and agencies. And such tradition has continued, only with a small change from preparing graduates for working in civil services to responding to the demand of labour market. One senior policy-maker explained about the rhetoric of research-intensive university. Starting with nine institutions from the creation of a National Research University Project (NRU) in 2009, there are now many more universities attempting to position themselves as research-intensive universities because of incentives. For instance, publications play a vital role in university’s ranking and its reputation. However, (s)he pointed out that none of higher education institutions in Thailand has well-established research culture and research outputs are usually produced by the minority of scholars with an aim for publication and ranking purposes only. (S)he gave an example that one of Thailand’s oldest and leading research-intensive universities only has twenty-nine percent of its academic staff working on research alongside teaching whereas the main focus of the rest of its academic staff is teaching.

The findings from educator participants working in research-intensive universities also confirm the lack of research culture in their workplaces. First, university teaching is still considered paramount. Customarily, the highest proportion of total workload for every academic staff member is teaching, unless assigned by the Dean or Department Head with other roles and tasks. Second, the majority of academic staff working in higher education usually present themselves with or are known for their individual professional expertise in the field rather than their research interests. For example, one is recognised by being a graphic designer, not a visual communication design scholar. Third, research funding application is highly competitive. This is because research grants and access to sources of research funding are limited. Fourth, the concept of conducting research for academic excellence and advancement of knowledge is rarely realised. In their view, most Thai academics do research merely for personal interest(s), self-image and reputation, additional income, or necessity when research is tied with QA and the promotion to a higher academic title.

In addition, the research dilemma affects sustainability research in design education too. Two design educators working in different research-intensive universities shared a particularly interesting insight that “most of the highly trained workers in Thailand, especially those working in academia, are wrongly allocated”. With regards to ESD, both of them obtained their

postgraduate degrees from overseas and their research interests concern design for sustainability. Since starting working as academic staff, both have neither yet worked on research nor teaching that contributes directly to the advancement of their specialist knowledge and skill areas. Instead, in order to complete the workload set by their Departments, one was assigned to instruct courses that are nearly completely irrelevant to his/her background and another has to join other research projects for which (s)he is neither fully competent nor passionate about. One of them criticised the short-sighted management mentality of the university executive board whose decision making is only limited to extreme upper levels of management and often involves finding ways to cut corners.

“The appointments of the University President, Deans, and Heads of Department have a term of four academic years. So, at multiple levels, changes occur every four years and many things are not continuous. They seriously lack a long-term vision. As I have witnessed, some prefer fast-track style of management, which involves centralisation of authority and lobbying for influencing policy outcomes.”

(interview, 9 January 2016)

The quote above implies that the business-as-usual mindset of the executives can restrain the full ability of the institution to effectively generate new knowledge. The current practice is on the contrary to both sustainable development and ESD which require a long-term vision and a capacity to develop and implement policies. In conjunction with the research questions, these short-sighted decisions negatively impacting both knowledge creation and other academic activities reflect a mechanistic view of educational management. Such mechanistic view also extends to a larger context. One senior policy-maker participant expressed his/her concern about this particular management issue. (S)he asserted that, because of the link between research outputs and international reputation of the institutions, some leading universities in Thailand are now so obsessed with the international rankings that their executive boards consider research “a kind of tool for climbing up to higher places”. This matter clearly presents an example of how the window dressing and face-saving characteristics affect the management practice in Thailand’s higher education. All in all, being a research-intensive university is a rhetoric which requires a lot of work from stakeholders at multiple levels. The findings suggest that it is yet to be well-implemented strategy and research practice in academia is not quite driven by a sincere intention to create new knowledge. In conjunction with the research questions, these findings present that it is challenging to shift the paradigm as ESD appears to have not been embedded into management processes of these research-intensive universities.

7.1.3.2 “Sustainable university” and “green campus”

Three institutions represented by participants in this research use the rhetorical term “sustainable university” in their core policies. A fourth has just started to pave its way to make one of their five

main locations a green campus. All four institutions are leading, multi-faculty universities. These two rhetorical terms appear to be directly related to the research questions.

Two senior executives at different institutions asserted that becoming sustainable is an extremely challenging task which requires time, resources and commitment. Both stated that fostering sustainability in a higher education institution must start from the top level where a big picture is created and discussed, in order to set clear goals and plans for implementation by the people at the operational level. One interviewee indicated that, even though the Western theorists suggested that the bottom-up approach is fundamental for the development towards sustainability, it is not always practical for Thais. Correspondingly, another interviewee stated:

“We should start small and build on success over time. But after all, if the people on top don’t act, those at the bottom won’t go anywhere.”

(Interview, 8 October 2015)

Even though Thais, in general, are familiar with the traditional top-down approach in workplaces in which they receive orders rather than think for themselves, the full-on, top-down approach is not the only ultimate option for gearing towards becoming a sustainable university. One university executive reported that the majority of staff in his/her institution are conventional and prefer to work only in their own disciplines following their routines, rather than welcome sustainability which is an unfamiliar concept and practice. That being so, it is very difficult to empower the academic staff to make positive changes for sustainability. Therefore, (s)he thinks that the idea to use a top-down management approach to embed sustainability into curricula across the university can never be successful in his/her institution. Instead, it can be more effective to use the bottom-up approach by introducing sustainability in students’ off-study activities.

“There are plenty of clubs and societies on campus for students to participate, from arts, to music, to sports. In this way, it contributes directly to students’ self-development process, which is more sustainable and relevant than the process of being taught in classroom. Including sustainability in any specific curriculum has a limitation because individual curriculum in each discipline is not connected to other curricula in other disciplines. It won’t lead to interdisciplinary learning. Without interdisciplinary learning, students won’t be able to deal with social problems in reality.”

(Interview, 22 December 2015)

With a more pessimistic view on the staff's side and a more optimistic sentiment on the students, the interview contains both a sense of desperation and a suggestion for hope. Although it is just a personal idea at this stage, it shows that a university-level policy-maker is aware of the potential of off-study activities to provide students with on-campus experiential learning opportunities on sustainability-related issues.

When considering another institution which has worked in line with its campus-wide sustainability strategic plan for nearly a decade, two educators also confirmed that the practice is “still far from perfect”. They reported that the top-down policy on implementing sustainability was initiated by the University President, who has a background in a scientific field, and one of its aims is to produce graduates who are change agents to lead the Thai society towards a sustainable future. The interviewees revealed that a large number of staff at their institution do not feel engaged with the policy. One of the interviewees hypothesised that it is partly because there is no mechanism or agent to evaluate what the staff do to contribute to the plan. This has resulted in the lack of comprehensive implementation of sustainability education in their Design Department too. Looking particularly at the experiential learning on campus, another interviewee stated clearly that most stakeholders of the campus do not support the concept of sustainable lifestyle. (S)he gave two examples to illustrate the situation. First, for takeaways, food vendors in a canteen only offer non-recyclable polystyrene foam boxes. They are reluctant when customers bring their own containers. Second, the recycling facilities have been well located, but most stakeholders on campus do not know how to use the bins properly. Communication seems to be a problematic issue.

The same recycling issue was mentioned by an educator with management responsibilities at another institution with a sustainability policy. The interviewee believes that the institution is among the first to have recycle bins located across the campus, but the campaign has never yielded effectiveness. Lack of communication to stakeholders was indicated by this interviewee as key to the problem.

To fully become a sustainable university or just to have a green campus seems to be extremely challenging. The findings show what has happened and how complicated this is when the sustainability rhetoric has been put into action. Weaknesses specified in the findings largely involve engagement of the individuals. Although the policy-makers believe that the top-down approach is suitable, it also requires listening to voices from the bottom as well as empowerment of all stakeholders at all levels in order to work to thoroughly cover all dimensions of sustainability. Despite challenges, the findings show a positive light in higher education institutional management and confirm that in practice these Thai universities are now at the very beginning of the paradigm shift to sustainability.

7.1.3.3 “Happy university”

Becoming “the university of happiness” is a rhetoric employed at three institutions with a sustainability policy. At one institution, a University Executive admitted that it still seems to be just an over-the-top rhetoric as their work on greening the campus has just begun. Likewise, another institution has recently announced that it started to pursue this rhetoric. The core activity of their

initial stage is inviting university staff to complete an online happiness survey called “Happinometer”.

A further university is brave enough to label itself with three big words: “sustainability”, “happy” and “research-intensive”. One University Executive at this institution asserted that (s)he regularly uses the term “happy” to express the institution’s mission to care for community, society and the environment. The use of this rhetoric is for building good relationships between the university and the surrounding communities, especially the people residing surrounding the campus. According to the interviewee, there were some local residents filing cases against the university management board, turning the executives into the enemy of the surrounding neighbourhood. With such lesson from the past, the institution decided to dedicate itself to the social services by focusing on maintaining, preserving and supporting local arts and culture of the community. One of the key current practices is that they offer a creative space for all, doing whatever they can to facilitate arts and culture activities for all stakeholders – internal and external to the university. Even though the decision was made based on a problem-solving approach, this also appears to contribute to the practice of ESD in the institution.

In a nutshell, “happy university” is positioned as a sub-rhetoric under each university’s sustainability statement. The findings show the importance of social capital to institutional management. The concept of community is central to this rhetoric.

Whereas ESD as rhetoric appears to fall flat at the big picture of Thai higher education, the findings present that there are attempts for establishing ESD at the institutional level. The next section unfolds further how institutional, rhetoric-based policies on sustainability are put into practice in Design Department contexts.

7.1.4 The Design Department level

The findings suggest that there are both conformities and tensions between the university-level rhetoric-based policies and department-level practices. First of all, let’s have a closer look at the department-level practices in three institutions employing the sustainable university and research-intensive university rhetorical terms. At one institution, one educator with management responsibilities confessed that (s)he was not aware of any tangible policy direction concerning sustainability issues in the institution. (S)he only sees sustainability as a personal matter of concern for each individual.

“We don’t have a strong intention to cultivate sustainability awareness through our curriculum. I think it is entirely up to individuals. To have sustainability concern or not, it’s a kind of personal choice.”

(Interview, 22 October 2014)

The interviewee confirmed that, with his/her leader role in the Department, his/her little concern about sustainability issues has led to a very weak will to support the integration of sustainability into the curriculum. Thus, a course on design for sustainability is included in the curriculum just as an add-on. The design curriculum at this institution falls short of recognising the sustainability imperatives advocated through the institution’s ambitious vision and outstanding performance in the international ranking of green universities.

Another institution offers more positive evidence. Two design educators explained that their programme placed an extra emphasis on sustainability by including three compulsory sustainability-related courses into the curriculum. The decision was made during the internal curriculum revision around the same time with the beginning period of the implementation of the institutional sustainability strategic plan. However, these courses are only lecture-based. And, the interviewees added, sustainability is not part of assessment criteria in design assignments in other courses. The lack of interconnection between courses in the curriculum is problematic. The research findings imply that, even though the design curriculum at this institution yields a high proportion of sustainability-related courses, possibly highest among all design curricula in Thailand, sustainability has not been holistically integrated into the teaching and learning. (At the time of writing, a couple of changes have taken place at this institution. The sustainability instructor has left the Department. And one of the decisions from their recent curriculum revision meeting is to reduce the number of sustainability-related courses, from three to just one. It is fascinating to observe that the direction of a shift can be volatile when the curriculum practice is driven by the institutional policy rather than a shared value among academic staff.)

At another institution, its Design Department accommodates one of the longest-running sustainable design courses on in Thailand. The course has been approximately a decade-long and included in the curriculum before the emergence of the sustainable university rhetoric. The course leader is one of the early members of staff in the Department. (S)he admitted that being senior helps to sustain the course to exist in the curriculum; however, his/her colleagues do not have a shared value or recognise the importance of the subject matter.

After all, even though these three institutions labelled themselves with the sustainable university and research-intensive university rhetorical terms, their sustainability policies are neither fully recognised nor valued at the Design Department level. It seems to be the lack of shared value on sustainability in design curricula that needs to be identified and questioned for these institutions.

This appears to precisely give a negative response to the second question – “Could ESD be embedded into Thailand’s design education through the ‘frame of mind’ concept?” To summarise, the findings presented in this section confirm that the rhetoric labels initiated by the university-level policy-makers are not always compatible with the department level practice. Issues and examples of the integration of sustainability in design curriculum will be discussed more thoroughly in the next section.

7.2 The current situation and pedagogical practices

This section explores the findings at the curricular level, based on data from sixteen design educators across thirteen institutions. To add more breadth and depth to the research, the findings from seven stakeholders from various design disciplines working in the creative industries are also included in the section. It aims to clarify the current situation of higher education concerning sustainable development, as well as how the notion of sustainability affects design education as a whole.

There are four sub-sections in total. First is design curriculum and pedagogy in practice. Second is the power structure. Third is voices from the industries. And fourth is ESD in Thailand’s design education. The first three topics look at the key elements contributing to the continuing mechanistic paradigm in Thailand’s design education. They lay a foundation for understanding the last topic, which explores ESD in design education and brings about a debate of how the non-student stakeholders in design education who took part in this research think about a paradigm shift to sustainability.

7.2.1 Design curriculum and pedagogy in practice

When looking at design curriculum and pedagogy in practice, the research findings present a number of tensions between the stakeholders in Thai design education. There are three areas to explore: the clash in core values between design educators and design practitioners working in creative industries, changes brought by students and the research dilemma among Thai design academics.

7.2.1.1 The clash in core values between design educators and design practitioners working in creative industries

As implied by the findings from both design educators and design practitioners, the core values of Thailand’s design education derive from an industry-oriented mindset, deeply grounded in the conventional “to design is to make and to sell” custom. On top of that, Thai cultural characteristics impact both explicitly and implicitly on design education through curriculum and pedagogical

practice. However, issues regarding the mismatch between education and the needs of employers were raised extensively in the design practitioner focus group discussion. The problems seem to lie in the design education's poor aim in industry-oriented training. All focus group participants perceive that the majority of design programmes in Thailand have a strong vocational focus. In their view, due to a profound tradition of fixed knowledge and skill transmission, what is taught in universities is not so relevant to meet the dynamic and constantly developing needs of today's design industries. For example, three young design educators at two institutions admitted explicitly that their current curricula lack advanced knowledge and skills while transmitting mainly outdated content and knowhow. Moreover, as the curricula have an emphasis on conventional, practical skill training, they neglect academic learning that requires critical thinking and research skills in students. These practitioners expressed their concern that Thai design education is unaware of the emergence of new knowledge, unable to catch up with the advancement of technology and incapable of understanding the ever-changing role of design.

Twenty-one design educators taking part in this research imply that the industry-oriented mindset forms the backbone of all design curricula in Thailand, but there has been an improvement over time in many aspects. A large number of design programmes have slightly shifted their focus away from the commercial nature of design to embrace the current social and cultural concerns. Many educator participants stated that their present curricula have less emphasis on mass production than before and consider more about the local scale. However, they admitted that the shift had been influenced by the external factors, rather than the internal factors. One senior educator declared clearly that external forces from the outside continue to be so vigorous that Thai design education remains just followers. These external forces range from the mechanisms associating with the standardisation of higher education such as QA and university ranking to new emerging design areas like information design, service design, user experience design, universal design and sustainable design.

7.2.1.2 Changes brought by students

This subtopic is significant in response to the research questions as it concerns the potentiality of Thai design students' power to transform the traditions of their curricula. Several educators from universities located in and around Bangkok consider that the new generation of design students help inject new energy, enthusiasm, and perspectives into Thailand's design education. When discussing external factors influencing Thai design education, they believe that it is because the internet has a great impact on how design students learn and they gain easier and quicker access to information than before. As these educators have observed the trend of students' thesis topics over the past years, they have found an increasing number of projects that are of non-commercial nature. For example, at one institution, outstanding emerging themes and contexts in design theses expand to include agriculture, folklore and community. Three educators from two other

universities asserted that mass and social media play a vital role in this shift. Three other educators from two further institutions believe that celebrated designers are also influential in initiating new interests and directions. Four educators from three institutions stated clearly that the current role of higher education is quite passive as most design educators are not active enough to inspire, support or encourage students' interests. The research findings imply that, although collective changes have been initiated progressively by students in a number of programmes, many issues brought to the spotlight by students have not been taken into serious consideration for curriculum revisions. Although the value shift has started to occur, especially among design learners, a large number of educator interviewees expressed that the majority of design curricula in Thailand are still largely oriented towards the traditional sector and pivot on outmoded design pedagogy. When looking at the first research question on the paradigm shift to sustainability, this certainly appears as a challenge. But referring to the third research question – “Can dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?”, this signifies that these design students tend to be active learners, interested in issues and questions that they think are relevant to their lives.

7.2.1.3 The research dilemma among Thai design academics

Higher education in Thailand places a high emphasis on teaching rather than creating new knowledge as the common mission of universities is to produce graduates for the labour market. The review of literature and the research findings from design educator interviews both suggest that the research dilemma in Thailand's higher education is a notorious result of the conventional, tradition of the teacher-centred approach in learning which focuses heavily on the transmission of "second-hand" knowledge.

The first thing to look at is the design educators' perception of research. Although all design practitioner participants in the focus group discussion agreed that new design-related knowledge constructed by research of academic staff could be very beneficial for students, it seems that design educators seldom think of themselves as researchers. As surveyed, sixteen out of twenty-one educators taking part in this research were not handling any research projects. Most of them have not conducted any academic research since they finished their postgraduate degrees. According to many interviews, teaching and research are often seen as two separated, disconnected tasks. Besides, they would like to see themselves as designers and prefer practical work to academic activities such as research and academic writing. Second, the findings reveal that a mismatch between an educator's personal research interest and the institutional rhetoric can occur. Two educators from two institutions asserted that their expertise and research interests are incompatible with the current curriculum practice of their Departments. Hence, they are in a difficult position in which they cannot use their full potential for teaching and advancing their specialisms. One educator argued that the institutional policy on research may be too rigid and

forceful for academic staff. (S)he mentioned his/her institution as an example. While the university requires academic staff to conduct research following the institutional rhetoric of localism, only a small number of staff in the Department are actively engaged in local-based research projects. This is because most of the academic staff do not have research interests that conform to such rhetoric. Third, the findings point out the close link between the teacher-centred tradition and the lack of development of research culture. Two educators from two institutions pronounced that research and critical thinking are vital skills for design educators. In their view, good learners and teachers alike must always be eager to learn. They suggested that the teacher-centred approach that revolves around knowledge transmission and ignores knowledge creation completely is “a dreadful problem”. Accordingly, without new knowledge creation activities, some interviewees expressed a relative concern about the tendency that a teacher may deliver false or outdated knowledge to learners. Fourth, not only that academic design research is rarely conducted, but academic resources such as textbooks and journals are scarcely produced by Thai design scholars either. The findings also indicate that only a small proportion of design educators can effectively access and benefit from resources available in other languages.

In conjunction with the research questions, the research dilemma among Thai design educators impacts ESD precisely. Only three out of sixteen design educators taking part in this study were working on research. And just two of the three research-active educators were conducting research concerning design for sustainability. Both projects are R&D-based. The findings reveal further that design educators who are course leaders and instructors of sustainability-related courses rarely do research that contributes to the realm of sustainable development in an integrated manner. For them, design is seen mainly as a tool for development, but not in a holistic sense. Themes of research projects that these design educators have conducted largely involve social, cultural and economic dimensions of localism, including the adoption of local wisdom and heritage craft skills in contemporary design, design for local industries, and community-based design. These research projects are usually produced in the tradition of market-oriented R&D while lacking critical questioning on human consumption and critiques on ecological impact created by design. These educators value applied research and aim to solve problems practically by producing design outputs, rather than to create new knowledge that advances the academic field of design.

To summarise, since the core values in design education have been constructed by a large group of conservative educators with a conventional view of design, the shift in values has been largely initiated by the external factors. The research findings from design educators pinpoint that the conservative core values in design education have been challenged considerably as the curricula are too slow to catch up with the changing reality. While students continue to bring in fresh perspectives to their curricula, the academic skills of Thai design educators remain questionable. Weakness in knowledge creation is evident in Thailand’s design education. This seems to be one

of the results of the long, well-established tradition of knowledge transmission combined with the high status of teacher within the society which traps them in the knowledge provider mode instead of seeing themselves as knowledge seeker.

7.2.2 The power structure

All non-student research participants asserted that Thai cultural values and characteristics are instrumental in enhancing the unique power structure of both higher education and design education and support a fragmentalist view of education. Due to the culture of seniority, interactions between Thais usually concern a set of social smoothing values like criticism avoidance, showing polite and humble "front", window dressing, face-saving, and compromising. Confrontation seems to be rarely an option for Thais to resolve problems. Therefore, while seniority is an outstanding driver of the hidden curriculum currently practised in Thai education, the social smoothing values contribute heavily to the submissive nature of younger and less superior stakeholders. But in some contexts, seniority was pointed out in a positive light by some stakeholders too. To help clarify this matter and make it easier when referring to seniority, Tables 18 and 19 present the age ranges of educator participants and their periods of working experiences.

Table 18: Roles and age ranges of participants in education

Role of participant	Age range of participant					
	Under 30	31-35	36-40	41-45	46-50	51 and over
Design educator	3	3	3	4	3	1
Design educator with management responsibilities	-	-	1	-	2	-
University executive	-	-	-	-	-	2
Policy-makers	-	-	-	-	1	1

Table 19: Roles and periods of working experiences of participants in education

Role of participant	Years of experience		
	Less than 5	More than 5 but less than 10	More than 10
Design educator	7	5	5
Design educator with management responsibilities	-	1	2
University executive	-	-	2
Policy-makers	-	-	2

Seniority plays an extremely significant role in various aspects and at multiple levels of education in Thailand and greatly underpins the teacher-centred tradition. According to a large number of research participants, Thai design education has been heavily rooted in vocational training, with the master-apprentice model of learning. To articulate the background of this phenomenon, one design educator explained his/her experience in the 90s when (s)he was a design student. (S)he pointed out that the educational experience (s)he received was grounded in the strong teacher-centred approach, the male-dominant hierarchy, the focus on skill-based training, and the single disciplinary view of the curriculum. Since there are more female designers and design educators in Thailand, the male-dominant hierarchy is much less distinct nowadays. It only remains in a small number of design programmes. As reflected consistently by designer and educator participants, the strong teacher-centred approach, the emphasis on skill-based training, and the single disciplinary view of the curriculum still persist dominantly. However, the vocational training style and the adherence to rigid disciplinary boundaries are both the result of the teacher-centred mentality.

A paradigm shift to sustainability can occur only when there is a transformation in a society's power structure. In this case, the power structure in Thai education is well-established and seniority is a dominant factor in the way that the Thai education system is structured. So, with regards to the research questions, seniority needs to be taken into consideration, especially an aspect of the hidden curriculum which seniority tends to confer superior judgment traditionally, automatically and repeatedly. Concerning the association between seniority and the hidden curriculum in Thai design education, there are several dimensions to explore. First is the teachers' view on the current generation of design students. Second is the teacher-centred tradition and teacher-student relationships. Third is the organisational culture in relation to seniority. And fourth is senior-junior student relationships.

7.2.2.1 The teachers' view on the current generation of design students

The findings suggest that the teachers' perception of students is instrumental to the hidden curriculum within the teacher-centred tradition. During interviews, educators presented more negative than positive views about their students. More than half of the educator participants spoke about the undesirable characteristics of students based on their experiences. These participants share the same demographic background – they are over thirty-five years old and have more than five years of experience in design education. The undesirable traits they described their students include: “self-centred”, “lazy”, “bored easily”, “unconcerned about tradition or their own cultural roots” and “unwilling to step out of their comfort zone”.

A large number of educators believe that advancement of technology has both positive and negative impact on design learning. In their view, as students rely more on internet search engines, they tend to be addicted to convenience, have a short attention span and dislike doing a certain activity for a long period of time. Many educators described their students as lazy. One educator commented on this matter:

“I usually find that the visual references students used are from the first few pages of the same keywords searched in Google Images. This generation simply relies on Google for pretty much everything in life. How handy!”

(Interview, 22 October 2014)

In a further interview, another educator implies the concept of control when talking about his/her students.

“It is difficult to teach these students. Their general knowledge is poor and they rarely attempt to seek for new knowledge. I need to spoon-feed my knowledge to them and hope that they understand what I mean. I think this generation is hard to please. Their interests shift all the time. It's difficult to make them concentrate on what they are learning. And you'll never know how they will react to you in class. So unpredictable!”

(Interview, 22 October 2014)

A large number of educators indicated that the current generation of design learners tend to be bored easily of the task at hand, especially when the task is repetitive or uninteresting for them. These educators claimed that students have become more impulsive because of the internet and the of digital media tools like smartphones and computer tablets. To tackle this issue, some educators reported that they have attempted to use other more practical activities alongside lecturing to prevent students from boredom. When reflecting on their choice of pedagogy, they admitted that the teaching is less academic by doing so.

Moreover, many educators commented on self-centredness in students based on their hierarchical attitude. For example, one educator regards design education as a kind of training grounded in the master-apprentice model.

“There are many students that I feel they are too self-obsessed. These students are very hard to train as they are too proud of themselves. They think they are always right and don’t consider the received feedback in order to develop their work further.”

(Interview, 16 December 2015)

However, two educators from another institution think that it is partly because, for the new generation of design students, the meaning of design has changed and become broader. As they have observed, design has become an act of self-satisfaction, rather than a problem-solving task, for many of their students. The focus of design seems to have shifted from functionality to emotional engagement. Several educators believe that the use of social media also shapes students’ perceptions of design and appreciations for certain types of designs. One educator commented on this:

“Traditionally, the focus of design must be on the users – their physical and emotional needs. But for the present-day students, they usually think of themselves first and prefer to design something that responds to their own needs.”

(Interview, 20 November 2014)

Furthermore, some educators asserted that the trend among new design graduates has shifted from seeking for job security by choosing to work for large corporates or mass manufacturing sectors pursuing more independent careers and setting up their own businesses. One educator explained:

“The thing is that most Thai design graduates and design practitioners would ideally like to work in the urban environment. Well, in a design studio, not a design department in a factory. One would not prefer to work in a modest office in a suburban production site and use the same toilet with the factory workers. That’s what the previous generations of industrial designers did. In contrast, the present generation of designers enjoy the sophisticated, designerly lifestyle and always put themselves before others. They perceive of themselves as a cool designer with a perfect life, with an expectation to receive full benefit from work and regularly have time to socialise or party after work hours. They would definitely not tolerate hard work.”

(Interview, 20 November 2014)

The interview excerpt above also reflects how the design educators think that the new generation sees itself in the industrial hierarchy and the wider society.

On top of that, the findings indicate that there is a tension between the academic staff attempting to integrate the cultural dimension, especially the concept of cultural preservation, into design

curriculum. Four educators from four institutions expressed their concern and frustration regarding students' shared perception of traditional Thai culture as "boring", "not cool", and "something in the past that does not matter to them anymore". They told similar stories about students joining museum visits and field trips without any interest or curiosity about the historical and cultural significance of the artefacts and practices they encountered. The findings show that the integration of the cultural dimension, especially the concept of cultural preservation, into design curriculum is problematic in many institutions. At the same time, the findings imply that a heavy focus on traditional Thai culture may be hard for students to connect with the current professional practices.

Many educators also asserted that their students are passive and tend to avoid challenging tasks. One senior educator commented that many of students' negative characteristics like being unwilling to get out of their comfort zone and inattentive in classroom could be considered the outcome of the well-established teacher-centred tradition. In his/her view, given that Thai students have been taught since they were young to value accuracy, they are spontaneously fear of getting the wrong answers. From his/her observation, students avoid challenges and dislike taking risks because most teachers are not open to new ideas. The majority of academic staff in his/her Department do not support students in the manner that they can solve any problem in their own ways. Also, the curriculum offers no playground for trial and error, whereas it is impossible for design students to succeed without facing failure. Another design educator at another institution, who also teaches a General Education course to students across university, reported that being unadventurous is not limited to design students.

While many interviewees raised an issue regarding a teacher-student tension by focusing on the undesirable characteristics of learners, several educator interviews imparted the interviewees' sense of powerlessness in term of improving the teacher-student relationship within the hierarchy.

In conjunction with the research questions, the teachers' negative perception of students appears to be a stumbling block to implementation of the student-centred approach, which is fundamental for transformative learning and ESD. It seems that there is a need to tackle the power structure that underpins the teacher-student relationships.

7.2.2.2 The teacher-centred tradition and teacher-student relationships

In Thai culture, seniority influences all dimensions of relationships between teachers and students. Traditionally, those who are diligent and obedient are considered "good students" in Thai culture. In some curricula, especially those rooted in or developed from the discipline of traditional arts and crafts, the situation is more intense than others.

Regarding the traditional teacher-student power structure, several educators elaborated that the conservative teacher-centred approach limits the students' understanding and experience of working with a design process of their own. From their experiences, there is a great number of design educators who usually position themselves as mock customers to their students, using their own preferences as assessment criteria. As the teachers have "the customer hat" on, the critiques given to students and the assessment process may be based on personal liking rather than critical thinking and reasoning. Correspondingly, many designer participants in a focus group also recalled that, when they were design students, the assessment criteria were so fuzzy that they could not figure out why they received such marks. Besides, explanation was rarely officially given and any further question to the teachers regarding the marks would be inappropriate.

Three educator interviewees who spent time studying and working abroad longer than the rest asserted in the same direction that Thai teachers often model their teaching on the pedagogy they experienced as students. Looking specifically at the impact created by the existing hierarchy, they indicated that if an instructor has been trapped in the teacher-centred approach all along, it may not be straightforward for the person to see clearly what is wrong with the approach and how it can be changed for the better. In addition, one educator reported that the majority of Thai teachers, including academic staff in universities, are so familiar with the transmission of second-hand knowledge that they think it is "the way" to "teach". Accordingly, many educator participants concluded, the repetition of the practice of pedagogy of the oppressed continues to persist in all level of education in Thailand, including the area of design education. This may imply that design graduates are merely produced to conform to the existing power structure of the society.

The findings also reveal that the approach has affected heavily on the pattern of activities and traditions in the curriculum. Some educators and all designer participants who are alumni of different institutions discussed extensively their experiences of the "thesis ritual" in a negative way. One educator explained that a conservative tradition of design thesis has been constructed and practised as a golden rule by the majority of the academic staff in his/her Department. When students are assigned to make prototypes, they were indoctrinated with "the bigger, the better" motto. During four sets of oral presentations and critiques in a semester, students are required submit multiple hard copies of their thesis drafts and presentation handouts for all teachers in the Department.

"Studying design is expensive enough. I feel awful to see students having to go through this ritual, spend a lot of money for photocopying handouts and making full-scale prototypes, and exploit a plentiful amount of natural resources."

(Interview, 21 December 2015)

The interview excerpt reflects the interview's environmental concern and his/her colleagues' mentality toward both educational worldview and sustainability.

From the young educators' point of view, three participants under thirty years old from two institutions taking part in this research confirmed that the teacher-centred approach is not healthy for the learning process of future designers, and it is often fully merged with the teacher's conservative view of design. Their interviews reflect that many design curricula involve both the proliferation of the conservative design practice along with the single disciplinary view of design learning. Two of them who work in a craft-based design programme described the current practice of their curriculum as "the continuity of pedagogy of the oppressed". One reported that she had observed many awkward learning situations resulting in students feeling discouraged and confined only to the senior teachers' ideas and directions for students' design projects. (S)he asserted that she would like to be "a shoulder to cry on" for his/her students. Another put it desperately that "the long journey of Thai education has nearly come to the dead end" and "the students are simply the victims of their teacher's biased judgement and ignorance of updated knowledge." In like manner, a further young educator from another institution stated that not all students are convinced by what the teachers say, but they simply choose not to speak out.

Although each design educator in this research holds their views very strongly, they all admit that the tension emerging from the negative teacher-student relationship often results in discouragement of students and students' unwillingness to develop their work further. To cope with such tension, several educators explained how they work to meet halfway with their students. One educator has used Facebook as a means of communication, implementing the flexibility orientation value for smoothing interpersonal relationship with his/her students. (S)he has used a Facebook group to give advice and update what they need to do weekly. However, another educator with management responsibilities in the same Department, who has observed such interaction activities on Facebook, insisted that too much of flexibility may lead to other problems. Consideration of consequences of actions was mentioned in a different dimension by a further educator in another institution. (S)he thinks that, because of the learners' self-centredness, they may not see clearly a situation and the effects that it has on other things. Therefore, she suggested that a teacher should speak with students in the way that the conversation starts from something closer to their lives before drawing the discussion to a bigger picture. Similarly, another educator suggested that sustainability must be taught step by step, whether to design students or non-design students. (S)he suggested that a teacher may start with basic concepts like recycling and waste management because there are real examples out there that students can see and experience. (S)he added that if a teacher begins a session with a far too advanced concept like zero waste or biomimicry, then students tend to think it is too idealistic and sustainability will be impossible to achieve.

Furthermore, three educators from three institutions asserted that they usually input their personal interests and adjust the course contents as they think appropriate rather than strictly following what is written in the official curriculum. In their view, sustainability is one of the modern themes that has been around and going strong. For instance, one educator introduced the concept of sustainable living in an animation design course that (s)he has been assigned to teach.

Moreover, some educators reported that they regularly attempted to arrange field trips for students to gain more hands-on design experience. An aim to cultivate in students an understanding of the local industries as one of the primary resources for learning comes across as highly relevant to the concept of place-based learning or experiential education, which is fundamental for ESD. However, some would like to take it to the extreme. For example, one educator from a design programme explicitly advocating SEP stated that, in his/her opinion, (s)he would ideally like to include more professional practice experience in the curriculum.

“If I could make any change in the curriculum, I would modify all courses in the first half of each semester to have classroom-based or studio-based learning only, then followed by job internship in actual local work establishments in the second half.”

(Interview, 2 May 2016)

(S)he believes that students deserve proper training and work placement is utmost important for them because universities should produce graduates whose qualifications and skills meet the requirements of the labour market. The findings imply that, as (s)he focuses solely on the practicality aspect of design that evolves around conventional skill training and existing production techniques, (s)he appears to devalue the cognitive and affective domains in her students' learning experience. His/her view is dissimilar to those working in design industries who prefer to see the new generation of designers being professionally competent yet well-rounded at other roles.

In the focus group discussion among stakeholders working in design industries, participants concluded that the teacher-centred approach is a hindrance to design education in many ways. In particular, they considered that the heavy emphasis on transmissive vocational training worsens the lack of critical thinking skills in students. They believe that positive teacher-student relationship does not only help improve students' learning experience but also supports the Thai style patronage system. In their view, a student who is close to a teacher tends to receive favouritism, possibly along with some personal benefits, from biased marks, to free meals and to job opportunities. As Thai culture is grounded in person-based social relations, a teacher or a student may make it personal while interacting between two parties.

However, regarding ESD, the findings from educators reveal that teacher's personal interest in sustainability tend to play a significant part in the courses they lead in constructing a kind of

hidden curriculum. Although sustainability is not included in the course descriptions, the teachers who are interested in sustainability sometimes hold a player mindset and input sustainability-related topics into the lessons. According to the energy investment model by Edmonstone (2003), a member working in an organisation who sees themselves as a 'player' tends to view ambiguity and changes as challenge and opportunity.

7.2.2.3 The organisational culture in relation to seniority

Most higher education institutions in Thailand have been bound by the civil service culture for decades. A number of research participants declared that their organisational culture is predominantly seniority-based, not merit-based. Seniority also refers to political power attained by position in the institution. Those who are senior always hold the advantage against their juniors. A policy-maker interviewee stated that the election of University President in public institutions is backed up by the concept of seniority. Candidates are usually former Deans of Faculties within the institutions. The university-level policy-makers usually lack proper management skills as well as an understanding of education philosophy. The research findings reveal that the concept of seniority in the organisational culture affects the institutional management and conditions the hidden curriculum in higher education. Some design educators assert that it is not straightforward to initiate change and ensure that changes are managed and implemented in an effective manner.

One design educator mentioned that the university fails to support the students' emerging technological needs due to the orthodox perspective in institutional management. In his/her case, the term "craft" has been interpreted as "handicraft" by the management board, which leads to a lack of advanced workshop facilities in the Department. This implies that a perspective on academic fencing between disciplines results in the constraint of budget allocation among Faculties and Departments. Another educator at another institution, who has been assigned to teach courses nearly completely irrelevant to his/her background, thinks that, to make any revolutionary change in an existing curriculum, the first thing one must do is to observe carefully the power structure within the organisational culture.

"I need to get a grip on reality. I think it takes time for me to fully understand politics in this institution. Once I have a clear idea of what is going on here and who I should speak to, I will try to persuade and propose to include a sustainable design course for the next revision of curriculum."

(Interview, 9 January 2016)

The interview excerpt conveys an impression that organisational politics can more or less shape the current practice of design teaching and learning. Whereas the concept of seniority is explicitly found in the teacher-student relationships, it is interesting to discover that the seniority-based organisational culture of higher education institutions also has a great impact on institutional

management and design education as a whole. Concerning the research questions, the findings imply that the rigid top-down organisational culture based on seniority can be a great challenge for a paradigm shift. As ESD aims to enable the learners to challenge and change the existing dominant power structure, the Thai cultural factor is so strong that the educators themselves struggle within the hierarchy too.

7.2.2.4 Senior-junior student relationships

The relationship between seniors and juniors among students is not only about the norm of respect for seniority but also the matter of trust. Almost every university in Thailand has a tradition of welcoming of freshmen, which strengthens the hierarchical relations and the person-based social institutions. This tradition is a means to instil conformity, aiming to help the newcomers to get along together and feel proud of themselves by becoming part of their institute. A number of university staff, especially those who are alumni of the institutions, support this concept because they are also “the product” of this tradition. These educators are likely to have empathy for students due to the feeling that they are their juniors. In turn, juniors always look up to seniors too. All focus group participants agreed that both juniors and seniors benefit from informal peer learning environment when working together in design workshops throughout their university years. The experience helps reinforce their relationships, which is also useful afterwards in term of personal connection and networking for future careers. In conjunction with the research questions, there seems to be a positive correlation between good senior-junior student relationships and implementation of the student-centred learning approach. Healthy junior-senior interactions, as an integral part of university life, can be beneficial for active learning, which is fundamental to ESD.

One design educator reported, in many cases, students tend to appreciate and be more convinced by the academic staff who are alumni. Similarly, two educators from another institution informed that students tend to be more enthusiastic when attending talks by guest speakers who are alumni. A personal tie can be beneficial as it helps to break the wall between teacher-student interactions. However, this kind of relationship also contributes to two problematic phenomena, which involve the political message of being or not being “one of us”. First, it contributes to the patronage system in design industries, which seniors tend to give job offers to their juniors rather than to other unknown applicants. Second, it is greatly instrumental in the practice of academic inbreeding, which is a common practice in a large number of institutions in Thailand. Thais, in general, believe that interacting with individuals who can be trusted helps maintain harmony within the community. This may result in the limited knowledge and perspectives among educators in the curriculum.

7.2.3 Voices from the industries

While design educators participating in this research think that Thailand's higher education aims mainly to produce graduates to serve the labour market, all participants who work in design industries feel that the attributes of Thai design graduates are not quite responsive to the real needs of the industries. In the view of these design practitioners, most design curricula fail to catch up with the real world. They suggested that the job of design educator must be to equip future designers with skills and perspectives to help them see the interconnections between different fields. They also expressed their concerns extensively about the mainstream design pedagogical approach. According to their discussion, Thailand's design education will continue to be inferior if these three issues still persist in the future. First is the teacher-centred design pedagogy. Second is the single disciplinary structure of design education. And third is the unhealthy hidden curriculum caused by Thai cultural values. All of them indicated that these three barriers to change are closely related.

All designer participants agreed that the teacher-centred control of learning is problematic – each educator is concerned only about their own value system. This also leads to the lack of connection between different courses in the curriculum. As a result, without considering the integrated learning outcomes of the curriculum, an individual design teacher commonly uses a transmissive approach to pass on their single disciplinary knowledge and value to the students. One participant cast doubt about the accountability of design educators and explained his/her experience when (s)he was a student:

“When knowledge was divided into subjects, it annoyed me that something taught in one course is neglected in another. This is simply because different instructors have different values. For example, the key concepts that I learned from an elective course on Sustainable Design were neither mentioned nor fused in other courses. The majority of instructors in the Department still completely overlooked the environmental and social dimensions of design.

(Focus group discussion, 23 August 2014)

Moreover, participants asserted that some positive changes had happened already but still on a small scale. It is an outcome of the attempts made by a small number of educators who are opposed to the norms and brave enough to have taken risks to create change. The recently-developed knowledge and emerging global trends are neither recognised by the majority of educators nor yet included in the official curriculum documents. All focus group participants stated that they placed hope in the hand of this minority group of design educators, especially those who have a passion to educate sustainability literacy to the new generation of designers. This implies that the role of educator is extremely vital in instilling sustainability awareness and develop sustainability capability in design students. They would like to see sustainable design being one

of the pivotal factors that drive the direction of Thailand's design education. In addition, to foster sustainable design at any level, they stressed that assistance from the government is crucial too.

One outstanding suggestion from all focus group participants regarding preparing students to be ready for working in the industries is that design curricula should offer more opportunities for students to learn from outside classroom. Activities like field study and work placement should be emphasised. One of the participants criticised the common practice of design curricula in Thailand that students are required to do an internship during or just before their final year. In his/her view, the sooner is the better. Thai students seldom do part-time jobs alongside their studies. So, the internship experience can help form their understanding of both design profession and how things work in reality. The rest of the participants added that design competitions are also another essential outside-classroom experience for design students. They also reported that there are more design competitions now than ever before. From focus group participants' point of view, work placements and design competitions are beneficial for students to develop their skills further, recognise the actual demands of the industry, and be more aware of the sustainability movement in design, such as eco-design, universal design and design for social enterprise.

7.2.4 ESD in Thailand's design education

This sub-section looks at the findings concerning ESD from a focus group discussion among stakeholders working in design industries as well as interviews with educators and policy-makers. To avoid confusing and intimidating the participants, the term ESD was not used directly in the interviews. Instead, ESD was elaborated less technically but still captured its overarching meaning.

7.2.4.1 Sustainability and Thailand's design industries

Before exploring issues about ESD in Thailand's design education, it is first and foremost to look at the current practices of the design industries in relation to sustainability. The first aspect to explore is the perception of sustainable design among people working in the industries. All focus group participants confirmed that the design industries in Thailand are largely stuck in a business-as-usual mindset. They have witnessed that terms like "sustainability", "eco" and "green" can be seen and heard more often than before, but the majority of designers are not so keen on committing to shift to a more holistic approach. These participants also pointed out that the public's perception of sustainability is problematic. They stated that, while the media plays a vital role in publicising sustainability, the public perceive numerous different definitions of the term. In their view, there are three issues to explain the lack of commitment to sustainability among the stakeholders in the design industries. First, they expressed that it is not simple to avoid making environmental impacts through design practices. Especially in large corporates, models and

prototypes are regularly destroyed due to the confidential nature and the intellectual property concerns. Discarded industrial prototypes are often toxic wastes. Second, when it comes to material and production process selection, there are not many safer or more sustainable options available. More sustainable alternatives are usually more expensive. Companies prefer to keep their costs down. And third, they asserted that clients usually do not see sustainability as a value that needs to be embraced. In their view, they think that unsustainable practices need to be changed, but they also found it difficult to change themselves. They indicated further that, to help shift the direction of the creative industries, it is an important task of design education to produce future design graduates who are sustainability literate and competent to act in a way that favours sustainable development.

Moreover, all focus group participants asserted that resistance to change is plain to see in a large number of organisations because “conservative seniors” usually serve as leaders and heads of organisations. This happens in every context, including the education sector and design industries. On a positive note, as observed by many research participants who are educators and design practitioners, there has been an increasing number of new designers who studied abroad and brought back new design ideas and methods to work in Thailand. Many of these people have detached themselves from the conventional ideology of working in well-established corporates. Instead, they work independently or set up their own establishments. Among these people, there are diverse small groups working on design to tackle various issues including sustainability. They have initiated numerous collective changes. Several focus group participants asserted that the new-generation designers, who have sustainability awareness and passion, working in mainstream companies are never going to get far. They believe that there are also a number of senior designers and business owners who have an interest in sustainability, but these people are still a tiny proportion.

Furthermore, the design practitioner participants discussed the government policy concerning to sustainability. All of them agreed that government should introduce an official sustainable development scheme or a reliable green policy to foster sustainability within the design industries. A participant who is a senior interior designer strongly believes that it is the government’s job to provide sustainability infrastructure. Another participant has worked as a senior designer in a mass production manufacturer for more nearly two decades shared his/her experience of taking part in some projects initiated by the government aiming for advancing sustainability in the manufacturing sector. (S)he concluded that discontinuity of government support and the lack of incentives for sustainable business practices are two critical issues playing a part in the previous lack of success of policy implementation.

Lastly, the focus group participants also shared their view on sustainable design teaching and learning. They stated that the new generation of designers who are sustainability literate are

valuable for the industries. All seven participants strongly confirmed that the role of design educator is both critical and challenging for fostering sustainability. Among them, only the youngest two had some sustainable design education experiences when they were university students. Although both participants graduated from different institutions, they remarked exactly the same message that sustainable design was “an eye-opening course”, instructed by “a one-of-a-kind teacher who is very passionate about sustainability”. All participants in the focus group agreed that sustainability must have a proper place in Thailand’s education scene and educators are key players in sustainability learning.

“Sustainability is something that needs to be embedded into the learning process. Sustainability should not be seen as knowledge. It’s more than that. It’s an ideology, a value, a vision. It should start from within. Sustainability should be instilled in every person since they are still young. Nurturing sustainability must be an important part of education, not just in design but in everything we do in daily life. Hence, the role of educator is extremely vital.”

(Focus group discussion, 23 August 2014)

These participants believed that, since Thais tend to associate with face saving and window dressing, an action of an educator is far more crucial in the process of empowering students to be active agents of change. Thus, these participants had more faith in individual educators who are decent and accountable than just impressive blurbs written in official curriculum documents. As the discussion continued, none of the participants thought of sustainability solely as knowledge. Most of them think sustainability is a kind of personal value, which can be developed to become a shared value. In their view, if a teacher truly understands sustainability, the person has a potential to instil the value of sustainability in students effectively. There were five suggestions for design education from these design practitioners. First, it is the design educators’ job to equip future designers with skills and perspectives to see the interconnections between different fields. Second, sustainability should not be just an add-on in the curriculum. Third, sustainability should be taught from the first year. Fourth, typical style lecturing is not a suitable method to teach sustainability because it is not effective. It must be equipped with activities or integrated into studio practice. And fifth, the best sustainability learning process must be experiential. Reflection on doing is key.

Without mentioning any theoretical term or description, the conversation eventually took all participants to discuss some features of ESD and transformative learning spontaneously. In relation to the second research question specifically, the findings support that these participants agreed that ESD should be embedded into Thailand’s design education through the ‘frame of mind’ concept. As they were in doubt how the whole education system and cultural barriers could change, they concurred that the role of teacher is major. They believe that any responsible visionary teacher has a potential to become a change agent for sustainability. However, based

on the educational experiences of these participants, all of them pointed out that different educators have different values and their values affect what and how they teach. Echoing the same concerns in the research findings from a large number of interviewed educators, these designer participants saw that educators who are conservative, inactive and narrow-minded are one of the key stumbling blocks to change. Several focus group participants mentioned that there is a sense of institutional pride instilled into students as they spend four (or more) years in university. They suggested that this kind of pride can be very beneficial if combined with informal sustainability learning on campus. This suggestion is exactly in accordance with the vision proposed by the university-level policy-maker at one institution, who also has little faith in the majority of academic staff to foster sustainability among students as well as themselves. A design educator from another institution articulated that sustainability can be instilled into the many aspects of university life, but it is all up to the policy-makers and their directions. (S)he believes that university can foster a sense of sustainability into students in many other ways, especially helping students realise the value of resources through activities involving maintenance of university facilities and waste management. After all, the top-down approach in management within an organisation is still crucial for this matter. Besides, the person-oriented culture remains very strong in a variety of aspects of the findings.

7.2.4.2 Lack of personnel and resources on design for sustainability?

Pasupa, Evans and Lilley (2012) asserted that the lack of enough knowledge on design for sustainability among a variety of stakeholders in Thailand results in numerous problematic issues. Their study declared that an ineffective implementation of sustainability in design curricula is derived from a very limited amount of literature and learning resources available in Thai language, and insufficiency of instructors with qualifications and experience concerning sustainable design. The findings in this research unfold further that there are a large number of complicated issues concerning sustainability teaching and learning in Thailand's design education. The deficiency in personnel and resources is a great challenge, as all university-level policy-makers taking part in this research believe so. However, through the findings from non-student educators, the lack of personnel and resources is only a kind of surface-level narrative.

Regarding the perception of sustainable design among the public, the findings reveal that celebrated designers are influential. Although university teachers have a high status, designers featured in the media play a more significant role for design students. The stakeholders working in design industries mentioned in the focus group discussion that there are a couple of designers who have brought sustainable design to public attention and what these designers communicate is always powerful. They believe that it is partly because knowledge sources about sustainable design available in Thai language are scarce. The findings from educator interviews also suggest that students learn about sustainability from social influences outside the education settings. From

experiences of educators from three institutions, they have observed that students tend to listen to celebrities and idols rather than low-profile practitioners. However, one of these educators expressed his/her concern that celebrated designers in Thailand who present themselves as eco or sustainable design advocates are often “superficial”. As (s)he has observed, these designers rarely communicate to the public with good knowledge of sustainability or philosophical-based critical reflections over their practices. Another educator revealed that these celebrated designers are sometimes hired by government agencies to endorse or work on the projects concerning design for sustainability. This kind of scenario also reflects that the staff working in civil services or design scholars working in universities may not be competent in sustainable design.

“Sustainability may not have been a crucial aspect of Thailand’s design industries yet, but the sustainable lifestyle trend is really strong outside our country. Such trend helps alert people to take action seriously. In Thailand, if someone in the media speaks up about sustainability – say a good-looking soap opera actor, it may catch the attention of more people to save and protect their environment. The new generation tends to go with this type of hype, without a true understanding of the content.”

(Interview, 22 October 2014)

One design educator who has worked to collect and analyse data to prepare a blueprint for the first sustainable industrial design programme in Thailand expanded further on this matter. There are four key issues discussed in his/her interview. First, (s)he thinks that policy-makers and educators are more aware of design for sustainability than before. However, (s)he doubts if it is seen as just a kind of fashion. Second, based on his/her study, there are a number of design for sustainability courses available; however, the proportion of curricula with such courses is still small when compared with all design curricula nationwide. Third, given that the new generation of Thai students is not close to nature anymore, typical teaching and learning approaches for sustainable design still lack some activity to help students realise the ecological values of resources. Forth, the public in general, including design teachers and students, have a very limited understanding of the product life cycle concept. They only focus on the end-of-life stage, especially waste management and popular analytical tools like the 3Rs (reduce-reuse-recycle) or the 4Rs (reduce-reuse-recycle-repair). As a result, they often fail to look at the whole product life cycle and lack consideration of environmental impacts produced from each stage of the life cycle.

As learned from the Literature Review, focusing solely on the quantity of human and technological capital may not alleviate the problem successfully to foster ESD in any context. The bottom line is that a shift in worldview is required. The shift in worldview toward sustainability is a key question to be explored in this research.

7.2.4.3 Sustainability as a frame of mind?

This sub-section aims to draw together evidence that highlights and responds explicitly to the second research question, “Could ESD be embedded into Thailand’s design education through the ‘frame of mind’ concept?”, which Bonnett’s (2002) concept of viewing sustainability as a frame of mind rather than an aspect of policy is central.

The research findings suggest that one of the significant factors contributing to the challenges to integrating ESD in Thailand’s design education is the shared or collective perceptions about sustainability among policy-makers and design educators. Through interviews, most participants think sustainability is a personal matter of concern. With the perception that sustainability is not a conventional subject matter in design, many of them elaborated that sustainability teaching and learning depends on personal value and interests of the academic staff. Hence, sustainability is often regarded as an add-on, not a fundamental subject in design curriculum. At the same time, this kind of situation holds back the educators who have a passion for sustainable design and wish to fully integrate it into the curriculum.

One educator admitted that sustainable design is new, complicated and hard to understand for all stakeholders associated with design. When it comes to teaching and learning, (s)he found that the serious aspect of sustainability can be a put-off for both design and non-design students. Based on the students’ cultural characteristics of fun and pleasure orientation, students prefer learning through interactions that are pleasant and humorous. The interviewee thinks it is difficult to teach sustainability in a light-hearted way.

An educator from another institution asserted that although sustainable design has long been a compulsory course in the curriculum, sustainability has never been a shared value among academic staff in his/her Department. It results in the condition that the sustainable design course is given no priority. Sustainable design is often viewed as less important than those skill-based courses. So, the course is located in the first semester of the final year. The interviewee admitted that (s)he thinks that students might have been more considerate and thoughtful if sustainability was taught during the first years. (S)he elaborated that students are trapped in the traditional way of learning design, which focuses heavily on the making process. They prefer to put more emphasis on the final design models or prototypes than to spend time on thinking about the whole picture of the system as well as the research part of their design process. In his/her view, when students come across sustainability during their last year in university, sustainability is viewed as something that limits their freedom to design. This perception is exactly in line with the one educator with management responsibilities at another institution.

A similar situation has occurred at another institution. Sustainable design has been a compulsory course for a decade but still remained just a lecture course, disconnected from other studio-based courses in the curriculum. As the course leader saw weaknesses of sustainable design being a lecture-based course, over the past several years (s)he has included studio-based activities in the last few sessions of the course to help students put their knowledge into practice. However, (s)he thinks that so far the course has not been effective yet in term of instilling a sustainability value into students. In addition, (s)he gave an opinion that the mainstream group of design educators in Thailand does not realise their role as being partly responsible to creating a more sustainable future as they merely consider sustainability as a trend from the West. (S)he pointed at his/her current curriculum:

“Having one course concerning sustainability in a curriculum may appear to outsiders that the curriculum is up-to-date but, in reality, it’s just an act of window dressing. As a Department, we don’t contribute as much as we should to a more sustainable future.”

(Interview, 21 December 2015)

The interviewee presented a strong critique on the lack of concern, vision and commitment for sustainability among a large proportion of Thai design educators. In this sense, Thai design educators who are passionate about sustainability are simply “the minority”. They have little power to negotiate the place of sustainability education in the curriculum and fostering the concept of sustainability as a frame of mind.

Another educator believes that it is entirely up to an individual teacher if one would like to input the concept of design for sustainability to a certain degree in their courses. But, in his/her view, only those who truly believe in sustainability and practice it in daily life can teach it effectively. (S)he indicated that the concept of sustainability as a frame of mind must start from the teacher first.

7.2.4.4 The place of sustainability in current design curricula

Currently, there has not been any operating design curriculum in Thailand that adopts sustainability as the heart of the curriculum. The closest to this concept is the curriculum being developed at one institution, aiming at being the nation’s first sustainable industrial design curriculum. Sustainability is considered an add-on in most design curricula studied in this research. The findings reveal that there are three ways that sustainability has found its place in Thai design curricula.

First is having sustainability as a compulsory course. As asserted by three educators from three institutions, sustainable design has been included as a compulsory course in their curricula since

the start (eleven, ten and three years). All these curricula have one thing in common, a focus on utilising the concept of localism in design. At another institution, sustainable design has appeared as a compulsory course in the curriculum since the university began to employ its sustainability strategic plan (five years). The course is lecture-based in two of these curricula. For the other two, the course is studio-based. The research findings reveal further that the emergence of a sustainable design course in some of these curricula was backed up by the same reputable senior design educator from one leading institution. These four educators implied in the same way that having sustainable design as a compulsory course may achieve the same result with sustainability being just an elective module as the course remains just a one-off thing and their students are unable to put sustainability knowledge and skills to use.

Second is having sustainability as an option. Sustainable design is an elective course in design curricula at two institutions. An elective course is one selected by a student from a number of optional subjects or courses in a curriculum, as opposed to a required course which the student must take. This means students can choose whether they would like to learn sustainable design or not. At these two institutions, there are also courses that contain sustainability-related issues, but the term sustainability is neither used nor communicated explicitly. Sometimes sustainability is chosen as one among other topics to instruct as a one-off. The nature of being a topic is that it is something considered by a teacher that students should know. Design educators tend to pick up particular sustainability-related topics that they feel appropriate to teach within the given timeframe and suitable for the nature of their students. However, both courses are not popular among students. This is because students tend to choose to learn something more practical. At another institution, there is a compulsory design course which aims to introduce an environmental aspect of sustainability through assignments. The course leader stated that teaching sustainability as a topic is a brief and concise way to introduce sustainability to students without overwhelming them.

Third is that sustainability does not officially exist in the curriculum. Five educators from four institutions reveal that sustainability is not officially included in the current curricula. All of them personally advocate sustainability and always do their best to incorporate sustainability-related issues into their teaching practice. One educator commented on this matter:

“I personally think that sustainability teaching and learning should be included in our design curriculum, but not taken it to the extreme. Just one elective course that takes sustainability very seriously is enough. It should not be compulsory. If our curriculum is confined to the core concept of sustainability and the principles of sustainable design, it can limit students' creative potential and freedom to design. We should not restrict students' ideas to create new things. What's more, none of the teaching staff here is passionate or has sustainability expertise. None of us has work experience in design for sustainability. We can only pass on superficial knowledge of sustainable design to students through lecturing, giving examples or telling stories. This is because we are not even wholly certain what sustainability is!”

(Interview, 16 December 2015)

The interview excerpt captures the two typical issues among Thai design educators. First, they perceive that sustainability limit students' creative potential and freedom to design. This finding is also in accordance with two other educator participants in this research. Second, whether they are passionate about sustainability or not, they are aware that they lack knowledge and skills of design for sustainability. This finding is in line with many other educators taking part in this research as well.

Furthermore, sixteen educator participants from thirteen higher education institutions reported that sustainability has never been included in the assessment criteria of any course in their curricula. It is a result of the lack of understanding of sustainability among the majority of academic staff. Even for institutions with sustainability policy, apart from the sustainable design course itself, sustainability is not part of assessment criteria of any design assignment. As stated by three educators from three institutions, marks are usually given based largely on creativity and practicality. All three educators reported that if a student chooses to deal with sustainability issues in a design project, it will be perceived by the academic staff as “interesting” or “creative” and the student tends to be given extra marks. This implies that, in this scenario, designing with ethics in mind is considered as an advantage rather than a norm.

7.2.4.5 Sustainability educators in design education

Design practitioners taking part in the focus group discussion thought that the role of design educator had the utmost influence to instil sustainability values in students. Likewise, many educators participating in this research believed that each individual educator should take the role of change agent for sustainability. Similarly, in the view of an ESD expert, the heart of the change-making process relies on the design educators, especially their ability to understand and practice both design and sustainability. (S)he summarised that, to teach sustainable design effectively, design educators must go even further beyond the content level. That means one must be able to realise the role of design and its impact on the society and environment, profoundly understand what sustainability is, practice interdisciplinary approach, and be able to implement ESD in the

teaching and learning process. Concerning sustainability educators in design education, the research findings suggest that there are three aspects to explore.

The first aspect involves the various interpretations of sustainability. The ESD expert asserted that how sustainability is taught depends largely on how a specific teacher interprets and sees the importance of sustainability. This is due to most Thai educators not fully comprehending sustainability. The research findings state that confusion is common among numerous educators beginning to teach sustainability for design students. As the subject matter is new to them, it is very understandable. During the early periods of the two longest-running sustainable design courses, the educators in both institutions were not so sure if they were “doing it right”. Likewise, one educator at one institution revealed that (s)he did not find himself/herself to be entirely competent to instruct sustainability but (s)he did the best (s)he could. As a result, the meaning of sustainability communicated in different courses can be diverse and serve various purposes. As specified by three educators from three institutions, it is not easy for most design educators, designers, design students and the general public to get to know sustainability and sustainable design. It is simply because the materials and resources in Thai language have been very limited. Moreover, according to three other educators from three institutions, the common confusion among stakeholders in design industries and design education is that they cannot tell the differences between “eco-design” and “sustainable design”. One educator stated that it is a danger that these terms are used interchangeably in many education contexts in Thailand. (S)he also expressed that the life cycle concept is fundamental for both eco-design and sustainable design but designers and design educators tend to ignore it and quickly jump into the design process by using common tools like 3Rs (reduce-reuse-recycle) or 4Rs (reduce-reuse-recycle-repair). In his/her opinion, the use of a teacher-centred, transmissive approach to introduce these tools to students makes the situation even worse. In this way, students tend to perceive design for sustainability as a concept that requires a particular set of methods. The perspective of whole systems thinking which should be included in sustainability education is completely excluded, leaving the 3Rs or 4Rs on their own as further technocentric tools for designers. Furthermore, six educators from four institutions reported that sustainability had been introduced to students via courses stressing more on the cultural and social dimension than the ecological dimension of sustainability. Common themes include social enterprise, design for community, cultural preservation and SEP. These courses usually offer visits to local communities or craft industries as one of the key activities. While issues around social and cultural sustainability are regularly communicated through these courses, the environmental aspect of sustainability is neglected.

The second aspect is that most of the interviewed educators who have the passion for teaching sustainable design see themselves as the struggling minority in their Departments. According to these educators, the enthusiasm to teach sustainability appears to be triggered by each individual’s life experience. With an aspiration to integrate sustainability into their curricula, the

research findings show that these design educators feel rather isolated as their views differ from the majority of academic staff. The degree of tension is varied from one context to another. For example, the two instructors of the two longest-running sustainable design courses asserted in the same way that they have struggled for years to convince their colleagues about the sustainability imperative. Both of them were once pioneers who worked as members of the curriculum committees to launch the current design curricula in their institutions. They admit that they have not successfully integrated sustainability to be at the core of the curriculum. In order to strengthen the work on fostering sustainability, one educator thinks that university should be a lot more active in encouraging sustainability debates among stakeholders. Although his/her institution is one of the few universities in Thailand that employ sustainability policy, (s)he feels that the university has not done enough to shift the mindset of its stakeholders. Another educator from another institution expressed that the concept of taking a village to raise a child is extremely challenging because the majority of stakeholders are not able to think holistically. From his/her experience, (s)he thinks that the top-down institutional policy does not help much at all. Likewise, two educators from another university with a sustainability policy unfolded that a large number of university stakeholders remain insensible to the concept of sustainable development. While some participants believe that a participatory approach is really needed, many put forward that the challenge lies in the question of how.

For the third aspect, the research findings reveal that spiritual transformation of educators is a significant factor that initiates and drives a passion for sustainability teaching and learning. The findings suggest that, regardless of the institution's policy and what is written in the official curriculum documents, the actual role and practice of an educator is extremely influential to learners. The findings also present the existing connection between transformative learning and sustainability education. Identical features found in the design curricula at two institutions, both focus on integrating the notion of localism in design practice. What set them apart from other design curricula in Thailand is that they have had a compulsory course on sustainable design since the beginning of the programmes and both are nearly equally longest running courses of their kind – approximately a decade. The course leaders have been the driving forces for the existence of their courses. Although not knowing each other and coming from non-identical educational backgrounds, both course leaders have been ordained as Buddhist monks and keen on reading Buddhist literature. Both admitted that previously they did not see the link between Buddhist concepts and design for sustainability. They have gradually realised the connection once constantly dealing with the teaching materials and lesson plans.

For them, spiritual elements have been utilised for teaching design for sustainability. It is the personal belief that keeps them going. One educator articulated the association between his spiritual aspiration and sustainability teaching and learning in design education. It is the link that he became to understand after the process of spiritual self-actualisation.

“I was once ordained as a Buddhist monk. I have always thought that being a monk is an ultimate example of sustainable living – having two meals a day, putting on simple outfits, no hair no shampoo. The last session of the sustainable design course that I teach contains a lecture about some concepts in Buddhism that are relevant to sustainable development. I am not going too deep into details though. As we know, the core of design business involves generating and satisfying needs, wants and expectations. Many design values, especially in the context of consumption and consumerism, can conflict with the core of Buddhism. If I talk about it extremely, students will be confused. Therefore, I focus mainly on the Buddhist Economics, which suggests to lower the desire for consumption and to be satisfied with lesser consumption. It’s all about balance. Then I attempt to suggest what designers can do based on the concept of Buddhist Economics to build a more sustainable future.”

(Interview, 21 December 2015)

The interview excerpt above conveys the idea of avoiding the extremes, which is embedded in his decision-making process. He considered “The Middle Way” or moderation when preparing the course content for his students. Thus, for the balance between the practice of Buddhist laymen and the practice of designers, he opted for the concept of Buddhist Economics.

Both educators revealed that, even though design for sustainability has been part of the curriculum since the start, they do not think their courses are successful. As they have observed over the years, students tend to neglect the whole concept of sustainable development when working on a sustainable design assignment and prefer to focus mainly on the practicality of working with natural materials, agricultural wastes, redundant scraps from manufacturing sites or other waste materials. For their students, sustainable design is considered merely “a practical approach to create a new language of aesthetics for design.”

The research findings regarding the spiritual dimension hint at a great potential for the process of self-actualisation and personal transformation to contribute to a learner’s realisation of sustainability. Still, all educator participants in this research asserted that sustainability seems to continue to remain as a shallow trend in Thailand’s higher education. A large proportion of educator interviewees who currently teach sustainability-related courses in their design curricula admitted that they are not fully aware the overarching concept of sustainability. Several of them are interested mainly in the social aspect of sustainability, particularly dealing with the question of how design can create social impact. Some of them focus solely on the basic design tools associated with green design. A few include SEP as a core of their sustainability-related course. The research findings suggest that what is completely neglected in the present design curricula nationwide is the long-term perspective concerning the future generations and the nature’s principle of interconnectedness, which make the learners realise that human beings are part of nature.

7.3 Conclusion and reflections

There are a number of rhetorical and ideological labels in the context of Thailand's higher education. Deeply grounded in the hierarchical tradition, these terms are situated in a clear power structure in a manner which reinforces the top-down authority. His Majesty the King, the government and the policy-makers working in the higher education are regarded by interviewees as major rhetoric initiators who deliver grand, context-specific figures of speech as a kind of foundation for designing policies and action plans. On the other hand, the rhetorical terms that are widely debated, developed extensively, and adopted from the external forces are often seen as insignificant – one of which is ESD. In addition, when discussing a particular topic, most interviewees spontaneously pointed out at individuals and institutions rather than any specific concept, system or ideology concerning such issue. This particular aspect shows the unique Thai characteristics of the hierarchical cultural relations and person-based social institutions, which focus chiefly on the importance of the social positions of the rhetoricians such as seniority, class, rank and power. **Since a number of rhetoric-inspired, top-down policies discussed in this section are rooted in the person-based approach in policy making, these policies have not been openly debated and systematically studied in term of feasibility.** In many cases, the interviewees confirm that there is not any effective mechanism to monitor policy implementation and evaluate the policy impact. Clearly, it is consonant with the literature review which suggests that the entire education system in Thailand, including higher education, is a vital infrastructure behind the reproduction and maintenance of the person-based approach tied to the hierarchical relations. However, regardless of credibility and persuasiveness of the rhetoric or its creator, the stakeholders at the operational level do not always follow the rhetoric or implement the rhetorical-based policy in their practice. This phenomenon shows another set of Thai cultural characteristics, such as valuing flexibility over ideology and laxness in principle. Hence, **the lack of accountability of stakeholders working in higher education** is repeatedly mentioned in the presentation of research findings.

One can observe that there are numerous rhetoric-based movements at multiple levels in Thailand's higher education. Sustainability-related ideas have found their place in many rhetorical situations too. A number top-down, rhetoric-driven policies have been formed, followed by the development of action plans. Still, when examining each case regarding the attempt to implement the rhetoric at the operation level, evidence usually exists on a spectrum and countless factors are identified. The factors span from the sociocultural dimension (such as bureaucracy and institutional culture) to the techno-practical dimension (like management approach and solutions to energy efficiency and waste reduction.) Most of these factors are closely connected to or influenced by Thai cultural characteristics. Undeniably, **a set of unique, well-established characteristics discussed in this section is socially and politically pivotal to the**

development of disagreement between rhetoric and practice in Thailand's higher education.

Through an investigation of phenomena in the current paradigm of both higher education and design education, the literature review and the research findings from non-student participants signal that **the current worldview of Thailand's higher education is mechanistic**. The disconnection between rhetoric and practice has been addressed throughout the chapter. At the same time, the research findings imply that **a paradigm shift to sustainability is necessary for all levels of education in Thailand**. However, there are numerous challenges to change the mindset and behaviour of all stakeholders at multiple levels, from **the lack of infrastructure provided by the government for design industries**, to **the bureaucratic culture in each institution**, to **the conflicts of interests among design educators in the Department**. A large number of barriers to change seem to be the Thai cultural values and characteristics.

The participants with management responsibilities taking part in this research believe in **the top-down approach in management to drive sustainability**. However, all participants who are educators and design practitioners thought that **the role of design educator is utmost important to instil sustainability values in students**. Furthermore, the research findings suggest that **individual educators who have a passion for sustainability play an extremely vital role in introducing and attempting to embed sustainability into curriculum**. The tension between those who consider themselves 'the minority' and the majority who are not advocates of sustainability has been brought to light in this research.

All seven design practitioners taking part in the focus group discussion asserted that **sustainability should be integrated into all design curricula**. It should not be regarded solely as knowledge, but it should be made clear as design ethics. They consider that each individual educator should be a change agent for sustainability. This implies that, in their view, ESD should be embedded into Thailand's design education through the 'frame of mind' concept. The question of how remains to be found in the next chapter.

Moreover, the research findings reveal that **the attempts to employ Buddhism as a means to create resolution frameworks to assist a shift to sustainability** have been recognised and documented. From the Buddhist-based rhetorics like Sufficiency Economy Philosophy (SEP) and Amicable Assessment Model (AAM) to examples of educators who reported that their personal spiritual transformation experiences have assisted their understanding of sustainability in order to teach sustainable design to students. It is interesting to look at how Buddhism influences a number of stakeholders at different levels and helps to transform Thailand's higher education toward a more sustainable direction. This also implies that the concept of "sustainability as a frame of mind" has already practised by some research participants.

CHAPTER 8: FINDINGS FROM DATA COLLECTED FROM STUDENT PARTICIPANTS

This chapter presents the findings from student data, which there are two parts. The first part (8.1) includes the findings concerning students' experiences in their design curricula. It responds directly to the first and second research questions – “Is a paradigm shift towards sustainability in Thailand's design education plausible and able to be put into practice?” and “Could ESD be embedded into Thailand's design education through the ‘frame of mind’ concept?” The second part (8.2) includes the findings regarding students' reflections on the curriculum interventions. It contributes greatly to the third research question: “Can dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?”

8.1 Students' experiences in their design curricula

This section explores the themes that present the curricular experiences of students in eight focus groups across six institutions. These themes are connected and nested together, as shown in Figure 21. The findings in this section are based on the theme of current situations and curricular practices, influenced greatly by the Thai cultural values and characteristics as well as the dominant worldview of Thai design education. Power structure plays a significant role within the current curricular practices, conditioning and shaping individual student's mindset and perception on sustainability. The previous chapter indicates that ESD has not been integrated fully and systematically into Thai design education. Therefore, student curricular experiences of ESD in various programmes are explored in this section too.

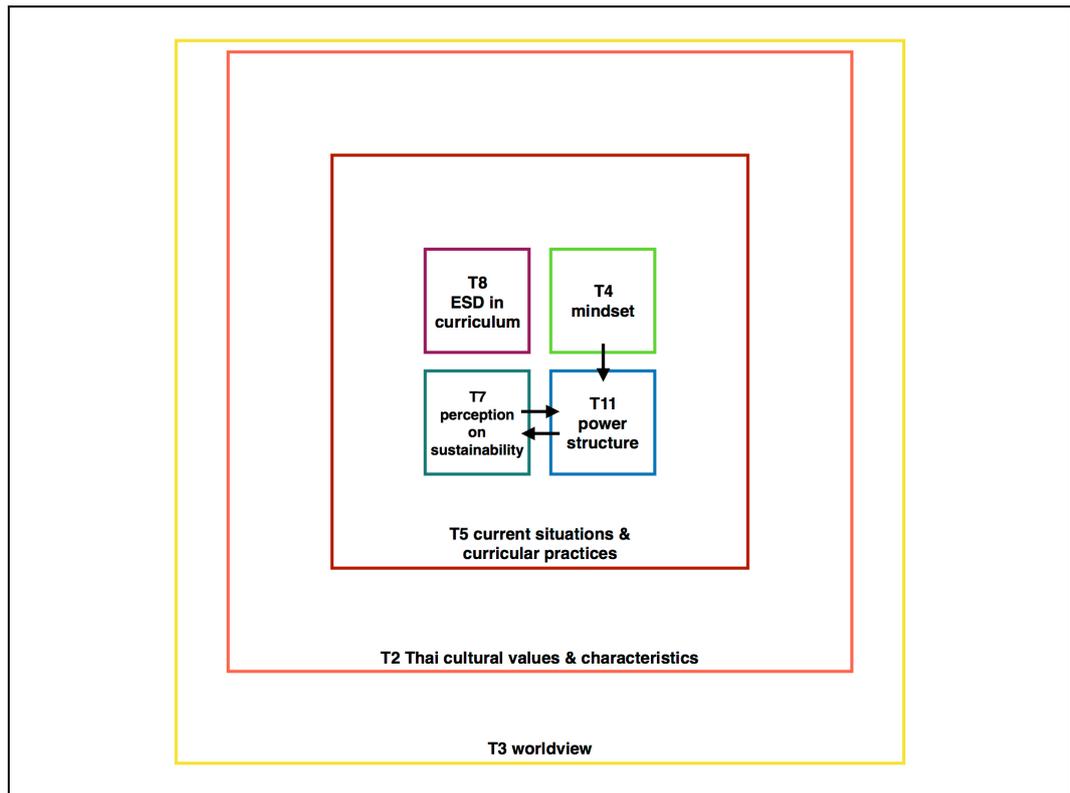


Figure 21: A diagram presenting the relationships between the key themes explored

This section aims to examine in depth the findings in three themes nested within the theme of current situations and curricular practices: power structure (in relation to mindset), perception on sustainability and ESD in curriculum. These findings concerning students' the curricular experiences were drawn from fifty-two students in total. Table 20 shows the breakup of the number of students from six different institutions taking part in eight focus groups at the end of their curriculum interventions.

Table 20: Number of student participants of each focus group discussion

Institution	A		B		C	G	H	I	total
	Pilot (A1)	Main (A2)	Pilot (B1)	Main (B2)					
Number of students	8	8	7	4	6	6	6	7	52

8.1.1 Power structure

The findings from student participants confirm that the culture of seniority dominates Thai design education and leads to the steep hierarchical structure in teaching and learning. There are five interlinked sub-themes contributing to the issues around the power structure.

8.1.1.1 The role of design educator

The seniority value is at the heart of the top-down, teacher-centred, transmissive approach in Thai education. It affects greatly how Thai design students learn, think and act. A number of findings present issues concerning the high hierarchical status of design teachers versus their performances. Unlike the views of the educator participants themselves, most students in the focus groups did not mention generational differences between the teachers and the learners as an outstanding obstacle in their design learning process. It is actually the whole range of hierarchical statuses, the ones that position the teachers as inevitably superior (*poo yai*) and the learners as always inferior (*poo noi* or *dek*). According to the data from students, a teacher may have multiple roles in one depending on the situation. The common roles suggested in the findings are “parent”, “boss” and “customer”.

8.1.1.1.1 “Teacher as parent and students as children”

According to Komin (1991), the superior’s role in Thai culture is more like that of parent, who is obliged to make decisions and take care of one’s family, much like the idiom “Father knows best”. In return, the family is grateful and respectful. In general, young people are quiet in the presence of older people, younger people seldom disagree with older people, opinions are rarely expressed, questions are not asked, and quietness is considered a virtue.

At one institution, this concept was argued extensively in the focus group. Students presented mixed feelings. They reported that some of their teachers regularly “nagged and moaned” at them about their lack of discipline and lack of dedication to their studies. One student suggested that the said behaviour was a kind of teaching and it was always done with care and a good intention, like parenting. However, all students in the focus group agreed that this repetitive behaviour always consumed a considerable amount of time during a session and had affected the quality of teaching and learning as a whole. Furthermore, they regard this “teacher as parent” concept as a key factor contributing to flexibility in their learning process. As observed by all students in the focus group interview, these teachers paid their attention to each student’s development pace and level, and they refrained from leaving anyone behind. Consequently, they usually failed to catch up with the timetable stated in the course outline.

At another institution, the concept of “being a favourite child” (*look rak*) was brought to debate by students in two focus groups. The debate largely involves the topic of judgement and prejudice. In their view, *look rak* may be a hardworking student, a student who have a very similar taste in design with the teacher, or a student who is so skilful at something that can be put to good use in the teacher’s private design business. They reported that the teachers’ act of favouring towards students who are their *look rak* can be so obvious that all students in the same year group can notice. Those who are not *look rak* are lower in status, receiving less amount of attention. In addition, all students in one focus group reported that they were labelled by their teachers “the most stubborn year group” because there is a large number of students who did not follow the teachers’ orders.

8.1.1.1.2 “Teacher is the boss. And the boss is always right.”

Students in all focus groups gave countless examples presenting a scenario that the teacher is the one who makes orders and decisions. The concept of task ordering (*sang gnarn*) is very common in Thai education. A student from the pilot study focus group at Institution A visualised what regularly took place in his/her studio learning experience.

A1-9 “The process usually goes like this. The class starts. Always late. A teacher or a team of teaching staff comes in and gives us a brief. By saying only, no document given. Then they walk out, leaving us to do everything by ourselves, without knowing the assessment criteria. We have to solve problems without knowing how to do it properly. We don’t even have any basic understanding of the topic. I wonder, since the teachers are more experienced than us, why don’t they guide us?”

Furthermore, as reported by students from all six institutions, there are teachers who tend to “ditch” their students’ ideas completely if not satisfied (*lom bab*). All students in the focus group at one institution asserted that one of the questions they usually received from the teachers is “Why don’t you do it this way?”. For these students, it means “You have to do it my way.” One student explained of the whole process.

H-13: “We get used to the design learning process that the teacher gives direction and makes a decision for us. First, we have to do initial research and present it to the teacher. Then we start sketching and develop our designs further. After that, the teacher picks the design that (s)he thinks it is the best among all, or perhaps the one (s)he likes most. We must develop the selected designs until the teacher thinks we have done enough. In the end, we must produce well-made, neat-looking prototypes using inexpensive locally-available materials. The whole process is so inflexible that we can’t suggest any change.”

All students in the eight focus groups asserted that the rigidity of the teachers’ request could be excessive. Their orders often come with requirements for something that has fixed formats and templates. After all, the boss sets any rule (s)he likes.

8.1.1.1.3 “Teacher is the customer. And the customer is the king.”

The most common trait of design teacher suggested in the focus groups is teacher as customer. As stated by students from all eight focus groups, when the teachers position themselves as the users or the customers, their design practices often fall into the trap of “doing whatever to please the teachers.” The students are aware of how a market works in reality and how important it is to understand their target users; however, they think that this kind of role-play practice is corrupt and unhealthy for their design learning process. Many of them expressed that they regularly received comments containing the teachers’ personal tastes and liking. The real needs of the target user as indicated in students’ research data may be less important than the teacher’s preferences. All students in the focus group at one institution stated loud and clear that “the ultimate goal of each assignment is to meet the teachers’ satisfaction.” In their view, this kind of practice is like a mind-guessing game. Moreover, all students in a focus group at another institution see it as implantation of the made-to-order attitude, which kills off creativity and ability to make decisions based on reasoning. For them, the teacher-as-customer mode repeatedly made them feel lost. One student in the group said that it is very difficult to get on with his/her work after receiving egocentric comments which are often too abstract.

H-8: “One teacher often says.... This is beautiful! Continue working on it. Make it even more beautiful!”

At another institution, two students from one focus group gave a couple of examples of what often happened during a project crit. Their male teachers required them to add more elements to the designs, even though the elements suggested are neither derived from the research and irrelevant to the needs of the female users of the designs. One student from another focus group at the same institution exemplified a similar situation.

A1-22: “Many of the teachers are stuck in outdated thinking, possibly because of their age. For instance, when they want us to do something with mechanics, they ask us to design elements that clearly exhibit the mechanism. Now we are in the period of time that products have touchscreen interfaces. What’s the point of designing something with an obvious button or handle? Just to please the teachers?”

Three students from another institution related this kind of mentality to the rationale why sustainable design has not been fully integrated into their curriculum. They expressed that the traditional design practice focuses on the needs and wants of the users. In their opinion, when this strong anthropocentric view of the mainstream design industries is combined with the teacher’s self-centred mentality, the out-turn is ignorance.

In a nutshell, the teacher-centred approach strengthened by the seniority-based culture can directly impact the lack of peer learning. This is because students have been conditioned that opinions from their peers have less value or are inferior than those from the teachers.

8.1.1.2 Judgement and prejudice

Because of the teacher-centred approach, students in all focus groups implied that the judgements and decisions of their teachers are utmost influential in the design learning process. There are two aspects to look at within this sub-theme.

8.1.1.2.1 Students' dilemma with "right" and "wrong"

The findings suggest that students believe that their freedom to be creative and to make decisions for themselves is confined due to the right/wrong judgements from their teachers. The direction of each design assignment depends very much on what the teachers think. Students discussed in many ways about their frustration regarding their teachers' comments and feedback, which frequently weakened their confidence and left them "feeling lost".

In two most conservative design curricula, which primarily concern the traditional craft traditions and employ the master-apprentice model, students revealed that the right/wrong conundrum results in their lack of motivation for learning design. The words "right" and "wrong" are subjective and regarded by these students as impractical for their learning process. Because of the judgmental manner of the superior, the feedback given is perceived by the inferior as "a big deal". Since the teachers did not offer constructive suggestions, these students silently question the orthodox concept of the role of teacher as "knowledge provider". Furthermore, all students in two focus groups from other two institutions asserted that this kind of situation has made them observe and become aware of how each individual teacher is like so that they can adjust themselves accordingly when approaching the teacher. The teachers' right/wrong judgements contribute to another, more complicated sub-theme – assessment.

8.1.1.2.2 Assessment issues

When it comes to the topic of assessment, the findings reveal that the majority of students from eight groups across six institutions feel that for most of the time design assignments revolve around the practice of pleasing the teachers rather than working to meet the learning outcomes officially stated in the curriculum handbooks. For them, the concept of assessment greatly involves the teachers' expectations. In the students' view, marks were given based on how well they could respond to each teacher's requirements and preferences. This phenomenon reflects the relation between the assessment criteria and the judgement grounded in the ego-orientation

value of individual teachers. According to the findings, such relation seems to override the universal set of considerations that design students must take into account when working on design.

Students in two focus groups asserted that the most challenging part for many of them is to conquer the teachers' mind-guessing games. And as time went by, these students learned to know each teacher's preferences. Accordingly, they worked on their assignments in the way that the teachers would like to see. Likewise, many students from two focus groups at one institution reported that several of their teachers display a fixed perspective on design. Thus, for students to gain good marks, they must work correspondingly to the teachers' expectations – the pictures that the teachers have in their minds. Similarly, students from two focus groups at another institution reported that their self-directed projects were tricky to handle because they would not be able to proceed with the proposals if the teachers could not visualise the final designs from the start. For them, they think that their teachers often corrupt the design process and the assessment part in the end is unable to truly justify the academic performance of any design student.

None of the students in all focus groups thinks the assessment criteria have been made crystal clear to them. They were not aware of the expected learning outcomes which they were intended to achieve. As the students pointed out, the only obvious matter for them is their teachers' preferences. The findings reveal how the three different design educator traits affect the assessment process.

The first to look at is the teacher-as-customer trait, which is most dominant among the three traits. The findings suggest that "the requirements" in each design brief are regularly coined as "what is requested by the teachers" or "the elements that the teachers would like to see". Therefore, the project requirements are seen as a set of checklists and can vary greatly from one teacher to another. In many cases, as indicated by students from various institutions, the areas concerning research and solution analysis are deemed less important than the physicality of the design outputs and sometimes completely overlooked by the teachers. Consequently, the person-based approach in assessment of students' design works results in a neglect of the sense of rationality which plays the most basic role in justifying the credentials of design practitioners. What is more, the concept of working to achieve the expected learning outcomes seems to be missing from this particular tradition of design teaching and learning. For example, at one institution, there is a compulsory course on materials and processes for design which all students in the focus group reported that they were encouraged to use natural materials and recycled materials in their design works. These students agreed that they only thought of the assignments as "something that the teacher wanted and asked them to do." None of them considered why the teachers were concerned about their decisions on material selection for design and what they really learned

from the assignments. Besides, one archetypal example from a number of dialogues across different focus groups is that some teachers value the aesthetic quality of design more than other aspects. That being so, these teachers require students to produce “beautiful” design outputs, setting aside what they count as insignificant. At one institution, all students in two focus groups articulated that they have been trained profoundly to design attractive-looking objects and nurtured extensively to appreciate some specific aesthetic styles. They have been cultivated in admiring elements of Western preferences in design like shapes, proportions, colours and so on. One student thinks of it as an advantage, as one of the unique strengths of the curriculum to assist students to have “a good taste”, which is very useful in the economic sense. Students in other three focus groups reported that the term “beautiful” is too often subjective and they are usually left puzzled about what should be perceived as “beautiful” and how to achieve it.

The second one to explore is the teacher-as-parent trait. At one institution, the findings suggest that how students work on their assignments connects to the concept of “living up to the teachers’ expectation.” In this way, what an individual teacher has in mind – what he/she expects to see – functions as a set of marking criteria. One student revealed that the teachers’ negative feedback often acts as a kind of punishment rather than a developmental tool aiming at enhancing each individual student’s learning curve.

I-6: “Each teacher’s personal preferences play a vital role in the assessment process of design projects. Our teachers know every student and have an expectation for each of us. They have monitored our development since year one. If we fail their expectation, they would say clearly that they are disappointed.”

In several other institutions, students are aware of the teachers’ biases and prejudices. In some groups, students reported that the sense of trust between them and some particular teachers is weak. A group of students in one institution asserted that the concept of *look rak* or “being a favourite child” is apparent and impacts how marks are given. Likewise, a group of students from another university doubts the fairness of the marking process.

The teacher-as-boss trait is the third to look into. The findings suggest that it is based on an aspect of seniority that the superior hold the right for making judgments on behalf of or against the inferior. This issue seems to inevitably result in an authoritarian orientation and affect how the assessment process is handled. Design students from different focus groups told stories reflecting this phenomenon in their curricula. One of the common practices is *lom bab* – a teacher ditching and banning completely the design proposed by a student. According to students, the act of *lom bab* may be done with or without giving a reason. It may or may not involve an emotionally intense interaction.

Many students from various institutions assume that their teachers believe that the high quality of a design model can reflect the dedication, diligence and expertise of the student who made it. One student summarised that assessment seems to be all about “what the teacher would like to see at the end of the project rather than the whole picture of the design and development process.” Hence, the criteria and how students’ works are marked often remain “mysterious” to them. All students in all focus groups indicated that the deficiency of decent feedback on assignments is extremely problematic.

In the perfect world, assessment and feedback must be embedded within supportive learning environments and relationships. However, the findings reveal that the reality in design education in Thailand is still far from ideal.

8.1.1.3 Deficiency of peer learning

The findings indicate clearly that peer-learning in the curriculum is rare as the teacher-centred mode is heavily employed in Thai education system. Students are seldom provided with activities that require them to interact constantly with each other like workshops and seminars. The lack of studio culture is also a common result of this phenomenon. There are three aspects to explore in this sub-theme.

The first aspect to look at is how the hierarchical tradition in learning affects peer learning in Thai design education. Students in all focus groups discussed extensively the deficiency of studio culture and peer-based activities, in relation to the hierarchical tradition in the Department. In their view, seniority plays an extremely crucial role in the lack of peer learning. In the craft-based design programmes, seniority is often backed up by the master-apprentice model of learning. The conversation below from one focus group helps to exemplify this phenomenon.

- I-8: “When we’re assigned to work in class, we are told to work individually at our desks. The teachers don’t come to check on us. Later, after we submit our works, each of us only received the work back along with a piece of sticky note with some comments written on it.”
- I-13: “Exactly, they don’t come to see us when we’re working. They just sit in their office doing their own things. Sometimes when I can’t think of anything, like I get stuck, I only glance at others and wish the class finishes soon.”
- I-4 “If you don’t go to see the teachers and ask them for help first, they will never come to see you.”
- I-6: “And if you have a different opinion from them, you need to have a solid evidence to back up your reason and support your argument. Otherwise, they will just overwhelm you with their ideas.”

This conversation visualises that, within the hierarchical tradition, although students are given an opportunity to do studio-based work, the whole process of studio culture does not exist in the curriculum. Students from various groups asserted that the cultural barrier between the teachers who hold a higher status and the students who hold a lower status impacts the way they learn as well as how feedbacks are given.

The second aspect to look into is how deficiency of facilities leads to the lack of peer learning. As indicated by a large number of design educators and students taking part in this research, institutions may provide inadequate facilities and staff to form studio culture. The findings reveal that, in this kind of situation, students get used to learning from peers either in their own time or when using the technical workshops together. Peer learning has seldom been planned and encouraged by the teachers. Instead, for most of the time, it is more like a result of the social behaviour of design students themselves. The findings imply that students could have learned from each other more if peer learning is recognised and conducted systematically in the curricula.

Students' view on peer learning is the last aspect to explore. Students from all focus groups reported that they would like to learn with and from their classmates. The findings imply that, even though the students' view on peer learning is generally positive, there are various factors contributing to the complexity of such view. The first factor is their past peer-learning experiences. For instance, at an institution, students revealed that they have been through some peer-learning activities provided by the curriculum. They enjoyed working on group projects as their classmates brought in different perspectives. One student gave a positive comment on this.

B-3: "Working as a group is extremely useful for two things. First, it's the emotional support. As we are going through the same task at hand, we can share our feelings and relieve the stress associated with the project. Second, it helps us see various potentials in the groupmates. One is good at this. Another is good at that. It's a delight when we have to plan something together. We can learn from each other a lot by working together."

The second factor is their year group size. Students from a large year group at another institution reported that lecturing is a standard method in their programme and they are familiar with having a passive role in the learning process. The exchange of dialogues between students or between students and their teachers in the classroom is not common. In their view, it is partly due to the large student group size. The third factor, which is most outstanding among all factors, is the face-saving attitude among peers, students from three institutions suggested that sharing ideas and criticism to peers may be awkward in many ways within the learning culture deeply rooted in the teacher-centred approach. They only give comments to peers when the teachers are not around, but they usually refrain from directly critiquing. This is because they do not want to make their peers feel bad or embarrassed. Two students expressed that they tend to avoid discussing assignments with peers since it may lead to comparison. Some students argued that they do not

feel safe to exchange ideas with peers as they cannot be certain if their ideas will be stolen or not. All these issues in the discussions reflect the intricate link between how they see the importance of peer-learning and how they hold the Thai cultural value of ego orientation.

8.1.1.4 One-way communication and the lack of feedback

The findings reveal that the steep teacher-student power structure is a great barrier to teacher-student communication. The role of teacher in communicating with the learners was critiqued to a great extent in various student focus groups. There are three aspects to look at in this sub-theme.

The first aspect is students' reluctance in communication. The findings indicate further that students in all institutions tend to ask their peers for clarification when they are confused with what is taught in classroom. If their peers cannot help, they then consider asking the teachers. All students in one focus group at one institution believe that the teacher-centred approach employed consistently in the education system is the significant factor in shaping students' "shyness." Moreover, two students from two institutions shared their thoughts in the same way about the feelings of uneasiness when communicating with the teachers, especially those who are much older than them. One student in another institution articulated this matter further by pointing out that this extra consideration affects his/her decision to communicate with the teachers. For him/her, asking a question to a teacher face to face is intimidating enough but writing an email is even more complicated. In his/her view, writing involves more formality and it is worrying when it comes to spelling accuracy and appropriate word choice. Thus, the process of crafting the language put him/her off from communicating with teachers. In addition, a communication problem may involve how much time students are given by the teachers to prepare themselves before communicating. Students at one institution reported that they have always tried to avoid being judged by their teachers. If they do not feel confident with the work at hand, they prefer keeping it to themselves. This is also part of the culture that Thais prefer to see the complete end results – it is also about the "face" issue.

The second aspect to explore is the common problems of one-way communication. Students from four institutions stated, based on their experiences, that a large number of teachers habitually do not explain anything in depth. Once students are asked if they have any question, they keep quiet as they cannot think of what to ask. Students are aware of and used to this kind of behaviour pattern and stated that there are two common scenarios which students find difficult. One is when a teacher is lecturing too fast and students tend to be reluctant to ask the teacher to slow down or repeat what has just been said.

G-31: “The teachers do lecturing as if it’s a routine job that they want to get it done. Sometimes they go from one slide to another so quickly that we can’t catch up. The explanation is usually concise. Only a few teachers are proficient at articulating the content.”

Another is when a teacher is giving a new assignment, but keeping explanation too brief. Many students from various institutions claimed that one typical issue is the interpretation and clarification of design assignments.

I-4: “The teachers come into the classroom and *sang ngan* (order us to work). They assign us to work on something without introducing us first about how to approach the design brief properly. They only bluntly said... you could do it this way or that way and that’s it. But I don’t think it is a proper way to teach someone to do something.”

Students from several institutions expressed that, owing to the lack of consistent two-way communication between the teachers and the students, miscommunication between them happens very frequently.

The third aspect, which is more of the outcome of the two previous aspects, is the lack of students’ feedback to the teachers. The findings indicate very strongly that the lack of feedback from students, especially on how the teachers teach, is a very common communication stumbling block. For example, all students from two focus groups at one institution are not satisfied with the teaching approach and content in the curriculum. Besides, they think the teachers’ performances should be monitored and evaluated constantly. The findings reveal further that students from various focus groups inevitably see themselves as the powerless in the learning realm and believe that, as their voice has not been recognised by the teachers, the true curricular problems piled up and hidden under the carpet remain unsolved. Many students commented that, even though they are aware of problematic issues in their curricula, they choose to keep going with the flow – “proceeding things as they have been before.” For instance, at one institution, the focus group discussion presented two behaviour patterns of the students. First, they get used to being told what to do by the teachers. And second, they fear to make mistakes or doing something wrong. As a result, they give in to struggle. They choose to “play safe” and comply with the traditions.

Students’ awareness of the problem does not lead to any path for resolution. As it happens, the practice of social smoothing remains strong – students choose to comply with the teachers in order to exhibit politeness and respect. In a big picture, students do not send feedback to the teachers and they are stuck with one-way communication.

8.1.1.5 the effects of the power structure: the imbalance between the hand, head and heart domains in the curriculum

This sub-theme explores the empirical consequences of the seniority culture in Thai design education, based on the view of students. According to the findings, students believe that the current power structure in design education underpins the imbalance between the hand, head and heart domains in the curriculum. On top of that, students in most focus groups asserted that the kick-off of such imbalance in design education begins during the pre-university years. More than half of the student participants taking part in this research revealed that they selected their current design programmes without knowing what exactly they were going to study. As stated by students in one focus group, art tutors in cram schools are very influential for the prospective design students' decision making. The decision to secure a place in a less competitive programme in well-known institutions was encouraged by these tutors for sharpening their practical skills in art and design. They also reported that the current curriculum is "not what they expected to learn." Moreover, students in less competitive programmes asserted that they did not quite know the differences between art, craft and design. This may be implied that the perceptions of design as well as design education among pre-university students are problematic.

In order to understand the effects of seniority in conjunction with the imbalance between the hand, head and heart domains in design curricula, there are three key features to look into.

8.1.1.5.1 The strong product-making tradition of design

According to both student and non-student participants, the aim of design education in Thailand is to only develop students' capacity in producing objects for the commodity-based capitalist economy. The findings reveal that it is a result of the educators' rigid, single disciplinary perspective on design. It also reflects the fragmentalist view of Thailand's design education.

The findings present that the lack of interconnectedness between design and other disciplines can be traced back to students' prior perception of design. Before commencing their undergraduate programmes, many students had noticed only the close association between art and design, not other disciplines. This is also partly because of the absence of Design and Technology education into the national curriculum. When looking at the curricular structure of the undergraduate programmes, there are General Education courses, which are compulsory courses for the first and second-year students. They are a set of basic coursework modules from across the spectrum of liberal arts and sciences. However, students revealed that they often perceived these courses as non-design subjects of minor importance for the training of future designers. A large number of students from various institutions reported that they dislike the General Education courses because they are unable to relate these courses to design, and these

courses are usually instructed as lectures, using the teacher-centred, rote learning approach. Hence, students feel that the General Education teachers are not attentive to students. These students commented that the academic staff do not point out the connection between different disciplines and how to integrate them for design. As a result, without proper guidance, they feel that they have been instructed a set of different knowledge and skills which are irrelevant.

When looking closer at design teaching and learning, the teachers are seen by their students as the ultimate decision-makers as they often hold the teacher-as-parent, the teacher-as-customer, and/or the teacher-as-boss traits. Therefore, students admitted that they have tended to become more or less unaware or uninformed of the notion of stakeholders in design as well as the significance of design research. Students think that the absence or undersupply of contextual studies in design within their design curricula is alarming. In their view, they have not been taught to understand the whole picture of where design sits in the society and that the design profession connects spontaneously to knowledge, skills and people of other disciplines.

Students across different focus groups, from both craft-based and industrial-based design curricula, reported the same issue that some of the skill sets their teachers emphasise or require them to have for assessment are often either outdated or irrelevant. The most mentioned aspect is the stress on techniques needed to produce neat-looking design outputs. All students in one focus group confirmed that, when it comes to assessment, their teachers have two main concerns. One is the size or quantity of the models, since the teachers prefer full-scale models with details or with a lot of elements in one. Second is the aesthetic quality of the designs, because the teachers tend to put an emphasis on the crafting quality more than the whole design and development process. By the same token, all students in a focus group at another institution reported that appearance, functionality and practicality are three key things that the teachers look for in any design assignment. But the visual quality is always utmost, especially how well models are made.

Furthermore, all students in three focus groups at two institutions asserted that the academic staff in their Departments have serious problems in working as a team. As these students had observed, they concluded that the conflicts of interests between academic staff cause the deficiency of communication among themselves. In their opinions, it is the main reason why different sets of knowledge and skills from different courses in the curricula are not linked. The findings suggest that their teachers' reductionist view, which only focuses on some favourable parts not the whole picture, is presented throughout the teaching and learning process especially the assessment. Hence, the result is the lack of continuity between courses taught by different teachers. Moreover, students from all focus groups believe that the lack of interdisciplinary value among design educators contributes greatly to the way sustainability is positioned in their curricula. The findings present that sustainability is considered by most teachers as an add-on or

a special interest of an individual teacher, rather than an overarching concern that needs to be given attention in the field of design.

Most importantly, all students taking part in the focus groups expressed that the strong making tradition often overrides all other dimensions of design education. As they looked back at their past experiences, they reflected that their early university years seriously lack a nurturing of the ethical dimension and the development of intellectual skills such as critical thinking, reasoning and research. One of the main issues in discussions is that teachers tend to instruct students in a vocational manner rather than theorising design from their practical perspectives. Students from all focus groups expressed that the teachers' object-oriented view of design is eminent. In their opinion, this narrow view of design seems to be linked to the curricular emphasis on the making tradition and the appearance of designs, the lack of critical pedagogy, and the deficiency of research culture in Thai design education.

8.1.1.5.2 The lack of research culture and critical thinking

Students in the focus groups from five out of six institutions reported that, as their curricula revolve strongly around the aspect of making and the teacher-centred approach, they have not been appropriately enhanced with critical thinking and research skills, such as project planning, data collection and data analysis. Even students from research-intensive universities think they were not confident with their skills in research. The findings point out that students struggle with design research in various ways. How research is instructed in the curriculum contributes to these students' negative perception of and attitude towards research.

All students in two focus groups at one university denounced that their curriculum did not provide them competent research skills. None of the students in both groups sees the necessity of taking a design research course provided by the Department. This is not because they think that research is unimportant, but because they think their teachers are not proficient in research. In their view, how their teachers instruct design research is seriously problematic. All students in both groups also asserted that they had been left with a question of how to use research appropriately in design. Students from both groups declared further that they could barely relate what they had learned in the research course to any other courses in the curriculum. They concluded that it is because research has not been taught in the way that it is an integral part of design process.

Likewise, students from two craft-based design programmes, familiar with the master-apprentice model of learning, reported that their curricular experience causes their negative attitude towards the research process. The conversation from one of the two focus groups can exemplify this matter.

- H-2 “The teachers keep telling us to do more research, but they never taught us how to do it properly.”
- H-5 “In comparison to doing something self-directed like research, I prefer getting the right answer directly from the teachers. I can memorise better when listening to an explanation from the teachers.”
- H-8 “It's like storytelling. If a teacher tells us the whole story, we understand right away how it ends. But if we have to find the book and read it by ourselves, it's more difficult. We may get the wrong book or wrongly interpret the story.”

The quotes above vividly reflect these students' frustration, a lack in critical thinking skills and a negative attitude towards research. The findings imply that they seem to be trapped in the teacher-centred manner as they expect to receive spoon-fed knowledge and know-how from their teachers. This dilemma leads to their lack of confidence in doing design research. In their view, they are concerned if the data they have collected is correct or not. Ideally, they would like their teachers to guide them or just give them “the absolute answer”.

Furthermore, students in other three institutions confirmed that, if they are assigned to do research, their most preferred source of data is the internet. This is because, regardless of the validity of collected data, the use of internet search engines is fast, easy and economical. At the same time, the practice distorts the perception of research in several students. Some students said that they used to perceive that research is a complement activity for “composing a pile of documents that students must submit to support their works.” The findings from these three focus groups also imply that, as students observed, there are two critical issues concerning the research culture in their curricula. One is the lack of support from the Department to connect students with their personal research interests. Another is a tendency that design instructors hold an explicit bias toward doing and making over thinking and researching.

All students in all focus groups suggested that design research should be more valued and repositioned, in order to enhance their intellectual learning experiences. On top of that, they think that the way design research is instructed must be reconsidered and improved.

8.1.1.5.3 The disconnection between what is learned from the curriculum and the reality

Students in all focus groups questioned what they have learned from the curricula and if they can use it in the daily and professional lives. Many found some values and practices embedded in their curricula “excessive”, “irrelevant” and “inconsistent” with the ever-changing role of design in the society. The findings imply that the situation seems to be a result of the transmission of old knowledge and personal values of the teachers.

Students from a number of institutions think that their curricula overemphasise the making dimension of design, especially the aesthetic quality, size and quantity of the design outputs. In their view, such overemphasis undervalues other dimensions of the curriculum and overshadows the link between making and other design-related skills. Students from four focus groups in two institutions revealed that, as of their experiences, theory and practice taught do not go hand in hand. At one institution, they often see lectures and studio practices as two worlds apart. Students from other two institutions revealed that the non-making dimensions of design education had been overlooked by their teachers, such as the skills in research and development as well as contextual studies in design, which they think are also vital for working as designer.

Moreover, as articulated by students in some institutions, the stress on prototype making in the curriculum, which requires them to bring to perfection their models for every project submission, sometimes necessitates them to seek help from and pay for professional technicians. In one institution, the focus group conversation hints that the Department may lack competent technical staff. At another institution, the accent on the quality of making, in conjunction with the culture of spending a large amount of money on prototype production, was discussed extensively in the focus group. At a further institution, students expressed that they did not see the connection between the research phase and the prototype making phase of their design process. This is because the teacher-as-customer trait often corrupts the whole design process instead of having the design resolutions based on analysis of research data. Students pointed out that the academic staff consistently put a stress on the making quality of design outputs rather than the whole design process which also requires critical thinking and the ability to make sound judgments. These students believe that the excessive emphasis on the quality of making is not quite compatible with how it works in the professional design field today.

A large number of students taking part in this research questioned if they are really prepared for the labour market as well as their future. As observed by students, they think that their curricula involve predominantly the transmission of old knowledge and personal values of teachers, which can only pull Thai future designers away from the present reality. The majority of students in the focus groups believe that what is taught and learned via their curricula is not compatible to the needs of the creative industries which require a wide range of knowledge and skills from design graduates. The findings reflect clearly the concept of education as an agent of cultural reproduction.

8.1.2 Students' perception on sustainability

To understand how design students had perceived sustainability prior to the curriculum interventions, answers from students who took part in the focus groups are classified based on the similarity of the answers. Then, within each answer theme, it may appear a pattern of how students from the universities with and without sustainability policies perceived sustainability before the curriculum interventions. There are eight answer groups in total, drawn from eighty-three comments of fifty-two students. These groups appear to be overlapped because many students gave answers that contain more than one reason.

8.1.2.1 Answer group 1: "I did not know about sustainability at all." (One comment from one student)

There is a student from an institution employing sustainability policy who revealed that (s)he did not know about sustainability before. (S)he explained that (s)he had been concerned only to the matters that are appealing to him/her and issues around sustainability had not been fascinating enough. For instance, "I have to admit that I didn't know that the concept of sustainability existed! I had never heard of this term."

8.1.2.2 Answer group 2: "I had no interest in sustainability" (Eleven comments from six students)

There are several students who admitted that they previously were not interested in sustainability. Surprisingly, all of them are from two institutions that employ sustainability policies. Their answers suggested that these students held a mechanistic view. Some of them gave their reasons; some did not. Some answers show a sense of ignorance. These are some examples: "For me, previously, sustainability was out of sight." and "No, I was not bothered." One of them expressed clearly that (s)he thought it was irrelevant to his/her life because it was unable to help fulfil his/her financial needs – "No, I was not interested in sustainability. I thought it had nothing to do with making money and making a living." Another reported that (s)he had not been interested in sustainability because (s)he thought the concept was too "romantic". (S)he explained further that his/her curricular experience, which the emphasis is on the aesthetic dimension of design, also did not support him/her in understanding sustainability – "At first I wasn't interested in design for sustainability. I thought it was too idealistic and impractical. Perhaps that was because I only saw the examples on the websites. Sustainability was very rarely mentioned in any class here. The curriculum focuses on mass production systems. Consequently, I thought sustainability was just a trend. And it's not common at all in Thailand. That's why I wasn't interested." A further student drew on the similar comment with the statement above that the examples of sustainable designs (s)he had seen look unattractive. – "When I saw sustainable design examples, they didn't look

appealing. The colours were dull. I didn't think anyone would like to own them. And when I was during the first and second years, I was still attached to the idea that design must be visually attractive. I completely overlooked the ecological aspect of design." One student noted that (s)he has not been interested in sustainability as (s)he has considered that sustainability brings challenges and limitations to design practice. As indicated in the previous chapter, this answer correlates to the view of several design educators too – "I thought sustainability was extremely difficult to achieve, and I still think so. I saw sustainable design examples and I didn't find much pleasure viewing them. There are lots of limitations. There is an endless list of materials that should not be used because of their high environmental impacts. I personally prefer to work on design in a more traditional form-giving way, like graphic or jewellery design."

8.1.2.3 Answer group 3: "Personally, I was not interested. I was made to learn about it." (Five comments from three students)

There are three students who reported that they felt that they were "forced" to learn about sustainability by their school and/or university curricula. One out of three students is from an institution with a sustainability policy. For these students, the experience was like just knowing that sustainability knowledge exists, rather than realising the importance of sustainability. Here are some examples of their comments: "I was not interested in it. Sustainability was taught in school, so I had some awareness of it. The current curriculum made me feel a bit like I had to pay attention to sustainability because it seemed somewhat relevant to design.", "I didn't want to know about sustainability. My school asked me to take part in some campaigns. It's like I was forced to learn about it." and "It is included in the curriculum. At first, I didn't want to know about it. I couldn't understand why I had to know about sustainability. I thought it was about nature, not me."

8.1.2.4 Answer group 4: "I thought it was just a trend." (Thirty-eight comments from twenty-seven students)

More than half of the students taking part in the focus group interviews saw sustainability as an external factor - a trend that comes and goes. This answer group is joint most popular with the next answer group. These students did not fully understand sustainability. Many considered it was irrelevant to their lives. More than half in the student cluster from the universities with sustainability policies are included here. In their view, they did not want to be out of fashion. For them, getting to know sustainability just for a little would not hurt. They simply wanted to do like what others do. Some of them also expressed that their view was dominated by greenwashing. They thought of sustainability as a concept associating with marketing. One student believed and still believes that sustainability is crucial for capitalism and greenwashing can help boost the sales. Moreover, there are a number of students who considered sustainability as an external factor – a concept or a practice advanced by the western countries which Thais need to catch up.

These are some examples: “World demand for sustainable goods and services is booming. I thought we had to keep up with this global trend.” and “The government agencies only began to have interest in sustainability for several years. Thailand is far too slow to adopt sustainability from the outside world. We hear of SEP in media all the time but it doesn’t mean anything and it has no impact on our lives.” Moreover, for some students, they thought of sustainability as a kind of knowledge that is good to know. However, they did not feel like putting it to practice. One student gave an answer that reflects the lack of interconnected between present and future in his/her view – “I have been interested in sustainability, but I didn’t want to practise it. I thought design for sustainability would be needed in the future, but not for the time being.” Another student is aware of or has some knowledge on sustainability but decided that it was not what (s)he would like to pursue. (S)he saw sustainability as an extra knowledge. She said “I thought it was good to learn about sustainability as something extra, something that others don’t know but I do. I would not like to pursue it like a life philosophy.”

8.1.2.5 Answer group 5: “I was quite interested in sustainability, but I was not sure about its meaning.” (Sixteen comments from nine students)

There is a large number of students who asserted that they thought sustainability was rather interesting but they were not certain about the meaning of the term. Most of them also thought of sustainability as a trend. There are many examples to illustrate this: “I was kind of interested (in sustainability), but I didn't know its real meaning. I thought sustainable design meant designing something that looks timeless, not something that is considered stylish in only one particular period of time.”, “For me, the term ‘sustainable’ was confusing. I thought it implied that the design would last forever.”, “I was aware of sustainability, but I was not quite certain of its meaning.”, “I thought of sustainability as permanence. I interpreted sustainable design as to design something long-lasting.”, “I thought it was about the 3Rs principle.” and “I used to misunderstand that sustainable design and eco-design were the same thing. And I thought it was just a trend, that would come and go. So I had no motivation to do it.” Furthermore, at one institution which employs the rhetoric of sustainability, all students in the focus groups thought that they knew what sustainability and sustainable design meant. But after they took part in the curriculum interventions, they realised what they knew is rather shallow and associates mainly with the basic concept of green design. Students from two craft-based design programmes also revealed that they had previously misunderstood sustainability and many related terms.

8.1.2.6 Answer group 6: “Sustainability was new to me. It made me curious.” (Three comments from two students)

There are two students who were not sure about the meaning of sustainability because it was new to them. They were curious how it could be linked to design. One of them seems to have had a negative image of sustainability. But both reflected in the answers that they hold a growth mindset as they expressed a will to learn. Here are their quotes: “I didn’t have any interest in this topic. I thought the course on design for sustainability had to be boring. It’s got to be stressful. And I don’t like taking things too seriously. It’s not my nature. But I would like to try. I want to know how serious it would be – just to see if it would be intimidating like I thought of it at first.” and “I suspected why sustainability was included in a design curriculum. Sustainability got nothing to do with design. And it made me curious”.

8.1.2.7 Answer group 7: “Sustainability has been interesting for me and I would love to know more.” (Six comments from three students)

There are three students demonstrating a positive attitude towards sustainability learning in the way that relates to the growth mindset. They have an interest in sustainability, due to some personal backgrounds. They asserted that they would like to learn more about it. Here are their quotes: “I personally like to learn new things, the more, the better. I’m not fear of hard work, as long as I get something out of it. I love design, so I’d like to know what sustainable design is. A few years ago, I came across a book on sustainability. There are case studies from other countries, especially those in Africa. I thought about the social and environmental impacts created by those designs. Wow! I spoke to myself... ‘Design doesn’t need to be for rich people only.’ It was the first time that I realised there are a lot of people out there who are in need of useful designs – designs that can change their lives for the better. I have been taught that design can be a value added over a primary need or just pure luxury. But this book suggests otherwise. I’ve learned about sustainability quite a lot from the outside-classroom experience. And I still would like to learn more.”, “Sustainability is a very interesting matter. It’s made me seriously think about life, and about my design practice. I have read and observed a number of case studies too. I wish sustainability is firmly included in the curriculum, like a compulsory course for the first-year students.” and “I have been interested in just about anything that makes this world a better place... For me, a good design must be something useful, economical and affordable. That’s the kind of design that I’d like to do. I would like to design products that enhance our well-being and reduce waste at the same time. And I would love to be taught how to do that.” (The first two answers were given by students from two different year groups at the same institution. Both had previously enrolled in an elective course on sustainable design.)

8.1.2.8 Answer group 8: “I would like to know about sustainability because sustainability is about goodness.” (Three comments from three students)

There are three other students who suggested that their perceptions of sustainability related to their moral judgements and concerns. Regardless of delivering any intellectual message, their answers point out the connection between the notion of sustainability and the concept of doing something good. The Thai society has been indoctrinated with the Buddhist idea that one should reach out to do a good cause for others. In Buddhism, giving (*dana*) is one of the essential preliminary steps of Buddhist practice. However, the degrees of willingness are varied. Here are their quotes: “I would like to know more about sustainability not because it is my passion but because I just want to be a good person.”, “I have considered sustainability as very important. I felt that we needed to do something because the ecological impacts created by human activities are obvious. I have wanted to do something good.” and “I have always thought that the concept of design for sustainability is special as it can add “a feel-good element” into designed products.”

The majority of students in this research (thirty-four students with fifty-four comments) gave answers that belong to the answer group 4 “I thought it was just a trend (that comes and goes).” and the answer group 5 “I was quite interested in sustainability but I was not sure about its meaning.” There is a mix of issues reflected from all answer groups. Looking specifically at the answers of students from universities employing top-down sustainability policies, the findings suggest that the institutions’ sustainability communication strategies may not be effective. The comments from the majority of students from these institutions exhibit that they had neither understood nor held a positive view towards sustainability before taking part in this research. Regardless of the use of institutional rhetoric, a large number of these students thought of sustainability as a trend and were not quite certain of its meaning. Apart from some students who mentioned a little on the curricula experiences in relation to sustainability teaching and learning in their curricula, the majority did not discuss any ESD activities at their universities.

8.1.3 ESD in curriculum

This section looks at the current practice of design education in relation to sustainability teaching and learning in the curriculum. It aims to find out if the design curricula of the students taking part in this research prepare or support them to be able to design for sustainability.

8.1.3.1 Experiences of students in the institutions with sustainability policies

Among the three universities that have sustainability policies, only one has sustainable design as a compulsory course in the curriculum. For the other two, design for sustainability is an elective course. Students in all these three institutions stated that, apart from the sustainability course in the curriculum, knowledge and practice relating to sustainability are not provided in other courses. There is a technical aspect of the curriculum that concerns material selection for design, which often deals with ideas around durability and the economical use of materials. However, these technical issues have not been mentioned in the context of sustainability.

At one institution, all students in two focus groups reflected that there is a compulsory General Education course which provides some of the concepts in relation to sustainability. It is a course for first-year students from all Faculties across the university. However, in their opinion, the connection between General Education courses and the design courses run by the Department had never been made clear. They also reported that none of the academic staff in the Department has mentioned or articulated sustainability purposefully. Therefore, as the students concluded, sustainability is not deemed important in their curriculum. Further, students continued to express their frustration on the tradition of model making in the Department. They questioned the post-submission stage of their assignments as they have observed that most models become waste and redundant in the end. They stated that they understand that they are required to produce prototypes for all design assignments as part of the learning process, but they also questioned the level of appropriateness in exploiting new materials for each project. In their view, this specific tradition, which is firmly supported by the conventional object-based design paradigm of the teachers, is a massive barrier to integrating sustainability into the curriculum. Before the curriculum interventions, these students had not previously experienced full-on sustainability teaching and learning.

At another institution, the position of sustainable design as an elective course was extensively discussed in two focus groups. There are three students in two focus groups from two year groups who had previously enrolled for an elective course on sustainable design. As students observed, this elective sustainable design course is often scheduled at the same time with another practical design course, which is more well-received. Therefore, a time table conflict is a critical issue, resulting in only a small number of students enrolled in the course each year. The findings also imply that the hierarchical relations and the person-based social institutions are very influential to the students' decision-making process of elective course selection. The popularity of a teacher among the students is a significant factor. Regardless of expertise and experience, teachers who are younger and hold the cultural value of fun and pleasure orientation tend to be more well-liked. According to the students, when a course with serious content like sustainability is taught by a

teacher who is more senior and/or more determined than average teachers, students tend to hold themselves back from the course. The findings reveal further that, every year, only a small number of students who have already been keen on the environmental issues enrolled for the sustainability course. When looking at the overall picture of the programme, they reported that the course lacks practical elements and they have failed to transfer their understanding and skills of sustainable design for assignments in other courses.

At the third institution, sustainable design is scheduled in the curriculum as a compulsory course in the first semester of the final academic year. Students revealed that their curriculum focuses mainly on designing for the local economy. Hence, they are more familiar with the social and economic aspects of sustainability, not the ecological one. The closest practice to the environmental dimension is that they have been encouraged by the teachers to experiment with locally available materials. Students also added that the market-driven orientation value is deeply rooted in the curriculum. The teacher-as-customer trait helps permeate such value through the assessment process. Since sustainability is often instructed via lecturing, students revealed that they did not feel so engaged. Besides, in their view, the position of the course, allocated in the first semester of the final academic year, is not logical. It is too late for them to learn sustainability and change their attitude towards design nearly at the end of the programme. Although the course is compulsory, all students in the focus group did not feel that it is regarded as essential by the teachers in the Department.

8.1.3.2 Experiences of students in the institutions without sustainability policies

For the three institutions without sustainability policy, their design curricula include sustainability in various degrees. At two institutions, where sustainable design is a compulsory course in the craft-based design curricula, the focus remains extremely strong in the making tradition. At another institution, the curriculum does not provide any specific course on design for sustainability but attempts to fuse sustainability issues into one of its core design courses. The findings imply that, among all six design programmes of students in the focus groups, the curriculum at this institution seems to provide the least exposure to sustainability education.

The findings from students in these three institutions state that, before taking part in the interventions, they had not come across the holistic concept of product life cycle. They were encouraged by their teachers to employ the principle of 4Rs (reduce, reuse recycle and repair) in their design assignments, without an introduction to the concept of product life cycle. They also reflected a number of issues in relation to the misinterpretation of terms associated with sustainability. Moreover, the reuse of waste materials is heavily promoted. Other aspects like toxicity, transportation, durability, end of life, and all other cultural and social issues had been

neglected. In short, students from these three programmes had mistaken the concept of green design as sustainable design.

Before moving onto exploring students' reflections on the curriculum interventions, here are the takeaways from the first part of the chapter. In a nutshell, the findings from students taking part in the six focus groups imply that the traditional view of design and the conventional education approach remain the bottom lines in how their teachers instruct design. The findings regarding students' experiences in their design curricula imply that it is extremely challenging for change in Thailand's design education to occur from the ground up. It is unfortunate that a great number of issues explored in the discussions with students from six institutions are very straightforward and can be immensely useful for the curriculum revision. On top of that, sustainability is not a shared value among teachers in the Departments. And that affects the way they value and position sustainability in their curricula. Hence, sustainability seems to be considered by most teachers as an add-on or a special interest of an individual teacher, rather than an overarching concern that needs to be given attention in the field of design. Furthermore, because of the emphasis on the cultivation of practical skills, Thailand's design education approaches sustainability in the aspect of materials. While the concept of life cycle is largely neglected, the basic understanding of green design principle seems to be the most common tool used in sustainable design teaching and learning in many curricula, especially those with an emphasis on localism. After all, the findings bring forward that the real challenge to implement ESD in Thailand's design education lies in the lack of whole systems thinking in its stakeholders. Due to the educational practice of Thais which is based on seniority, the role of design educator remains extremely critical in advancing a shift to sustainability.

In relation to the first research question on paradigm shift, from the students' point of view, the shift is urgently needed. For the second question, "Could ESD be embedded into Thailand's design education through the 'frame of mind' concept?", students asserted that the major challenge lies in design educators. In their view, the lack of shared value of sustainability among key stakeholders in design education is a great stumbling block. The next section looks particularly at the findings contributing mainly to the third research question, "Can dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?"

8.2 Students' reflections on the curriculum interventions

This section explores students' reflections on the curriculum interventions as well as how the curriculum interventions have been influential to the shift in their perspective and behaviour towards sustainability. It contributes to the third research question of the thesis: "Can the dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?" The findings derived from reflective diaries and other supporting data, including the video clips which were recorded during the curriculum interventions, assignments, as well as the classroom observation data collected prior to the curriculum interventions. The themes to explore in this section include worldview, peers, critical thinking and reflection, students' attitudes and feelings, interconnectedness, shift in perspective and suggestions. The curriculum interventions were conducted following the content structure based on the interrelationships between Buddhism, sustainability and design for sustainability. (See Appendix G, where the curriculum interventions are described, for detail of the activities.) Instead of presenting the findings based on the order of activities in the curriculum interventions, the findings are articulated through a series of themes. Figure 22 shows how these themes are connected and nested together.

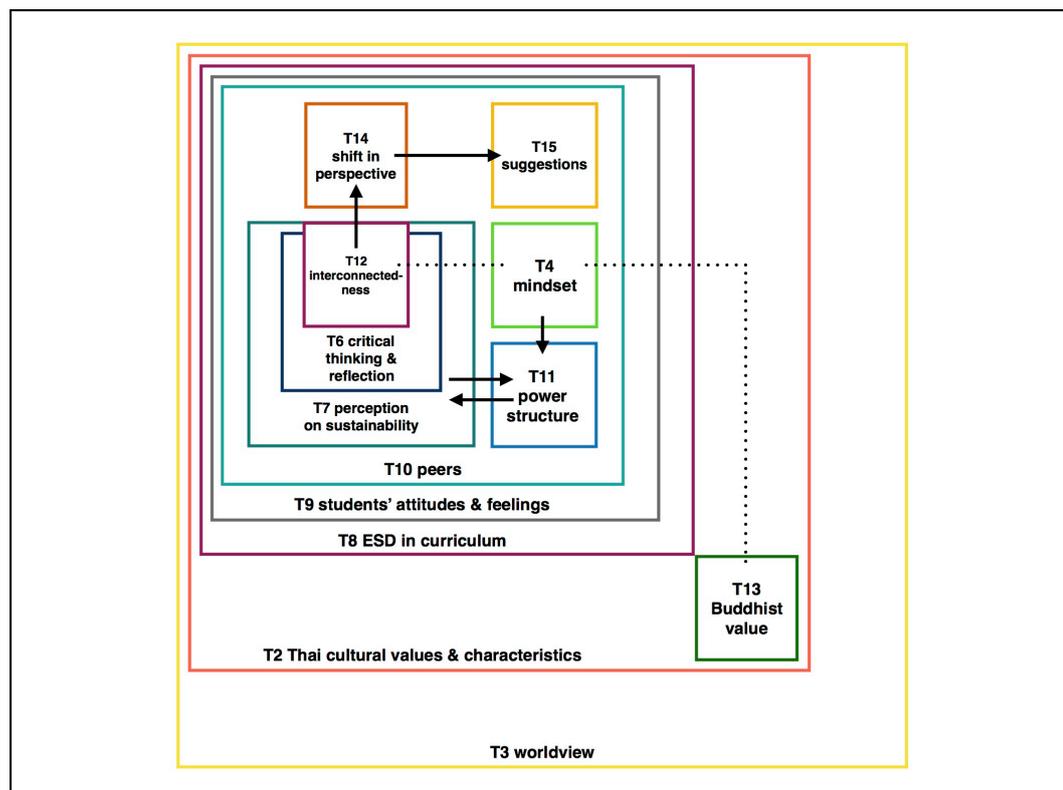


Figure 22: A diagram presenting the relationships between the key themes explored

Table 21 shows that there are ten groups of students from eight institutions participated in this research.

Table 21: The number of students taking part in the curriculum interventions

Institution	A		B		C	E	F	G	H	I	Dropped-outs (A2)
	Pilot (A1)	Main (A2)	Pilot (B1)	Main (B2)							
Number of students	22	16	7	5	18	13	8	56	22	26	10

8.2.1 Worldview

This section presents the theme of worldview based on the analysis of data from the curriculum interventions conducted with ten groups of students in eight institutions. There are three aspects to look. First is students' dominant anthropocentric worldview towards nature (examined through the pre-test activity). Second is students' awareness of their worldview. And third is the missing link between the institutional policy on campus greening and students' environmental awareness and concern.

8.2.1.1 Students' dominant anthropocentric worldview

The pre-test activities conducted with all groups reveal student's dominant anthropocentric worldview through dynamic student-driven dialogues. This finding implies the core value embedded in their curricular practice.

The pre-test activity was conducted during the first sessions of the curriculum interventions of ten groups of students at eight institutions. It was a whole-class group discussion based on students' dialogue about their favourite design. Each student's selected design, as cultural prop, was used to interpret their personal worldview. However, the activity was not included in the curriculum interventions at one institution due to the large number of students in the course. Students were asked to write about it individually instead. The research findings reveal that the majority of students hold the anthropocentric view of design. There are only three students from three different groups (one out of twenty-two, one out of eight and one out of fifty-six) who brought photos of designs that can be considered less anthropocentric and leaning towards the ecocentric end of the spectrum. They are three out of two hundred and three students to be exact. These three designs include a clay refrigerator that keeps food cool without electricity, a traditional Thai bamboo container for cooking sticky rice (*kra-tib*), and a backpack made out of reused car tyre inner tubes. However, when these students presented why they preferred these designs to others,

they gave rather vague statements with greenwashing messages. For instance, “This product is made out of reused materials so it can make the world a better place.”. Thus, there is a tendency that it could be a tailor-made decision because they might have chosen the products that are relevant to the name of the course. Otherwise, it is possible that it is a communication issue as Thai students are rarely given a chance to speak in class.

The rest of the designs student brought are a mix of objects used or found in everyday life, printed promotional media, fashion accessories, tech gadgets and iconic works of Western designers seen in design magazines and websites. On the selection criteria, the reasons given by students are highly subjective as their decisions are based on their personal tastes. Grounded in the form-giving tradition of design, most of the chosen designs are two and three-dimensional objects. Only two students from two groups (one out of seven and one out of five) from one of the most advanced design curricula in Thailand brought designs that associate with service and a larger system. The designs brought by two groups of students from the craft-based design programmes are least variety. Nearly half of the chosen designs are furniture and another nearly half are home accessories. Students in the largest group of the study present designs that are most variety, which the range spans from design as art to design as problem solving and encompasses various themes of production from local craft practices to mass customisation and to rapid manufacturing. Appearance and functionality of the chosen designs were two most mentioned features when students talked about the selection rationale. Regarding the appearance, most frequently used keywords include “stylish”, “attractive”, “cool” and “trendy”, respectively. When speaking about the functionality of the chosen designs, students either communicated in the way that the product serves the marketing purpose or the product responds well to the need of consumers. The keywords commonly used to describe functionality include “clever”, “practical”, “convenient” and “compatible with modern lifestyle”, respectively. Amongst all, two groups of students from two private universities provided designs and descriptions with the most marketing-oriented perspective. To conclude, the research findings from the students at eight institutions suggest that design is largely perceived as a discipline that concerns mainly three areas: production, consumption and economic growth. This corresponds to the research findings from the participants who are Thai professional design practitioners, reflecting the reality of dominant design paradigm that remains deeply grounded in a mechanistic worldview.

Furthermore, as presented in other supporting data alongside the reflective diaries, the pre-test activity did not quite proceed as expected at two institutions. One group is the largest student group in the study which the pre-test activity was transformed into a kind of written assignment. The assignment was perceived by students as an attendance-checking mechanism in place of the conventional roll call method. As a result, more than half of the students treated the assignment superficially as a way to gain an attendance mark, not as an opportunity to think seriously about their favourite designs. They simply copied what they found on the internet rather

than reflecting their thoughts on the selected design and synthesising the information. I interpret this phenomenon as a practice with a mechanistic view, which students put a focus on form over content and quantity over quality. An example to articulate this incident is that there is one student who used both Google Images and Google Translate in producing his/her pre-test assignment. The submitted document seems to be that (s)he dragged and dropped both images and texts straight onto the worksheet. Due to the automatic English-Thai translation, the work submitted is unreadable. The practice is clearly linked to plagiarism. Another is a group from a craft-based design programme. Approximately one-fourth of students were unable to explain their selected designs thoroughly. They did not know the name of the designers. Some of them just picked random computer rendered images and did not know anything much about the designs. These students later revealed that they searched for pictures via Google Images and picked what they thought of as visually-pleasing designs. They said that they quickly prepared the pictures only a few hours before attending the session. These two cases present two Thai cultural values, form over content and flexibility and adjustment orientation, which tend to affect a person's accountability and responsibility negatively. The bold cultural characteristics of these students also resonate with what can be analysed as their mechanistic worldview.

8.2.1.2 Students' awareness of their worldview

In the curriculum interventions, there are activities which introduced the overarching concept of environmental ethics and allowed students to examine their worldviews towards nature. To find out about the detail of the activities, see Appendix G, where the curriculum interventions are described. The activities concerning environmental ethics are included in Activity set B.

The findings suggest that the use of nature in sustainable design learning can contribute greatly to students' awareness of their worldview. The deep ecology activity is one of the mostly mentioned activities. Students from different groups asserted that they were able to understand nature's phenomena and impermanence by observing and becoming aware of the natural elements in the environment. The activity was very close to the practice of mindfulness, but none of the students described explicitly with any Buddhist term. They only expressed in the way that it was associated with the spiritual aspect of sustainability learning. Many students in these four groups asserted that, since participating in the activity, they had become more considerate and able to take various relevant factors into account when designing. In their view, the activity was extremely unconventional. Some students in one focus group pointed out that they relied very much on the intuitive approach and their learning process was spontaneous. Furthermore, students in four focus groups stated that this activity was a fundamental practice for its spin-off activity, discussing a comparison between a tree and a mobile phone.

The activity asked students to discuss the differences between a mobile phone and a plant in order to learn about the mechanistic paradigm and the holistic paradigm. Through such comparison, many students reported that the activity helped them considerably to comprehend the two opposite paradigms, understand their own worldview, and be more considerate. Below is a short conversation from students in one institution who expressed that this activity was their favourite.

G-18: “We had never done anything like that before and it resulted in an extensive debate on how each of us views the world. Very intriguing indeed.”

G-21: “It (the activity) contained open-ended questions for discussion. And everything in the answers was connected. No fixed answers. No right or wrong. Anyone had the freedom to think.”

G-4: “It made me realise how I view nature. It triggered me to consider my personal values and ethics, which have shaped my life to be what I am today.”

In these students’ opinion, as they enjoyed sharing ideas and debating with their classmates, the confidence in peer learning was also further strengthened through the development of their dialogue on this unusual topic. In other groups, students expressed that the activity trained them to respect views of others too. For instance, one student reported:

A2-2: “Through the discussion with peers, I started to realise other aspects around me rather than just sticking to my single viewpoint like I always did before. I learned to appreciate different opinions and consider the various aspects deeper and wider.”

In addition, ten students from different groups reported that they enjoyed the learning of a new way of thinking. Six out of these ten strongly asserted that they began to think in a system-oriented way after realising that humans are also part of nature. Some students articulated that they became aware of interconnectedness through the discussion and suddenly felt more concerned for the environment.

H-3: “I learned new and different perspectives. The session made me realise that the things always thought about were just tiny matters. There were so many other things that I was never aware of – including the global and environmental impacts that I overlooked.”

On top of that, there are fifteen students from all groups who gave comments which reflect a growth mindset.

A2-11: “The activity motivated me to change myself and learn new things for initiating new ideas and discovering the balance of our needs and the existence of nature.”

- F-4: “Although some parts of the activity are difficult, I tried my best to develop a holistic approach and systematic thinking.”
- H-5 “The comparison of the mechanistic and holistic paradigms gave me a completely new perspective to look at design. This challenged me to assess myself and determine whether I need to adjust my thinking process. I also became more considerate of other factors pertaining to design, such as the ecology and the sources of materials used for my designs. It made me seriously think how to utilise the “circular” approach, as found in nature, in my design practice.”

Moreover, there was an optional activity which two groups of students were given beans to sprout as part of ecoliteracy learning. Several students who participated in the mung bean sprouting task reported that the assignment helped them exercise the sense of care as they were given a chance to try to nurture something. One student said, “I began to feel connected to the beans as I had to look after them.” These students also think that the use of bean sprouts for the life cycle analysis activity was effective. In their view, it is the first step that facilitates them to visualise interconnectedness. Another student reported “By examining where my lunch came from, it made me realise that I’m part of a big messy system. Whether I see myself as a consumer or a designer, I’m part of it. My actions always affect others. And I see the power of design from there.”

The findings suggest that students’ awareness of their worldview is fundamental for their further practice of whole systems thinking and developing an understanding of sustainability. This responds directly to the second research question on the ‘frame of mind’ concept and the third research question on dissemination of transformative learning.

8.2.1.3 The missing link between the institutional policy on campus greening and students’ environmental awareness and concern

The findings from the deep ecology activity also reveal another dimension. Two groups of students from campuses with more green spaces presented more negative thoughts towards the activity and seemed to feel less appreciative of nature than students from campuses with less green spaces. In other three groups of students in the campuses with limited green spaces, there is no single student expressing any negative feeling towards the activity. As students from the campuses with more green spaces are also from the institutions currently employing sustainability rhetoric and utilising the campus-greening policy, this particular finding raises the question regarding the tensions between sustainability rhetoric and practice in higher education institutions. These two groups include the main study group and the largest group.

The students in the largest group are from the campus with most green spaces among all. Out of fifty-six students, there are eight students who thought that the activity was boring, two students who thought the activity was difficult, and two students with mixed feelings – fresh yet boring at

times and fresh yet confusing at times. Figure 23 illustrates that, in comparison to the proportion of students who had negative feelings towards the previous lecture on environmental ethics, the proportion of students with negative feelings decreased in the deep ecology activity.

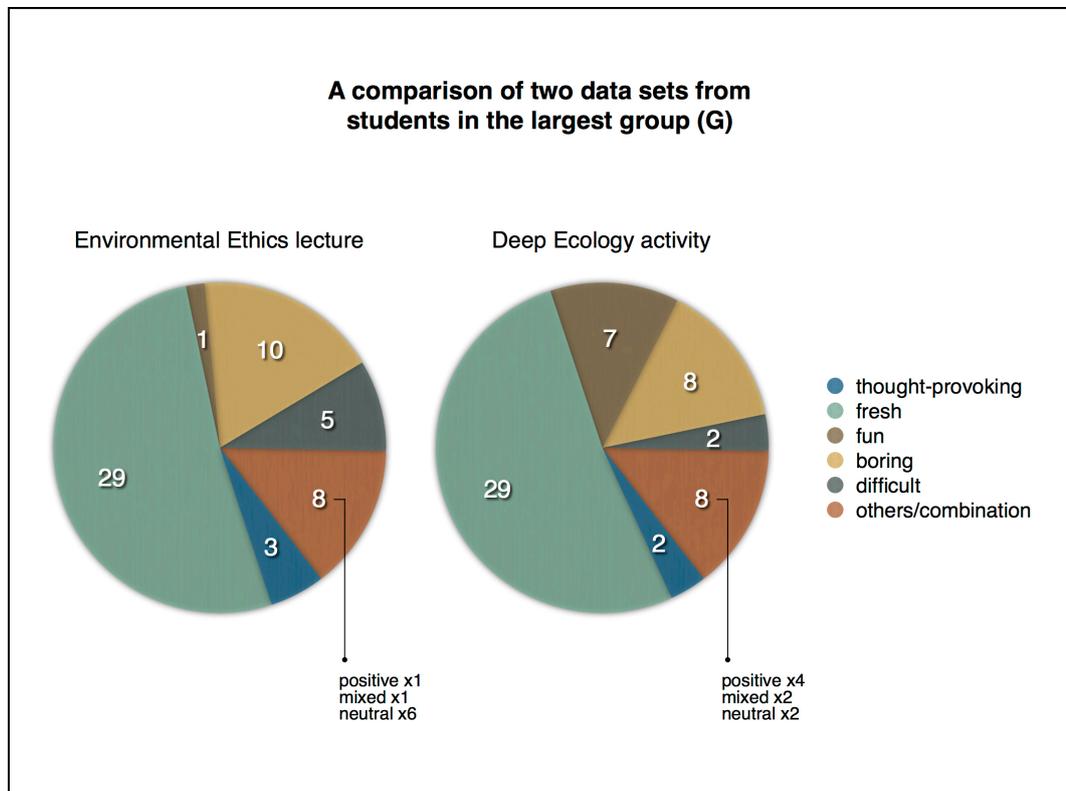


Figure 23: A comparison of two data sets from students in the largest group – their feelings towards the environmental ethics lecture and their feelings towards the deep ecology activity

At the same time, there is an increasing number of students who thought the activity was fun – from one to seven. The proportion of students feeling fresh remained unchanged at all. The result corresponds to the comments made by several members of the group that they prefer activities to lectures. However, some students even wrote in their reflective diaries that the activity was silly and not suitable for them. One student put explicitly that the activity should be for kindergarten students. Furthermore, a young lecturer who observed the session later notified that, although these students were at their final year, it was the first time for them to take part in an empirical activity based on philosophical grounds. In his/her opinion, the whole session, with both a lecture on environmental ethics and a deep ecology activity, is “too complicated and irrelevant” for this group of design students as they are “more familiar to a vocational learning approach than an academic style of learning”. The findings from this group seem to reflect through students’ weak environmental awareness the lack of integration of the institutional policy on sustainability into the

curriculum, point out an opportunity to employ more place-based activities, and suggest a reexamination of the curricular structure, especially the positioning of the sustainability learning.

For the main study group, the findings reveal that there is an external factor that should be taken into account when introducing outdoor environmental education through a place-based pedagogy. As this group of students did the session in the campus park during afternoon hours, many of them used the reflective diaries to make complaints regarding the outdoor learning environment rather than reflecting their ideas and thoughts on what they had received from the activity. Most common comments include that students tend to feel distracted and lose concentration easily when studying outdoor and the hot weather can affect their ability to learn negatively and tremendously. In their view, outdoor learning is not suitable at all. These students asserted that they preferred to learn in an air-conditioned room rather than under shades of trees in a hot climate. Students in this group did not seem to be aware of the institutional policy on campus greening. This finding reflects that there is a lack of integration of the institutional policy on sustainability into the curriculum.

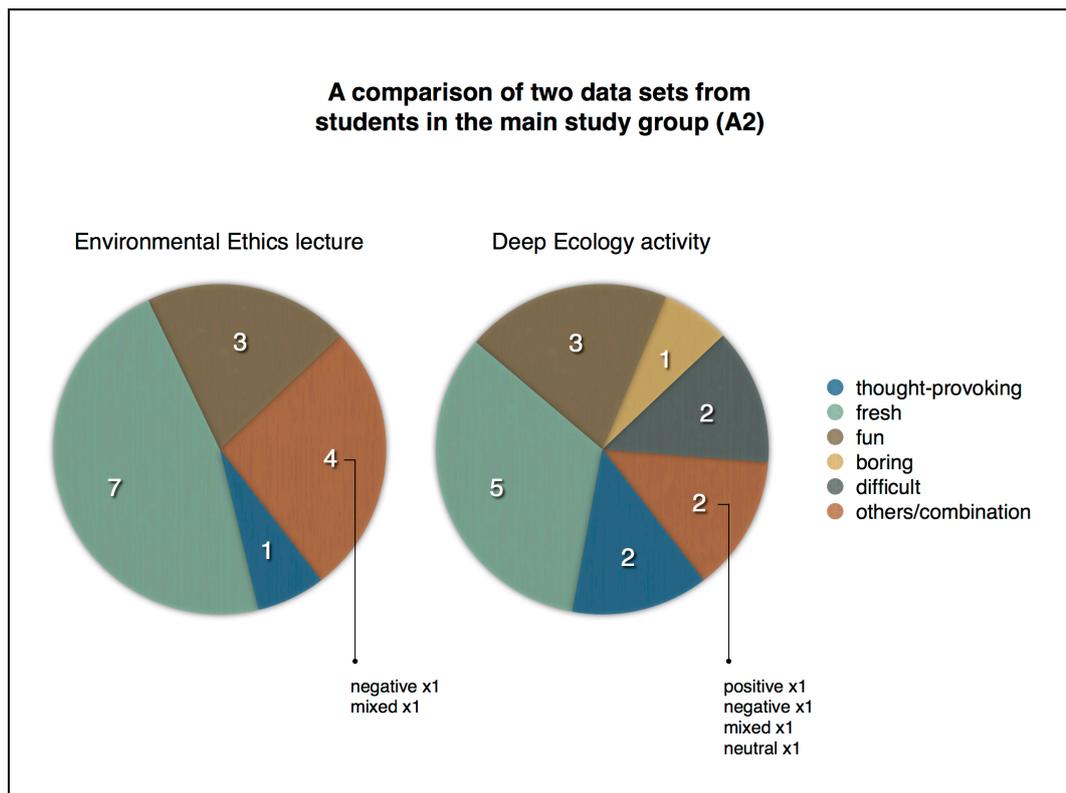


Figure 24: A comparison of two data sets from students in the sixteen-session group – their feelings towards the environmental ethics lecture and their feelings towards

As shown in Figure 24, there was only one student with a negative feeling towards the environmental ethics lecture, but the proportion of students with negative feelings increased dramatically in the deep ecology activity due to a combination of hot weather and the use of some

unfamiliar philosophical terms concerning environmental ethics. Visual data from a video clip, especially the non-verbal language including gesture and facial expressions of students, also confirm this particular finding. One student wrote explicitly in his/her reflective diary:

A2-1: “The weather was too hot and gave me a headache. Combined with advanced language level introduced in the lecture, I could not understand what the teacher delivered. I was exhausted.”

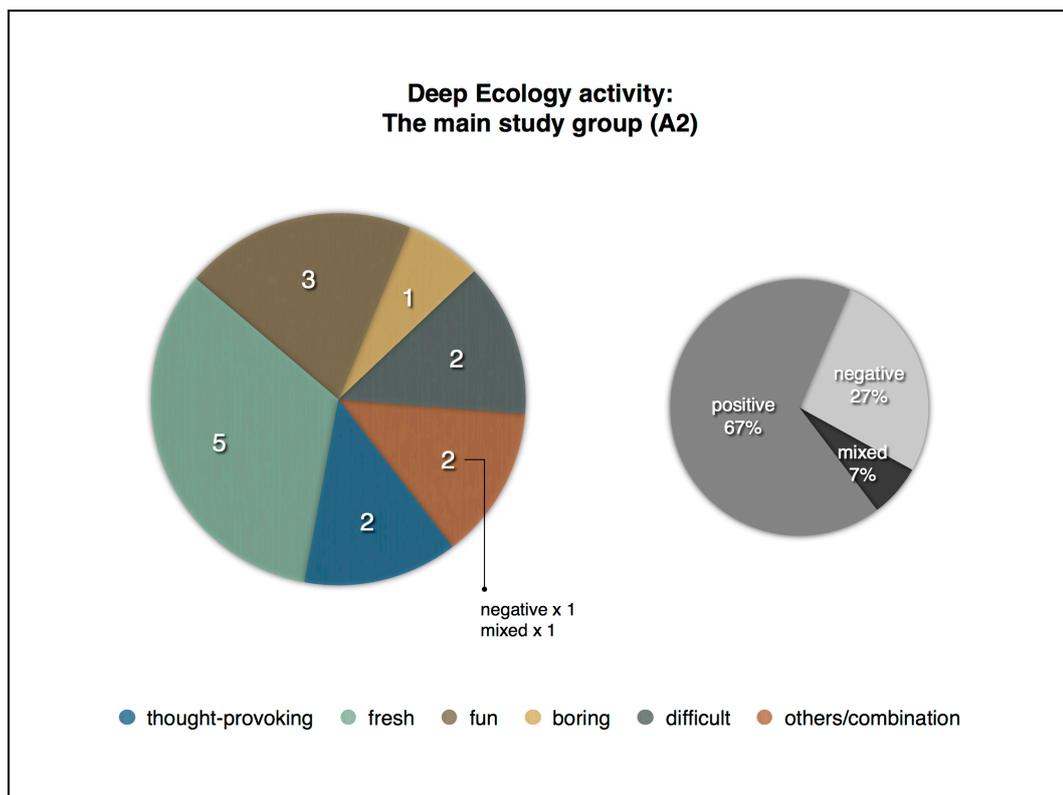


Figure 25: A chart presenting what the students from the sixteen-session group think of the deep ecology activity

As illustrated in Figure 25, nearly one-third of students in the main study group expressed negative feelings towards this activity. The findings from this phenomenon evoke that the climate-related issues should be taken into account when planning a place-based learning activity. This is in order to prevent any undesirable effect which may cause a negative attitude towards environmental education, especially a challenging topic like deep ecology. For a hot and humid country like Thailand, the weather seems to be a very influential factor for place-based environmental education.

In short, the findings in this sub-theme point out the missing link between the institutional sustainability policy and students' environmental awareness and concern. The deep ecology activity unfolded ineffectiveness of the implementation of the policy on campus greening in two

universities. Accordingly, the situation results in students' lack of recognition of sustainability matters. As groups, data from video clips and reflective diaries reveal that these students did not exhibit any significantly higher level of environmental commitment when compared to those from campuses or institutions without the greening policy. As this sub-theme contributes to a debate on the sustainability rhetoric and practice in higher education institutions, it correlates to the second research question "Could ESD be embedded into Thailand's design education through the 'frame of mind' concept?"

8.2.2 Peers

Peer learning is imperative for ESD as it contributes directly to key practices like participation in decision-making and empowering people. Since peer learning is one of the fundamental elements in the curriculum interventions, "peers" is a significant theme emerging in conjunction with many other themes of data from students. There are three aspects to explore: students' recognition of peer learning, teacher as facilitator, and the success of the mini design charrette.

8.2.2.1 Students' recognition of peer learning

The findings suggest that the introduction of student-centred approach through the curriculum interventions results significantly in students' recognition of peer learning right from their first sessions. The majority of students from all groups reported that their first sessions were full of unexpected and surprising elements. In their view, the most outstanding feature is the student-centred approach, which involved mainly peer-learning via group discussion. For several groups, the data from video clips also show that students became more relaxed in the activity, compared to the data from classroom observation sessions prior to the curriculum interventions.

There are five favourable features of peer learning mentioned extensively in students' reflective diaries. The first feature concerns the sharing and exchange of ideas. Students reported that they developed a better understanding of design and sustainability via exchanging different thoughts and ideas with peers. In their view, peer-based activities assisted them to be more active while learning. Receiving a variety of new perspectives is the second feature. Students asserted that they received diverse, new perspectives from their dialogue with peers. This aspect of peer-learning involves mainly a learner's awareness and appreciation of different perspectives. Many reported that the activity prompted them to be more open to differing viewpoints. For some, this aspect also concerns a learner's mindful engagement in the activity. Third, peer-learning assists them in getting to know oneself better. Students suggested that the activity assisted them in reflecting their thoughts and feelings about a particular design or issue, through dissimilar views of peers. In this way, peer-learning helps a learner to re-examine and re-define things, concepts or situations differently. For this reason, a number of students considered the activity

unconventional and unique from their usual learning experiences. Fourth is getting to know one another better. This feature goes beyond the practice of sharing and exchanging thoughts and ideas. It concerns a learner's process of opening up to understand others with no judgement. It involves active listening and interaction that strengthens the social capital of the group. Even though these students had known each other very well as they were all final-year students, it was the first time that they had their peers as part of the formal learning process. The research findings suggest that, as this aspect involves nourishing the social capital of the group, it is beneficial for their later sessions too. And fifth is to have a teacher as a facilitator to wrap up the discussion. This last aspect focuses on the position of teacher in the peer-learning activity. The research findings imply that students felt comfortable for and saw the benefit of having a teacher with a facilitator role when they took part in a group discussion. In other words, students appreciated when a teacher took a backseat by helping capture and summarise key points of the group discussion instead of taking over and lead the lesson. Several students asserted that this approach made them feel a lot more engaged in the learning process. Challenging the traditional power structure directly in a classroom, the teacher-as-facilitator role will be looked at more in depth in the next sub-theme.

The research findings also indicate a strong link between collaborative learning and critical thinking. This link will be explored further in the theme of critical thinking and reflection.

8.2.2.2 Teacher as facilitator

The findings point out that the teacher-as-facilitator role is essential for initiating peer learning among Thai design learners. The findings also strongly suggest that Thai design students' willingness to participate in the learning of an unfamiliar subject is linked with the repositioning of the educator in the teacher-learner relationship. Students' responses in the curriculum interventions are generally positive. Although different details were given, one identical point from students in all eight focus groups is that the teacher-as-facilitator role is a very critical factor contributing to the effectiveness of sustainability learning. Based on the findings, there are two features deriving from a teacher taking the facilitator role. One is barrier-free communication and another is active learning.

For the first feature, which is barrier-free communication, the findings indicate that most students from all focus groups felt free from the teacher's judgement in the curriculum interventions, which for most of the time the teacher had a facilitator role. According to these students, the role significantly changes the position of the teacher within the conventional teacher-student power structure and in turn offers students "a safe space" for learning. Many students pointed out that the activity was pleasing and enjoyable mainly because their thoughts and ideas presented in the discussion could not be judged as right or wrong by the teacher or their peers. A large number of

students from all groups wrote in their reflective diaries that they were more confident and less anxious to share what they had in mind with their classmates in front of a teacher. They reported that they were able to express their views willingly and outspokenly. They felt that they were allowed to be themselves during the learning process. A great number of students also asserted that the use of open-ended question helped them feel relaxed and comfortable because they did not need to be worried about giving right or wrong answers. As the curriculum interventions progressed, the findings confirm to a great extent that the lower position of a teacher assists in the transactional learning approach resulted in the removal of students' negative attitudes towards learning. The shift away from the transmission model of learning towards a more transformational model was indicated to be beneficial and healthy for sustainability education in design programmes.

Students in six focus groups at six institutions discussed the barrier-free communication feature by making a comparison to their previous learning experiences. Their discussions mentioned the traditional position of teacher in the teacher-student power structure as a key stumbling block in learning. Students in one focus group indicated specifically that they prefer straightforward communication and instant teacher-learner interaction, which are not common in their curricular practices. Moreover, in their view, language plays a vital part in the practice of barrier-free communication. All students in two focus groups from two different institutions pointed out specifically in the same way that the highlight of the curriculum interventions is the teacher-student interaction which goes beyond seniority along with the use of easy-to-understand language. They stated that simple language and thorough explanation used in the sessions helped visualise the content well and the presentations were clear without fancy words.

H11: “For example, when we were learning about nested systems, which is one of the principles in ecoliteracy, you (I, as a researcher and with a teacher-as-facilitator role) referred to the human body as the larger whole system. The notion of nested systems could be very complex if you explained it in a literary way.”

It is interesting to see that this contradicts the views expressed by some students in other groups mentioned earlier about difficult language associating with philosophy. The same language was seen in a more optimistic light by these two groups of students who are from craft-based design programmes and among the youngest participants in this research (third-year students). To look at this matter by using seniority as a lens, it may imply that, the gap between them and their teachers in the Departments is larger than those in other year groups and programmes. So, when the gap was made smaller, which the relationships between them and the teacher (myself as a teacher and researcher) became less distant, they became more open and active in their learning. In this case, as a result, they held a more positive attitude in learning and overcame the language challenge.

Responding to students promptly is not the only desirable feature, positive non-verbal communication of the teacher is crucial too. One student stated clearly that only a teacher made eye contact and nodding when (s)he was talking, (s)he would feel that his/her thoughts and ideas were valuable. For him/her, it was a confirmation that the teacher did not miss any point in the conversation, which made him/her feel positive towards learning. In his/her view, it was an expression of empathy, making the learning an engaging process. All in all, the findings imply that attentive, two-way communication is a vital factor to engage students in learning an unconventional subject like sustainability.

For the second feature, which is active learning, the findings reveal that the student-centred approach used in the curriculum interventions contributes greatly to an increase in students' concentration while learning and assists in changing their role from being passive to active. Students in all focus groups asserted that peer learning had improved their view of learning, from passive to active. In their view, two-way communication constantly used in the curriculum interventions helped them become active learners and maintain eagerness to learn. A large number of students reported that the curriculum interventions provided them the first time in their student lives to experience active learning. As a group of learners with dynamic interactions, they felt empowered and were able to learn without encountering the fear of being judged by the teacher. Some students also elaborated that they have recognised the positive change in themselves when learning from and with peers

It is interesting that even students from an institution with weak studio culture pronounced that they have long been aware of the importance of peer learning, but they had never experienced it in the past. They asserted that they had always wished to have learning activities that are open and encourage them to give comments to peers freely in classroom. In their view, the absence of peer learning in the curriculum and the lack of facilities to form studio culture deteriorate the quality of design learning.

8.2.2.3 The success of the mini design charrette

The mini design charrette, a peer-based activity aiming at development of sustainable design solutions, was conducted with two groups of students from two institutions. It was a successful activity and there are complex issues to explore. (See Appendix G, where the curriculum interventions are described, for detail of the mini design charrette activity.)

In a big picture, a great number of students in both groups revealed that they thought that they achieved better design performance under this method of peer learning. Many students from both groups stated that the activity set them free to work with peers in a dynamic, fast-paced environment. It is a total opposite of their experiences of the teacher-centred approach which only

the teachers hold the rights to comment on their work and tend to make decisions for them. In their view, the highlight of the activity was the give-and-take process, which they were able to learn from and share freely with peers. According to the students, there are two favourable features of this activity. First is the mutual support of peers. Below are sample quotes from students from two different groups.

A2-6: “To give opinions or to question back does not mean to win the argument, but to benefit a conversation in some ways. Also, the different roles of speaker and listener are crucial and mutually supportive. Respect plays an important role here.”

I-2: “We supported each other during the exchange of ideas, allowing all of us to become aware of diverse opinions.”

The second feature is the trusting relationships between peers. Below are sample quotes from students from two different groups.

A2-12: “The debate really reflected the thoughts of the participants. People get what they give. To talk openly with trust and comment sincerely, my classmates gave me the same response. The sharing accelerates the process of work to the efficient outcome. Many ideas were recognised and unbelievably adaptable to our works. Personally, I prefer this style of learning. It was like chatting with friends while we can also complete the assignment.”

I-6: “It is better to work as a team than alone.”

Figure 26 shows the students feelings towards the mini design charrette activity. Since both groups had weak studio culture (as indicated in the focus group interviews), the concept of mini design charrette was considered innovatory for them. Thirty-five out of fifty-seven in total reflected that peers are at the heart of this activity and they benefited a great deal from peer learning. Even though the majority of students felt positive towards the activity, it was received quite differently by two groups of students in two institutions.

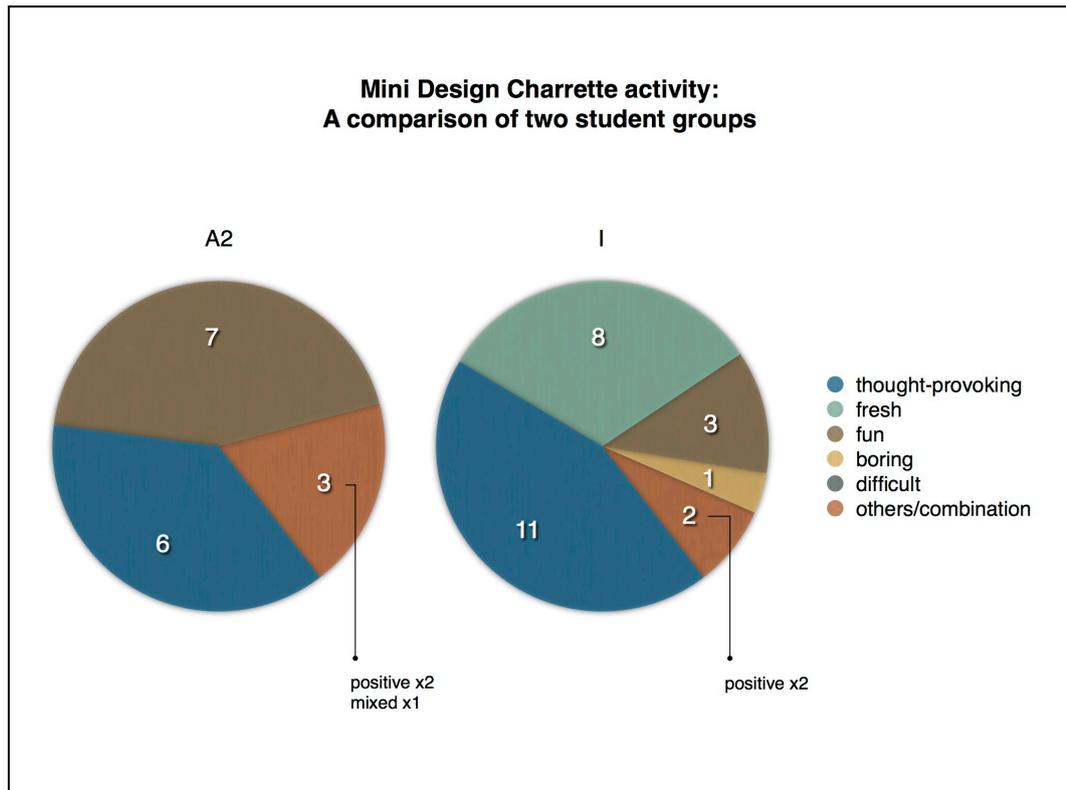


Figure 26: A chart presenting what the students from two groups in two institutions think of the mini design charrette activity

For the first group, which is the sixteen-session group, about half of the students had fun in the activity while another nearly half found it thought-provoking. About one-third of students in this group picked up that the challenge lies on the specialism of each classmate. In their view, the task involves a kind of pressure that one may not be able to suggest anything better than the original versions.

A2-11: "The products which had been designed and developed by peers were close to perfection that I could not suggest any additional improvement."

For another group, which is a group from a craft-based design programme, students' feelings were more diverse. Out of twenty-five students, eleven found the activity thought-provoking, eight thought it was fresh, three was fun, one was bored and two expressed that the activity was a combination of being thought-provoking, fresh and fun. The visual data from a video clip suggest that the atmosphere was a little tenser than the group previously mentioned. It is also very noticeable that students split themselves in half to form two small groups largely based on gender. During the activity, they worked well within their own groups. At the end of the activity, when students were encouraged to share with another group their mini design charrette experience, they refused to say anything. The social capital among students in the whole year group seems to play a significant role in this scenario. Furthermore, there are two students feeling

uncomfortable with the activity. One thought the session was too long. Another expressed that (s)he did not enjoy the session and felt nervous from having to create and ask questions.

In a nutshell, this theme on peers responds directly to the third research question: “Can dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?” The findings prove that, as the student participants were comfortable with active learning, peer-based activities and the teacher-as-facilitator role, the answer for this research question appears to be positive. The findings hint that it is possible to create and disseminate transformative learning for sustainable design in Thailand based on facilitation methods that allow students to learn from one another by contributing and exchanging their views and ideas freely. As student empowerment is fundamental for transformative learning, it is also crucial to reconsider and reposition the power structure in teacher-student interactions.

8.2.3 Critical thinking and reflection

Critical thinking and reflection are part of fundamental skills for ESD. These skills concerns learning to question the current belief systems, examine something methodically and in detail, and recognise the assumptions underlying the existing knowledge, perspective and opinions. This theme of critical thinking and reflection emerges largely from the findings concerning the use of student-centred approach, which students were encouraged to examine various issues in the context of sustainable development. Within this theme, there are two aspects to explore. One is students’ practice of critical thinking, analytical thinking and critical reflection skills. Another is students’ struggle with philosophical content.

8.2.3.1 Students’ practice of critical thinking, analytical thinking and critical reflection skills

Students pinpointed that the curriculum interventions developed their critical thinking and reflection skills to a great extent, through questions, dialogue and group working in assorted activities. A large number of students asserted that the whole experience from the curriculum interventions was unconventional. Since the beginning of the curriculum interventions, students had been surprised by the classroom activities that encouraged them to share thoughts and discuss ideas. They reported that interactions with and dialogue between peers in classroom activities did not only encourage them to be active and engage in activities but also contribute substantially to their critical and analytical thinking skills. The pre-test activity was not only used to explore the students’ worldview towards nature through their favourite designs, but it was also intended to be a tool for ice-breaking too. As the activity introduced the transactional learning approach to the students, a large number of students thought that the activity encouraged them to practise and improve their critical and analytical thinking skills. They described in the reflective

diaries that the activity encouraged them to be more critical when they presented the reason why they picked the particular designs which they brought to the discussion. In their view, dynamic questions from the teacher and peers supported them to see the connection between their selected designs and the surrounding contexts and factors. The research findings further reveal that students felt that the activity exceeded their expectation because of two reasons. One is that it made them look at the designs they brought from many other perspectives. Another is that the focus of the discussion was moved from the object itself to how it can be seen as part of a larger system. A large number of students reported that once the seniority practice was removed, they became to feel less restricted and have more enthusiasm for learning. In some groups, students' discussions encompassed more complex issues. For example, students from one group reported that the activity assisted them in questioning two things: their existing knowledge and prior perception of sustainability and their role as designer. Some of them included their spin-off ideas and questions from the discussion in their reflective diaries. Furthermore, since the first sessions, as written in the reflective diaries, several students began to pick up random designed objects and looked at them with a more critical eye in relation to the environmental aspect of sustainability. One student wrote, "Now I've come to think that using a plain wooden pencil is a lot more environmentally friendly than using a mechanical pencil."

Whereas Thai students are often seen as passive learners, the findings indicate that the majority of design student participants in this research were willing to communicate their thoughts and posed numerous interesting questions right from the start of each fieldwork. This is because, as stated in the reflective diaries, they felt that they were in the judgement-free zone. There was no right or wrong labelling in the group discussion and they remained anonymous by using the code names that they preferred in the reflective diaries. On top of that, since sustainability issues had been very rarely mentioned in other design courses in their curricula, they were aware that they were exploring new areas of knowledge. The findings imply that the lower position of a teacher in the teacher-student hierarchy can assist in the process of overcoming what Freire calls "the culture of silence". For one specific group, the findings suggest that a teacher with the lower position prevailed successfully over the passive behaviour in female students caused by the gender-biased hidden curriculum within the Department. Students from a craft-based design programme elaborated that the approach was unexpected for them because they were familiar only with the master-apprentice model of learning and had not been given a chance to learn actively as a group before. Some of these students reported that they were nervous and frustrated during the first session and needed time to adjust themselves accordingly to the student-centred approach.

Although Thai students, in general, are not familiar with critical thinking, the curriculum interventions indicated that their critical thinking skills could be developed with practice. A large number of students asserted that the student-centred approach took them out of their comfort

zone and assisted them in exploring new areas of knowledge. They articulated that, whereas their curricula put a heavy emphasis on the practical dimension of design, the curriculum interventions introduced them to the contextual dimension which helps them to see the connection between design, other disciplines and a variety of issues. The findings indicated that the majority of those who enjoyed exploring new knowledge identified the activity as thought-provoking. However, the findings also suggest that design students learn best with visuals and practical elements. Giving examples and visualising unconventional issues help make the introduction of new knowledge less intimidating. Most students regarded sustainability as a complicated subject matter but asserted that they felt more relevant when the learning proceeded in the way that sustainability had a connection to what they had been already familiar with. According to these students, once they can make such connection by themselves, they feel engaged with the topic simultaneously. The pre-test activity, which they brought their favourite designs to discuss with peers, and the life cycle analysis activity, which they practised whole systems thinking in groups using their meals, are two common examples they gave. In their view, the learning activities that require them to think critically tend to make them realise that they had previously taken so many things for granted.

A1-21: "Now I realise how ignorant I have been. Today I have learned so much about many things that have been surrounding me since the day I was born."

E-10: "Previously I've focused solely on the needs of the customer as the problems waiting for designers to solve. The activity inspired me to identify the root causes of the problems and develop a more holistic approach to look at things. It was quite difficult at first to think deeply in this way, but the activity helped me understand and grasp the concept better when practising with the object I brought. This learning experience can be applied both to my design practice and in life."

The use of reflective diaries seems to play a part in developing the way students reflect their thoughts. As the curriculum interventions proceeded, a large number students from time to time reflected their thoughts in reflective diaries through a technocentric view. Many of them focused on resource management for the benefit of the future generation. Some students even wrote in the way that is quite egocentric. For example, one student wrote, "I'd like to preserve this world for future generations, especially for my loved ones." There are also those who mentioned a shift in perspective and behaviour, like "to work together to figure out the root causes of the problems" and "to change the way we think and stop exploiting nature".

8.2.3.2 Students' struggle with philosophical content

There are students who declared openly in the reflective diaries that they preferred practical activities to a focus on theory. In their view, the lack of hands-on experience in learning made it hard for them to keep up their concentration. According to these students, lectures and

discussions on philosophical themes and questions tend to be boring, as theoretical studies is usually completely out of their interest. The concepts they mentioned negatively include environmental ethics and Buddhist economics. They considered that these concepts were irrelevant to design. For example, this type of comment is found again and again in the reflective diaries of students in the largest group. For example, one student put it briefly “The ideas introduced in the environmental ethics lecture were distant, boring, and hard to connect with.”

The largest student group in this research is from a university with sustainability policy and ample green spaces. Fifteen out of fifty-six students expressed negative feelings towards the environmental ethics lecture. Five out of fifteen students thought the lecture was too difficult. This group is the only group of students who found the lecture difficult. The common reason given is that the content was too abstract and hard to grasp. The other ten students thought the lecture was boring and asserted that the content was neither exciting nor interesting. Four complained about the lengthy period of the lecture, which made them feel overwhelmed. Although the lecture was only forty minutes long, it started half an hour behind schedule due to late attendance of the majority of students. It seems that the situation inevitably gave them the impression of being in a classroom for a long period of time. A lecturer who observed the session commented that it is typical behaviour of students in the Department as the academic staff do not take late attendance seriously. One student who gave mixed feelings towards the lecture reported that, even though the content was fresh, (s)he could not help falling asleep. The visual data from a video clip also show that about one-fourth of the students in this group took a nap during the lecture, which decreased the degree of interaction during the lecture. In contrast, none of the participants in other groups fell asleep. So, in comparison with other groups, this group as a single unit presented themselves as more passive than others. More than half of the group rated their level of understanding as “moderate” and one-sixth of students rated their level of understanding as “low”. On top of that, nine students in this largest group notified that the “abstract” content is not inviting for them and the lecture full of philosophical knowledge can lead to opposite effects to what was intended. In their view, they have been trained to be practical and more drawn to visually-pleasing content. Regarding the group-size in this case, the student-teacher ratio may be a significant factor too. There are two points that they suggested correspondingly. First, the lecture should be more fun and easy to grasp. It should contain less philosophical content in the slides and more stimulating elements in the approach. Second, they prefer the faster pace of learning and would like a shorter and more concise version of the lecture. At the end of the session, the lecturer who observed the session also commented that the content was too difficult for his/her students. In addition, all students in the focus group at this institution stated that the negative perception on theoretical studies is the result of their curricular experiences which focus on the vocational dimension of design. According to these students, lectures conducted in the curriculum often emphasise rote learning rather than critical thinking.

Critical thinking is a challenge for Thai students. At another institution, students also have a similar issue with their Small is Beautiful session. The next theme looks at this case in connection with an examination of the intricate association of pleasure, ignorance and challenge in learning.

8.2.4 Students' attitudes and feelings

Students reported that they had never reflected their thoughts and feelings towards learning before taking part in the curriculum interventions. The quantitative data of students' feelings towards each activity in the curriculum interventions are presented in Appendix L. In this theme, there are four aspects to explore: the first impressions of the curriculum interventions, an introduction to the ethical dimension of design, an introduction to interdisciplinarity, and the intricate association of pleasure, ignorance and challenge.

8.2.4.1 The first impressions

As data of the first sessions in the pilot study phase are not fully available in the statistic form, Figure 27 is based only on the quantitative data collected from the checklist part in the reflective diaries of eight groups of students.

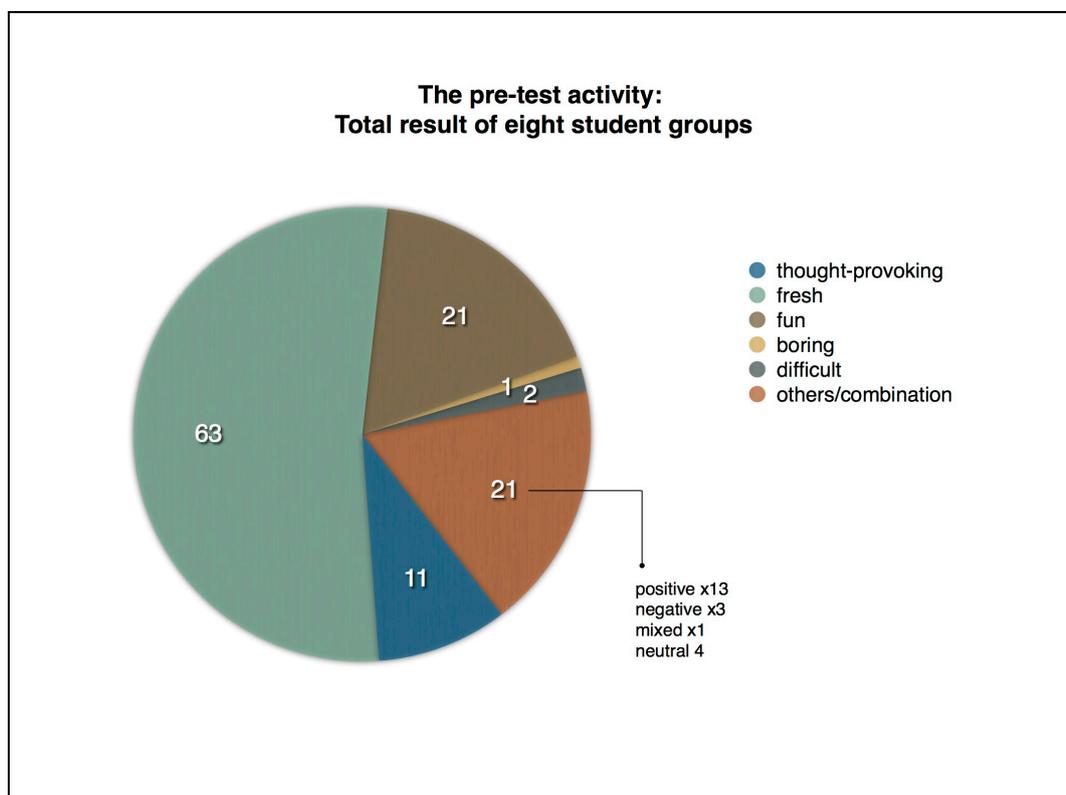


Figure 27: A chart presenting what the students from eight groups in seven institutions think of the pre-test activity

The chart demonstrates the proportion of different perceptions of students towards the pre-test activity. Both quantitative and qualitative data reveal that the majority of students felt that the activity was fresh. The research findings from the written data from all groups of students in the reflective diaries help clarify the meaning of fresh very well. There are two key factors. The first factor is the process of peer-learning, which is unconventional in Thai education. In this aspect, the activity was a new experience for them. Many students revealed that the highlight of this activity is the peer-learning process. In addition, as students were given an opportunity to share their thoughts and ideas, many considered that the activity was fun. The second factor is an urge to think critically through a series of questions in a group discussion, which brought students out of their comfort zone. Such urge was initiated by me as a facilitator but later, because of the dynamic of the activity, students gradually encouraged each other to interact naturally. In relation to the unanticipated elements in learning, many students also added that the activity was thought-provoking. Therefore, there are students who reported a combination of feelings towards the activity. There are those who think the activity was “fresh and fun”, “fresh and thought-provoking” and “fresh, fun and thought-provoking”. However, there are also a small number of students who filled in their own feeling which can be categorised as neutral, positive, negative and a combination of positive and negative. Their feelings mostly revolve around the experience of a transactional learning approach.

According to data in reflective diaries, students realised that the pre-test activity assisted them in exploring new areas of knowledge while practising critical thinking skills. The approach used in this activity indicates three things. First, design students usually learn best with visuals, objects and practical elements. Second, students tend to appreciate an unfamiliar subject, like sustainability, only when they learn in the way that the new knowledge is connected to what they are already familiar with. In this case, as each student brought a favourite object, one felt relaxed and were confident when talking about it. At the same time, the object one brought was a piece of learning material of an unfamiliar subject. Third, when the dialogue proceeds along with some questions relating to the environmental aspect of design, students tend to simultaneously feel an urge to have the environmental concerns.

However, after the first session, ten out of twenty-five students in the sixteen-session group withdrew from the study. (See Figures 28 and 29.)

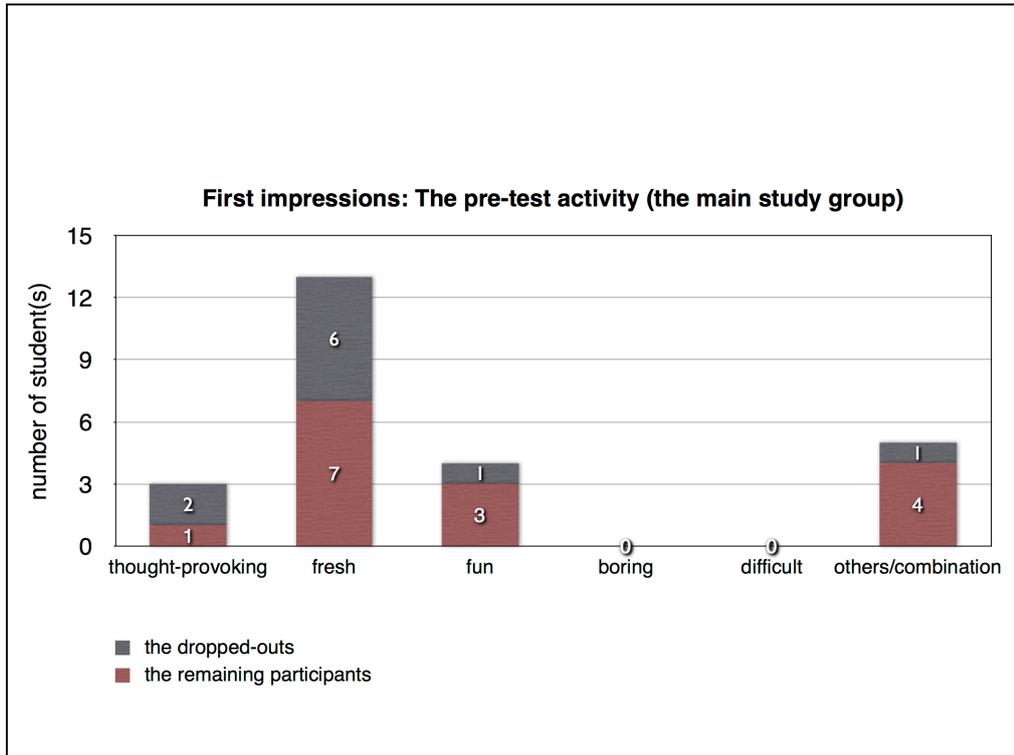


Figure 28: A chart presenting the proportion of the remaining participants and the dropped-outs in relation to what they think of the pre-test activity

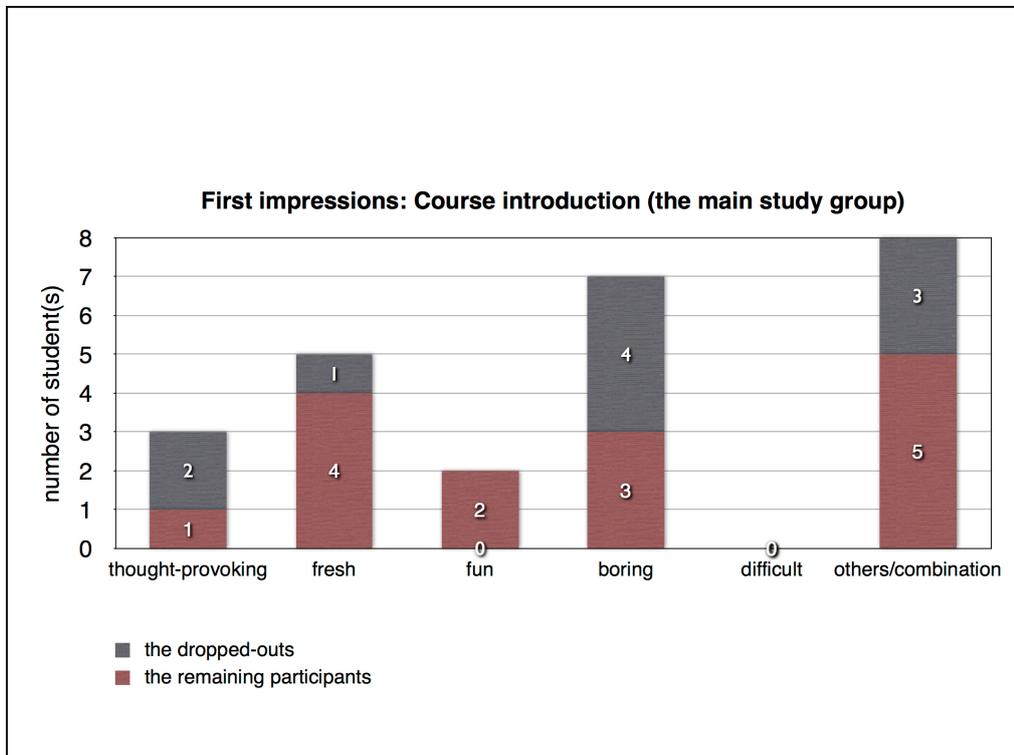


Figure 29: A chart presenting the proportion of the remaining participants and the dropped-outs in relation to what they think of the course introduction activity

The curriculum interventions were slotted in as an elective course for the final year students. Hence, the reasons for the dropped-outs tend to lie in two factors. These students might have selected another elective course that they preferred to this one, or terminated simply because they have taken enough credits already for enrolling in the thesis course in the upcoming semester. When looking at the statistical data, four out of seven students who thought the course introduction was boring left the study. Three students who wrote “It’s okay.” in the others/combination box, which can be categorised as a neutral feeling towards the course introduction activity, also quit. It seems that their positive feelings towards the pre-test activity are not significant enough to encourage them to participate in the study.

8.2.4.2 An introduction to the ethical dimension of design

Most students in the focus groups reported that the curriculum interventions provided knowledge and skills that are highly relevant to their lives, especially the ability to think critically about their role as designer and how to contribute to more sustainable futures. All students in the eight-session and sixteen-session groups asserted that some topics in the curriculum interventions offered them a wider, more critical perspective, which assisted them to consider the ethical dimension of their design practices seriously. These topics, including Design Thinking, Design for Localism, and Design for the Other Ninety Percent of the World, aimed at motivating students to realise a variety of problems, issues as well as needs of people they had not considered or thought of.

The findings strongly suggest that these sessions assisted them in seriously thinking about their role as designer. They began to realise the non-capitalist side of the potential of what they can do as designer. Moreover, in their view, examples and case studies from different countries used to visualise and articulate the topics are very useful. All students in the eight-session group confirmed that these topics assisted them in realising a variety of problems as well as needs of the people whom they had not considered or thought of before. They began to empathise more with those people and recognise the non-capitalist potential of what they can do as designer. Below is a short conversation from their discussion.

A1-13: “I’m impressed that the curriculum interventions helped me recognise a lot of things and issues that I used to take for granted. It made me think of a large variety of impacts created by design. It made me think critically about my role as a designer too.”

A1-9: “Seeing images of people living poorly in Africa, I asked myself... what on earth am I doing? Now I want to use my design skills to do something truly useful, not just for money.”

A-10: “When listening to a case study on designing clothes for the wheelchair users, I realised all the current problems that the wheelchair users have to go through every single day. That inspired me. It was something that I never thought about before as a designer.”

A1-9: “it made me compare what we are doing right now with what we’re supposed to do.”

Moreover, a large number of students from all focus groups reported that the ethical dimension of design was subtly presented via the activities involving the use of natural elements in the learning process. Most of the students in the focus groups revealed that their favourite activities are those employing the concept of “nature as teacher”. This has already been explored in the theme of worldview (8.2.1).

8.2.4.3 An introduction to interdisciplinarity

A large number of students pointed out that one of the outstanding features of the curriculum interventions is the crossing of knowledge boundaries and recognition of interdisciplinarity. An interdisciplinary approach to sustainability learning was used in the curriculum interventions and students were encouraged to explore a variety of sustainability issues during the sessions. All students in the focus groups reported that the curriculum interventions provided them with a wider perspective, instead of fixed knowledge and judgements. In their view, they felt encouraged to step out of the single disciplinary design learning. A large number of students reported that they became more open to accepting different views, thoughts and ideas from others. Many students also stated that they were more comfortable to take part in constructive arguments. Some revealed further that they were more straightforward and less concerned about losing face when discussing with their peers and the teacher. The practice of broadmindedness practice seemed to help increase the social capital of each student group too. A number of students said that the new learning approach assisted them in strengthening the sense of community in the learning environment, as they learned from each other.

Moreover, although a minor thing, students in one focus group noticed the choice of a term used during the sessions. In their view, the constant use of the general term “design” instead of the name of the Department, which refers to a sub-discipline in design, gives a more holistic description of the subject’s concern – the link between sustainability and the overarching practice of design. They asserted that, by doing so, it encouraged them to be more creative and think beyond one specific sub-discipline.

Many students from the eight-session and sixteen-session focus groups reported that the understanding of interconnectedness is foundational for being more open-minded to

interdisciplinarity, especially when learning non-design subjects. The findings suggest that interconnectedness is recognised by students in a number of ways: from seeing themselves as part of the ecosystem, to realising ecological and social impacts created by designers, to becoming aware of the complex link between different sets of knowledge included in the curriculum, or throughout their whole lives for some. All students in one focus group elaborated that they enjoyed the crossing of knowledge boundaries while recognising interdisciplinarity. They were also interested in learning how design is interconnected with other disciplines. Through a number of examples and case studies, students were subtly introduced to the value of interdisciplinary collaboration, rooted in both design thinking and ESD. In these students' view, they were impressed with the sessions discussing a radical shift away from designing physical artefacts and traditional problem-solving methodologies. Such transition away from the traditional mode of design supported by an interdisciplinary approach is new and exciting to them. However, there are a small number of students who found an interdisciplinary learning approach difficult. This matter is going to be looked at next.

8.2.4.4 The intricate association of pleasure, ignorance and challenge

The findings imply that the Thai cultural value of fun and pleasure orientation has a tremendous effect on students' attitude towards learning. Students revealed that they tend to learn more productively if they are "emotionally aroused" while learning. There are two aspects to look into. The first aspect is the role of teacher. Students from three institutions discussed the desirable personality of a teacher in connection with students' satisfaction. In their opinion, they would ideally like to learn with young teachers who have natural likability, charisma and a great sense of humour. Joking and teasing would be very welcome. For them "entertaining" personality of the teacher would immensely help with their learning process. In addition, students in the main study focus group revealed that they were thrilled and overjoyed during one of the sessions in the curriculum interventions which is a visit to a design shop owned by a renowned eco-designer. They felt so not just because it was conducted outside the classroom environment, but also to meet up with "the celebrity" and listen to his/her "charming" presentation. Consequently, a number of students in different focus groups stressed that the curriculum interventions were effective and productive due to the assortment of activities but they would prefer the sessions to be more fun and playful. Their comments are based on their personal preferences and interests, highlighting their dislike of academic learning, theoretical knowledge and the seriousness of sustainability. They would like a sustainability educator to be more entertaining at all time to reinvigorate the atmosphere and rescue them from boredom. The second aspect is the emotional quality of the topics instructed. A large number of students asserted that a sense of empathy triggered their goodwill in sustainability learning. They reported that they found pleasure in receiving a broader, more critical perspective on design, especially from peers. For some of them, fun was originated alongside the recognition that they had overlooked important and urgent issues related to design.

This has been discussed in the sub-theme of an introduction to the ethical dimension of design. But apart from the example of the cultivation of empathy in the social aspect of sustainability learning, students talked about this emotional quality in the environmental dimension too. For instance, one student talked about the deep ecology activity in relation to empathy, an initial awareness of ecocentrism and the link between environmental ethics and design practice.

A1-13: "I began to fall in love with this course (the eight-session curriculum intervention series) during the second session that we were given half an hour to have a conversation with a tree. The activity was very touching. The process concerned something that is deep down inside me. I think it was the touch point for many of us. It's amazing that suddenly we all had empathy for those trees. We all know that there are many trees on campus, but we had never paid close attention to them. It was an eye-opening activity."

A1-15: "It was something that we couldn't get our head around at first when you asked us to have close observation of any tree and see what we could find. We had no idea what kind of answers you expected from us."

A1-10: "We didn't quite know how to start. But after that, everything flowed."

A1-9: "Then we saw something physical that the tree presented. I started to understand that the tree was facing an uncomfortable situation caused by us – human beings. It has been here before us and we always take it for granted."

A1-10: "The tree has a life and it needs to survive. I often thought of wood in the workshop as raw material. I never realised that it was once part of a living tree."

A1-13: "After that (having a conversation with a tree), when we discussed our experiences, everyone was eager to participate in the group conversation. It was great. It was like reviewing the content of the lecture (a previous lecture on the environment ethics) through practice and discussion. And it was fun. I think the content structure is really well prepared. The learning process was emotional. It assisted me spontaneously to understand environmental ethics and its link to design practice."

However, the findings present that the fun and pleasure orientation value also tends to result in a negative mindset towards challenges and threats. There are two main reasons which students gave when they felt negative towards an activity or a topic. First, they were not satisfied with the approach employed by the teacher in a particular activity. It seems to be a person-based matter as students have been familiar with the teacher-centred approach. This can range from the teacher's use of language, the personality of the teacher, the method used (such as a long lecture). Other external factors affecting the learning process, like the hot weather and a noisy learning environment, have been mentioned in the way that it should have been taken into consideration more seriously by the teacher when planning the learning activity instead of thinking that the factors may be unavoidable. Second, they expressed that they had no interest in the particular topic. This presents that personal bias plays a vital role in learning unfamiliar subjects.

To illustrate this matter, the session on “Small is Beautiful” can be a good example. The session contains two parts, a lecture and a group discussion.

As presented in Figure 30, the majority of students have positive feelings towards the “Small is Beautiful” lecture. The reasons given by students who felt negative towards the lecture generally revolve around the students’ personal uninterestedness in the topic. The five students who thought the lecture was boring reported that, because of the spiritual and economic aspects of the lecture, the content was not appealing to them. The two students who fell asleep during the lecture expressed that the content was too intensive to concentrate. A student who found the activity difficult explained that the content on the Buddhist economics was too complicated for him/her and some examples given required the basic economic knowledge which (s)he lacked. When looking at the sixteen-session group in particular, one-third of students expressed that they were put off by the topic. Although all students in this group enjoyed the business perspective of design, confirmed by the data from the eco-design shop visit session, there are students who did not feel enthusiastic to learn about the economic system, especially the role of designer in relation to the local economy. The sense of interconnectedness embedded in how the economy works seems to be much less visible to them, in comparison to when analysing stakeholders and life cycles of objects. This may also imply that, due to their experiences in the curriculum, they might not have been able to see clearly that the design industries are also an integral part of the economic system.

This confirms that, because of the students’ lack of knowledge combined with lack of personal interest in the topic, it is not simple for a sustainability educator to get a message across via lecturing alone.

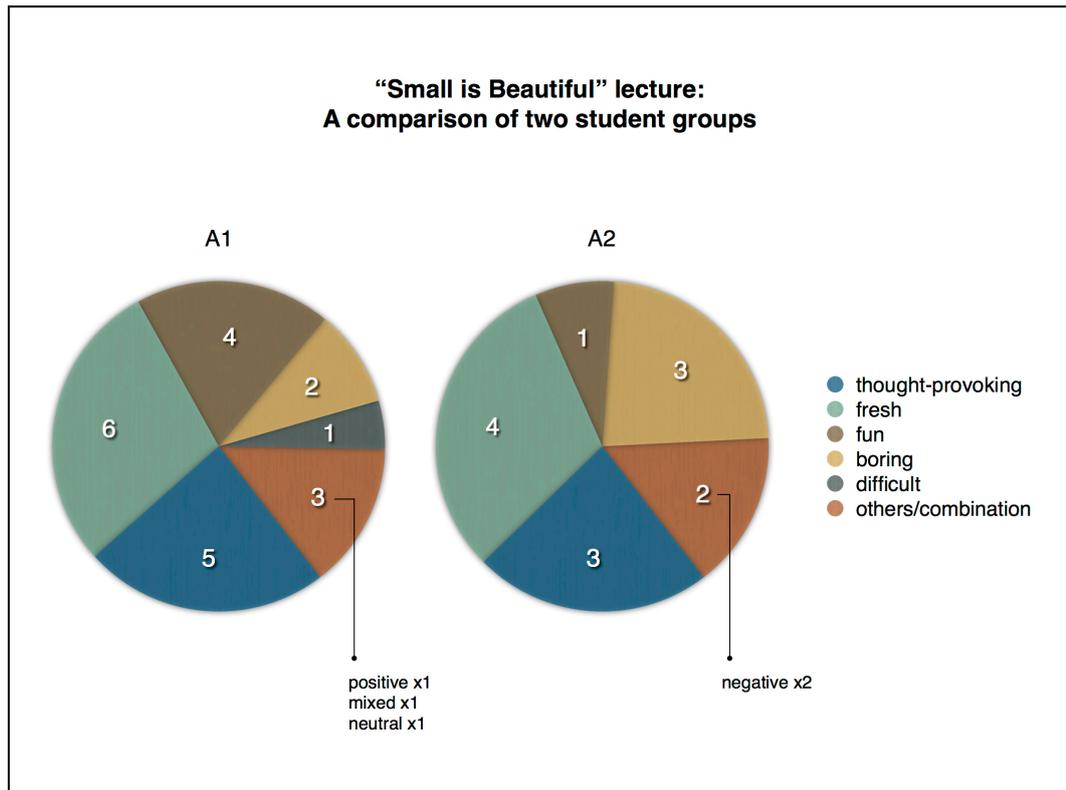


Figure 30: A chart presenting what the students from two groups in the same institution think of the “Small is Beautiful” lecture

For the after-lecture discussion on design and localism, students were given an opportunity to express and exchange their views on design for community. The situation got better in one group. Figure 31 shows that students in the group had entirely positive feelings towards the discussion. In another group, five out of thirteen students who previously had felt negative towards the lecture still had negative feelings towards the discussion. According to these students’ reflective diaries, the main reason is their uninterestedness on the topic. Four of them indicated that the discussion was difficult. Another student thought it was boring and confusing. For these students, with their lack of attention to the topic, the transactional approach used based on peer learning was not able to bring any enjoyment to them.

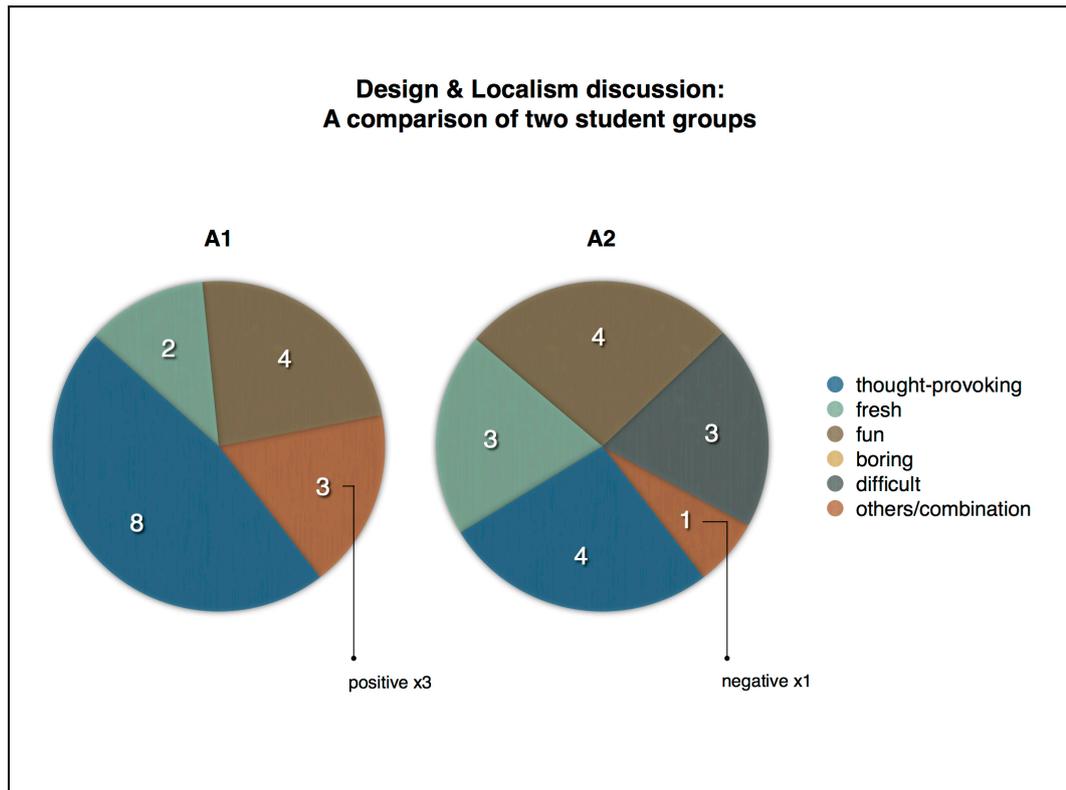


Figure 31: A chart presenting what the students from three groups in two institutions think of the discussion on design and localism

Furthermore, the findings reveal that “the unknowns” and “the uncertainties” often cause anxiety to many students. Such anxiety keeps them from taking on challenges. A number of students in various focus groups admitted that they simply dislike “taking so much into consideration”. The cultural trait of not wanting to experience unpleasant or awkward situations is outstanding in this scenario. Many students implied that the dislike of uncertain situations and the tendency to avoid the unknowns is a major result of the conventional education approach that focuses on repeatedly transmitting the teacher’s idea of what is right and what is wrong to students. Students in two focus groups think that this is the reason that their peers skip some classes or dropped out of the study. Consequently, the challenges of the unfamiliar, offered by the subject matter, may not always lead to eagerness to learn in Thai students. In contrast, it can have a tendency to diminish their willingness to learn from the start.

To conclude, sustainability is a challenging concept. In a big picture, the curriculum interventions helped increase students' intellectual and spiritual concerns towards design and sustainable development. However, the findings also imply that, for the context of Thai design education, challenge can be a double-edged sword for sustainability learning. The level of challenge is critical for the planning of sustainable design pedagogy. The Thai cultural value of fun and pleasure

orientation should be employed in the way that it contributes to students' motivation for learning unfamiliar topics.

8.2.5 Interconnectedness

Interconnectedness is fundamental and at the heart of sustainability. It is an overarching concept key to the whole systems thinking, one of the skills required for ESD. Whole systems thinking concerns acknowledging complexities and looking for links and synergies when trying to find solutions to problems. Within this theme of findings from students, there are three aspects to look at: the practicality of whole systems thinking, Students' new perception of future and students' recognition of the link between design and localism.

8.2.5.1 The practicality of whole systems thinking

This sub-theme looks at the findings from three activities based on the concept of interconnectedness: life cycle analysis, stakeholder analysis, and project planning exercise. These activities offered practical tools that facilitate students to practise whole systems thinking in various contexts and dimensions. Many students participated in the research revealed that whole systems thinking as a concept was abstract but it became much easier to grasp when put into practice. Most students think of whole systems thinking as a practical method. For the life cycle analysis activity, there are six groups of students categorised into three clusters. (See Activity set C in Appendix G for detail of this activity.) The summative findings for the three clusters of students reveal in Figure 32.

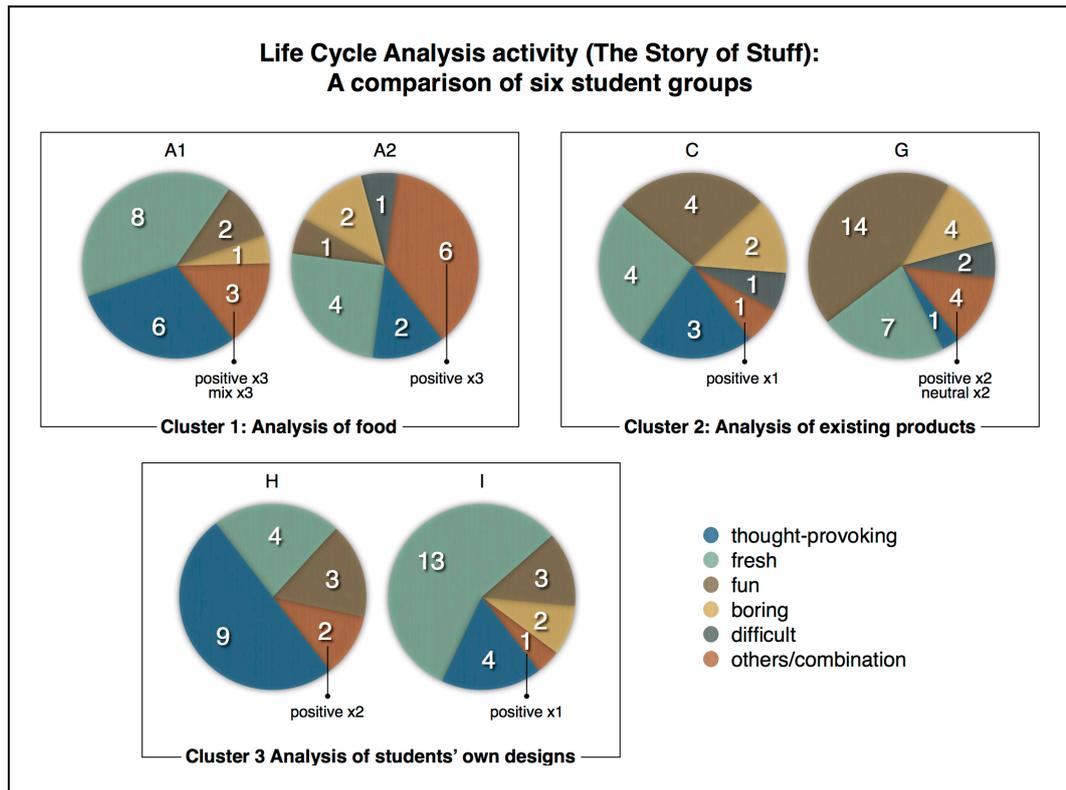


Figure 32: A chart presenting what the students from six groups in five institutions think of the life cycle analysis activity (The groups are divided into three clusters.)

For the first cluster, according to the visual data from video clips, most students in both groups were surprised at the beginning of the session when knowing that they were going to analyse their lunch. Some considered life cycle analysis a complex tool which put them off from participating in the activity. Some did not find the relevance of the analysis of food in connection with design. But when students had their hands on analysing their lunch in small groups, the atmospheres became much more positive as they learned largely from peers and browsed for data on their smartphone. For the second cluster, the visual data from video clips reveal that, among the three clusters, students in this cluster seem to be least motivated. The data from reflective diaries also confirmed that students in the cluster found the activity practical and useful but still lack enthusiasm to be involved. A small number of students from both groups explained further that, as they selected existing design objects based on attractiveness, they did not have enough knowledge of the products, especially the technical data of the products. Therefore, once they got on with the activity, they felt that they did it without much sense of purpose. For the third cluster, as seen in the video clips, students in both groups seemed hesitant and unconfident at the beginning of the activity. Many struggled with the technical aspect of the designs. Even though both are from craft-based design programmes which focus mainly on the making dimension of design, students obviously demonstrated the lack of knowledge on the sources of raw materials. According to the data in reflective diaries, they implied that the use of transactional approach

through the dynamic of questions and answers helped to relieve their difficulties during the activity.

Moreover, for the first cluster, students took part in a spin-off exercise – their second life cycle analysis activity. Students were assigned to select one of their previous design projects and critique their own work by using life cycle analysis. Then, students were asked to pair up and swapped the work that they brought with their partners. Each student was encouraged to come up with a more refined design solution for their partner. Figure 33 presents a comparison of two data sets from the largest student group, revealing the proportions of their feelings towards the first part and the second part of the session. For the eight-session group (A1), the findings reveal that students had more fun in the second activity than the first activity because they felt more engaged with the objects for the analysis and enjoyed dealing with the development part for their partners. However, For the sixteen-session group (A2), the number of students finding the activity difficult is outstandingly increased in comparison to their experience in the first activity. Several students in this group asserted that they struggled with the development task as they were concerned if the new designs would look less attractive than the original versions. In these students' view, eco-design gave them a limitation to their creativity in the form-giving dimension of design.

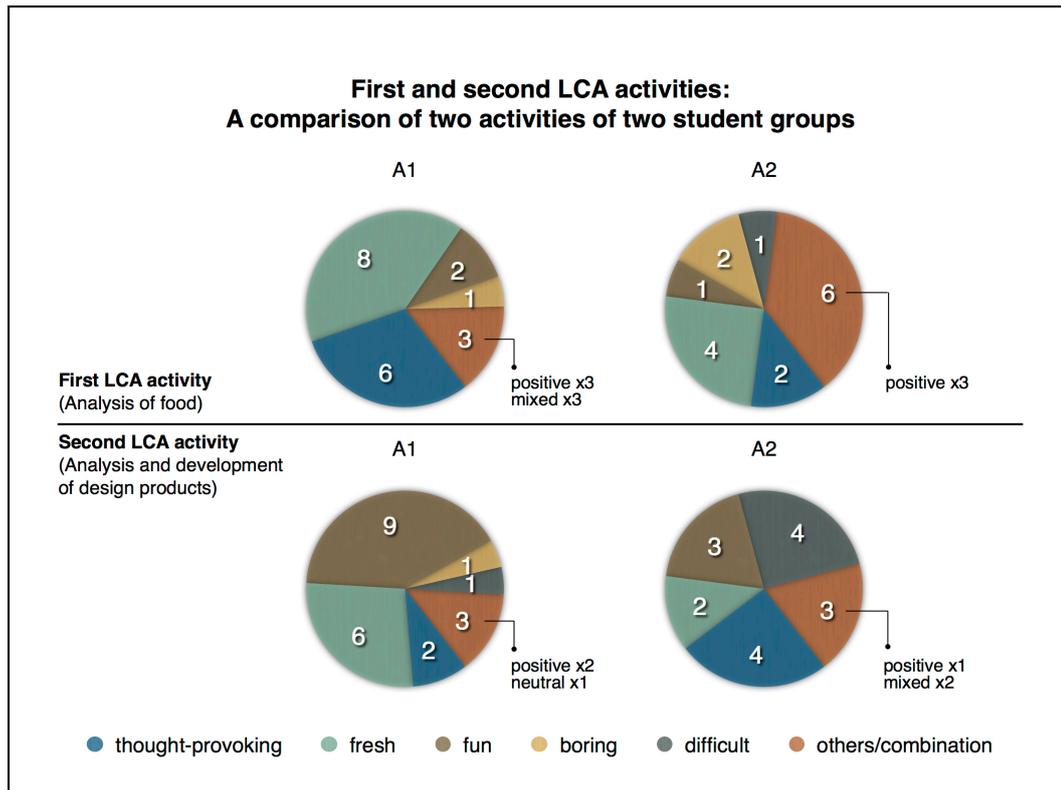


Figure 33: A comparison of data sets from students in the eight-session and the sixteen-session groups (A1 and A2) – their feelings towards the first and second life cycle analysis activities

Visual data from video clips presented that the majority of students in the main study group carefully chose to work with designs made out of a single material or a combination of few materials. In contrast, many students in the first group were more advantageous when selecting the designs they would like to analyse, even though they were given only one week for the development phase. The main study group was given three weeks to develop their designs. Even though these two groups are from the same programme, they took on challenges differently. This can be referred to the sub-theme of “the intricate association of pleasure, ignorance and challenge” under the theme “students’ attitudes and feelings”.

For the stakeholder analysis activity, it was a combination of a lecture and a roleplay conducted with three groups of students. It was well received. More than half of the students in total thought the lecture was fun because the role play element in the activity. (See Figure 34.)

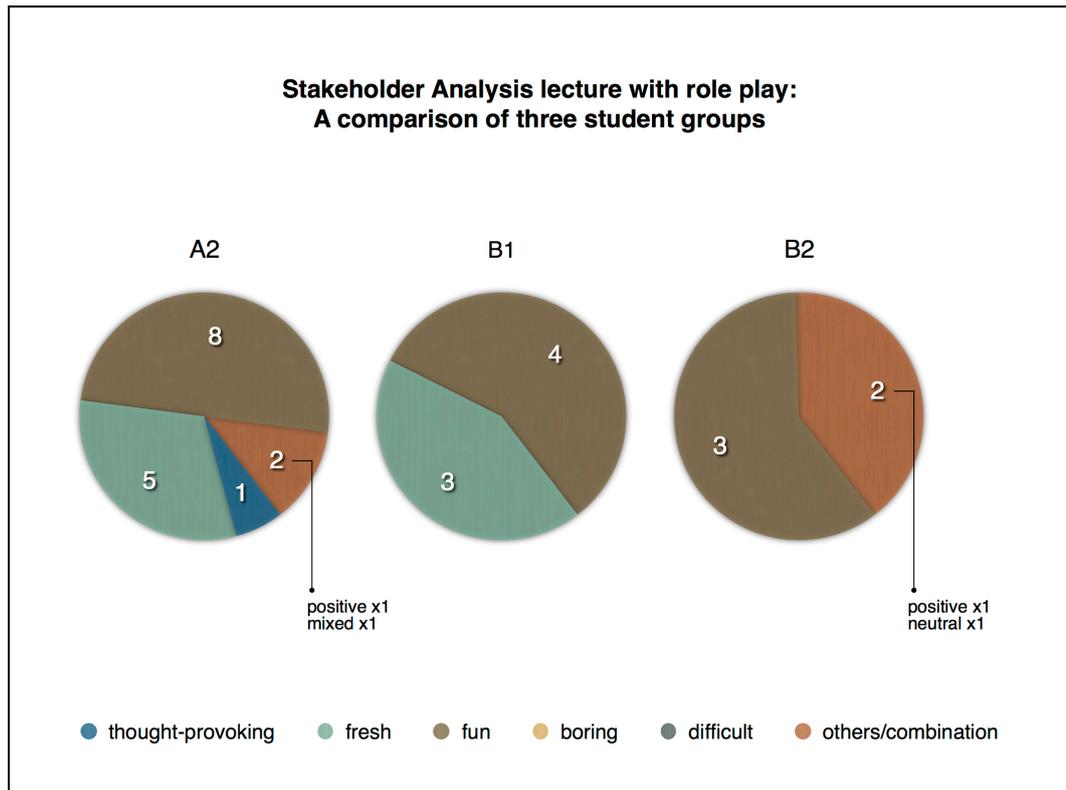


Figure 34: A chart presenting what the students from three groups in two institutions think of the stakeholder analysis lecture with role play

There are two main points found from the written data in reflective diaries. First, although also grounded in the overarching concept of whole systems thinking, students regarded stakeholder analysis as “much less complicated” than life cycle analysis which requires technical background or understanding of materials and production processes. Many students indicated that the activity offered them the right amount of challenge with the opportunity for them to be engaged in a role play as part of the lecture. Hence, nearly all students from three groups had positive feelings towards the learning of this topic. Second, twenty-two students confirmed that the role play considerably helped demonstrate the applicability of an unfamiliar theory. The activity enhanced their understanding of the topic as well as the connection with their previous knowledge, especially the concept of interconnectedness. Seventeen out of these twenty-two students implied that the session would not be as effective if the lecture was conducted solely without the role play. However, there are two students from the main focus group expressing their confusion. They had been familiar with the transmissive approach which their teachers gave them “the right answers”. In contrast, the sessions in the curriculum intervention series could only provide perspectives and tools to assist their thinking process. This can be implied that, although a large number of students think of whole systems thinking as a practical method which they can use to visualise issues and solve problems, some still would like to hear the ultimate right answers from the teacher.

For the project planning exercise, Figure 35 presents that nearly all students from four groups felt positive, while only one feeling neutral, towards the activities. As indicated in the findings, the major reason is that students found the activity practical and applicable to their ongoing practice, particularly beneficial for the planning phase for their group works and thesis projects. More than half of students in each of two smallest groups thought the activity was fun because they could focus on their own work while learning from peers at the same time. For the group that had least contact in the study (E), the curriculum intervention was conducted as a one-off session and this activity was included in the latter part of the session. This group of students also have least background knowledge of sustainability. Hence, due to the nature of activity which involves an unfamiliar type of thinking process, a large number of students considered that the activity was thought-provoking.

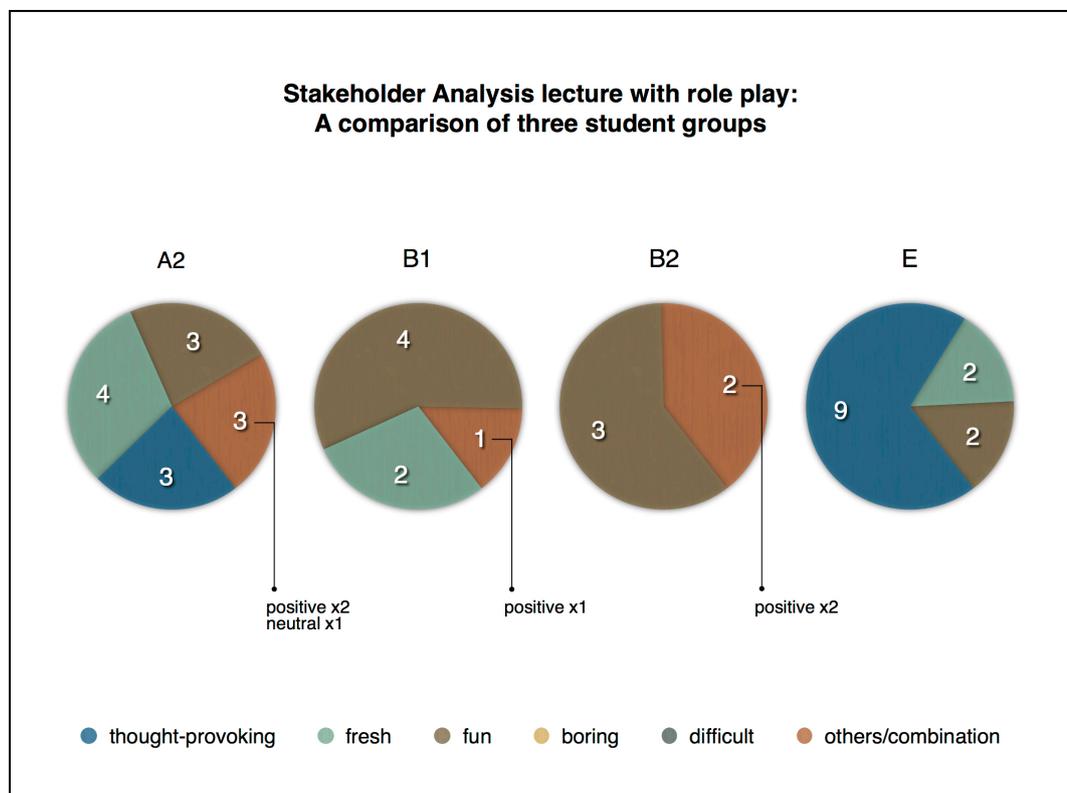


Figure 35: A chart presenting what the students from four groups in three institutions think of the systems thinking activity (The project planning exercise)

There are several issues concerning the activity which students pointed out their reflective diaries. First, giving a tool for whole systems thinking can help students to practise it more confidently. A large number of students reported that mapping out their thoughts in a template is useful. The template assisted them in articulating and organising their thoughts and ideas for their projects. Several students asserted that it is particularly beneficial in order to prepare themselves before discussing with their teachers in a tutorial. In their view, having things mapped out neatly in a

template may help them present a good impression to their teachers and get away from being judged negatively. Second, more than half of students taking part in this activity indicated that the activity facilitated them to be more considerate. The template facilitated them to see more clearly the complex connections between designer, the stakeholders of the proposed design, and numerous factors, both controllable (internal) and uncontrollable (external). They added that previously their focus was on the target users, based on how the market works and their capability to understand the needs of target users. Third, a small number of students in each group found the activity very challenging but worthwhile to try. These students were confused from time to time during the activity because working with the whole systems thinking template depends on their ability to visualise their own thoughts and ideas and they were not used to justify their own thinking. Some students said they were quite anxious because they were not sure if they were doing it the right way. In particular, visual data from a video clip shows that students in the group which had the least contact in the study struggled with the task at hand most often, compared to students in other groups. However, all of them wrote in the same way that they were going to put to use whole systems thinking for planning and developing further their thesis proposals. The overarching findings suggest that this activity set contributes in various degrees to three things. First is students' recognition of interconnectedness – seeing themselves as part of the larger system. Second is students' view on whole systems thinking as a challenge. Third is students' recognition of the benefits of practising whole systems thinking. Activities that are more hands-on and more relevant to students are more well-received by students. A great number of students regard peers as fundamental to the learning of whole systems thinking.

8.2.5.2 Students' new perception of future

One of the skills essential to ESD is envisioning – being able to imagine a better future. This sub-theme presents the analysis of data from the sessions concerning design futuring and design defuturing. Based on the overarching concept of interconnectedness, the sessions looked particularly at students' perception of future and how they could contribute to sustainable futures.

The findings from students in the sixteen-session group suggest that the activities in this theme contribute greatly to students' new perception of future. They have become more aware that the future is the result of our actions in the present and the past and in that way they felt motivated to change or make things better. Whereas the philosophical concept of future was perceived as challenging by these students, most of them reported that the field trip activity was far more interesting and influential. This is because, as they indicated, their focus is on the practice of new product development for sustainable futures and they tend to learn better from actual experiences and physical objects than a theoretical-based lecture alone. According to the quantitative data collected, all students had positive feelings towards the visit to an eco-design store. This activity is highest rated and best received among all activities in the curriculum interventions.

As found in the student reflective diaries, the field trip concerns four features which reflect several dimensions of using a place-based pedagogy for sustainable design in the commercial context. The first feature is the link between sustainable design and the commercial world. Prior to the curriculum interventions, all students had been curious how sustainable design could be practical, cost-effective and good for both society and business. The trip to an eco product store seemed to provide them much confidence. All twenty-two students thought that the activity gave them a new perspective in design, out of which thirteen students reporting that the visit offered them specific knowledge on the marketing aspect of eco-design. These students found it refreshing to get to know the practice that is active and unique in the business realm. They also learned from the owner about many eco-design products in the store, which they had never seen before. With an admirable tone in their writing, many students felt that the business attempted to juggle and balance between presenting the environmental concern and marketability of their items. However, these students seem to justify what they experienced in the visit nearly entirely based on the traditional paradigm of marketing. One student perceived that eco-design was a strategy utilised for adding value to products and increasing sales. Likewise, another asserted that the eco-design story behind each product is the necessary marketing tool. And another student reported that the expensive price points of eco-design items seemed sensible due to the shop's positioning for the niche market. This may be implied that these students visualised a sustainable future in the way that eco-design can survive in the commercial sector in Thailand.

The second feature is technocentric thinking. As noted in reflective diaries, more than half of the students mentioned their favourite items in the store. They tend to pick up products with specific features concerning certain types of waste-reduction technology. The emphasis seems to be placed on the technocentric solution to environmental problems. Five students wrote clearly that they were very interested in the items that were made using biodegradable and recyclable materials. According to the rationale they gave, they overlooked completely other important yet basic factors such as functionality and durability of the designs. This happened even though whole systems thinking had been highlighted for them in relation to the visit, to look at items in the store and consider multiple issues from basic design factors to life cycle thinking.

The third feature is charismatic teaching. Students indicated the qualities of charismatic teaching, as they were inspired by the owner's casual talk about eco-design and the items in the store. Unlike other sessions, the field trip was the only session that students attended learning on time. Many students revealed that they had looked forward to this visit because of the meeting with the store owner, who is also a celebrity eco-designer. Eleven students wrote in their reflective diaries about the store owner, especially his/her personality and presentation. Positive terms were largely used, such as "interesting", "inviting" and "enjoyable". Students commented that the store owner was a charismatic speaker and an impressive storyteller. They were fully captivated by the talk and throughout the shop tour.

The fourth feature is inspiration. Many students regarded the store as a major source of inspiration. They reported that they were inspired by the visit in two ways. One is that it gives fresh ideas, beneficial for shaping thoughts and ideas for their upcoming thesis projects. There are several students who would like to do thesis projects that involve eco-design because they were impressed by the stories behind the products they saw in the shop. Another is that students felt that they could visualise their future career paths with sustainability. Many students said they were triggered that they could combine their sustainable design knowledge and skills with a business prospect. One student felt motivated by one of the key messages in the shop owner's talk, which is "how to pay your bills with design for sustainability". In a similar note, another student wrote:

A2-5: "In relation to design, I immediately realised a lot of things about production processes and marketing during the visit. This real experience at the shop went beyond all lessons that I studied in previous sessions (of the curriculum interventions). It inspired me so much to create good designs for this world."

This activity achieved its aim, which is to enhance students' perspective on how design for sustainability can be situated in the context of Thai design industries. The findings also suggest that this field trip was powerful as it was compatible with the fun and pleasure orientation value of the Thai learners. Apart from the personal expertise and the non-classroom environment, it is undeniable that the success image and charismatic personality of the store owner also contributed greatly to the students' overall experience.

The findings also suggest that, for introducing the concepts of design futuring and design defuturing, the use of actual design examples works well with other groups too. The activity included a lecture on design futuring and design defuturing in the first half and a group discussion around sustainable product development in the latter half. Even though a large number of students said that they were not familiar with the philosophical concept and terms used in the lecture, almost all students had positive feelings towards the activity. Many students indicated that the group discussion, which is based on the analysis of real sustainable design products, plays a vital role in making sense of the theory. In term of the positive/negative attitudes towards the activity, there is not any significant dissimilarity in the findings between the students from different year groups. However, the only group of students who had been familiar with the master-apprentice model of learning reported two things. One is that it was the first time that they were given an opportunity to learn from handling and observing closely actual exemplary products. Another is the activity required them a lot more critical thinking than usual. This hence results in large proportions of students who think that the activity was thought-provoking and fresh, whereas other three groups have more proportions of students feeling fun.

The findings from the sustainable design product development exhibitions, which were conducted with two groups of students as an alternative to the conventional project presentation, are also promising. Peer learning plays a crucial role in this activity. Most students asserted that seeing all in one room how peers' products could be developed more sustainably altogether helped to boost their confidence in designing for sustainability and contributing to better futures. A number of students felt that they achieved a challenging task – they thought the initial designs were already complete, but their peers developed them further for better results. Many students reported that feedbacks from peers were really helpful. Some students pronounced that the activity made them realise that “a desired future can be achieved through design.” Students preferred this new approach of presentation to the typical style of verbal presentation that one speaks in front of a large audience and receives comments only from the teacher. Based on their ego-orientation value, they state that this exhibition approach is more unconstrained and less intrusive.

In a nutshell, as students prefer to learn through visuals, objects and direct experiences, examples and case studies are important in sustainable design learning, especially when introducing unfamiliar philosophical concepts like design futuring and design defuturing. Besides, place-based learning can bring students the sense of reality. In this case, a visit to an eco shop, it articulates clearly how sustainability can be tackled by designers. Through the practice of mutual support between peers and along with elements of storytelling, examples and case studies can assist students in visualising more sustainable futures.

8.2.5.3 Students' recognition of the link between design and localism

The session on “Small is Beautiful”, containing both a lecture and group discussion, concerns the social and economic aspects of sustainability. Key topics in the sessions include the link between design and localism, stakeholder analysis, appropriate technology and Buddhist Economics. According to the reflective diaries of students in two groups, students acknowledge the link between design and localism in various ways and there are four categories of opinions that stand out. Most students shared their thoughts containing multiple categories.

First, the findings suggested that students felt that the session gave them new knowledge and broadened their perspectives. Through a series of examples from various contexts, the majority of students in the one group were excited to see designs that target at the underprivileged, especially those responding to the needs of the poor and the groups of people they had previously overlooked. The sub-topic of “Design for the Other Ninety Percent” was mentioned positively in reflective diaries of five students. In their opinion, these examples helped them to understand the actual global situations, and that design serves not only economic growth but also the common good of the society as a whole. Second, the session encouraged students to think about design

ethics and designer's social responsibility, especially concerning the concept of Buddhist Economics. According to many students, examples given in the lecture made them recognise the role of design to strengthen their community and think of how they can contribute to their community via their design knowledge and skills. A large number of students indicated that they were also inspired to take action. These quotes from two students in different groups are examples:

A1-2 "The lecture gave me so much inspiration. I think all designers should be instilled with this small-is-beautiful idea very early in their career path. This idea, which starts from individuals, will play an important role in genuinely creating sustainable change. Tiny actions from designers here and there can accumulate and drive the community tremendously. The lecture made me feel that I have to do something good."

and

G-23 "Being a designer, I used to feel lost on the path to sustainability. The examples in the lecture inspired, encouraged, and gave me a beautiful thought that a designer can be a sustainability community developer too. I personally believe in the "less is more" concept. The lecture reminded me to "think small" in order to create the "balance" in and through my design practice."

Both quotes do not only present a kind of commitment on social responsibility but also implicitly address the spiritual dimension of the learner too. Third, the findings state that the session fostered an appreciation for appropriate technology. Based on the context of Thailand as a technological adopter country, several students wrote in reflective diaries their realisation that, instead of relying on the imported high technology, understanding and practising appropriate technology can maximise the capability of local designers and lead the way to a more sustainable future. In their view, technology should be small and controllable. For them, it is very much about putting the local resources, both human and materials, to the best use, not just thinking and trying to catch up with other countries in order to be more "civilised". Fourth, students expressed that the session enriched their understanding of localism. Students articulated that the examples given in the lecture urged them to look at the contribution of design to the locals from a different angle. When talking about local designs, they were only familiar to see them as products made and sold as souvenirs to tourists. In contrast, the examples are mostly product-service system designs created through the lens of localism to benefit the local community. As data suggest, this resulted in them having a glimpse to visualise a big picture of their local economy. Several students pointed out that their previous understanding of interconnectedness and whole systems thinking assisted in making sense of the link between localism and design.

However, the findings present that it is very challenging to introduce via a lecture the concepts of "Small is beautiful" and the Buddhist Economics to students who are not interested in or lack

background knowledge of economics. In addition, localism and appropriate technology were perceived by these students as unexcited topics. It is the after-lecture discussion that assisted them in making sense of the theory they had just learned. Twelve students from both groups asserted that they preferred discussion or an in-class exercise after a lecture to articulate their thoughts with peers while having a teacher facilitating the dialogue and guiding them on specific points. Furthermore, many students reported that the discussion, grounded in the sharing of different experiences and ideas from peers on the same issues, gave them the confidence to try putting theory into practice. These students revealed that the discussion helped them to see the light at the end of the tunnel because community issues are often complicated and too difficult to solve on one's own.

8.2.6 Shift in perspective

The findings confirm that the curriculum interventions, which represent the dissemination of transformative learning, assisted in the shift in Thai design students' perspective on and motivation concerning sustainability in many ways. Some activities have more impact than others. For example, three students in the main study group stated that after the life cycle analysis activity that they had lunch altogether, they do not look at a plate of food the same way again. Furthermore, all students in all focus groups revealed that they had previously thought of sustainable design as a kind of approach or tool – something that they can pick and use when needed, depending on the design brief at hand. The sessions did not meet but exceed their expectation. Instead, the curriculum interventions introduced sustainability as an overarching concept and encouraged the learners to use whole systems thinking as part of the design process when tackling unsustainable issues.

Moreover, the findings reveal that a shift in perspective leads to behaviour change in many students. Most students in five focus groups at three institutions asserted that they had begun to view the world differently and felt committed to changing their lifestyles. They think more critically about their daily life, especially when making decisions concerning buying or throwing away things. All students in the main study focus group revealed that they did not only initiate change in personal lifestyle but also encouraging people surrounding them, including friends, parents, relatives and lovers, to change too. As these students continue to pursue sustainability knowledge and skills for either personal or professional reasons or both, this may also be implied that not only they have been through the process of perspective transformation, but also practising sustainability as a lifelong learning process.

However, as suggested by students in the focus groups, the effectiveness of the approach used in the curriculum interventions depends on a number of interlinked factors. First, existing human capital qualities in the learners, such as experience, personal interests, and level of education are

very influential for the process of realisation in individual students. Students in all groups revealed that personal interests and the pre-perception of sustainability are instrumental in changing for sustainability. In particular, the findings present that students who are interested in Philosophy tend to comprehend the overarching concept of sustainability more clearly and promptly than others. For these students, after participating in the sessions, they did not regard sustainability only as a subject, but also a set of transferable thinking skills that they can use in real life. Some students relate sustainability to their personal Buddhist belief of doing good deeds. One student stated that to learn to design for sustainability support his/her mission of becoming a better designer. On the other hand, for the students who found the philosophical content unfamiliar from the start, they regarded sustainability learning as a challenge. However, these students responded differently to the different levels of challenge. There are students who feel bored very easily when facing unfamiliar subject and give up. Hence, many students dropped out. When looking at the aspect of the level of study, the findings reveal that most of the students who skipped classes and dropped out of the curriculum intervention series and are final year students. One of the key reasons seems to be driven by students' perception of sustainability as uninteresting, unimportant and/or irrelevant to them, especially when they would like to focus on their thesis projects. Moreover, a lot of students asserted that the curriculum interventions were instrumental in their personal development. Students who participated in the curriculum interventions and took on the challenge until the end reported that they were enhanced with critical thinking and self-reflection skills. Many of them commented that they were satisfied to have found that the skill learned from the sessions are beneficial for planning out their thesis projects too.

Second, the level of social capital among classmates is a significant factor for peer-learning activities. Peers are at the heart of the curriculum interventions. Positive social capital qualities such as social relations, norms and trust, which had been developed during the learning process, assist in the reinforcement of realisation as well as the mindset shift. Peer pressure plays a vital role, in both positive and negative ways. The competitive groups of students tend to find the peer-learning process rather awkward as it may lead to face-losing and face-saving behaviours. This resulted in students refrained from sharing opinions or chose to work with their close classmates only.

Third, the time frame and pace of learning are critical too. Students who participated in the eight-session, four-session, three-session and one-session curriculum intervention series commented that the period for their curriculum intervention series was "too short" as sustainability is a new and complex subject. They would like to have more time to assimilate the unfamiliar content and adapt to the student-centred approach. However, all students in the main study focus group questioned about the pace of learning in the sixteen-session curriculum interventions. They felt that the inside-out transformation process, focusing on a learner's change from within, is effective and powerful but at the same time the pace of learning was too slow that they were sometimes

trapped in boredom. Whereas there are a large number of students who enjoyed exploring the spiritual dimension of sustainability via assorted activities, there are also those who would like to receive instant, concise answers within a much short period of time. Some students stated that they had come to realise and understand the purpose of slow learning nearly at the end of the curriculum intervention series, but they could not help feeling displeased at times that they were not given immediate design tools to use. They believe that it is a result of their curricular experience which has made them familiar with making objects for specific purposes rather than exploring, thinking, analysing and debating wider issues. And this contributes to the fourth factor.

The fourth factor is students' experiences. All students who claimed that the curriculum interventions were effective made their comments based on a comparison between their experiences of curriculum interventions and the learning experiences they had previously received from their Departments. Students from most groups asserted that they prefer the approach used in the curriculum interventions to the teacher-centred approach employed by their sustainable design course leaders. Prior to the curriculum interventions, they were sceptical about the concept of sustainability. While they thought it was abstract, hard to understand and impractical, their teachers simply introduced a set of instant eco-design tools, allowing them to just pick and use for design. After the curriculum interventions, they reported that they now perceive sustainability differently, have a lot more understanding of it, feel less self-centred, and are more active and confident to learn other new things. They also claimed they have become more considerate of others and the environment. They still consider that sustainable design is challenging, but they also think that now they know they have fundamental knowledge and skills to deal with it. Furthermore, one student who had an internship with a renowned Thai eco-designer elaborated that the curriculum interventions offered a well-rounded experience in sustainability learning while his/her previous work placement only refined particular design knowledge and skills rather than enhanced the complete understanding of sustainability.

Apart from data from reflective diaries and focus groups, assignments submitted at the end of the curriculum interventions are also beneficial for the examination of change in individuals. Students from the eight-session and sixteen-session groups submitted pocketbooks on a personal philosophy of design for sustainability. The contents from all pocketbooks imply a shift in perspective in the learners in various degrees. There are several interesting points emerging from the data. First, the shift in perspective occurred alongside critical reflection on past learning experiences. Whereas the original objective is that the reflective diary is a data collection tool, a number of students mentioned it as part of the process of working on their final assignments. One student said, "To create a pocketbook containing my philosophy of sustainable design, I stepped back to observe myself thoroughly and seriously via what I had written on the reflective diaries." In this way, a reflective diary also works as a real diary for a student, not just a data collection tool for the researcher. Second, while all students presented through their assignments that their

perspectives have been changed, many of them produced their assignments as the writing of a report, instead of a self-developed critique. In their pocketbooks, they reported what they learned in each session, based on the timeline of the curriculum interventions. This may demonstrate that they misinterpreted the assignment, struggled to step away from the rote learning mode or had not practised critical thinking skills via writing. Most of the students who produced their pocketbooks based on what they learned in each session copied exact text from the original teaching materials. This finding seems to reflect one of the characteristics of Thai students which is avoidance of mistakes or fear of failure, based on the judgments of right and wrong. Third, some students tended to emphasise the design of the pocketbook over the content. There are a number of students put an emphasis on “beautifying” the form and template of the pocketbook rather than focusing on developing their essay. But it can also be seen as an attempt to include design elements in the writing task. Some pocketbooks come in quirky forms, such as a calendar, a can of snacks and a set of Chinese fortune sticks, to name a few. This finding seems to reflect the object-oriented view of design which has been deeply embedded in these students. Fourth, some students included the teacher as part of their stories. These students wrote their pocketbooks in an appreciative manner and included the teacher (the researcher) as part of their sustainability learning journey. This finding presents clearly the seniority and grateful relationship orientation values instilled in them. Through the individual assignments, students from both groups displayed their shift in perspective in different ways. The pocketbooks produced by the students in the eight-session group were more sophisticatedly written and convey more critical contents than the works of students in the sixteen-session group. When looking at this finding alongside others, it seems that students in the sixteen-session group spent more time on the group assignments and less time on the personal assignments. The topics selected by students in the sixteen-session group are more challenging as they chose to work on the campus-wide context whereas students in the sixteen-session group dealt mainly with issues at a smaller scale.

When looking at the group assignment presentations specifically, data from reflective diaries reveal three points to discuss. The details within each feature contribute differently to the shift in perspective towards sustainability and behaviour in learning. First is that students enjoyed new ideas. They found that the session was enjoyable because of the presentation of a variety of fresh ideas and interesting design solutions. However, students in the eight-session group indicated that they found pleasure in the dynamic of questioning and answering taking place after each presentation. In contrast, students in the sixteen-session group commented that they enjoyed their role as audience, viewing unconventional works created and presented by their peers. Eight students implied that they felt more comfortable to hold onto the final advice from the teacher more than their peers. The visual data from video clips also confirm these two different situations. The second point to look at is the importance of peer-learning and team working. Thirty students from both groups regarded the final presentation as a kind of proof that they could work cooperatively to pull off the challenge. Twenty out of these thirty students expressed an

appreciation for team-working. For the eight-session group, students also presented the documentation of their working processes, showing how they practised design thinking and whole systems thinking for their projects. In addition, nine students from the eight-session group asserted that they benefited from seeing a variety of working styles from their peers. For the students from the sixteen-session group, their comments are largely based on how well they worked as a team. Several students picked up from their experiences that a student's human capital is increased when working as a team. The third point concerns inspiration to deal with problems. Seventeen students asserted that the ideas and solutions introduced in the presentations gave them the inspiration to take action against unsustainability and make change for a better future. Twelve out of these seventeen students (eight from the eight-session group and four from the sixteen-session group) implied that they felt empowered to create a better future for their community. These students also stated that they felt positive towards the challenge they had taken, even though they were not confident at the beginning that they would be able to come up with any solution for their chosen issues.

In short, the shift in students' perspective correlates directly to the effectiveness of the curriculum interventions and the third research question of the thesis: "Can the dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?" Based on the success of the curriculum interventions, students in all focus groups also reflected on their curricula and gave suggestions on embedding sustainability in design teaching and learning.

8.2.7 Suggestions

This section looks at how students visualise ESD in design education, along with their hopes to revitalise the current broken feedback loops between them and their teachers.

The findings strongly suggest that, from the students' point of view, the place for sustainability education in design curriculum must be seriously considered by policy-makers and design educators. After experiencing sustainability education through the curriculum interventions, issues around integration of sustainability in the curriculum were discussed extensively in all focus groups. First of all, students in the eight focus groups from six institutions asserted that fostering sustainability in higher education alone is not enough. They think that sustainability should have been included in the first or second year of their programmes. In the big picture, they consider that it is vital to educate people of all ages about sustainability in a variety of settings. They are of the same mind that sustainability learning should begin at a very young age. They pointed out that Thai education as a whole is extremely inferior in sustainability learning when compared to how sustainability is practised in the West and other industrialised countries in Asia. According to these students, their perception was based largely on what they had seen from the social media,

which assisted in keeping them up to date with international news and trends. Further, they think that the government has never done enough to tackle this important issue. They all believe that it is vital to include sustainability education within all kinds of curricula.

For design education in particular, students expressed that, the root cause of the problem seems to lie in the psychological dimension of design educators. Students in all focus groups discussed the lack of shared values on sustainability among academic staff in their Departments. A large number of students think that the curricular focus should be rationalised by shifting to the direction that it facilitates students to think more, care more and exploit less. Most students in the focus groups admit that they have been trained through a design curriculum that puts a heavy emphasis on traditional artefact making but largely neglects the contextual studies in and the ethical dimension of design. Accordingly, in their view, now they have become concerned about the counterbalancing of the cognitive, psychomotor and affective domains in the curriculum. To adjust the balance of hand-head-heart in design education, they regard that sustainability should be integrated as the foundation of the curriculum. For example, one student expressed “If our curriculum emphasised sustainability from the start, we would have produced design graduates with an ability to think more holistically.” Students in all focus groups also discussed how to embed sustainability into the curriculum effectively. They suggested that the resolution could be that the curriculum structure is reviewed and revised with an honest intent to transform their current operating model to a more sustainable one. Students from four groups in three institutions pointed out that curriculum revision should be conducted in a more comprehensive way that fulfils the needs of students and the industries, including the need to create a sustainable future together.

Students from the curricula considering sustainability as an option (four groups from two programmes in two institutions), asserted in the same direction that design for sustainability should not be just an elective course. Instead, in their opinion, design for sustainability is fundamental for design education and should be a compulsory course for all first-year students. On top of that, the concept of sustainability may be mentioned, reinforced and practised more in other courses in the curriculum. Some students reported based on their previous experiences that, with sustainable design being just an optional module, they were unable to choose the course due to timetable conflict. In these cases, the curriculum structure is problematic as it tends to refrain students from learning sustainability. In their view, sustainability learning should be accessible to all students.

Students from the curricula that have already included sustainability as a separate compulsory course (three groups from three programmes in three institutions) expressed in the same way that their curricula did not prepare them to design for sustainability. In their view, it is mainly because the content of the course has not been instructed in connection to other courses in any way. That means, having a standalone compulsory course on sustainability does not contribute

much to effective implementation of sustainability in design education. Based on their curricular experiences, regardless of the compulsory status of the course, sustainability has been taught as an add-on. These students suggested two things. One is that the academic staff in their Departments should reconsider their core values for and the role of sustainability in design education. Two is that the connection between courses, especially sustainability and others, should be made clear. Besides, students who are from a university employing the sustainability rhetoric in policy making stressed that sustainability learning should be repositioned as one of the core aspects of every curriculum in the institution if the policy-makers are truly concerned about sustainable development.

Students from a curriculum that only some sustainability issues are included in a couple of core design courses expressed that it is “a big mistake” that their programme puts only little emphasis on sustainability. From their experiences, learning just a glimpse of sustainability in studio-based courses is not effective. Besides, they do not think that the academic staff in the curriculum are competent to teach sustainable design. Ideally, in their view, having design for sustainability as a compulsory course or a pathway in its own right would be more impactful. But they also believe that sustainability learning must be conducted as place-based learning so that students can relate to real situations and the experience is going to be more memorable.

What is more, students from all groups stressed that sustainability learning that they would like to see in Thai design education is one that challenges the traditional power structure within the classroom. They would prefer an experience of “learning for sustainability” rather than just “learning about sustainability”. Therefore, in their opinion, a sustainable design pedagogy should focus on the thinking process of the learners, especially critical thinking and whole systems thinking, rather than the implication of sustainability as design tool.

Since these students were not able to communicate directly to the academic staff in their Departments or the policy-makers in their institutions, they truly wish that any of their thoughts and suggestions expressed through this research would eventually be received and taken seriously by key players in Thai design education.

8.3 Conclusion and reflection

From a transformative learning perspective, the findings from student participants point out very clearly that the current design curricula do not meet their needs in many ways. One of the needs refers to an emerging demand for the provision of sufficient knowledge and skills to shape their sustainable futures. A large number of critical issues concerning the teacher-centred approach in design education, in which Thai cultural values play a vital role, are mentioned extensively in the

findings. The three factors described by students as resistance to change include three elements which revolve around the reductionist view of design education.

The first factor is **the steep hierarchical structure in teaching and learning**. The research findings from students confirm the literature review that the culture of **seniority** dominates Thailand's education system, playing a major role in strengthening **the top-down, teacher-centred, transmissive approach**. As explored in the chapter, there are numerous hierarchical issues found in design education, affecting how Thai design students learn, think and act. The traditional position of teacher in the teacher-student power structure as a key stumbling block in learning. Moreover, it directly impacts **the lack of peer learning**. Students have been conditioned that opinions from their peers have less value or are inferior than those from the teachers. According to the findings, there are three main traits of design teacher which students perceive and are familiar with. First is **the teacher-as-parent trait**. This refers to a design teacher being protective towards or in favour of a particular student or a group of students. Such trait results in both positive and negative ways. Second is **the teacher-as-boss trait**. This refers to a design teacher being a chief who makes decisions and controls directions of students' works. It concerns **the master-apprentice learning model**, which is found to be particularly outstanding in craft-based design programmes. Third, is **the teacher-as-customer trait**. This refers to a design teacher being a client who requires students to fulfil specific needs based on personal view and liking. These traits particularly lead to **the lack of studio culture, the lack of peer-based activities** and numerous **assessment issues**. Judgement and prejudice from teachers are often transmitted to students. Consequently, the top-down power structure in design education gives rise to communication issues. First, the flow of communication between the teachers and the students is often **one-way communication**. Students are rarely given an opportunity to initiate a dialogue or express different opinions. Second, when students take a passive role, it results in **the lack of feedback** to the teacher.

The second factor is **the imbalance between the hand, head and heart domains in the curriculum**. It is the current practice that is a direct result of the seniority-based culture coupled with a traditional view of design. Deeply grounded in **the making tradition of design**, the aim of design education in Thailand seems to be **to exclusively develop students' capacity in producing objects for the commodity-based capitalist economy**. The curricular emphasis is on the psychomotor domain of design education. Object-oriented design skills are considered extremely fundamental and the practicality of the current technology of production system is utmost. While their practical skills have constantly been developed, they lack skills in critical thinking and reflection. As students had observed, **Thai design teachers tend to instruct students in a vocational manner rather than theorising design from their practical perspectives**. Design education as a whole is short of the teaching and learning of contextual studies in design as well as design ethics. **The lack of research culture** also contributes to this

dilemma. Students asserted extensively about **the disconnection between what is learned via the curriculum and the reality**. In their view, Thai design education fails to catch up with the reality because the employment of the transmissive learning approach, focusing heavily on the traditional practical design skills like model making and technical drawing, is unable to provide students with enough understanding of the ever-changing role of design and designer. In other words, such imbalance results in students failing to realise a variety of external factors affecting design as well as the creative industries.

The third factor is **the rigid, single disciplinary perspective**, which is also an aftermath of the first two factors. The findings indicate that **the object-oriented view of design remains extremely eminent in Thailand's design education**. During the early years in university, it is compulsory for design students to enrol in General Education courses taught by non-design faculties alongside intensive skill-based courses in art and design. Based on how their curricula are structured, students perceive these two types of courses as disconnected and irrelevant. Adding in the intellect domain through the General Education lectures is not only ineffective but also counterproductive. Students greatly prefer the practical studies in art and design, which are based on vocational training, to the non-design subjects, which are usually instructed through lecturing. Understood from a single disciplinary perspective, students perceived that subjects provided and instructed by their own faculties were more important. Due to the long-established arts and crafts tradition, the apprenticeship model of learning is even more dominant in the craft-based design programmes. **The lack of interdisciplinarity** in Thai design education leads to a number of critical issues. It particularly affects the learning of sustainability. Prior to the curriculum interventions, **sustainability was considered an unfamiliar subject** for all student participants in this study. Many had not heard of the term sustainability before. The findings concerning students' former experiences of sustainability teaching and learning in their curricula point out that **design for sustainability is often taught through a technocentric approach and treated as an additional interest for designer**. In this way, it fails to instil in students shared value for sustainability.

Regarding the first research question on a paradigm shift, the three elements explored above confirm that the current paradigm of Thailand's design education is mechanistic. From the students' perspective, change is needed. For the second research question which concerns ESD and the 'frame of mind' concept, the findings from students affirm that there is a lack of shared value on sustainability among academic staff in their Departments, and that results in a major challenge in integrating sustainability into any design curriculum. Furthermore, students indicated how the curriculum interventions have been influential to the shift in their perspective and behaviour towards sustainability. The conclusion below, based on the three elements of curriculum interventions, responds to the third research question of the thesis: "Can the dissemination of transformative learning be a critical strategy for teaching sustainability to design

students in Thailand?” They are actually the reverses of the previous three factors identified by students as resistance to change.

The first factor is **the teacher-as-facilitator role**, which was introduced alongside a shift from teacher-centred approach to student-centred approach. **Learning from and with peers** is at the heart of the curriculum interventions. The position of the teacher in classroom is lower than usual by taking a facilitator role for most of the time. Based on the research findings, there are three features deriving from a teacher taking the facilitator role. First, the approach leads to **barrier-free communication**. A number of students asserted that **the use of open-ended questions** helped them feel relaxed and comfortable because they did not need to be worried about giving right or wrong answers. Second, the approach contributes to **an increase in students' concentration while learning** and assists in changing their role **from being passive to active**. Third, the approach develops their critical thinking and reflection skills to a great extent. That is to say, through **collaborative learning**, the curriculum interventions supported them to restore their **eagerness to learn**, leading them to have **more confidence in expressing their thoughts and ideas, asking questions to the teacher, initiating dialogue in classroom and participating in activities**. Furthermore, the findings present that **peer learning helped alter Thai design students' negative prior perception and expectation of sustainability education**. In their view, constant interaction with peers and the teacher ties into engagement in learning and betters the learning atmosphere. However, as sustainability is a challenging subject, there are a number of students who would like the sessions to be less academic and more entertaining.

The second factor is **the emergence of the head and heart domains in design learning**. The findings indicate that the curriculum interventions significantly helped increase students' intellectual and spiritual concerns towards design and sustainable development. During the sessions, students implied that they were engaged in critical thinking, reflection and realisation of **the ethical dimension of design** in relation to environmental, social and economic sustainability. All students in the focus groups reported that, compared to their previous design learning experiences, the curriculum intervention series is unconventional and effective, with lessons that are highly relevant to their lives. In their view, it is because the sessions enabled them **to think critically about their role as designer as well as their sustainable futures**. A large number of students asserted that **the use of nature in the curriculum interventions** to exemplify the concept of interconnectedness is unconventional and fascinating. Many reported that it facilitated them to grasp and practice whole systems thinking efficiently. A great number of students pointed out specifically that it was the first time that they came across the spiritual aspect of learning.

The third factor is **an introduction to interdisciplinarity**. The curriculum interventions aimed to provide a transformative learning experience, allowing design students to learn sustainability with

an interdisciplinary perspective. This is simply because sustainability is interdisciplinary and multi-dimensional, revolving around **the concept of interconnectedness**. Apart from the focus in design, the sessions encompassed a variety of disciplines, from philosophy to environmental science, offering knowledge in contemporary fields like holistic science, future studies and the Buddhist economics. Students confirmed the curriculum interventions helped them see that **design is interconnected with other disciplines** and their design practice can impact the environment and the society in both positive and negative ways. In particular, students taking part in the two longest curriculum intervention series reported that the sessions had fostered an interdisciplinary perspective and encouraged them **to go beyond focusing on object making to provide a systemic framework for solving more complex problems**. For the main study group, the session that is most well received by students is a visit to an eco-design shop. Students had an opportunity to meet the shop owner who is also a reputable designer. They were thrilled to gain new perspectives on business and marketing, learning how design for sustainability can survive in the commercial world.

Concerning the third research question, the findings confirm that the curriculum interventions, which represent the dissemination of transformative learning, assisted in the shift in Thai design students' perspective on and motivation concerning sustainability in many ways. The majority of the students participating in the curriculum interventions had positive feelings towards the sessions. Some activities have more impact than others. Activities involving working in small groups were better received than others. However, from time to time, the interdisciplinary aspect of the curriculum intervention presented challenges in getting some key messages across to students. For example, several students in some groups struggled with the theoretical-philosophical content of sustainability. A number of students also suggested that sustainability learning should be more entertaining, due to the intense and seriousness of the subject. Moreover, students discussed in many ways about the realisation of them and their practices being part of the larger system as well as the shift in their perspectives and behaviours towards sustainability. Many reported that the sessions facilitated them to be more considerate and empathetic towards others as well as nature. In their view, what they learned from the sessions do not only impact their design practices, but also the way they think and how they live their lives.

Students from all focus groups stressed the importance of embedding sustainability learning into the curriculum. As elaborated by students, sustainability learning should not refer to only the transmission of knowledge on sustainability itself but also a personal transformation towards sustainability. Numerous students embrace the course outlines of the curriculum interventions as exemplary for sustainability learning – with the use of the learner-centred approach that fosters cognitive skills (such as interdisciplinary, critical, and whole systems thinking) alongside increasing competence in practical skills (such as the know-how for analysing environmental and social impacts). In their view, it is urgent for design education as a whole to put an emphasis on

sustainability so that the new generation of designers are able to think holistically. They wish to communicate to their teachers to reconsider the status of and place for sustainability in their design curricula. According to their suggestion, sustainability should be taught as a foundation for all design programmes. A great number of students think that sustainability should be compulsory for all first-year students. And even if sustainability is taught as an independent module, various topics of sustainability should also be included throughout the program at every level. All in all, this implies that students advocate the integration of ESD in design education. This can be an initial answer to the second research question “Should ESD be embedded into Thailand’s design education through the ‘frame of mind’ concept?”, but more will be discussed in the next chapter.

This chapter also reveals that there are some cultural factors influencing sustainability learning in Thai design education, especially the mindset of the learners. Cultural characteristics in the learners associating with values like seniority, fun and pleasure orientation, flexibility orientation have been presented throughout, explicitly and implicitly. The next chapter is going to examine and discuss the issues further through the critique lenses of both Thai and Buddhist culture. It is going to look at how the cultural values in and mindsets of the participants entail all the three research questions.

CHAPTER 9: DISCUSSION AND CONCLUSION

As this research investigated the context of Thai design education in relation to a paradigm shift towards sustainability, ESD and transformative learning, the big picture of the research results presents the tensions between rhetoric and practice in relation to sustainable development, along with insights at the learning and pedagogy level. This chapter discusses the results in connection with the research questions. Reflecting on the purpose of the research, the study sought to respond to three nested research questions. The first research question asks **“Is a paradigm shift towards sustainability in Thailand's design education plausible and able to be put into practice?”** To respond to this question, concerned two steps. The first step was to study the existing paradigm of Thailand's design education, which determines whether a paradigm shift towards sustainability is plausible. The second step, leading to the other two research questions, was to explore the practicality of the shift. The second research question: **“Could ESD be embedded into Thailand's design education through the ‘frame of mind’ concept?”** focuses on design educators and educators with management responsibilities. These participants' views and practices were explored in connection to ESD. The findings from design educators personally advocating and teaching sustainability were particularly important for this question. The third research question **“Can dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?”** looks specifically at the classroom practices, especially the learning process of design students. For this question, the research also set out to create and assess the impact of a newly developed pedagogical model to facilitate sustainability learning of Thai design students based on Buddhist values, Thai cultural values and feedback from students.

9.1 An examination of the results in relation to existing literature

The review of literature addresses the need for implementing ESD in Higher Education and an understanding of the cultural values of Thai people. As this research brings into focus the implementation of ESD in Thai design education, it connects these two well-established bodies of literature. Therefore, to examine the research results with regard to the existing literature, there are two main areas to look at. One is ESD and Thai design education. Another is the impact of Thai cultural values on design learning and pedagogy. The examination in this section contributes significantly to all three research questions.

9.1.1 ESD and Thai design education

Higher education is important to sustainable development because it drives social change through preparation of a future workforce, new knowledge creation and use of research to link business and community (UNESCO, 2009). To work towards the implementation of sustainable

development, higher education institutions must lead the way through ESD. This thesis is the first study, to my knowledge, to examine ESD in Thai design education in a holistic sense by taking into consideration current practices, views, needs and cultural values of multiple groups of its stakeholders. The research results are broadly consistent with Pasupa's (2016) study, which indicated four problems in Thai design education in relation to ESD. First is the lack of sustainable design courses and modules. Second is the lack of government drive and business demand. Third is that the current teaching activities cannot fully contribute to the integration of sustainable design in the industry. Fourth is that the target lecturers lack a holistic view of sustainable design. However, this research provides extra insights involving the hierarchical power structure and the contrasts between sustainability rhetoric and actual practices of Thai design education. Being a hierarchical society with top-down governance, Thai students' voices have always been excluded from multiple levels of the nation's education development. The highlight of the research results is the insights concerning learning and pedagogy from design students, which are essential for improving the performance of Thai design education for pursuing a paradigm shift towards sustainability.

This section aims to discuss mainly the stumbling blocks of ESD implementation in Thai design education. The results of this research are overall related to a UK study by Dawe, Jucker and Martin (2005, p. 28) which presents five barriers to embed ESD into curriculum across different disciplines in higher education. The first barrier is that curriculum is usually too crowded already. Likewise, for the Thai context, this research indicates that, when sustainability is included as part of a curriculum, it is usually scheduled for either third or fourth-year students only. This research links this barrier to the second one too, which is that sustainability is perceived irrelevant by staff. In Thai design education, sustainability is regularly seen as an extra knowledge or knowhow not fundamental for design learning. A large number of design educators and Heads of Design Department taking part in this research regard sustainability merely as "a personal matter of concern". Consequently, sustainability remains just an add-on in a curriculum. The third barrier is the lack of staff expertise and the need to acquire new knowledge. Several educator participants in this research identified this barrier too, especially in connection with the unavailability of sustainable design sources in Thai language. The fourth barrier is the lack of institutional drive and commitment. This research shows that there are five out of fourteen sampled institutions currently and explicitly adopting sustainability rhetoric in their policies, with labels like "sustainable university", "green campus" and "happy university". All these universities appear to use a top-down approach for the implementation process. However, participants from these institutions commented that the work had only been in the initial stage of development. Regardless of numerous attempts to implement ESD which have been made at multiple levels across different institutions, the research points to the lack of shared responsibility and values of sustainability among stakeholders in Thai design education. Using Bonnett's (2002) concept of education for sustainability as a frame of mind and Sterling's (2011) ecological view of education as a set of

lenses to examine the situation, Thai higher education institutions appear to be operating in a mechanistic paradigm in which the process of putting sustainability rhetoric to use does not take into account the empowerment of stakeholders to contribute to sustainable development. The fifth is lack of staff awareness of sustainability. This research points out that it is not only the lack of awareness but the lack of shared values of sustainability among staff that contributes significantly to the current missed opportunity in integrating ESD into a design curriculum. All of these barriers relate to the link between ineffectiveness of sustainability teaching and learning in Thai design education and the priority of sustainability in curriculum, as stated in Pasupa's (2016) research.

Pasupa identified that there are two root causes of the barriers to implementing ESD into Thai design education. One is that sustainable design was considered a lower priority than other more conventional design subjects in the curriculum. Another is the lack of expertise related to and insight into sustainability among Thai design educators. Pasupa concluded that these two reasons lead to ineffective teaching activities of sustainable design. However, as this research proposed to look at this matter more holistically, the results argue that the overarching root cause to the problems is more complex than Pasupa's conclusion due to some Thai cultural values. In particular, seniority and ego orientation, play a vital role in reinforcing a negative view of sustainable design learning too. As Thais value tradition and continuity, conventional design knowledge and skills are more well-received among staff and tend to remain well-rooted in the curriculum, leaving no or little room for sustainability, which is new, unfamiliar and often perceived as a trend from the West. Based on this negative view, sustainability is thought of as "something that limits freedom to design" by several research participants, from Department Heads to Design academic staff on the teaching track. However, views on this matter from students taking part in the curriculum interventions are interesting to look at. A small number of students from a three-session group who regarded sustainability as an obstacle for design suggested that an increasing proportion of ESD in design curriculum can be key to overcome their negative view. Some students from the eight-session and eighteen-session groups revealed after completing the curriculum interventions that sustainable design was still challenging for them, but they had become more confident with a good foundation of knowledge and skills to approach sustainability challenges. These contrasting views reflect a fixed mindset of one side and a growth mindset on another.

With regards to Pasupa's claim on the lack of expertise on and insight into sustainability among Thai design educators, this research also confirms that there is a shortage of design educators who are ESD competent. But what is more interesting is that, among design educators working in different higher education institutions who are highly competent in and committed to sustainability, there are those who struggle to advocate ESD in their curricula. Five sustainable design educator participants in this research fall into this category. As they commented, none of them have successfully fostered sustainability in their design learners. Among these five

educators, two expressed that they have been wrongly allocated as they have been assigned to teach in courses irrelevant to their skills and interests. In their view, their sustainability-related research interests and expertise in design for sustainability have been depreciated by their colleagues and senior managers. The other three educators are more senior. Two of them have long been course leaders of a sustainability course. But all three have felt powerless to make any significant change in their curricula. At the time of writing, one of these three has just resigned because of career unfulfillment, in relation to his/her attempt in integrating ESD into design learning.

To summarise, recent studies have argued for the need to embed ESD in modern curricula. Thai design education appears to currently be at an early stage of the ESD movement, Pasupa's study provided a review of the situation and analysis of the challenges through the perspectives of key players in government, business and education sectors. This research employed a holistic approach, focusing more on the learning and pedagogy level and linking the findings between different stakeholders across the power structure of Thai design education. It discovered that, regardless of top-down institutional ESD policies or availability of design educators skilled in and advocating sustainable design in the curriculum, the lack of shared values of sustainability among design educators contributes greatly to the current missed opportunity to implement ESD into design education.

9.1.2 Impact of Thai cultural values on design learning and pedagogy

According to Komin (1988), Thai cultural value orientations must be taken into account in any development programme as they often prove to be obstacles to social change. Hofstede's (1997) theory on cultural dimensions was also useful for making sense of the research results in conjunction with national culture and the phenomenon of change and development. With respect to Thai culture, existing literature offers a more general view on Thai cultural values (Komin, 1990, 1991, 1998; Holmes and Tangtongtavy, 1995; Malikhao, 2017), which some studies discussed more specifically in the context of education (Hallinger and Kantamara, 2001; Raktham, 2008, 2012; Taylor, 2014; Lao, 2015). What this research provides is not only a strengthening of these Thai-specific studies but also a comprehension in how Thai cultural values impact design education as well as higher education, especially in connection with implementations of ESD and transformative learning. This section discusses two sets of Thai cultural values relevant to the research results. The first set is hierarchy and power. This set concerns the concept of high power distance (Hofstede's, 1997) and includes values like seniority, ego-orientation and smooth interpersonal relationship orientation (Komin, 1991). The second set looks at cultural values regarding change, including avoidance of uncertainties (Hofstede's, 1997) and fun-pleasure orientation (Komin, 1991).

9.1.2.1 Cultural values relating to high power distance

According to the findings in relation to cultural reproduction theory (Bourdieu & Passeron, 1990), Thai education institutions appear to be a major mechanism of social reproduction, reflecting Thailand as a “strongly hierarchical and bureaucratic society” where “differences in power and status are accepted as the natural order of life” and “people expect to be told what to do and how to do it” (Hallinger & Kantamara, 2001: 391). Thai educational system is highly centralised and the Thai approach to leading change by orders or mandate has long been culturally viable (Hallinger & Kantamara, 2001; Lao, 2015). The large power distance in the Thai society affects the teacher-student relations (Hallinger & Kantamara, 2001; Raktham, 2012; Taylor, 2014). Numerous findings from this research confirm Lao’s (2015) study that seniority dominates Thailand’s education system and the units within it. It is common that policy-makers and management staff in education institutions are seniors, regarding age and rank. This research implies that, in the big picture, seniority, accompanied by the traditional value system of patronage, contributes to the bureaucratic mindset of Thai education and underpins the power structure that facilitates the practice of authoritarian submission in education, which inevitably affects design education. Looking at ESD in the context of Thai design education, the teacher-centred approach, grounded in hierarchical teacher-student relationships, is one critical factor contributing to the ineffectiveness of sustainability teaching and learning. The results of the research uncover a large number of power structure-related issues, especially those concerning the contrasts of views of learning between design educators and design students, the gap between rhetoric and practices of ESD in institutions with sustainability policies, and the conflicts of interests on graduation production between design educators and design practitioners working in creative industries.

As examined in Chapters 7 and 8, Thai design education appears to focus mainly on the technical and vocational nature of design education and hold a strong, conventional view that higher education produces graduates for the labour market. However, design professionals and current design students reported in the same way that they found Thai design curricula outdated, irrelevant and disconnected from the actual needs of the industries. Design practitioners participating in this research suggested that, in the broad picture, unsustainable design practices need to be changed, but they also found it difficult to change themselves. In their view, to assist in the shift, design education must produce sustainability-literate and competent graduates. They put forward that the role of design educator is the utmost influence to instill sustainability values in students. However, as sustainability has been seen by the majority of design educators as unconventional and externally inconsistent with their curricular view and practice, this area of tension concerns the question of why ESD has not been reflected as a priority in design programmes.

At the classroom level, seniority plays an outstanding part in establishing roles of design teacher supported by a steep hierarchical structure of learning. This research found that there are three traits of design educators perceived by students: teacher as parent, teacher as boss, and teacher as customer, which allow design educators to exercise power and control over students. The three positions interrupt students' design learning process and affect how assignments are assessed in many ways. Students have been conditioned that their own research and opinions from their peers have less value or are inferior to their teachers' advice and preferences. Consequently, these positions directly impact the lack of peer learning in Thai design education. Concerning the maintenance of the traditional view that students are passive subjects, the research unfolded further that more than half of the educator participants taking part in the study provided negative views of their learners, including "self-centred", "lazy", "bored easily", "unconcerned about tradition or their own cultural roots" and "unwilling to step out of their comfort zone". Some of these characteristics contradict the concept of paying respect to seniority and as suggested in Komin's (1991) but correlate to Raktham (2012)'s finding from classroom observations of Thai school students. Komin stated that "ego preserving" is fundamental for social smoothing and underlying the attitude of *kreng jai*, which means feeling considerate for another person and refraining from causing trouble to the person or hurt the person's feeling (1991, p2). On the other hand, Raktham (2012) pointed to a noticeable absence of *kreng jai* among observed students. Raktham (2012) used the term "misbehaved" to describe some students lacking good manners and the *kreng jai* attitude, which also matches with interviews given by several design educators taking part in this research. According to many educator participants, the advance of technology contributes to these "the undesirable characteristics of learners". While many educators focused on the negative views, several educator interviews imparted the educators' sense of powerlessness regarding the improvement of the teacher-student relationship within the hierarchy. In particular, educators aged under thirty participating in this research were more likely to express concern for students.

When looking closely at the tensions between the views of the teachers and those of students, it appears to be a symbolic negotiation of power between the two sides. Besides, it can be understood that the mainstream pedagogy employed in Thai design education enables students to accommodate passive learning. This is in line with Pongpipattanapan's (2017) observation that the Thai conventional education tradition which is tied tightly to the hierarchical power structure, does not only refrains the learners from questioning but also holds back the learners' imagination and capability to create innovations. This aspect of the tensions also involves ego orientation and smooth interpersonal relationship orientation values. Students taking part in this research reported that judgements and decisions of their teachers are influential in their design learning process. The direction of each design assignment depends very much on what the teachers think or the teachers' preferences. In a number of design curricula, current pedagogical practices predominantly align to a great extent with a master-apprentice model. Students in the focus

groups discussed in many ways about their frustration regarding their teachers' comments and feedback, which frequently weakened their confidence and left them "feeling lost". Because of the judgmental manner of the superior, the feedback given is often perceived by the inferior as "a big deal". As Thais in general usually avoid any form of overt conflict or confrontation, especially with those who are senior, students inevitably remain passive and disempowered. There is a high cost to maintaining "the surface harmony" between the teachers and learners.

9.1.2.2 Cultural values relating to change

According to Hofstede, Thailand is a society with short-term orientation and high uncertainty avoidance culture (The Hofstede Centre, 2014) That means, Thai culture is more likely to value tradition and the current social hierarchy, and avoid making decisions where there are uncertain outcomes. Consequently, Thais generally tend to avoid taking risks, because risk means bringing in more uncertainty and increasing their responsibilities. Moreover, because of seniority, Thai culture encourages only people at the top of the hierarchy to make decisions and discourages subordinates to dare to make mistakes (Holmes and Tangtongtavy, 1995: 84). This research shows that, in Thai design education, avoidance of uncertainty has been strengthened through pedagogical practices. The strong teacher-centred tradition of education, which concerns mainly the transmission of fixed knowledge, have been long grounded in the Thai society because of this high uncertainty avoidance characteristic and the respect for seniority. The research results from classroom observations confirm high uncertainty avoidance in design students. Derived from the master-apprentice model of learning, the conventional design learning approach focuses on repeatedly transmitting teachers' idea of what is right and what is wrong. Even when students were given an opportunity to have a voice, they remained silent. In several sustainable design lectures at various institutions, none of the students posed any questions. When being asked by their teacher, students dealt with a stressful or awkward situation by smiling and keeping quiet. This research indicates that uncertainty avoidance does not only affect a design student's ability to step out of their comfort zone, but also results in a tendency to become comfortable with receiving the transmitted knowledge without thinking critically. This reflects the face-saving attitude in students as well.

To elaborate on this issue more clearly, below is a quote of one student from the sixteen-session group talking about his/her peers who dropped out of the study after attending only the first session of the curriculum interventions.

A2-5 "I spoke to several classmates who opted out of the course (the curriculum interventions), they simply said they couldn't be bothered to learn an unconventional subject in this unusual environment. They dropped the course and enrolled in another studio-based course instead. For them, the other course is more fun and much less stressful. You have to understand that we, as learners,

have not been trained to discuss our thoughts and ideas in class. We did not expect that we had to be active and engaged in classroom activities. We're used to listening to lectures without making any other effort. We prefer a learning environment that is laid back. Critical thinking can be too much for us."

The quote implies three things. First is that a challenge of an unfamiliar subject like ESD may not contribute to eagerness to learn in Thai students. Too much challenge can diminish students' willingness to learn from the start. Second is that Thai design students, in general, are comfortable with passive learning as it is what they are used to. Third is that students tend to only pay attention to what they think is essential and relevant to them, based on their personal interests. How one sees importance in specific knowledge and skills is built upon a person's preference and value, rather than urgency, necessity or for the sake of self-development. A large number of students in various focus groups linked this matter with ESD by expressing that sustainability was ignored by their teachers and peers who are not interested in what is going on at the global scale as well as the future of the planet. In their view, if one is not interested in or curious about a subject matter, one fails to recognise it. This correlates to Komin's (1988) observation that Thai cultural value orientations often prove to be stumbling blocks to change.

As stated by one senior design educator, the cultural trait of not wanting to experience unpleasant or awkward situations can be a hindrance for sustainability learning of Thais, not limited only to Thai design students. Interestingly, through the conduct of the curriculum intervention series, this research discovered that the feeling of being in control is crucial for Thai design learners. According to students in focus groups from the eight-session and eighteen-session groups, more understanding of sustainability results in their satisfaction in sustainability learning as well as increase interest in sustainability. Some students revealed further that sustainable design was still challenging for them, but they had become more confident with a good foundation of knowledge and skills to approach sustainability challenges. While Komin (1991) asserted that the fun-pleasure orientation value tends to result in a negative view towards challenges and threats, this research indicated that the favour of having fun and leisure could be a critical strategy for sustainability learning in Thailand. In theory, the fun-pleasure orientation value associates with the concept of *sanuk* which is to have fun or to have a good time. Therefore, Thais are easily bored and lack serious commitment (Komin, 1991, p. 14). In this research, *sanuk* came into play as a feature of peer-learning. That means, based on the framework of transformative learning, the curriculum interventions lessened the teacher-student power distance and put more emphasis on students' fun-pleasure orientation value.

During focus group discussions, a large number of students highlighted their usual dislike of lectures. Some students reported that they sometimes fell asleep during the lecture parts of the curriculum interventions because of a lack of preference in some topics. However, they commented that they enjoyed all other non-lecture activities. Students in all focus groups asserted

that the curriculum interventions were effective and productive due to the assortment of activities, but, if possible, they would prefer the sessions to be less academic and more playful. In two focus groups, students argued that *sanuk* was not the only element that brought them pleasure or joy of learning. The majority of students in both groups pointed that empathy was essential to trigger their good will in learning. In their view, they found pleasure in receiving a broader, more critical perspective on design, especially from peers. For some of them, fun was originated alongside the recognition that they had overlooked important and urgent issues related to design. Learning with and from peers assisted them in feeling in control of their learning process.

In summary, Thai cultural values impact pedagogical practices in many ways. Seniority strengthens the teacher-centred approach and passivity of learners. Avoidance of uncertainties is inevitably integral to the learning culture. Fun-pleasure orientation can turn students away from difficult assignments and unfamiliar subjects. As it happens in design education, these values remain stumbling blocks for change and often refrain students from taking on challenging tasks. This research took into consideration these values to design and develop a culture-specific ESD pedagogical model for Thai design education. The findings from the curriculum interventions shed light to the third research question on dissemination of transformative learning for ESD in Thai design education. The next section provides a detailed discussion and summary of research results, in connection with the three research questions.

9.2 Discussion and summary of research results

This research has shown that there are a number of possibilities and challenges to create a paradigm shift towards sustainability in Thailand's design education through the embedding of ESD into and the use of transformative learning in design curricula. In relation to the three research questions, the results of this thesis will be discussed in a reverse order to follow the inside-out process, starting from the innermost and smallest context, which is the learning and pedagogy level, before moving to the two larger ones, which are the curriculum and institution level and the paradigm level.

9.2.1 “Can dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?”

This question “Can dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?” focuses on the level where learning takes place, especially the results of the curriculum interventions conducted with eight groups of students across ten universities to exemplify dissemination of transformative learning of ESD in Thai design education. In order to respond to the question, this section aims to discuss the background of the situation in connection to the concept of mindset, the role of design educator and the aim

of Thai design education, a pedagogical model for ESD in Thai design education, and the challenges of implementation of transformative learning for ESD in Thai design education.

9.2.1.1 Mindset

This first area looks at the background of the situation, in respect to the concept of mindset. As previously explored on the impact of Thai cultural values on design education, it appears to be inevitable that the teacher-centred design pedagogy can transmit a fixed mindset to the learners. According to Dweck (2017), a person with a fixed mindset lets failure or success define them. On the other hand, a person with a growth mindset is enthusiastic to learn to increase performance, open to constructive criticism, takes feedback and uses it, seeks out challenges and learns from mistakes. The fixed mindset in Dweck's theory correlates with many Thai cultural values. The desire to look smart, ignoring criticism and feeling threatened by the success of others are linked with the value of ego-orientation. Besides, avoiding challenges, giving up easily when facing obstacles and seeing the effort as pointless associate with the fun and pleasure orientation. As stated by Komin (1991, p.11), knowledge-for-knowledge sake does not receive high value in the cognition of the Thai in general. So, for Thais, education can be compared to a social ladder on which people climb to success and a firm social position. Transmission of a fixed mindset appears to be grounded in the bureaucratic-authoritarian culture. It is clearly not a healthy practice and can be damaging in the long run. In general, a fixed mindset in teachers affects immensely on Thai students' views of challenge and failure. Since 1999, the educational reform in Thailand, inspired by the 1997 Constitution and the 1999 Thai National Education Act, has made it mandatory for the learner-centred approach to be applied to teaching at all levels and to create a more active learning environment for students (Hallinger and Kantamara 2001; Hallinger 2004; Kantamara et al., 2006; The Nation 2010) But, according to Naruemon's (2013) study, Thai teachers do not welcome this new approach because it goes "against the rote learning tradition that was ingrained in both the educational and religious traditions of Thai culture" (Foley, 2005, p. 224). This statement is consistent with multiple findings in this research, especially those from classroom observations.

This research suggests that design educators' transmission of a fixed mindset can be found regularly. Many students in this research pointed out that the Thai education system as a whole has not only refrained them to be creative but also fostered in them a fear of challenges. They asserted that they had been convinced by their design teachers to avoid setting themselves difficult tasks when working on assignments. For example, students from some design curricula were encouraged to choose to work on designing decorative products, which concern mainly the aesthetic quality, instead of dealing with design projects that require analytical thinking and problem-solving skills. This situation seems to hold back possibilities of these students to contribute to the issues that matter the most to them.

As stated by Dweck (2017), great teachers with a growth mindset are fascinated with the process of learning and it is the process of learning that is important, not the product. Thus, in order to take up the student-centred approach, the role of an educator must shift from being a knowledge giver to a facilitator of learning. This assumption was put to the test via the curriculum interventions, along with an attempt to introduce ESD in the area of Thai design education. One of the key features implemented was to reconsider the position of teacher in the teacher-student power structure by transforming traditional instruction to active learning. Regarding the readiness of learners for the new learning approach, some initial findings from a small number of design educators signified that there is a portion of design students who tend to be active learners and interested in issues and questions that they think are relevant to their lives. In their view, based on an increasing proportion of self-initiated design projects that are of non-commercial nature and involve unconventional topics such as those concerning social enterprise and ecological responsibility, the new generation of Thai design students have helped inject new energy, enthusiasm, and perspectives into Thailand's design education. Accordingly, as examined in Chapter 8, the results of the curriculum interventions suggest that a growth mindset, which is significant for learners of ESD, can be developed through practising transformative learning. The majority of students taking part in the curriculum interventions had positive feelings for the learning activities of ESD and thought of the activities as fresh, fun and thought-provoking. (See Appendix L for statistic information.)

To articulate further on shifting students' mindset, in three focus groups, two of which are the youngest groups in the study, students extensively discussed their learning motivation. They said explicitly that they had previously perceived that the principle of 4Rs (reduce, reuse, recycle and repair) was "everything" they had to know to design for sustainability as the making tradition of their curricula restricted them from thinking beyond object creation. Thus, in their view, once they discovered via the curriculum interventions that they had misunderstood the meaning of sustainability for a long time, it triggered their eagerness to learn more about sustainable design. This may also be seen as associating with the ego-orientation value and the face-saving attitude of the Thais, as students felt disturbed when knowing that what they had previously perceived was not accurate. Students' way of thinking was changed from a negative to a positive one as they were empowered by peer-learning, knowing that they had a stake in the learning process. Furthermore, as stated by students across different focus groups, students' anxiety of dealing with the unknowns can be compromised by their trust for a teacher who knows the subject well and is willing to give guidance and support to students. Several students revealed that the facilitator role of a teacher can trigger them to adopt the "nothing to lose" attitude and feel open to new challenges. Many students added that the peer-learning process that they helped each other to overcome the challenges brought them enjoyment. In other words, pleasure in learning is not something provided solely by the teacher but one of many spontaneous things they benefited from learning from peers. It would seem that what truly brings them satisfaction is the

student-centred approach.

To exemplify a shift in students' mindset, the four-session group, which is a group of students from one craft-based design programme, is interesting to point out. Originally, the fieldwork plan at this institution was to conduct only three sessions of curriculum interventions. But at the end of the third session, a large number of students said the sessions were so enjoyable and inspiring that they would like to learn more. They asked me if they could have at least one more session. As a group, they marked in the checklists of their reflective diaries with almost all positive feelings towards the learning activities. Only one in sixteen students was confused during two activities in one session. The most selected feeling for each session was "fresh". The particular student who chose "confusing" in the checklist also took part in the focus group. (S)he revealed that the life cycle analysis activity and the lecture on defuturing were complicated for him/her. But later (s)he realised that (s)he felt so because (s)he did not know much about the origins and extraction of raw materials. An educator from this programme taking part in this research commented that his/her design students were inferior to many other institutions in terms of level of existing skills and knowledge, institutional ranking, and socio-economic status. However, compared to other student groups in the study, this group of students demonstrated the most outstanding shift in a growth mindset for learning through the curriculum interventions. This research confirms that it is vital for both design educators and students to have a growth mindset. As presented in this research, the new role of teacher, converted from a knowledge provider to a facilitator and the change of approach, from teacher-centred to students contributed significantly to a shift in mindset in Thai design learners.

9.2.1.2 The role of teacher and the aim of design education

A large proportion of participants from different groups in this research stated that the role of teacher is utmost powerful, especially in the context of the learning environment. The policy-maker participants in this research pointed particularly to the link between the role of teacher and the ethical dimension of teacher-student relationships. They suggested that universities should focus on constructing new knowledge alongside being guiding lights for their students and the society, based on the grand rhetoric of "teacher as moral agent for students" bestowed by His Majesty the late King Bhumibol Adulyadej. The rhetoric involves the concept that educators must train students intellectually, mentally and morally, so that they know how to use reasoning, take responsibility for their actions, and realise not to abuse their knowledge by taking advantage of others. In this aspect, it is in line with the practice of transformative learning, which involves largely critical thinking and reflection. It is in contrast with the current view of higher education, supported by most research participants who are university executives, educators with management responsibilities and design educators, that the key aim of higher education is to work towards making its graduates skill-ready for the labour market. However, this research presents that there

is a clash in core values between design educators and design practitioners working in creative industries too. As Thai design education holds a strong vocational focus, based on a profound tradition of fixed knowledge and skill transmission, design professionals taking part in this research considered what had been taught in universities as irrelevant to meet the dynamic and constantly developing needs of today's design industries. As a result, a classroom where design education takes place tends to be a disconnected place from both the industries and the ideal role of higher education. This does not only reflect the gap between the rhetoric on the role of educator and the aim of Thai higher education, but also the mismatch between the practices of design education and industries. This provides more background to discuss further the debate on the dissemination of transformative learning and ESD in Thai design education.

The ESD curriculum interventions used in this research had been designed to include the ethical dimension in design learning. For example, a session on the environmental ethics, conducted at the initial stage of the interventions, aimed to assist students in defining their personal ethical obligations towards the environment of which they are a small part. The session formed a foundation for learning design ethics, recognising ecological impacts created by design and understanding designer's social responsibility.

9.2.1.3 A pedagogical model for ESD in Thai design education

The classroom-based fieldwork used the curriculum interventions series designed and developed based on an aim to create an effective pedagogical model of sustainability learning for Thai design students. On the whole, as explored in Chapter 8, the curriculum interventions provided positive results in students' development linked to the balance of hands, head and heart dimensions of design learning. The results drawn from reflective diaries and student focus groups present that the curriculum interventions contributed largely to significant increases in students' confidence in becoming active learners, recognition of importance of peer learning, and skills they had lacked before participating in this study, such as reasoning, critical thinking and reflection, analytical thinking, researching, problem-solving and decision-making. Most importantly, the curriculum interventions resulted in a shift in learners' views of sustainability in various degrees. A large number of students from multiple focus groups also discussed changes in their behavior. This research suggests that there are two main features contributing to the effectiveness of the curriculum interventions: the content structure and the learning approach.

The first feature is the content structure. This research involves the development of a pedagogical model of sustainability learning for Thai design students and exemplifies an attempt to employ Buddhism as a means to create such model to assist a shift towards sustainability. Regarding the content structure, as explored in Chapter 6, the model contains three interconnected layers of knowledge, which encompass relevant concepts of Buddhism, sustainability and design for

sustainability. As illustrated in Figure 36, the transformative learning process used in the curriculum interventions refers to an inside-out process of transformation which focuses on deep change within individual learners. The majority of students taking part in focus groups asserted that this content structure beginning from critical reflection on themselves before considering their actions and relations to environment and society was beneficial for them to learn sustainable design. In this way, based on the concepts of interconnectedness, cause-effect relations and moderation, this model helped them to see that the subject of sustainability is relevant to their lives. Even though only a small proportion of students in focus groups explicitly commented that they understood the rationale of this the content structure based on their spiritual understanding of nature, the majority reported concisely that, compared to their previous sustainability learning experiences, the curriculum interventions provided the learning content in the order that “worked well” for them. But, according to all students in the focus groups, what made the curriculum interventions outstanding is the student-centred learning approach, which complements this content structure.

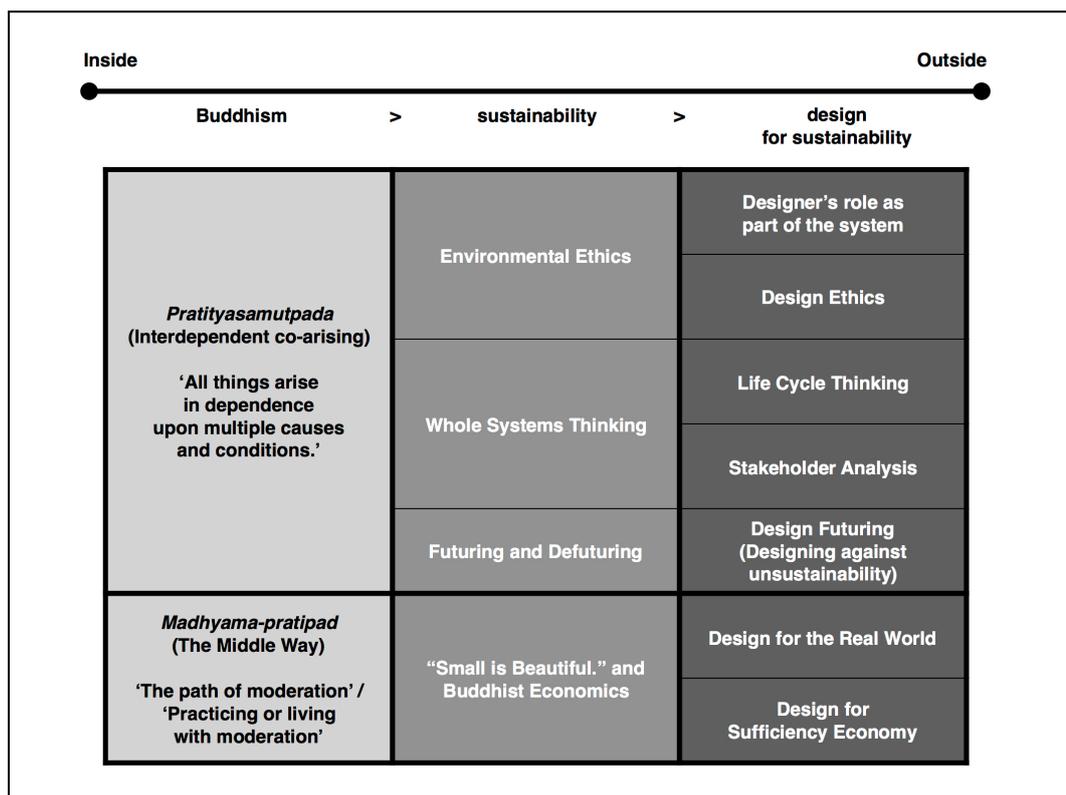


Figure 36: The content structure of ESD that supports students' inside-out process of transformation

The second feature is the student-centred learning approach in which the teacher holds a facilitator role and peers contribute greatly to the active learning process. This research has indicated that, for the Thai context, a shift in a teacher's position from being a knowledge provider

to a facilitator of learning is powerful and beneficial for design students when learning about sustainability. Students tend to be more mindful on the task at hand and express their own thoughts and ideas comfortably when they are in control of their own learning and free from teacher's judgement. Students commented on their experiences of the curriculum interventions that critical thinking skills were fostered in dialogue with their peers and the teacher (with a facilitator role), and it was the dynamic of the dialogue that helped them to step outside their comfort zones. Throughout the series of curriculum interventions, I, as researcher, infrequently recognised students' behaviours reflecting "the undesirable characteristics of learners" such as "lazy", "bored easily" and "unwilling to step out of their comfort zone" that many educator participants found in the same groups of students. In contrast, for the majority of students and for most of the time, the behaviours were the total opposite.

The increase of students' ability to think critically, as a result of a transformative ESD pedagogy proposed in this research is interesting to point out. Thai students' incompetence to think critically appears to be a culture-related issue. Atkinson (1997) asserted that critical thinking is a tacit, socio-cultural practice and behaviour which individuals in the Western society subconsciously and naturally acquire. Likewise, Naruemon (2013) confirmed that Thai students were not nurtured to think critically and independently. This research has indicated strongly that a role of a teacher is influential – once the steep teacher-student hierarchy is removed and Thai design students are empowered to take control of their own learning of a topic that they feel relevant to their lives, they are free from the fear of judgement and put themselves out there to be in the moment with their peers. This seems to be because involvement with community and peers is highly desirable for a collectivist society like Thailand and compatible with the fun-pleasure orientation value. While the facilitator role of a teacher helps create a partnership in learning between the teacher and students, peer learning promotes analytical thinking, critical thinking and problem-solving.

For the context of Thai education, to initiate a paradigm shift towards sustainability via ESD at the classroom level, seniority needs to be taken into consideration, especially an aspect that seniority tends to confer superior judgment. Students indicated that, whereas the steep teacher-student hierarchy is a great stumbling block in learning, a teacher taking a facilitator role can provide "a safe learning space where students are free from the teacher's judgement". It is necessary to create a learning environment where students feel safe to ask questions and contribute to discussions. Based on students' reflective diaries, this research reveals that Thai design students prefer to learn through interactions with peers, storytelling, visuals, objects, examples and case studies and direct experiences. Lecturing alone can be far from effective especially when introducing unfamiliar concepts associating with sustainability, such as environmental ethics and deep ecology, life cycle thinking and design futuring and design defuturing. The curriculum interventions indicated that lectures on unconventional topics could be better received when used in conjunction with other student-centred activities. In students' view, student-centred activities

can help them in making sense of theory from lectures. Mutual support between peers fostered in classroom activities can assist students in visualising more sustainable futures together. To bring students the sense of reality, place-based learning is important. The positive findings from sessions that involved students' interactions with trees, analysis of their lunches, visit to an eco-design store, and projects on tackling unsustainability issues in their campuses support this claim. Empowering students during the learning process is also crucial.

9.2.1.4 The challenges of implementation of transformative learning

The majority of design students from all focus groups expressed explicitly that they would advocate the use of transformative ESD pedagogy in design education. Through the curriculum interventions in this research, the use of transformative learning has been indicated strongly to be successful at a small scale and pointed an opportunity to apply to a larger audience. This research suggests that, in order to implement and disseminate transformative learning for ESD in Thai design education, there are four key challenges to consider. First, culturally, it is not simple for Thai design educators to reconsider and restructure the current teacher-student hierarchy in the way that supports implementation of ESD and transformative learning. This challenge is a major stumbling block for change as it involves a number of cultural values, especially seniority and uncertainty avoidance. Second, this research reminds Thai design educators to take into consideration students' concerns for their sustainable futures. Due to the teacher-centred tradition, Thai design educators may find it difficult to shift their focus from what they would like or feel comfortable to teach to the actual needs of their students. A mindset shift in a teacher, as change from within, is fundamental for a flourishing transition from the teacher-centred approach to the student-centred approach. Third, even though at a small scale, transformation is a dynamic process and change takes time. At the beginning of each curriculum intervention series, students showed awkwardness towards the unexpected student-centred approach which asked them to be active learners. Because they had been familiar only with the teacher-centred approach since their early years of schooling, it took time for them to adapt to this new approach. A small number of students who found the first session, which focused on students' discussion and exchange of views, too overwhelming and pressuring later left the studies. This concerns directly the uncertainty avoidance value, which has a tendency to apply to Thai design educators too. Although this research proposed a newly developed and extensively tested pedagogical model specifically for sustainability learning in Thai design education, it should neither be seen by educators as an instant quick-fix tool or a technocentric means of maintaining the teachers' status quo. Rather, prospective users of this model must appreciate the transformation in their design learners as well as in themselves as teacher-as-learner practitioners. Fourth, educators must recognise that what happens in one classroom should not be disconnected from other classes and from the world around us. The recognition of interconnectedness of different units in curriculum is fundamental. This research has already demonstrated success of ESD and

transformative learning in Thai design education at a small scale. But to put this pedagogical model into practice, it requires support from the curriculum as a whole for continued effectiveness. So, the next thing to discuss is the results that respond to the second research question.

9.2.2 “Could ESD be embedded into Thailand’s design education through the ‘frame of mind’ concept?”

In respect to the second research question “Could ESD be embedded into Thailand’s design education through the ‘frame of mind’ concept?”, it is interesting that this research provides both positive and negative answers.

The discussion in the section of ESD and Thai design education (9.1.1) has already responded to this research question through an examination of the results in relation to existing literature. In brief, this research reveals that the overarching root cause to the problems is culture-related, culture-dependent and deeply grounded in reductionist values which underpin what design education means to Thai design educators as well as the way they manage their curricula. Consequently, it leads to multiple curricular issues, from the formation of a collective, negative view on an advanced practice of sustainable design, to misfit allocation of staff who are highly competent in and advocate sustainability within a Design Department, to professional isolation or disempowerment of staff responsible for a sustainability course in design curriculum, to a collective lack of responsiveness to institutional policies on ESD and so on. For the institutional level, the research results indicate a lack of effective monitoring mechanism, a lack of willingness on the part of staff to practise ESD, and a lack of collective readiness among staff to pursue the sustainability vision of their institutions. For this section, the discussion continues with other research results across different groups of participants in connection with the second research question. There are three interlinked aspects to look at: the resistance to curricular change, the current views on ESD and sustainability advocates in design curriculum.

9.2.2.1 The resistance to curricular change

As indicated by design students in focus groups, there are three factors that revolve around the reductionist view of design and resist change in curriculum. The first factor concerns the traditional position of teacher in the teacher-student power structure. Typical terms inherited from the master-apprentice learning model and used widely in Thai design education like *sang-ngan* (to ask students to work on order) and *lom bab* (to ditch students’ ideas completely if not satisfied) reflect an authoritarian orientation. The three common design teacher positions – teacher-as-parent, teacher-as-boss, and teacher-as-customer – contribute to the lack of studio culture, the lack of peer-based activities and numerous assessment issues. The top-down teacher-student hierarchy gives rise to communication issues as the communication flow is often only one-way.

The teacher-centred approach does not restrict only to classroom practices but also curriculum development and revision, which often neglects the learners' needs. The second factor is the imbalance between the hand, head and heart domains in design curriculum. Thai design education is deeply grounded in the making tradition of design, compatible with the view that the aim of Thai higher education is to produce graduates for the labour market. So, the curricular emphasis is mainly on developing exclusively students' capacity in object making. But, due to the transmissive learning approach focusing on traditional skills and the lack of research culture, design education fails to respond to the industries' changing landscape. Both designer participants and students from multiple focus groups confirmed the disconnection between the reality and what is learned in design programmes. The third factor is the rigid, single disciplinary perspective. This reductionist perspective contributes to the lack of interdisciplinarity in Thai design education and obstructs the integration of ESD in design curriculum. These three factors altogether reflect a fixed mindset in Thai design education, obstructing the embedding of ESD into design curriculum. Hence, with a fixed mindset, ESD is viewed merely as an external force affecting design education instead of a social learning process which stakeholders in design education draw meaningful paths toward sustainable futures together.

For this research question on embedding ESD in design curriculum, students asserted that the major challenge lies in design educators. In their view, in connection to the 'frame of mind' concept, the lack of shared value of sustainability among staff in a Design Department is a great hindrance for ESD to flourish in a curriculum.

9.2.2.2 The current views on ESD

The second aspect to discuss is the current views on ESD at the institution and curriculum levels. This research shows that the collective view on ESD among university staff is generally weak and biased. Looking specifically at the institutions currently employing sustainability policies, two university executives expressed a view that their institutions are facing the lack of engagement of individual staff concerning ESD implementation. On the other hand, six design educators from four different institutions regarded the lack of policy awareness as part of the results of the one-way communication and top-down approach in management. One identical example among these educators indicated is the provision of recycle bins on campus without implementing information on and the culture of recycling. Some educators commented that it is not only that they found it frustrating to use the bins, but also they have no idea who or where to send feedback to. This example illustrates a lack of empowerment of university staff in relation to implementation of ESD.

Furthermore, this research unfolds that the rhetoric labels initiated by the university-level policy-makers are not always compatible with the department level practice. According to university executives, educators with management responsibilities, and design educators at three

institutions with sustainability rhetoric, the institutional sustainability policies have neither been fully recognised nor valued at the design department level. In line with the findings from students, all design educators taking part in this research identified that the 'sustainability as frame of mind' concept has not been recognised at the department level. A large number design educators also reported that sustainability has often been perceived as a personal matter of concern. One concrete evidence is that sustainable design is positioned as an add-on in a curriculum, instead of a priority. From classroom observation and students' experiences prior to the curriculum interventions, the teaching and learning of sustainable design focused solely on the technocentric view of sustainability. The instruction involved green design tools for tackling waste reduction, especially the popular strategies of reduce, reuse and recycle. The philosophical dimension of sustainability was not included. A large number of students in various focus groups indicated that, as the courses embraced a reductionist view on the subject and a mechanistic learning approach, they failed to perceive sustainability in a holistic sense and as relevant to their lives.

As discussed at the end of Chapter 8, students highlighted the importance of ESD in Thai design education. According to their point of view, emphasising sustainability in design curriculum alongside fostering whole systems thinking can contribute to the new generation of designers being able to think more holistically. Many students across all focus groups commented that the place for sustainability education in design curriculum must be seriously considered by policy-makers and design educators. They noticed the lack of shared values on sustainability among academic staff in their Departments and linked it to the imbalance of hand, head and heart dimensions in Thai design education. To embed sustainability into the curriculum effectively, students suggested that the curriculum structure should be reviewed and revised in a more comprehensive way that fulfils the needs of students and the industries and with an honest intent to transform the current operating model to a more sustainable one.

9.2.2.3 Sustainability advocates in design curriculum

The third aspect discusses sustainability advocates in Thai design education. Since ESD has not been seen as a shared responsibility that depends on the efforts of everyone in the higher education institutions, educators who advocate sustainability are inevitably the minority in their Departments. Although Thai design education is a small community, where a large number of Design Departments are located in Bangkok, sustainable design educators taking part in this research reported that they only know a limited number of educators who share similar sustainability-related interests. It appears that there has not been a strong network of sustainable design educators in Thailand, which may assist in empowering them to collectively address the issue and strengthening knowledge sharing between them on design for sustainability. Furthermore, for most of the time, these educators expressed 'a victim mindset' in their interviews, focusing on the lack of power to drive change towards sustainability in their design curricula.

According to the energy investment model by Edmonstone (2003), a member working in an organisation who sees themselves as a 'victim' tends to have bruised self-esteem, feel powerless and is in need of understanding and peer encouragement. Two of these educators explicitly gave political messages concerning a short-sighted vision in the management of their Design Departments and a bureaucratic style of institutional leadership, which they pinpointed as one of the key causes of the lack of ESD implementation in their curricula.

Pasupa (2016) pointed in his study Thai design educators' unawareness of ESD in connection with a lack of professional development training. This research indicates further that weakness in new knowledge creation in Thai design education appears to impact greatly the flourish of ESD research as well as sustainable design research. Even design educators who are course leaders and instructors of sustainability-related courses are rarely research-active in the area of sustainable design. This contributes to the lack of literature in Thai on design for sustainability. For those who are research-active, their works usually comply with the mainstream academic design research projects based on the tradition of market-oriented R&D, excluding critical questioning on human consumption and environmental impacts created by design. As stated by designer participants, when practitioners and students would like to seek knowledge on sustainable design, they tend to consider the objects produced by Thai celebrated eco designers as exemplary pieces. The danger can be that it strengthens the object-oriented view of design while fundamental sustainability issues behind the objects may be overlooked. Without a strong research culture and ESD commitment in design education, the situation has resulted in a missed opportunity for sustainability advocates in design education to use their full potential to produce appropriate materials for educating a wider audience about sustainable design.

9.2.3 “Is a paradigm shift towards sustainability in Thailand's design education plausible and able to be put into practice?”

This question is the most challenging to respond to among the three research questions. The collective results of this research aid in developing a better understanding of the current state of Thai design education in relation to ESD and a paradigm shift towards sustainability. There are three aspects to look at in this section. The first aspect brings together the notion of paradigm shift, the Thai worldview and sustainability to discuss. The second aspect concerns a paradigm shift at the institutional level. And the third focuses on change agents.

9.2.3.1 The notion of paradigm shift, the Thai worldview and sustainability

In the simplest sense, a paradigm shift is a fundamental change that occurs when the usual way of thinking about or doing something is replaced by a new and different way. In the big picture, a paradigm shift towards sustainability seems to be particularly strenuous for Thais. Being a society

with short-term orientation, as coined by Hofstede (1997), Thais in general place their values on the past and present, have a strong concern with establishing the absolute truth, exhibit great respect for traditions, and focus on achieving quick results. However, to shift a paradigm is time-consuming and difficult due to the resistance it encounters from the establishment. Hence, a paradigm shift towards sustainability is extremely challenging for the Thais.

Both the literature review and the research findings from participants suggest that Thai cultural characteristics like respect for the King, seniority and person-based social institutions play an outstanding role in the scene of the nation's sustainable development. The impact has been significant in providing rhetorical awareness to the public. As it reflects the importance of the concept of leadership in sustainable development, culturally, this is a manifestation of the hierarchical Thai society. Looking at the context historically, as stated in Grossman (2015), traditional systems of patronage and hierarchy combined with Buddhist teachings of righteous kingship mean the monarchy has long been paramount in Thailand, especially in term of leading and developing the nation. Thais refer to the monarch by many names, including "God Upon Our Head" (*phra chao yu hua*) or the *dharmaraja*, a righteous ruler who promotes justice, virtue, wisdom and disperses the *dharma* to the people (p. 201). Both the monarchy and Buddhism matter to sustainable development of Thailand.

Buddhism teaches that the law of cause and effect underlies the workings of all phenomena and recognises the interconnectedness of all beings in nature. That means it speaks to the most vital principles underlying sustainable development, which also involves the concept of interdependence and deep ecology (Suwan, 2008). Buddhism in Thailand is largely of the Theravada school, followed by the majority of the population. Theravada Buddhism draws inspiration from traditional accounts in early Buddhism for relating with nature. Regarding *Dharma* or Buddhist teachings, "classic Buddhist texts encourage ethical behaviour by presenting a hierarchical universe in which bad behaviour will be punished with purgatory while good behaviour will be rewarded now and then" (Grossman, 2015, p.208). This implies a sense of hierarchy concerning moralising Buddhist virtue, inevitably top-down and transmissive but compatible with the Thai cultural values.

At the dawn of sustainable development in Thailand, after the financial crisis of 1997, Sufficiency Economy Philosophy (SEP) was bestowed on the Thai people by His Majesty King Bhumibol Adulyadej who was regarded as Thailand's guiding light. SEP called for a shift in priorities and a return to a more reasonable pursuit of economic growth, based on the Buddhist concept of *Madhyama-pratipad* or "the middle way". SEP has become Thailand's own framework of sustainable development, known by the Thais as Setthakij Pho Phiang or "just-enough economy". With an aim to develop a moderation mindset in future generations of Thais, SEP is now on the curricula of thousands of schools nationwide (Grossman, 2015, p. 35). In October 2016, Prayut

Chan-o-cha, the head of the military junta serving as the Prime Minister of Thailand since 2014, asserted SEP in connection with the Sustainable Development Goals (SDGs). According to his speech, SEP is employed as a guideline for development and building stronger communities, and for leading secure lives as good citizens, grounded in morality, ethics, honesty and unity (Royal Thai Government, 2016). The moral and ethical dimension embedded in the message is explicit and specific to the Buddhist-based Thai culture. A senior policy-maker taking part in this research pronounced that (s)he supported both the concept of having SEP as an ethics-oriented development guideline and the political stability under the junta. In his/her view, political stability is vital for attaining sustainable development.

This research demonstrates that, even though sustainability rhetoric has been well-established by those at the top of the socio-political hierarchy and fused with spiritual beliefs of the citizen, putting sustainability-rhetoric into practice is never simple for Thailand. Policy-maker participants taking part in this research pronounced that SEP has been used as national rhetoric but not yet implemented successfully. In their view, the efforts made with an autocratic approach and through the mainstream bureaucratic civil service system have been weak attempts. One senior policy-maker pointed to the laxness in principle of Thais as the root cause of failure in implementing SEP. In his/her view, the laxness in principle is a cultural characteristic that tends to involve decision-shifting and corruption because it is based on personal or in-group interests usually supported by a patronage system. From his/her experience, it has affected Thai education as a whole, which relates directly to the dimension of human resource development within sustainable development. This is in line with Lao (2015), who stated more specifically that personal connection and the patronage system destroy higher education quality. An ESD expert argued that a great challenge lies in the communication of the meaning of sustainability. In his/her view, the concept of sustainability has been distorted by other rhetorical terms coined by key players in the Thai society, especially SEP which has long been promoted by government agencies through various media. The situation has led to a huge diversity of interpretations of sustainability among Thais. Moreover, the perception of the association between sustainability, SEP and the late King tends to limit public debate and criticism of both SEP and sustainable development. The ESD expert concluded that SEP has cast a shadow over the internationally recognised concept of sustainable development and slows down the emergence of ESD in Thailand.

9.2.3.2 A paradigm shift at the institutional level

This research confirms that there is a close association between seniority and the concept of change at the institutional level. Seniority usually affects how a Thai organisation works (Lao, 2015). This research unfolds that seniority is influential in the organisational structure of higher education institutions as well as the decisions regarding the direction of ESD, though which university executives tend to initiate change via a top-down management approach. According to Baczek (2013), effective leadership has been a challenge and struggle in Asia, including Thailand. One of the suggestions from the Centre for Creative Leadership and Human Capital Leadership Institute (2012) is that Asian leaders must understand that constant learning needs to occur in order to become more effective. When looking at this aspect in relation to the research findings from policy-makers, university executives and educators with management responsibilities, it appears that there is a strong link between the seniority-based culture and the concept of change. This research points out that university executives and educators with management responsibilities tend to focus on the top-down approach in management, using an autocratic and hierarchical style of decision-making, rather than constant learning with and empowering staff, to drive organisational change. This research also shows that, based on the results obtained from four universities employing sustainability policies, top-down change alone is not ineffective to implement ESD within higher education institutions. However, this result should not be seen as entirely negative. Instead, it provides an opportunity to explore the matter further, especially how to assist in strengthening the existing sustainability policy practices. Even though there are institutions currently employing sustainability policies, design curricula in these institutions are not fully active to follow to the institutional rhetoric and plans. This is partly because, as some educators commented, monitoring mechanisms are not implemented. This research identifies the lack of empowerment that exists due to the hierarchical power structure within each higher education institutions. It indicates the ineffectiveness of the top-down approach in management alone in responding to ESD.

On a positive note, this research presents that a small number of Thai universities are now at the very beginning of the paradigm shift towards sustainability. Even though it appears that there are still missing links between the institutional policies on ESD and design learning within universities, the results from educator interviews and the classroom-based fieldwork and indicate a number of ways to assist the paradigm shift. One university executive taking part in this research discussed this matter extensively. (S)he suggested that, in Thailand, it may be more effective to implement ESD through students' off-study activities than embedding ESD into curriculum. In his/her view, there are three reasons. First, because of the bureaucratic culture, university staff are generally sluggish to respond to policies. This reason correlates with the research findings concerning design educators' lack of insight and willingness to advance ESD in their design curricula. Second, students will not feel forced to learn an unfamiliar subject. This reason correlates with

the research findings on students' former perception on sustainability before taking part in the curriculum interventions. Third, participation in off-study activities in clubs and unions involves real-life experiences and enables students to develop interdisciplinary perspectives and skills with peers from different fields of studies. In this way, sustainability can be perceived as relevant to students' lives. This reason correlates with the concept of transformative learning. Moreover, according to numerous positive findings from the curriculum interventions, a transformative ESD pedagogy can be employed to tackle this matter right at the design learning level. The pedagogical model proposed in this research aims at design educators who advocate sustainability. It has been tested on multiple occasions and settings, evident that it can be adapted and applied in practice. As discussed previously, both design educators who are sustainability advocates and design students need to be valued and empowered in order to contribute to the paradigm shift towards sustainability. They need to play an active part in co-creating change because the top-down approach alone is insufficient as a solution.

9.2.3.3 Change agents

A change agent is a person who encourages people to change their behaviour or opinions (Cambridge business English dictionary, 2011). The term change agent is often interpreted in Thai as "change leader" (*poo nam garn plien plang*). In the Thai society, a change agent has a tendency to be accepted only when the person associates with power and hierarchy. In a collectivist society, like Thailand, people are concerned about what others think of them (Hofstede, 2001). It is not common for an individual person to just stand up and make change happen. Only with empowerment, a trusted leader can encourage people to do so. Besides, based on Thailand's patronage system, Thais expect their leaders to be benevolent and kind (Selvarajah et al., 2013). To create or impact change, there is a close association between seniority and person-based social institutions. As power and hierarchy play a vital role in the realm of sustainable development in Thailand, the question of "Is a paradigm shift towards sustainability in Thailand's design education plausible and able to be put into practice?" is not straightforward to answer without taking the Thai cultural values into account.

The late King was referred to by a number of research participants across all groups as a role model of a change agent, creating awareness of SEP and sustainable development and triggering change at multiple levels. Regarding sustainable design, this research points that there is a lack of shared values of sustainability among stakeholders in Thai design education. A large number of research participants who are design educators, students and practitioners stated that some celebrated designers play a crucial part in creating mass attention on the sustainable design trend and communicating with the public through their professional design practices. In addition, as part of the curriculum interventions, students in the sixteen-session group went on a field visit to an eco-design store owned by a celebrity designer. The designer was there to greet the students,

gave a talk on eco-design and introduced outstanding items in the store. According to students' reflective diaries, the session was most successful among all sixteen sessions. One of the reasons given was that they had a chance to meet up with and be inspired by the celebrity designer. Some students stated in their reflective diaries that the visit made them appreciate sustainability a lot more and they would like to follow his/her path.

Another aspect to look at is the concept of teacher as change agent. As discussed in Chapter 7, seniority and personal spiritual experiences (ordaining as Buddhist monks and practising Buddhist teachings) appear to play a significant part in two design educators who have led the longest running sustainability courses in Thailand. But the lack of empowerment results in lost opportunities for these educators to become effective change agents in their curricula. Another point explored in Chapter 7 is that design educators and guest speakers who are alumni tend to be more convincing for, and well-received by, students, compared to those who are non-alumni. This phenomenon was seen in two different lights. Whereas some senior participants linked this practice with potential for strengthening a patronage system which leads to corruption and academic inbreeding, younger participants considered these alumni as role models for students with the potential to create change. This research examined the concept of teacher as change agent through the classroom-based fieldworks. Even though the curriculum interventions were conducted by a non-alumna of the participated institutions, students in various focus group reported a shift in perspective and behaviour. This research points out that, due to the Thai cultural value associating with seniority, being a teacher is powerful enough to begin the role of change agent in a classroom. But after all, empowering change agents is critical to real change.

To conclude, with a lens on ecoliteracy (Capra, 1996; Centre for Ecoliteracy, 2013), this research suggests that Thai design education can be considered as an example of an imbalanced system. In theory, 'feedback loops' keep a system in a state of 'dynamic balance', which provides 'resilience' in the face of ecosystem change. For this context, Thai design education, as a system, lacks dynamic balance because of an absence of feedback loops co-created collaboratively and straightforwardly by its various stakeholders. It is inevitable to be so because it is nested within Thai education system which is deeply grounded in a mechanistic paradigm. How the education system works is hierarchical and bureaucratic. The collective tensions among stakeholders of Thai design education signify numerous challenges towards a paradigm shift towards sustainability. Looking at the learning and pedagogy level specifically, the situation is critical. The teacher-centred approach, usually involving transmission of fixed knowledge, skills, tastes and preferences from a teacher to passive students, is found commonly not only in lecturing but also studio-based instruction. Due to the hierarchical relations, the constant one-way communication in the learning process refers to the absence of feedback from students to a teacher. Without healthy feedback loops and a culture of maintaining them, it is impossible to improve the learning process in the way that truly benefits the learners. This research recommends that, to restore the

absence of feedback loops in design learning, the transformative learning approach is necessary. In relation to ESD, this research puts forward that dissemination of transformative learning is particularly beneficial for implementing ESD in design education and proposes a pedagogical model designed, developed and tested for this specific purpose. With the 'frame of mind' concept, design educators who advocate sustainability, should be empowered to become ESD change agents. To empower these potential change agents, the concepts of 'networks' (all living things in an ecosystem are interconnected through networks of relationship and depend on this web of life to survive) and 'cycle' (members of an ecological community depend on the exchange of resources in continual cycles) in ecoliteracy are useful. At present, the lack of a strong network of sustainable design educators in Thailand confines an exchange of ESD-related ideas, knowledge, skills, experiences and resources among them. But most importantly, it limits the potential to produce more ESD change agents in design education. This research aspires to be part of the change through introducing a transformative learning pedagogical model for ESD in Thai design education.

9.3 Limitations of the study

The research has limitations which may restrict the generalisability of the results to some degree. There are two main areas to look at. One is participant recruitment and another concerns the process of the fieldwork.

9.3.1 Limitations in participant recruitment

There were three limitations regarding the recruitment of research participants. First, there was only a small proportion of senior design educators willing to participate in this study. As seniority is a significant factor in the research, the results would be more inclusive if there were a larger proportion of elder or more experienced educator participants. Second, there was a lack of participants from some sub-disciplines in Design. Due to the diversity of design curricula in Thailand, many programmes do not provide sustainability-related courses. Therefore, educator participants were recruited from programmes most likely to have sustainability-related courses. Third, there was just a small proportion of participants from newer and less well-established higher education institutions. Even though the research was conducted mainly with participants from well-established universities, it covered participants from a wide range of design programmes – from industrial design, to product design, to visual communication design, to craft-based design, and to media arts and design. Based on the mix of design programmes of student participants, the findings suggest that the pedagogical model developed in this research would be beneficial in various sub-disciplines in Design and transferable to a broad range of institutions.

9.3.2 Limitations of the fieldwork

There were four key limitations during the fieldwork periods. The first limitation concerns the function of reflective diaries. A large number of students only used the reflective diaries' checklists and left blank the space for critical reflection. Some students reported in person that it was difficult for them to reflect their thoughts because they were not used to it. The second limitation involves students' late attendance. In many sessions, the majority of students turned up about half an hour late, which resulted in interruption of the ongoing learning activity. This limitation contributed to both the pattern of interactions within activities and the missing data in reflective diaries. The third limitation is relevant to students' conditions. Although participation in the curriculum interventions was voluntary, students might have felt obliged to attend the sessions as they were slotted in actual courses in universities. In most courses, students could not be absent more than three occasions in one semester. This was communicated clearly to all parties involved but might have some impact on students' feelings or perceptions towards the sessions. The fourth limitation concerns exclusions of the actual course leaders in the curriculum interventions. Most course leaders treated me as a visiting lecturer, which they chose to neither attend nor observe the sessions. This resulted in a major lack of data concerning educators' view on the curriculum interventions.

9.3.3 Limitations in communication

There were some communication issues which resulted in limitations and miss opportunities in data collection. First, many potential participants did not recognise design education research as part of design research. Second, I inevitably used the terms which appeared to be too academic for some potential participants. Some of these do not have a direct translation in Thai language, such as 'pedagogy', 'education for sustainable development' and 'paradigm shift' and required further explanation. Potential participants tended to turn down taking part in the research if they were not sure about the purpose of the research and/or the terms used.

9.4 Contribution to knowledge

This research proposed to advocate ESD and transformative learning in Thai design education and contributes directly to the ongoing debate about the implication of ESD in design education. As discussed in section 9.1 on an examination of the results in relation to existing literature, this research contributes mainly to two areas of knowledge. First is the intersection between ESD and Thai design education. Although a number of findings correlate with Pasupa's (2016) study, most findings are newly discovered and different. While Pasupa's work concerns mainly the perspectives of key players in government, business and education sectors, this research focuses mainly at the learning and pedagogy level and embraces the voices of Thai design students in

addressing their perspectives and needs of sustainability. This research context has long been under-researched. The second area of knowledge that this research contributes to is the impact of Thai cultural values on design learning and pedagogy. Thai cultural values played an outstanding part in this research from start to finish. The research results have made significant links to cultural dimensions and values discussed in Komin's (1990, 1991, 1998) and Hofstede's (1980, 1991) key texts.

Apart from these two main areas, this research's contribution to ESD research and design pedagogy should be mentioned too. As both design education and ESD are not widely recognised research fields in Thailand, this research makes a connection between the two and assists in creating a better understanding of design pedagogy research among Thai design scholars. Using participatory action research (PAR) for design education is also novel for the context of Thailand. As described in Chapter 6, there are research instruments designed and developed specifically for collecting data from Thai design students in relation to ESD, including the observation sheet, the reflective diary and the pedagogical model with an 'inside-out' content structure. The development of these instruments was based on an interdisciplinary approach, which involved an intersection of knowledge from whole systems thinking (Bateson, 1972; Capra, 1996, 2002; Sterling, 2001), environmental ethics (Devall & Sessions, 1985; Naess, 1973), critical pedagogy (Freire, 1970), ESD (Bonnett, 2002; Burns, 2011), design and technology education (Stables, 2008), design philosophy (Fry, 2009), economics (Schumacher, 1973) and Buddhism.

9.5 Implications and practical applications of the research

This research reinforces the recommendation for the introduction of ESD in Thai design education. At the institutional level, this research provides implications for institutional policy and decision making regarding ESD, as explored in Chapters 7 and 8 and discussed in this chapter. Since the lack of feedback loops in actual practices limit communication flows from the bottom up, this research addresses issues on ESD implementation in higher education institutions by presenting findings from points of view of various of stakeholders at multiple levels across different universities. Creating shared values among stakeholders and empowering change agents are two key messages suggested by this research.

At the department level, the findings can contribute considerably to the development or revision of design curriculum in connection with ESD. The results derived from design educator interviews, especially those who are sustainability advocates, and from students in curriculum interventions and focus groups are of direct practical relevance. At the classroom level, the creation of shared values in sustainability and empowerment of design learners through a transformative ESD pedagogy was exemplified in detail in Chapter 8 and discussed concerning a shift in mindset in this Chapter. The insights offered through this research can function to improve the flow of

communications between students and academic staff in a Design department and strengthening the feedback loops within an institution.

The 'inside-out' pedagogical model proposed in this research can be adapted and transferred to other learning disciplines or other communities facing similar barriers in Thailand. The model was designed and developed specifically for students, but it can also be used for educating design practitioners.

9.6 Recommendation for further work

Thai design education is still at the early stage of ESD and there are plenty of opportunities to take action towards creating sustainable futures. Through a holistic approach, this research tackled ineffectiveness of sustainability teaching and learning in design curriculum alongside revealing key issues regarding implementation of ESD in Thai design education. The results emerged in the study can assist design educators and educators with management responsibilities in developing their professional practices in line with ESD. However, future work is required to advance the embedding of ESD based on the transformative learning approach and the concept of change agent. Recommendation for further work include three dimensions.

The first dimension concerns empowerment of Thai sustainable design educators. This research identifies that design educators who are sustainability advocates tend to feel that they are the minority in their Design departments and powerless to make change. The first recommendation, based on the teacher-as-learner concept, is to identify the needs of sustainable design educators in relation to networking with each other for exchanging knowledge sources and ESD pedagogical experiences.

The second dimension concerns empowerment of Thai design students via the dissemination of transformative ESD pedagogy. The second recommendation builds upon the first one. Creating a network of sustainable design educators can assist in collaboratively strengthening and refining the pedagogical model proposed in this research by putting into actual practice in different settings. The process is iterative and participatory.

The third dimension concerns expanding the learning platform and target audience. Although this research focuses on the classroom and pedagogy level of ESD in design education, there are still other groups of stakeholders, especially design practitioners and entrepreneurs, who identified a lack of available learning materials on design for sustainability in Thai language as a serious concern. This requires a further study on creating a virtual co-learning community on sustainable design based on the transformative learning approach and the potential learners' needs.

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APPENDIX A: THE ETHICAL STATEMENT

DEPARTMENT OF DESIGN
Research and Enterprise Committee
RESEARCH ETHICS APPROVAL FORM (Staff and students)

This form should be completed for any research project that involves human participants or if the research involves animals or if it may involve environmental harm. The principal investigator or, where the principal investigator is a student, the supervisor, is responsible for exercising appropriate professional overview of the research.

You should:

- first, read and understand the Goldsmiths Code of Practice on Research Ethics:
<http://www.gold.ac.uk/media/research-ethics.pdf>
- then complete and submit this form
- then, wait for approval before contacting any potential participants in any research.

Section One **Applicant Details**

1.1 Name of researcher	Treechada Chotiratanapinun
1.2 Status (undergraduate student, postgraduate student, staff)	postgraduate student
1.3 Email address	dtp01tc@gold.ac.uk
1.4 Contact address	25 Aland Court, Finland Street, London SE16 7LA
1.5 Contact phone number	07763836830

Section Two **For students only**

2.1 Programme	MPhil/PhD
2.2 Course	Design
2.3 Your supervisor or course leader's name	Prof. Kay Stables
2.4 Your email address (if different from above)	
2.5 Your contact address (if different from above)	

Section Three **Project Details**

3.1 Project title: Transformative learning for a shift towards sustainability in Thailand's design education
3.2 Brief outline of the project, including its purpose: Thailand has attempted to expand its focus on sustainable development over the past decade and there are an increasing number of initiatives contributing to the knowledge of sustainable design. However, the implementation of sustainability in design is not yet well established. The thesis explores the education aspect of this phenomenon, especially looking at the role of the sustainable design pedagogy currently practiced in Thailand's higher education. It brings Whole Systems Thinking (Capra, 1996, 2002), Deep Ecology (Naess, 1973), Critical Pedagogy (Freire, 1970), Thai education culture (Komin, 1990; Mounier & Phasina, 2010) and Buddhism into focus together. The literature review leads to the development of the curriculum interventions in a participatory action research plan, with an aim to create a transformative pedagogical model for teaching sustainability to undergraduate design students in Thailand.

In relation to sustainability, Thailand's design education has two outstanding issues. First, it has long been dominated by Eurocentric cultures and mainly conducted as vocational training without an emphasis on critical thinking. Consequently, it has lost its true educational purpose and been unable to keep up with to rapid pace of socio-technological change. Second, although extremely important and immensely needed, the concept of sustainability is still relatively new to local design practitioners, educators and students. Sustainability is often perceived as too complicated to understand. It is neither successfully integrated into the mainstream design curriculum nor the mass of design industries.

Therefore, the research aims to answer these key questions regarding the design education in Thailand.

- 1) Is a paradigm shift towards sustainability in Thailand's design education is plausible and able to be put into practice?
- 2) Could ESD be embedded into Thailand's design education through the 'frame of mind' concept?
- 3) Can dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?

3.3 Brief description of methods of data collection:

The research will employ a mix of qualitative methods with different groups of participants.

- 1) To examine if a paradigm shift towards sustainability needed in Thailand's design education, the researcher plans to interview educators and conduct a focus group with stakeholders.
- 2) To explore why the concept of education for sustainability (ESD) could be embedded into design education, the researcher plans to interview policy makers and educators, as well as to conduct focus group discussions with students.
- 3) To find out if a transformative pedagogy is necessary for teaching sustainability to design students in Thailand, the researcher plans to interview educators, do classroom observations and conduct curriculum intervention studies in a number of higher education institutions in Thailand.

3.4 Where will the data collection be undertaken?

At a number of higher education institutions in Thailand.

Section Four Human participants

4.1 How many and what type of participants are involved in the research? Approximately 30 people. Participants are stakeholders of design education in Thailand, mostly educators and students. <i>If NIL go to Section Seven. Otherwise, complete this Section.</i>			
4.2 How will the participant(s) be recruited? (<i>Attach copies of any recruiting materials if used.</i>) The participants are recruited through personal contacts and joint interests.			
4.3 How will the participant(s) consent be obtained? (<i>Include a copy of any proposed consent form.</i>) Consent forms are attached.			
	Insert ✓	Y	N
4.4 Will it be necessary for participants to take part in the study without their knowledge and consent at the time? (e.g. covert observation of people in non-public places)		*	✓
4.5 Is there any deception involved?		*	✓
4.6 Will the participant(s) be paid or rewarded?		*	✓
4.7 Will the participant(s) be fully informed about the nature of the project and of what they will be required to do? (<i>Attach any associated materials.</i>)		✓	*
4.8 Will the participant(s) be told they can, if they wish, withdraw from participation at any time? (<i>Attach any associated materials.</i>)		✓	*
4.9 If you have ticked a box marked * please give the question number/s and fuller information here:			

Section Five Persons who are young, vulnerable or in legal custody

	Insert ✓	Y	N
5.1 Will any young persons (under the age of 18 years), vulnerable persons (e.g. with learning difficulties or with severe cognitive disability), or those in legal custody be involved in the research?			✓

<i>If NO, go to Section Six. If YES please complete this section.</i>			
5.2 How will consent be given (i.e. from the participant themselves or from a third party such as a parent or guardian) and how will agreement to the research be asked for? (<i>Attach any associated materials.</i>)			
	Insert ✓	Y	N
5.3 If you are conducting research with young persons under the age of 18 years or 'vulnerable persons' do you have Criminal Records Bureau clearance? (<i>Please attach evidence of such clearance.</i>)			
5.4 Will face-to-face interviews or observations or experiments be overseen by a third party (such as a teacher, care worker or prison officer)?			
5.5 Is it possible that the research might disclose information regarding child sexual abuse or neglect? (<i>If yes, indicate how such information will be passed to the relevant authorities (e.g. social workers, police), but also indicate how participants will be informed about the handling of such information were disclosure of this kind to occur. A warning to this effect must be included in the consent form if such disclosure is likely to occur.</i>)			
5.6 If you have ticked a box marked * please give the question number/s and fuller information here:			

Section Six **Participants' personal data**

	Insert ✓	Y	N
6.1 Will personal data of any kind (including digital and images) be gathered on participants? <i>If NO go to Section Seven. If YES, complete this Section.</i>			
6.2 Will the data be anonymous?			
6.3 Will the data be treated confidentially?			
6.4 Will the study involve discussion of topics sensitive to the participants (e.g. religious or culturally sensitive issues, sexual activity, drug use)?			
6.5 How long will the data be stored and how will it be eventually destroyed? Approximately 2 years after the completion of PhD. Data in paper format will be shredded before it is disposed of. Data in digital format will be deleted.			
6.6 If you have ticked a box marked * please give the question number/s and fuller information here: All the data collected will be anonymous and treated confidentially, partly due to participants' cultural sensitivity.			

Section Seven **Risk and Duty of Care issues**

	Insert ✓	Y	N
7.1 Will the research involve the investigation of illegal conduct?			
7.2 Are there any potential adverse consequences to the participant(s), or any other person?			
7.3 Are there any procedures which may cause discomfort, distress or harm to the participant(s), or any other person?			
7.4 Will the research place you in situations of harm, injury or criminality?			
7.5 Have you any special personal considerations or vulnerabilities that might influence your safety while carrying out fieldwork (injuries, disabilities, allergies, asthma, personal conflicts with informants/community etc.).			
7.6 Might the research cause harm to those represented in it?			
7.7 Will the research involve any animal subjects?			

7.8 Will the research cause any environmental harm?	*	✓
7.9 Are drugs, placebos or other substances (e.g. food substances, vitamins) to be administered to the study participants or will the study involve invasive, intrusive or potentially harmful procedures of any kind?	*	✓
7.10 Will blood or tissue samples be obtained from participants?	*	✓
7.11 Is pain or more than mild discomfort likely to result from the study?	*	✓
7.12 Could the study induce psychological stress or anxiety or cause harm or negative consequences beyond the risks encountered in normal life?	*	✓
7.13 Will the study involve prolonged or repetitive testing?	*	✓
7.14 Do you know of any other potential developments arising from this research that may lead to ethical, health, safety, risk, harm, or duty of care concerns?	*	✓
7.15 If you have ticked a box marked * please give the question number/s and fuller information here:		

Section Eight Other matters

	Insert ✓	Y	N
8.1 Are there any conflicts of interest regarding the investigation and dissemination of the research (e.g. with regard to compromising independence or objectivity due to financial gain)?		*	✓
8.2 Is the research likely to have any negative impact on the academic status or reputation of the College?		*	✓
8.3 Is data to be collected from an institutional location (such as a school, prison, hospital)? <i>If so, attach evidence of agreement obtained from the relevant authority (e.g. Head Teacher, Local Education Authority, Home Office)?</i>		✓	
8.4 If you have ticked a box marked * please give the question number/s and fuller information here:			

Section Nine Attachments, signatures and submission

Wherever possible, applications will be dealt with within two weeks of receipt. Delays will occur if the application has not been carefully completed. The decision regarding your application for ethical approval will be communicated to you and your supervisor (if applicable) directly.

You should now complete the following checklist, supply any necessary signatures and submit the full application/documentation to the Department Research and Enterprise Committee Chair/Department Ethics Office via the Design Office.

9.1 Attachment checklist:

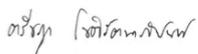
Have you attached copies of all supporting materials? Please indicate which and insert ✓ in the appropriate column

Document	Not applicable	Attached
Recruitment document/s	✓	
Informed consent		✓
Other information for participants	✓	
Consent agreements for young, vulnerable or 'in custody' persons	✓	

Criminal Records Bureau clearance	✓	
Institutional location agreement		✓
Other (please specify)...		

9.2 To be completed by student applicants.

Please note that your Supervisor and the Department Research and Enterprise Committee Chair/Department Ethics Officer should be notified of any adverse or unforeseen circumstances arising out of this study. If there are significant changes to the research design regarding research ethics, please notify the Committee immediately.



Signature of Applicant (Treechada Chotiratanapinun)

Date 14/07/2014

APPENDIX B: PERSONAL APPROACH TO RESEARCH

Taking the role of transformative learner, to comprehend the essence of transformative learning for sustainability by experiencing the interconnectedness of self with others and the world, is extremely crucial for my personal approach to research. There are two tasks that I assigned myself. The first is the mindfulness practice at Wat Pa Sukato Forest Monastery in Thailand and the second is Deep Ecology learning at Schumacher College in the UK.

1) Mindfulness practice at Wat Pa Sukato Forest Monastery

My Buddhist background has a huge influence on the work I do. I am a Theravada Buddhist who is interested in the Socially Engaged Buddhism Movement. The movement aims to apply the Buddhist values to the problems of society in a nonviolent way (King, 2009). At its core, the practice flows from the understanding of the complete yet complicated interdependence of all life. In this fashion, I perceive great compatibility between Buddhist principles and the ecological perspective.

Wat Pa Sukato is a forest monastery situated in a remote area in Northeast Thailand. The temple offers monthly short courses on mindfulness practice. The practice focuses specifically on the dynamic meditation technique, which is to cultivate self-awareness through rhythmic movements. Different from the conventional meditation, this method consists of a set of rhythmic motions of the hands and arms which can be practised while sitting, standing and walking. The key principle is to be aware of every movement of the body at all time. Then, when a thought arises, be aware of the thought too. The method of cultivating self-awareness is all about being aware of the movement of the body and the movement of the mind. When practised properly, practitioners become aware simultaneously of any or all of their movements and physical feelings, in order to “be in the now” and come to be more conscious of the world around them. This is what is meant by the term mindfulness.

When looking at the link between mindfulness and sustainability, with increased skill in being mindful, practitioners have an easier time of making conscious and deliberate decisions. This linkage was made clear during the practice at Wat Pa Sukato too. The on-site accommodation provided was a range of small-sized simple huts with basic facilities. On the first night, all practitioners were notified by the Venerable to not leave the light on unnecessarily at night. Instead of explaining with the typical energy saving point of view, the Venerable explained that the light would attract mosquitoes and moths. Once the insects came to play with light, frogs would come to eat the insects. After that, snakes would come for the frogs. That means our mindless action can bring harm to ourselves. We were reminded to be aware of our every single

action and its potential impact. This is a very simple way to teach and learn the concept of *Pratityasamutpada* or dependent co-arising – the dharma of natural systems describing that everything arises in dependence upon multiple causes and conditions; nothing exists as a singular, independent entity (Dalai Lama 1992).

The meditation practice at Wat Pa Sukato evoked the practitioners about causes and conditions for the changes we would like to see in our lives. Human beings are capable of recognising what is helpful and what is destructive, to abandon the unwise and develop the wise. On the last day, the Venerable particularly gave a thought to those who work in the developmental sector “Keep doing what you believe in patiently and cultivate the conditions as best as you can.” (In Thai, “ทำให้เห็น อยู่ให้เย็น”.) In my view, such saying suggests what a mindful, sustainability educator should do.

2) Deep Ecology learning at Schumacher College

While drafting the Literature Review Chapter, I decided to enrol in a short course on Deep Ecology at Schumacher College in Dartington, Devon. Schumacher College is well-known for being an educational institution based in whole systems thinking. It is a centre for nature-based education, personal transformation and collective action. Like other courses offered, this Deep Ecology course employed place-based pedagogy with a strong spiritual aspect. The key conviction of the course is to be taught by and learn from nature, while interaction in dialogic spaces helps enhance the learning process. Built upon the Gaia theory, which considers Earth as a living organism, the course articulated the concept of wholeness - seeing nature as a holistic system rather than an assembly of isolated components. It aimed to trigger students to consider their personal environmental ethics and bring the realisation that human beings are all part of nature. This particular aspect is well-matched with my existing Buddhist view on nature,

As Deep Ecology seeks to develop individual’s “ecological wisdom”, the transformative learning process contains three stages: 1) deep experience, 2) deep questioning and 3) deep commitment. These three stages make up a system that is interconnected as each gives rise to and supports the other. In my view, this notion manifests the balance of Hand, Head and Heart domains of learning. Here is my take on the interpretation of the three stages of Deep Ecology learning.

1) Deep experience (Hand)

The learners are encouraged to immerse themselves in nature by spending a lot of time in serene natural surroundings. In my case at Schumacher College, the forest. This stage is for contemplating oneness within nature. It is all about the physical experience.

2) Deep questioning (Head)

The learners are encouraged to consider nature as a holistic system as well as their connections with nature. This stage involves critical thinking and reflection of thoughts of each individual learner. It concerns mainly the intellectual domain.

3) Deep commitment (Heart)

The learners are encouraged to feel the spiritual connection with nature. For me, this stage generated the shift in perception – to see nature as home instead of potential resources for exploitation. The feeling of love and care then led to the deep personal commitment to protect the nature.

According to Harding (2010), Naess called this entire system an ecosophy – an evolving but consistent philosophy of being, thinking and acting in the world, that embodies ecological wisdom and harmony.

References

- Dalai Lama. (1992). *The Meaning of Life, translated and edited by Jeffrey Hopkins*, Boston: Wisdom.
- Harding, S. (2010). Gaia theory and deep ecology. In M. van Eyk McCain (Ed.) *GreenSpirit: Path to a New Consciousness*. London: John Hunt, 36-49.

APPENDIX C: FOCUS GROUP QUESTIONS FOR STAKEHOLDERS WORKING IN DESIGN INDUSTRIES

Focus group discussion with stakeholders

The Paradigm Level

- Can each of you please tell us your current practices and what you do in relation to sustainability?
- Is it important for higher education to empower the future generation of designers with knowledge, skills and values towards sustainability? To what extent and why?
- What would you like to see the future generation of designers contribute to the design industry in Thailand?

APPENDIX D: INTERVIEW QUESTIONS FOR THE POLICY-MAKERS, EDUCATORS WITH MANAGEMENT RESPONSIBILITIES, AND DESIGN EDUCATORS

Interview with policy-makers

The Paradigm Level

- Can you please introduce yourself in term of professional experience as well as current professional position?
- Can you please give a brief explanation of the current practice and direction of Thailand's higher education? This may include the nature of management and the hierarchical structure of higher education system, the direction of government policies on higher education, and other significant issues such as quality assurance, quality assessment, Thai public university system in transition (autonomous universities) challenges towards the establishment of ASEAN Community and so on.
- Can you please share your opinions on the influence of sustainability trends on Thailand's higher education, such as education for sustainable development (ESD), the academic research on sustainability, green university ranking for higher education institutions, the integration of sustainability knowledge in university curricula?
- Are there any sustainability issues embedded into management of higher education system?
- What do you, as a policy-maker, think of embedding sustainability in management of higher education system?
- Can you please identify opportunities and threats for implementing education for sustainable development (ESD) for the context of Thailand?
- Sustainable design is now becoming a significant issue in design industries, what do you think of implementing education for sustainable development (ESD) in Thailand's design education?

Interview with educators with management responsibilities

The Curriculum Level

- Can you please give a brief explanation of the current practice of the institution in term of management? What is the management direction of the institution?
- Does the institution have any plan to enhance environmental management on campus, such as recycling and energy-saving schemes?
- What management approach does the department employ? Top-down or other alternative approaches?
- Does the department see sustainability as a competitiveness factor?
- Are sustainability issues embedded into the design curriculum? If yes, how?
- What do you, as a policy-maker, think of embedding sustainability in management of the department?

Interview with educators

The Paradigm Level

- Can you tell me about your teaching experience and how you see the direction of Thailand's design education? Have you noticed any shift around the issues of sustainability?
- Do you think a shift towards sustainability is needed in Thailand's design education? And why?

The Curriculum Level

- Is there any sustainability concern embedded in the curriculum? What are these concerns?
- Can you clarify such embedding process?
- What are the aspects of environmental issues employed in the curriculum? And does the curriculum offer students a process of personal transformation, e.g. to return to their own cultural or spiritual roots?
- How do you evaluate or assess design projects related to sustainability?

The Pedagogy Level

- Can you please tell me your experience of sustainability teaching? What courses or topics have you taught?
- When it comes to teaching design for sustainability, what is your view of learning? Are there any particular pedagogic techniques that, you think, make sustainability more understandable and practical for students?

APPENDIX E: THOROUGH DETAILS ON DESIGN AND DEVELOPMENT OF THE CLASSROOM OBSERVATION SHEET

This section is adapted from the paper **First Practical Step to Achieve Education for Sustainable Development (ESD) in the Context of Thailand's Design Education: Exploring a Transformative Pedagogical Approach** submitted for and presented at the 29th PATT conference in Marseille, France, 7-10 April 2015.

The paper focuses on the context of Thai higher education institutions that offer sustainability-related courses within their Design Departments. It looks for obtaining insights into their pedagogical approaches through classroom observation, investigating if ESD is employed for the teaching and learning of 'Design for Sustainability'. This paper is part of the research project aiming to create a transformative pedagogical model for teaching sustainability to Thai undergraduate design students. Although the project has been built upon a number of well-known literature, including key concepts like Whole Systems Thinking (Capra, 1996, 2002), Deep Ecology (Naess, 1973) and Critical Pedagogy (Freire, 1970), Thai education culture (Komin, 1990; Mounier & Phasina, 2010) is taken into account too. The hierarchical system in Thai culture is a unique factor. Whereas the effectiveness of the transmission approach to teaching is widely put in question, teacher-centred instruction has long been a usual practice in Thailand. Buddhism also has much influence on the roles of teacher and learner, especially regarding status and respect. Hence, it is interesting to find out how Thai cultural characteristics affect the teaching and learning of sustainability and if the sustainable learning process is employed in this particular context.

Observation of teaching and learning

Taking place in classroom and other learning environment, the study is formal observation of teaching and learning, teacher-student interactions and students' participation in their classroom activities. The qualitative data were collected through direct, passive observation. The researcher was present in the learning environment but neither interacted nor participated. Regarding ESD, observation is important for analysing the pedagogical model in relation to sustainability education. This paper presents the development of the observation sheet as data collection tool. The observation sheet is made up of two parts, a) the space for open-ended narrative and b) the checklists for marking key concepts captured during observation. The narrative space simply allows writing and drawing for recording the teaching and learning situation. In order to design the checklists, the observation framework was formulated from a number of theories and designed systematically to observe classroom activities. It is best to make use of the observation sheet to examine each activity, instead of each session. This is because one session may consist of a variety of activities.

The observation framework

The observation framework contains four aspects concerning sustainable design education including 1) General view of education, 2) The environmental ethics and the environmental education approach, 3) The perspectives of design, and 4) Model of sustainability pedagogy. There are tools allocated for each aspect, ranging from tool A to H. They are a collection of analysis tools in the form of checklist. Each tool is rooted in different works of literature. The checklists were primarily built upon a conceptual continuum that spans from the mechanistic worldview on education to the holistic worldview on education. However, the model of sustainability pedagogy (Burns, 2011) also contributes to the design of the checklists and provides the structure for designing the observation sheet.

1) General view of education

This set comprises of tools for analysing education approaches (Tool A), for view of teaching and learning (Tool B), for view of learner (Tool C) and for teaching and learning style (Tool D).

Tool A: Tool for analysing education approaches

This tool is built upon critical pedagogy (Freire, 1970) which efforts to foster the transition from transmissive to transformative approaches. It focuses on the educational paradigm level, pinpointing that there are three different educational positions along the continuum. The three worldviews including fragmentalism, pragmatism and holism (Greig, Pike and Selby, 1989) correspond well with the three approaches to education, which are transmission, transaction and transformation (Miller, 1988).

- 1) The transmission model highlights the teacher-centric learning as its goal is to transmit knowledge, attitudes, or skills from teacher to learner. Knowledge is considered as content.
- 2) The transaction model is more active and emphasises on knowledge sharing. It regards learning as an inquiry process that learners and teacher co-participate in, so learning is considered both social and individual.
- 3) The transformation model engages a systemic view of education. It sees learning as holistic, participatory and practical. It is a process of increasing an individual learner's capacity for change. Knowledge is assumed to be interconnected and enriched by multiple perspectives.

Table E1: Tool A for analysing education approaches

Worldview: Greig, Pike & Selby (1989)	Fragmentalist /Mechanistic	Pragmatic	Holistic
	Teacher-centred <----->		Learner-centred
Curriculum model: Bowers & Flinders (1990)	Technocratic	Academic rationalist	Critical pedagogical
Education approach: Miller (1988)	Transmission	Transaction	Transformation

Tools B to D: Tools for analysing view of teaching and learning, view of learner, and teaching and learning style

Drawn from Sustainable Education (Sterling 2001), these tools focus particularly on learning and pedagogy. With mechanistic worldview at one end and holistic worldview at the other, the table provides a number of contrast characteristics represented through the teaching and learning situation.

Table E2: Tool B for analysing view of teaching and learning

Worldview:	Mechanistic	Holistic
View of teaching and learning:	Product oriented	Process, development and action oriented
	Emphasis on teaching	Integrative view: teachers also learners, learners also teachers
	Functional competence	Functional, critical and creative competencies valued

Table E3: Tool C for analysing view of learner

Worldview:	Mechanistic	Holistic
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
	Learners largely undifferentiated	Differentiated needs recognised
	Valuing intellect	Intellect, intuition and capability valued
	Logical and linguistic intelligence	Multiple intelligences
	Teachers as technicians	Teachers as reflective practitioners and change agents
	Learners as individuals	Groups, organisations and communities also learn

Table E4: Tool D for analysing teaching and learning style

Worldview:	Mechanistic	Holistic
Teaching and learning style:	Cognitive experience	Also affective, spiritual, manual and physical experience
	Passive Instruction	Active learning styles
	Non-critical inquiry	Critical and creative inquiry
	Analytical and individual inquiry	Appreciative and cooperative inquiry

2) The environmental ethics and the environmental education approach

Since the development of values and environmental ethics is fundamental to sustainability, the tools in this section are incorporated for analysing environmental ethics and environmental education approaches used in the teaching and learning.

Tool E: Tool for analysing environmental ethics

According to the Stanford Encyclopedia of Philosophy (1997), environmental ethics is the discipline in philosophy that studies the moral relationship of human beings to, and also the value and moral status of, the environment and its nonhuman contents. Three key concepts concerning environmental ethics utilised in this tool include the followings.

1) Anthropocentrism positions human beings at the centre of the universe. The anthropocentric belief is that humans possess greater intrinsic value than non-human nature. It is therefore acceptable to employ the resources of the natural world for only human ends.

2) Technocentrism is an environmental perspective that humans are able to control and manage resources by the use of technology. The values are explicitly centred on technology. This type of view believes that it can provide solutions to all environmental problems.

3) Ecocentrism is a nature-centred system of values which also recognises non-living things, set against to the human-centred, system of values. Grounded in ecocentrism, the term ‘deep ecology’ derives from an essay by Arne Naess (1973) on the distinctions between ‘shallow’ and ‘deep’ approaches to environmental protection. Deep ecology calls for a more balanced and egalitarian interaction between humans and nature as opposed to the relationship of human dominance over nature, whereas shallow ecology is anthropocentric – concerning primarily with human well-being.

Table E5: Tool E for analysing environmental ethics

Worldview:	Mechanistic			Holistic
Systems of Values:	Technology-centred	Human-centred		Nature-centred
Environmental Ethics:	Technocentric	Anthropocentric		Ecocentric
		Egocentric	Shallow Ecology	Intermediate-depth Ecology

Tool F: Tool for analysing the environmental education approach

Environmental education is a learning process that allows individuals to explore environmental issues. According to Constance L. Russell (2001), there are three approaches to environmental education. These are positioned in relation to the three previously mentioned education

approaches – transmission, transaction and transformation. The table represents the contrasting views between dominant social paradigm to the new ecological paradigm, in connection with these environmental education approaches.

Table E6: Tool F for analysing the environmental education approach

Worldview:	Mechanistic <-----> Holistic		
Paradigm:	Dominant Social Paradigm		New Ecological Paradigm
Education approach: Miller (1988)	Transmission	Transaction	Transformation
Teaching approach to nature: Russell (2001)	Nature as resource		Nature as more than a resource, nature as home
	Nature as series of building blocks	Nature as complicated system but manageable through rational planning and the use of science and technology	All life interconnected and interdependent Biological and cultural diversity valued
Approach to Environmental Education: Russell (2001)	Behavioural modification and technofix solutions	Problem-solving Skill development Action-oriented	Personal growth and social change Development of “whole” person Commitment to social and environmental justice Collaborative, participatory
Key concept:	Economic growth / Cost effectiveness / GDP	Human well-being / Eco-efficiency / Waste management	Systems thinking / Futuring

3) The perspectives of design

Tool G: Tool for analysing the perspectives of design

This tool emphasises the creation of design perspectives through design education. Drawn from Rob Fleming (2013) and linked with environmental ethics, the multiple perspectives of design are offered in the checklist. Different design practices are positioned in relation to the value systems and worldviews.

Table E7: Tool G for analysing the perspectives of design

Worldview:	Mechanistic		Holistic	
Environmental ethics:	Technocentric	Anthropocentric		Ecocentric
System of values:	Economy-centred	Human-centred		Nature-centred
Design Practice:	Conventional Design <-----> Design for sustainability			
	Mainstream (Economic-driven)	Design for society/ well-being	Eco design	Sustainable design
Green design				

4) Model of sustainability pedagogy

This aspect explores Heather Burns' (2011) model of sustainability pedagogy, which is comprised of five key elements. This pedagogical model reflects education as sustainability, a transformative learning process through which learners' values and perspectives change so that they are able to embrace sustainability and take action for change. The design of observation sheet follows this model as a guideline.

Table E8: Model of sustainability pedagogy (Burns, 2011)

Element	Goal
1) Content	To increase learners' systemic understanding of complex sustainability issues.
2) Perspectives	To provide learners with opportunities to think critically about dominant paradigms, practices and power relationships and consider complex ecological and social issues from diverse perspectives.
3) Process	To enhance learners' civic responsibility and intentions to work toward sustainability through active participation and experience.
4) Context	To increase learners' understanding of and connection with the geographical place and the community in which they live.
5) Design	To utilise an ecological course design to create transformative learning.

Tool H: Tool for analysing context of the teaching and learning

This tool is derived from the fourth element of the model – 4) Context. Since the goal of this element is to increase learners' understanding of and connection with the geographical place and the community in which they live, it denotes the concept of place-based pedagogy. Unlike other tools described previously, tool H is not majorly built upon a conceptual continuum ranging from the mechanistic to the holistic worldviews on education. Instead, it focuses on the details of the context for teaching and learning.

Table E9: Tool H for analysing context of the teaching and learning

Does the session employ place-based pedagogy?			Yes	No
Dimensions to explore:	Economic	Political	Social & cultural	Ecological
Methods used to connect with the community:				
- Observation / field note taking				
- Survey / questionnaire				
- Interview / focus group / discussion				
- Experimentation				
- Community knowledge sharing				
- Community participatory project				

This sustainability pedagogy model regards teaching as action research, contributing to continuous development and sustainability. Using this model as a guideline, the observation sheet is designed to fit with the four out of five elements in the cycle of sustainability pedagogy planning: 1) Content, 2) Perspectives, 3) Process, and 4) Context. The 5) Design element is not included. This is because it is more practical to comprehend the design of the course by doing document analysis of the course syllabus.

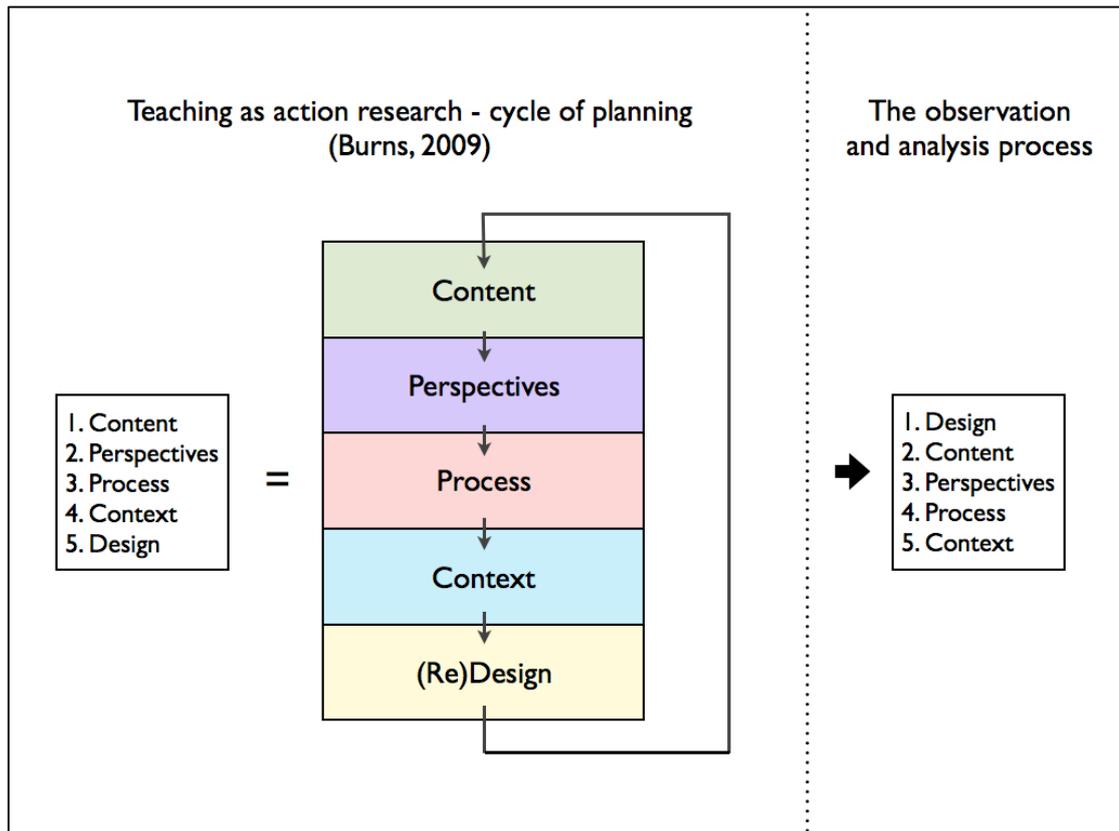


Figure E1: Teaching as action research versus the classroom observation process

Table E10: The summary of how to allocate the five elements of sustainability pedagogy model into the observation process

What to explore	What to do
1) Design	Before the session starts: <u>Document analysis</u> using detailed course outline to understand the design of the course
2) Content	During the session: <u>Classroom observation</u> using observation sheet to understand the current practice
3) Perspectives	
4) Process	
5) Context	

The final design of observation sheet

The observation sheet was constructed to allow the space for an open-ended narrative to sit in the middle of the template with the checklists placed along both sides. Once refined, tools A-D are grouped under the topic ‘Process’, tools E-G are grouped under the topic ‘Perspectives’ and tool H is under the topic ‘Context’. The final design is presented below in Figure E2. One A4-size sheet is made up of two templates in total.

Course: Venue: Date: Page:

Time:				Process			
Activity:							
Content Topic/theme:							
understand of		knowledge	skills	value(s)			
Perspect view							
env ethics	technocentric	anthropocentric	ecocentric				
view of nature	Technical solutions to environ proba	ego centric	shallow ecology	intermd depth eco	deep ecology		
env ed approach	behav modifn	technofx solutions	prof-adv & action orient	skill dev	soc & env jstc	collab, priority	
key concept	profit making	cost eff	waste mgnt	eco-efficiency	systems thinking	future	
design practice	maintainism (economic driven)	des well-bng green design	eco design	sustainable design			
Process							
approch	transmission	transaction	transformation				
view of teaching & learning	fixed knowl	skills	dialogue	prob solving	meaning fulning	Coop ming	
teacher	technician / lecturer	reflective practitioner	change agent				
learner	individuals	groups	with an org	with a comm			
value	intellect (head)	physical experience	effective experience	apprntal experience			
I & style	cognitive experience	physical experience	effective experience	apprntal experience			
Context							
Does the session employ place-based learning?				Y N			
directed to explor	economic	political	soc & cult	ecological			
methods	obs & fld note taking	survey & qnttr	intvw, fca grp, discuss	exptmt n	comm knowl sharing	comm priority project	

Figure E2: The final observation sheet

Table E11: The left-side checklist

Time:						
Activity:						
Content	Topic/theme:					
understanding of	knowledge		skill(s)		value(s)	
Perspectives						
environmental ethics	technocentric		anthropocentric		ecocentric	
			ego centric	shallow ecology	intermediate depth ecology	deep ecology
view of nature	Technical solutions to environ problems.		Nature is manageable.		All life connected + interdependent.	
environmental education approach	behaviour modification	technofix solutions	problem solving & action oriented	skill development	social & environmental justice	collaborative / participatory
key concept	profit making	cost effectiveness	waste management	eco-efficiency	systems thinking	futuring
design practice	mainstream (economic driven)		design for well-being	eco design	sustainable design	

Table E12: The right-sided checklist

Process						
approach	transmission		transaction		transformation	
	fixed knowledge	skill(s)	dialogue	problem solving	meaningful learning	cooperative learning
view of teaching & learning	emphasis on teaching			teacher = learners, learners = teacher		
	functional competence		critical competence		creative competence	
teacher as	technician / lecturer		reflective practitioner		change agent	
learner as	individuals	groups	with an organisation		with a community	
value	intellect (head)		capability (hand)		emotion (heart)	
teaching & learning style	cognitive experience	physical experience	effective experience		spiritual experience	
Context	Does the session employ place-based learning?				Y	N
dimension(s) to explore	economic		political	social & culture		ecological
methods	observation & field note taking	survey & questionnaire	interview, focus group, discussion	experimentation	community knowledge sharing	community participatory project

Conclusion

ESD skills, including envisioning a better future, critical thinking and reflection, systemic thinking, building partnerships and participation in decision-making, are significant for the teaching and learning of sustainable design. It is not overstating to say that an educator teaching design for sustainability is considered a change maker. The aim of the study is to obtain insights into the pedagogical approaches currently employed through classroom observation and this paper demonstrates the development of the analysis tools used for creating the observation framework. As data collection tool, the observation sheet presented in this paper has been used during exploratory fieldwork in Thailand. With several groups of third and fourth-year Design students of leading universities based in Bangkok Metropolitan Region, the researcher conducted passive

observation during the sessions related to design for sustainability. Through the use of the observation sheet, the researcher found that the layout of the sheet was practical enough for both writing the narrative of what happened in the learning environment and marking related key concepts in the checklists. As planned, it assisted the researcher well to address the characteristics of the mechanistic and holistic worldviews articulated in learning and teaching. The teacher-centred instruction was found most common and the learning activities often reflected the mechanistic worldview of education.

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APPENDIX F: THE DESIGN AND DEVELOPMENT OF THE CURRICULUM INTERVENTION STRUCTURE

This section is adapted from the paper **Designing Curriculum Interventions for Teaching Sustainable Design in Thailand** submitted for and presented at the Nordic Design Research conference - Design Ecologies: Challenging Anthropocentrism in the Design of Sustainable Futures at Konstfack University College of Arts, Craft and Design in Stockholm, 7-10 June 2015. It explores theoretical framework which underpins the design and development of the curriculum intervention structure used in this research.

Seeing nature through the lens of Buddhism

Thailand is a predominantly Buddhist nation. But, as it is actually practised by the majority of the people, Thai Buddhism has long been integrated with folk beliefs like animism and Brahmanical magic and divination. It is considered largely anthropocentric because it often concerns self-effort to overcome sufferings. The rise of consumer culture has also affected Buddhist virtues through the mass media. To speak about sustainability with Thais, it tends to be more empirical to begin from articulating the concept of nature through the lens of Buddhism than from the typical Western-oriented perspective of sustainability. Three essential terms to be clarified here are *Dharma*, *Pratityasamutpada* and *Madhyama-pratipad*.

Dharma means the teaching of the Buddha as an exposition of the Natural Law applied to the problem of human suffering. One must understand the nature of things in order to attain wisdom. Hence, for Buddhist practitioners, nature is not narrowly interpreted as the phenomena of the physical world such as plants, animals and the landscape. Ideally, Buddhists do not regard nature as resources to be exploited. But this seems to remain a conceptual conflict with the way Thais practice Buddhism. The discussion on such conflict will continue in the initial findings.

Pratityasamutpada or dependent co-arising is the dharma of natural systems describing that everything arises in dependence upon multiple causes and conditions; nothing exists as a singular, independent entity (Dalai Lama 1992). *Pratityasamutpada* is in line with a number of fundamental concepts in sustainability, such as ecological literacy (the understanding of the patterns and processes by which nature sustains life), deep ecology (the philosophy considering that the living environment as a whole should be respected and regarded as having certain inalienable legal rights to live and flourish, independent of its utilitarian instrumental benefits for human use), futuring (bringing proactive concrete responses to future issues into present-day operation) and defuturing (doing something that takes a future away or prevents it from arriving). They all share the same characteristics of holism and systems thinking.

Madhyama-pratipad or the middle way is a path of moderation, between the extremes of sensual indulgence and self-mortification. It implies a balanced approach to life and the regulation of one's impulses and behaviour. This concept is central to Buddhist economics, which concerns the entire process of causes and conditions. Buddhist economics investigates how a given economic activity affects the three interconnected spheres of human existence: the individual, society, and nature or the environment (Payutto 1994). It is suggested in E. F. Schumacher's (1973) *Small is Beautiful: A Study of Economics as if People Mattered* as a major alternative to the Western economic mindset.

The interrelationships between Buddhism, sustainability and design for sustainability

It is currently not common to integrate the link between Buddhism and sustainability into design teaching in Thailand. In spite of that, I propose the structure that underpins the connection between Buddhism, sustainability and design. Table 15 in Chapter 6 presents the parallel conception of these domains, from spiritual wisdom, to foundational concepts in sustainability, to methods and tools for design for sustainability. The understanding of nature is meaningfully central. I believe that this table is pragmatic enough to be used as the content structure for the teaching and learning of Design for Sustainability in the context where Buddhist culture plays a vital role.

Taking into account the unique cultural responsiveness of the students, the course syllabuses of both the eight-session and sixteen-session versions of the curriculum interventions contain a balanced mix of approaches – transmission, transaction and transformation. For example, below is the structure for the eight-session version.

Table F1: The structure of the eight-session curriculum intervention series

	Topics	Activity	Key approach
1	Pre-test and course introduction	Dialogue	Transaction
2	Role of Designer	Dialogue	Transaction
	Environmental Ethics VS Design Ethics	Lecture, Q&A	Transmission
	Deep Ecology	Outdoor activity	Transformation
3	Holistic Paradigm VS Mechanistic Paradigm	Dialogue	Transaction
	Whole Systems Thinking & Ecological Literacy	Lecture, Q&A	Transmission
4	Life Cycle Analysis & Stakeholder Analysis	Lecture, Q&A	Transmission
	Whole Systems Thinking Activity	Workshop	Transformation
5	Design Futuring VS Design Defuturing	Lecture, Q&A	Transmission
	Sustainable Design Case Studies	Dialogue	Transaction
	New Product Development for Sustainability	Workshop, Setting up exhibition	Transformation
6	“Small is beautiful.” & Buddhist Economics	Lecture, Q&A	Transmission
	Resolving local unsustainability issues by design	Dialogue	Transaction
7	Group tutorial	Dialogue	Transaction
8	Post-test	Presentation, Dialogue	Transaction

The full range of topics and details of sessions of the curriculum interventions conducted with ten groups of students from eight different institutions are included in the Appendix G.

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Schumacher, E. F. (1973). *Small is beautiful; economics as if people mattered*. New York, Harper & Row.

APPENDIX G: THE TOPICS AND DETAILS OF SESSIONS OF THE CURRICULUM INTERVENTIONS CONDUCTED WITH TEN GROUPS OF STUDENTS FROM EIGHT DIFFERENT INSTITUTIONS

This section describes the topics in the sessions of the curriculum interventions conducted in ten groups of students from eight different institutions. To make it more understandable, they are grouped into sets of activities based on the themes explored in Table 15 and 16 in Chapter 6. There are five activity sets in total.

Activity set A: First impressions: Role of designer & sustainability

The key objectives of the first sessions include:

- To explore design students' worldview of nature through the pre-test activity.
- To recognise students' first impressions of the learner-centred approach.

Table G1: Topics in the activity set A

Topics from the sixteen-session version	A		B		C	E	F	G	H	I
	Pilot	Main	Pilot	Main						
Session 1) Pre-test [discussion]	/	/	/	/	/	/	/	/	/	/
Session 1) Course Introduction [lecture]		/								
Session 2) Role of Designer [discussion]	/	/								
Session 2) Design & Ethics [lecture]		/								

The pre-test activity was conducted during the first sessions of the curriculum interventions of ten groups of students at eight institutions. The pre-test activity is a group discussion based on students' dialogue about their favourite design. Each student's selected design, as a cultural prop, was used to interpret their personal worldview. However, the activity was not included in the curriculum interventions at one institution due to a large number of students in the course. Students were asked to write about it individually instead. Two groups of students at Institution A also took part in a discussion on role of designer.

Activity set B: Environmental Ethics

The key objectives of the topics around environmental ethics include:

- To introduce environmental ethics in relation to design ethics
- To introduce deep ecology via the “conversation with a tree” activity along with discussion

Table G2: Topics in the activity set B

Topics from the sixteen-session version	A		B		C	E	F	G	H	I
	Pilot	Main	Pilot	Main						
Session 3) Environmental Ethics VS Design Ethics [lecture]	/	/						/		/
Session 3) Deep Ecology [outdoor activity]	/	/					/	/	/	

The aim of the lecture on environmental ethics is to introduce environmental ethics, a branch of ethics that studies the relation of human beings and the environment and how ethics play a role in this, as an addition to design ethics.

The deep ecology activity attempts to utilise the concept of deep ecology – “Deep experience and deep questioning will lead to deep commitment.” – to inform their own sense of embeddedness in nature and hopefully reconsider the choices they make in their design practice. Depending on the situations and locations available, students were encouraged to spend time in a campus green space, in a small garden or with a plant pot, in order to have a conversation with a tree or a plant. Hence, subject to the settings, the activity was named either “Conversation with a tree” or “Conversation with a plant”. Students were split into small groups to look closely at one particular tree or plant and its environment. Then students were asked to write down what they saw and discuss with their teammates on the following points: ‘How old is the tree?’, ‘How is it designed by nature?’, ‘What has it been through all these years?’, ‘Do we treat it well?’, ‘What else does it tell us?’ and so on. When they came back to the classroom to discuss their experiences, what they found, how they felt and their reflections on the activity. The deep ecology activity is foundational for the following Mechanistic Paradigm VS Holistic Paradigm activity.

Activity set C: Whole Systems Thinking

The key objectives of the topics around whole systems thinking include:

- To introduce whole systems thinking, which is based on the concept of interconnectedness
- To introduce the principle of ecoliteracy as guideline for sustainable design
- To facilitate the practice of whole systems thinking through tools and activities such as life cycle analysis, stakeholder analysis, project planning workshop

Table G3: Topics in the activity set C

Topics from the sixteen-session version	A		B		C	E	F	G	H	I
	Pilot	Main	Pilot	Main						
Session 4) Mechanistic Paradigm VS Holistic Paradigm [mobile phone VS tree discussion]	/	/					/	/	/	
Session 4) Mechanistic Paradigm VS Holistic Paradigm [lecture]		/	/			/				
Session 5) Whole Systems Thinking & Ecological Literacy [group discussion]		/					/		/	
Session 5) Whole Systems Thinking & Ecological Literacy [lecture]	/	/		/	/			/		
Session 6) Life Cycle Analysis [lecture]	/	/			/			/	/	/
Session 6) Life Cycle Analysis [Story of Stuff]	/	/			/			/	/	/

Topics from the sixteen-session version	A		B		C	E	F	G	H	I
	Pilot	Main	Pilot	Main						
Session 7) From Life Cycle Analysis to Eco Product Development [discussion]		/							/	
Session 9) Stakeholder Analysis [lecture, role play & workshop]		/	/	/						
Session 13) STEEP Analysis [lecture + whole systems thinking activity]		/	/	/		/				

The Mechanistic Paradigm VS Holistic Paradigm session focuses on learning from and with peers, depending on a dynamic, open-ended dialogue created by the group members. Students were asked to compare a mobile phone with the tree or plan they previously observed by making a list of similarities and differences and bring to discuss. The initial discussion topics given include age, structure, value, energy use, maintenance, disassembly and life cycle. During the roundtable discussion, they were introduced to the two contrasting paradigms, mechanistic and holistic, based on their analysis of the mobile phone and the tree. A mobile phone represents the mechanistic paradigm and a tree represents the holistic paradigm. They were informed later that both trees and mobile phones actually have the same starting point in life, which is nature. Then students were asked to think of their own design practice – what they had done and how they saw nature. The philosophical concepts were employed to make it clearer to understand. They were encouraged to share how they could link what they learned in this session to the design ethics.

Ecoliteracy, formally referred to as ecological literacy was introduced via a lecture. The lecture aims at providing the students with an understanding of the nature's patterns and processes including networks, nested systems, cycles, flows, development, and dynamic balance, as well as how to utilise them for sustainable design. Due to the requirements of some courses in some institutions, there are two groups of students which only a single concept from nature was taught in a lecture: the concept of network for the group focusing only on stakeholder analysis and the

concept of cycle for the group aiming solely at life cycle analysis. All versions of the lectures were equipped with examples and case studies illustrating how the patterns and processes found in nature can be used as a framework for design for sustainability.

There is an optional assignment, a link between the ecoliteracy and life cycle analysis sessions. There are two groups assigned to this optional task. Students were split into four small groups. Each group was given a different kind of beans. They were asked to sprout the beans using any technique that they would like, observe and record the growth of their bean sprouts once a day using a Facebook group to share the images of their plants among classmates. They were also encouraged to discuss the ongoing growth of their plants in relation to the ecological principles learned in the ecoliteracy lecture.

The session on life cycle analysis contains two parts: the lecture and the group activity. First, students were introduced to life cycle analysis alongside the screening of *The Story of Stuff*. Later, they were assigned to work in groups. However, the analysis tasks slightly differed depending on the rationale and structure of their courses. As the session was conducted with six groups of students, students are categorised into three clusters to make the grouping more understandable.

Cluster 1:

Students from the two groups which previously handled the optional bean sprouting task were asked to have lunch together and assigned to do an analysis of their food. They were asked to trace all the stakeholders related to the meal as well as to analyse the whole life cycle of their meal. Cooked bean sprouts were part of their lunch, making it more convenient for them to visualise how to analyse one of the ingredients in their plates. Students were also encouraged to bring what they discover to discuss.

Cluster 2:

There are two groups assigned to do life cycle analysis of existing products of their choices. Students were asked to present what they found in their analysis tasks at the end of the activity.

Cluster 3:

There are two groups of students assigned to do life cycle analysis of their own design projects. They were asked to share with peers in the end the results of their analysis tasks and the ideas on how they would like to develop their projects further based on the reduction of environmental impacts.

The lecture on stakeholder analysis was coupled with a role play activity, which each student was assigned to portray and think as a different stakeholder role of an organisation or a design.

Activity set D: Futuring and Defuturing

The key objectives of the topics around futuring and defuturing include:

- To introduce the concepts of design futuring and design defuturing and help students visualise their sustainable futures via design
- To facilitate the practice of design futuring via case studies and a mini design charrette

Table G4: Topics in the activity set D

Topics from the sixteen-session version of the curriculum interventions	A		B		C	E	F	G	H	I
	Pilot	Main	Pilot	Main						
Session 7) Design Futuring VS Design Defuturing with Sustainable Design Case Studies [lecture]	/	/ (lecture)			/ (case studies)					
Session 8) Mini Design Charrette		/								/
Session 9) New Product Development for Sustainability [class activity/group tutorial]	/	/								
Session 10) Eco Shop Visit [field study]		/								
Session 12) Exhibition on New Product Development for Sustainability	/	/								

The concepts of design futuring and design defuturing, coined by an Australian design theorist and philosopher Tony Fry, were introduced to students in the way that echoes the notion of interconnectedness in Buddhism. Although a small number of philosophical and theoretical terms were used, the introduction was conducted in avoidance of a heavy Eastern and Western

philosophical discourse which may put off the students. Rather, the content was mainly grounded in the principle of interconnectedness as found in nature, without labelling everything “Buddhist” outstandingly.

A lecture on design futuring and design defuturing was included in a group activity. The lecture concerns an introduction to Future Studies in relation to how designers can envision and work towards more sustainable futures. The group activity involves an analysis of exemplary sustainable design objects. Students were encouraged to examine these objects closely and share what they thoughts with peers.

The mini design charrette activity was conducted with two groups of students in two different institutions. Students were working on developing their partner’s design. The aim of the activity is not only to assist them in developing and refining the designs to be more environmentally friendly through a number of strategies previously introduced but also to demonstrate that they, as a group, can potentially create a more sustainable future. Since the process of mini design charrette involves mainly peer-learning, it provides a forum which immediate feedback is given to the co-designers. The message that this activity would like to send across to them is that they are in charge of making their own decisions and crafting their own future. For both groups, due to the time limit and the number of students, they were split in half to work in two smaller groups.

Students in the main study group participated in the field study as an activity to enhance their perspective on how design for sustainability can be situated in the context of Thai design industry. They visited a shop owned by a celebrity designer. The owner also gave a casual talk and a shop tour, introducing environmental friendly products in his/her shop. The session lasted just over two hours.

Two groups of students in the same institution were assigned to put up an exhibition for showcasing their new product development results, instead of the traditional approach of project submission which students are required to do a presentation in front of a teacher and their passive peers. In this way, both a teacher and peers were exhibition audience, free to give feedbacks on sticky notes provided.

Activity set E: Small is beautiful.

The key objectives of the topics around the “Small is beautiful” concept and the Buddhist Economics include:

- To introduce the concepts of Buddhist Economics and localism
- To facilitate the practice of design for community / design for local economy

Table G5: Topics in the activity set E

Topics from the sixteen-session version of the curriculum interventions	A		B		C	E	F	G	H	I
	Pilot	Main	Pilot	Main						
Session 11) Design & Localism [lecture with case study]		/	/							
Session 11) Design & Localism ["Resolving Local Unsustainability Issues by Design" discussion]	/	/		/						
Session 13) Small is Beautiful & Buddhist Economics	/	/								
Session 14) Group Tutorial 1 for "Resolving Local Unsustainability Issues by Design" Project	/	/	/	/						
Session 15) Group Tutorial 2 for "Resolving Local Unsustainability Issues by Design" Project		/								
Session 16) "Resolving Local Unsustainability Issues by Design" Project Presentation	/	/								

Students were introduced to E.F. Schumacher's concept "Small is Beautiful" which is close to King Bhumibol Adulyadej's philosophy on Sufficiency Economy. Students were reminded that both are rooted in their basic understanding of the Buddhist middle way. The emphasis was placed on design for the local community and economy. Key concepts in the "Small is beautiful" lecture include the Buddhist Economics, appropriate technology and localism. When presenting the concept of Buddhist Economics, the terms "the middle way" and "balance" were used interchangeably to avoid the feeling of religious teaching. The lecture contained a variety of images and videos to exemplify how design can contribute to such economic concept.

Discussion on design and localism was conducted with three groups of students from two institutions. For the two groups from the same university, the activity is a spin-off from the lecture on “Small is beautiful”. For another group in another university, the activity was planned to enhance their understanding of stakeholder analysis. The theme for each group was based on the issues in their community which they felt interested and picked to discuss. There were encouraged to use whole systems thinking to convey their thoughts.

There are two main options for learning through an exercise to practise whole systems thinking. First, the activity relates to the group assignment to explore the campus or the nearby community, in order to identify “unsustainability” issues that can be resolved by design and/or small-scale economics. This option is for the eight-session and the sixteen-session groups, equipped with tutorial sessions to develop their works further. Second, the assignment aims at helping each student to write a more well-rounded design proposal for their thesis project. The activity was conducted like a workshop, allowing students to work in groups to map out their group projects or visualise their potential thesis projects. Students were given a diagram template on a large piece of paper as a tool that guides them to consider and indicate various things, such as external factors, potential impacts and stakeholders of their proposed design, a context of production, a context of consumption, a scenario of user behaviour and so on. Then they were encouraged to use to their maps in the near future to plan out and refine their design project proposals.

The final session facilitated the presentation of “Resolving Local Unsustainability Issues by Design” project, which is part of the post-test activity for students taking part in the eight-session and sixteen-session curriculum intervention series. The details of the post-test activity are included in the Appendix H.

APPENDIX H: THE DETAILS ON THE POST-TEST ACTIVITIES

The post-test assignments are included in the eight-session and sixteen-session versions of the curriculum interventions. There are two tasks: one is a group work and another is an individual work.

Assignment 1) Design for sustainable community project

The group work concerns recognising and dealing with unsustainable issues in their community. Students were expected to work as a team by carefully selecting one challenging unsustainable issue in their campus. As design practitioners, they were encouraged to employ the concepts learned in the curriculum intervention series, especially whole systems thinking, to tackle the challenge. Students were split to work in groups of four to five students. Tutorial sessions were planned to help facilitate the development of their projects. Students were given three weeks with one tutorial time slot for the eight-session group, and six weeks with two tutorial time slots for the sixteen-session group. The presentations were conducted in the last session of the curriculum intervention series. Each group had twenty minutes to present their work.

Assignment 2) The pocketbook containing personal philosophy of design for sustainability

The individual work is a written assignment. Students were assigned to write their personal philosophy of design for sustainability based on the experiences, reflective thoughts, knowledge and skills from the curriculum interventions. They were encouraged to do it as a sustainably-made pocketbook. There is not any restriction in terms of word count and format.

These post-test assignments are crucial for the examination of students' shift in perspective towards sustainability, responding directly to the third research question: Can dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?

APPENDIX I: THE QUESTIONS FOR STUDENT FOCUS GROUPS

Focus group with students

The Pedagogy Level

- Did you originally want to learn how to design for sustainability?
- To what extent does the curriculum provide knowledge and practice which enable you to design for sustainability? Does the curriculum meet your needs regarding sustainability? And why?
- What do you think about how your work is evaluated and assessed?
- What is the learning approach that you are familiar with?
- From your experience of the curriculum interventions, what do you think of such new pedagogy?
- To what extent does it help enhance your understanding of design for sustainability? Does it help shift the students' worldviews to a more holistic direction?

APPENDIX J: EXAMPLES OF FIRST AND SECOND CYCLES OF CODING

To exemplify how thematic analysis was managed, Table J1 and Table J2 present how a theme was constructed. The examples look at the theme of “current situation and pedagogical practices” which focuses on data about learning and pedagogy. This theme contributes directly to the third research question: “Can dissemination of transformative learning be a critical strategy for teaching sustainability to design students in Thailand?” as it drew mainly the data collected from educator interviews, classroom observations prior to the conduct of the curriculum interventions, and students’ focus group discussions focusing on students’ experiences of their design curricula. Appendix J shows examples of first cycle coding and how a theme was constructed after second cycle coding.

A large number of codes relate to some theoretical models explored previously, including Table 6 in the literature review which presents two contrasting views: the mechanistic view of transmissive education and the ecological view of transformative education and the “process” part in the observation sheet shown in Figure 15. Other codes came out of participants’ data, providing insights specific to the research context and questions.

Table J1: Examples of first cycle coding

Code	Phrase or sentence pulled out from raw data	Source
<ul style="list-style-type: none"> - View of learner - Active learning - Changes brought into curriculum by students 	<p>“When considering the students’ thesis topics over the past several years, there has been an increasing number of thesis projects that are non-commercial. This transition shows that there are more and more students focusing on cultural and social values rather than commercial ones.”</p>	Educator interview (Ed-E)
<ul style="list-style-type: none"> - Industry-oriented training 	<p>“I think our curriculum has achieved our goal as we have always expected our graduates to work for the local economy. A large number of alumni are local entrepreneurs.”</p>	Educator interview (Ed-G)
<ul style="list-style-type: none"> - Transmissive approach - Power structure - Product-oriented learning - Physical experience - Skill training - Impact of seniority culture 	<p>“I always find that the majority of third and fourth-year students cannot follow a design process from the initial stage right through to making decisions for their design outcomes. It sounds unbelievable, but it is happening here. I think it must be the conservative approach to teaching and learning that limits students’ understanding and experience of working with a design process of their own. They have been trained to be just makers. Many final year students can’t work systematically. Their skills, in general, are still underdeveloped.”</p>	Educator interview (Ed-I)
<ul style="list-style-type: none"> - Hidden curriculum - ESD 	<p>“There is not a place for sustainability teaching and learning in our current curriculum. Design for sustainability is not mentioned in any part of the official curriculum documents. The only thing I can do is to incorporate sustainability, which is what I believe, into the course that I teach. It’s a personal act. It solely depends on the teacher.”</p>	Educator interview (Ed-M)
<ul style="list-style-type: none"> - Mechanistic view of learning - Values - Needs 	<p>“When we had an internship, we started to realise that what we had been taught failed to catch up with what the industries are doing.”</p>	Student (A1-9)
<ul style="list-style-type: none"> - Transmissive approach - Power structure 	<p>“The hardest thing is that different teachers have different design tastes. And we have to please all of</p>	Student (C-4)

Code	Phrase or sentence pulled out from raw data	Source
<ul style="list-style-type: none"> - Teacher-as-customer trait - Judgement and prejudice - Assessment 	<p>them. There were times that we had to revise our designs to suit their likings.”</p>	
<ul style="list-style-type: none"> - Tranmissive approach - Power structure - Teacher-as-boss trait - Judgement and prejudice - Design learning process 	<p>“We get used to the design learning process that the teacher gives direction and makes a decision for us. First, we have to do initial research and present it to the teacher. Then we start sketching and develop our designs further. After that, the teacher picks the design that (s)he thinks it is the best among all, or perhaps the one (s)he likes most. We must develop the selected designs until the teacher thinks we have done enough. In the end, we must produce well-made, neat-looking prototypes using inexpensive locally-available materials. The whole process is so inflexible that we can't suggest any change.”</p>	<p>Student (H-13)</p>
<ul style="list-style-type: none"> - Tranmissive approach - Passive learning - Cognitive experience - Fixed knowledge 	<p>“When it comes to the end of the guest lecture, the lecturer asked if anyone has any question. The classroom remains silent. One student woke up from a nap. The course leader smiled awkwardly and popped up a question to break the silence.”</p>	<p>Classroom observation (CB-B2)</p>

Table J2: How a theme was constructed after second cycle coding

Key theme	Subtheme	Code
<p>Current situation and pedagogical practices</p> <p>(This key theme concerns the current pedagogical practices in Thailand's design education. It looks primarily at classroom-level data involving learning and pedagogy. Data were collected from both educators and students through multiple methods.)</p>	Views of teaching and learning	<ul style="list-style-type: none"> - Transmissive approach - Transaction approach - Transformative approach - Product-oriented learning - Process, development and action oriented learning - Cognitive experience - Physical experience - Affective experience - Fixed knowledge - Skill training - Dialogue - Problem-solving
	Teaching and learning styles	<ul style="list-style-type: none"> - Passive instruction - Active learning - Non-critical inquiry - Critical inquiry - Role of peers in learning - Assessment
	Views of learner	<ul style="list-style-type: none"> - Learners as individuals - Learners as group - Learners being passive - Learners being active - Learners being cognitive beings - The preferred characteristics of learners - Changes in curriculum brought by students
	Views of teacher	<ul style="list-style-type: none"> - Teacher as knowledge provider - Teacher as facilitator - Teacher as technician - Teacher as reflective practitioner - Teacher as change agent - Teacher as parent - Teacher as boss - Teacher as customer

Key theme	Subtheme	Code
		<ul style="list-style-type: none"> - The preferred characteristics of teachers - Other interactions in classroom - Other learners' behavior
	Values	<ul style="list-style-type: none"> - Core values of curriculum - Hidden curriculum - The teacher-centred tradition - Traditional disciplinary value - Industry-oriented training - Product-making tradition - Knowledge creation
	Impact of rhetoric	<ul style="list-style-type: none"> - Research-intensive university - ESD - QA
	Teacher-student relationships	<ul style="list-style-type: none"> - Judgement and prejudice - Communication and feedback - Seniority culture - Other power structure issues

APPENDIX K: THEMES EMERGING FROM DATA ANALYSIS OF EACH SESSION OF CURRICULUM INTERVENTIONS

Table K1: The fifteen key themes of research findings

theme code	theme
T1	rhetoric
T2	Thai cultural values and characteristics
T3	worldview
T4	mindset
T5	current situation and pedagogical practices
T6	critical thinking & reflection
T7	perception on sustainability
T8	ESD in curriculum
T9	students' attitudes and feelings
T10	peers
T11	power structure
T12	interconnectedness
T13	Buddhist value
T14	shift in perspective
T15	suggestions

Table K2: The matrix presenting the themes emerging from data analysis of each session of curriculum interventions (Outstanding themes are in bold.)

Session/Topic	Institution										
	A1	A2	B1	B2	C	E	F	G	H	I	
1) Pre-test	(T2) (T3) (T6) (T9) (T10)	(T2) (T3) (T6) (T9) (T10)	(T2) (T3) (T6) (T9) (T10)	(T2) (T3) (T6) (T9) (T10)	(T2) (T3) (T6) (T9) (T10)	(T2) (T3) (T6) (T9) (T10)	(T2) (T3) (T6) (T9) (T10)	(T2) (T3) (T6) (T9) (T10)	(T2) (T3) (T9) (T10)	(T2) (T3) (T6) (T9) (T10)	(T2) (T3) (T6) (T9) (T10)
2) Role of designer	(T3) (T6)	(T3) (T6)									
3) Environmental Ethics	(T3) (T6) (T9) (T10) (T14)	(T3) (T6) (T9) (T10) (T14) (T15)					(T3) (T6) (T9) (T10) (T14)	(T2) (T3) (T4) (T6) (T9) (T10) (T14)	(T3) (T6) (T9) (T10) (T14)		
4) Mechanistic Paradigm VS Holistic Paradigm	(T2) (T3) (T6) (T9) (T10) (T14)	(T2) (T3) (T6) (T9) (T10) (T14)	(T3) (T6) (T9)			(T3) (T6) (T9)	(T2) (T3) (T6) (T9) (T10)	(T2) (T3) (T6) (T9) (T10)	(T2) (T3) (T6) (T9) (T10) (T14)		
5) Whole Systems Thinking and Ecological Literacy	(T3) (T6) (T9) (T14)	(T3) (T6) (T9) (T14)		(T6) (T9)	(T2) (T6) (T9)		(T3) (T6) (T9)	(T2) (T3) (T6) (T9)	(T2) (T3) (T6) (T9) (T14)		

Session/Topic	Institution									
	A1	A2	B1	B2	C	E	F	G	H	I
6) Life Cycle Analysis	(T2) (T3) (T6) (T9) (T10) (T12) (T14)	(T2) (T3) (T6) (T9) (T10) (T12) (T14)			(T2) (T6) (T9) (T10) (T12) (T14)			(T2) (T3) (T6) (T9) (T10) (T12) (T14)	(T2) (T3) (T6) (T9) (T10) (T12) (T14)	(T2) (T3) (T4) (T6) (T9) (T10) (T12) (T14)
7) Design Futuring VS Design Defuturing	(T2) (T3) (T4) (T6) (T9) (T10) (T12) (T13) (T14)	(T2) (T3) (T4) (T6) (T9) (T10) (T12) (T13) (T14)			(T2) (T3) (T6) (T9) (T10)				(T2) (T3) (T4) (T6) (T9) (T10) (T12) (T13) (T14)	
8) Mini Design Charrette		(T2) (T4) (T6) (T7) (T9) (T10) (T12) (T14)								(T2) (T4) (T6) (T7) (T9) (T10) (T12) (T14)

Session/Topic	Institution									
	A1	A2	B1	B2	C	E	F	G	H	I
9) Stakeholder Analysis		(T2) (T4) (T6) (T9) (T10) (T12)	(T2) (T4) (T6) (T9) (T10) (T12)	(T2) (T4) (T6) (T9) (T10) (T12)						
10) Eco Shop Visit		(T2) (T3) (T4) (T12) (T14)								
11) Design & Localism	(T6) (T7) (T9) (T12) (T13) (T14)	(T6) (T7) (T9) (T12) (T13) (T14)	(T6) (T7) (T9) (T12) (T14)	(T6) (T7) (T9) (T12) (T14)						
12) Exhibition on New Product Development for Sustainability	(T2) (T6) (T9) (T10) (T12) (T14)	(T2) (T6) (T9) (T10) (T12) (T14)								

Session/Topic	Institution									
	A1	A2	B1	B2	C	E	F	G	H	I
13) Small is Beautiful & Buddhist Economics / whole systems thinking activity (project planning)	(T4) (T6) (T7) (T9) (T12) (T13) (T14)	(T2) (T4) (T6) (T9) (T12) (T13) (T14)	(T4) (T6) (T9) (T12)	(T4) (T6) (T9) (T12)		(T4) (T6) (T9) (T12)				
14) Group Tutorial 1	(T6) (T9) (T10) (T12)	(T6) (T9) (T10) (T12)	(T6) (T9) (T12)	(T6) (T9) (T12)						
15) Group Tutorial 2		(T2) (T6) (T9) (T10) (T12)								
16) “Resolving Local Unsustainability Issues by Design” Project Presentation	(T3) (T4) (T6) (T7) (T9) (T10) (T12) (T14)	(T2) (T3) (T4) (T6) (T7) (T9) (T10) (T12) (T14)								

APPENDIX L: QUANTITATIVE DATA ON STUDENTS' FEELINGS TOWARDS EACH ACTIVITY IN THE CURRICULUM INTERVENTIONS

Table L: Quantitative data on students' feelings towards each activity in the curriculum interventions

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
Pre-test [discussion]						
* Most students held anthropocentric view towards nature through their chosen favourite designs. Most designs that were selected and presented are from Western designers/brands, especially focusing on the styling/aesthetic dimension of design.						
Institution A (pilot)	N/A	N/A	N/A	N/A	N/A	N/A
Institution A 15 students	1	7	3	0	0	Thought-provoking + Fun x1 Pressurising x 1 Fresh + Boring x 1 Fresh + Fun x1
Institution A 10 dropped-out students	2	6	1	0	0	Boring + Pressurising x1
Institution B (pilot) 7 students	0	2	2	0	0	Boring + Difficult x1 It's okay x2
Institution B 5 students	0	2	0	0	0	Fresh + Fun x2 Unconventional x1

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
Institution C (pilot)	2	8	5	0	0	It's okay x2 Fresh + Fun x1
Institution E 13 students	4	5	2	1	1	-
Institution F 8 students	0	1	6	0	0	Wow x1
Institution G	N/A	N/A	N/A	N/A	N/A	N/A
Institution H 19 students	1	12	1	0	0	Thought-provoking + Fresh + Fun x2 Thought-provoking + Fresh x2 Exciting x1
Institution I 24 students	1	20	1	0	1	Thought-provoking + Fresh + Fun x1
Course Introduction [lecture]						
Institution A 15 students	1	4	2	3	0	Thought-provoking + Fresh + Fun x1 Fun + Boring x1 It's okay x2 Sleepy x1

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
Institution A 10 dropped-out students	2	1	0	4	0	It's okay x3
Role of Designer [discussion]						
Institution A (pilot) 22 students	3	9	7	1	0	It's okay x2
Institution A 16 students	4	8	2	0	0	Thought-provoking + Fresh x1 Thought-provoking + Fun x1
Design & Ethics [lecture]						
Institution A 16 students	5	6	1	0	0	Thought-provoking + Fresh x1 Thought-provoking + Fun x1 Thought-provoking + It's okay x1 Enlightening x1
Environmental Ethics VS Design Ethics [lecture]						
Institution A (pilot) 22 students	6	4	6	1	0	Thought-provoking + Fresh x1 Fresh + Fun + Confusing x1 Fresh + Fun x1 Relaxing x1 Excellent x1

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
Institution A 15 students	1	7	3	0	0	Thought-provoking + Fresh + Fun x1 Boring + Confusing x1 Fresh + Confusing x1 It's okay x1
Institution G 56 students	3	29	1	10	5	Fresh + Fun x1 Fresh + Sleepy It's okay x5 Deep x1
Institution I 24 students	0	16	4	1	0	Thought-provoking + Fresh + Fun x1 It's okay x1 Enlightening x1
Deep Ecology [outdoor activity]						
Institution A (pilot) 22 students	3	11	5	0	0	Thought-provoking + Fresh + Fun x1 Thought-provoking + Fresh x2
Institution A 15 students	2	5	3	1	2	Fresh + Confusing x1 Exhausting x1

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
Institution F 8 students	3	3	0	0	0	Thought-provoking + Fresh + Confusing x1 Wow!!! x1
Institution G 56 students	2	29	7	8	2	Thought-provoking + Fresh x3 Fresh + Boring x1 Fresh + Confusing x1 It's okay x2 Interesting x1
Institution H 19 students	2	7	5	0	0	Thought-provoking + Fresh + Fun x2 Fresh + Fun x3
Mechanistic Paradigm VS Holistic Paradigm [mobile phone VS tree discussion]						
Institution A (pilot) 20 students	6	4	6	0	0	Thought-provoking + Fresh + Fun x2 Fresh + Fun x1 At ease x1
Institution A 16 students	4	4	6	2	0	-

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
Institution F 8 students	3	3	0	0	0	Thought-provoking + Fresh + Confusing x1 Wow!!! x1
Institution G 47 students	3	20	8	9	2	Thought-provoking + Fresh + Fun x1 Thought-provoking + Fun + Boring x1 Fresh + Confusing x2 It's okay x1
Institution H 13 students	3	6	2	0	0	Thought-provoking + Fresh + Fun x1 Thought-provoking + Fresh x1
Mechanistic Paradigm VS Holistic Paradigm [lecture]						
Institution A 16 students	3	6	3	1	1	Thought-provoking + Fresh x1 Thought-provoking + Fun x1
Institution B 5 students	0	1	2	0	0	Confusing + Enlightening x1 Exciting x1
Whole Systems Thinking & Ecological Literacy ["learning from an orange" group discussion]						
Institution A 16 students	1	7	6	0	0	Fresh + Fun x1 Boring + Confusing x1

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
Institution H 13 students	2	7	2	0	0	Thought-provoking + Fresh + Fun x1 Thought-provoking + Fresh x1
Whole Systems Thinking & Ecological Literacy [lecture]						
Institution A (pilot) 20 students	3	5	6	2	2	Thought-provoking + Fresh x1 Fresh + Confusing x1
Institution A 16 students	3	8	3	0	1	Fun + A bit too much x1
Institution B (pilot) – “Network” 7 students	0	2	1	1	0	Activating x1 Illuminating x1 Great x1
Institution C – “Cycle” 18 students	2	10	1	1	3	Fresh + Confusing x1
Institution F 8 students	1	5	1	0	0	Fresh + Fun x1
Institution G 47 students	5	18	2	15	2	Thought-provoking + Fresh + Boring x1 Thought-provoking + Fun + Boring x1 Fresh + Fun x1

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
						It's okay x2
Life Cycle Analysis [lecture]						
Institution A (pilot) 20 students	5	6	2	1	1	Thought-provoking + Fresh + Fun x2 Motivating + Overwhelming x1 Fresh + Fun x1 Thought-provoking + Fresh x1
Institution A 15 students	2	2	6	1	0	Fresh + Confusing x1 Fun + Boring x1 Surprising x1 I like it! x1
Institution C 18 students	1	7	3	2	1	Fresh + Sleepy x1
Institution G 33 students	3	11	2	4	5	Fresh + Fun x2 Fun + Boring x1 It's okay x2 Sleepy x2 Fine x1

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
Institution H 19 students	6	8	2	0	0	Thought-provoking + Fresh + Fun x2 Fresh + Fun x1
Institution I 23 students	3	11	5	1	2	Thought-provoking & Fresh x1
Life Cycle Analysis [Story of Stuff]						
Institution A (pilot) 20 students	6	8	2	1	0	Thought-provoking + Fresh + Fun x3
Institution A 15 students	2	4	1	2	1	Fresh + Fun x2 Fun + Confusing x1 Surprising x1 Thought-provoking + Confusing x1 Fresh + Confusing x1
Institution C 18 students	3	4	4	2	1	Good x1
Institution G 32 students	1	7	14	4	2	Fresh + Fun x2 It's okay x1 Fine x1

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
Institution H 19 students	9	4	3	0	0	Thought-provoking + Fresh x1 Fresh + Fun x1
Institution I 23 students	4	13	3	2	0	Thought-provoking + Fresh + Fun x1
From Life Cycle Analysis to Eco Product Development [discussion]						
Institution A 15 students	2	5	3	0	1	Fresh + Boring x3 Deep x1
Institution H 18 students	7	4	3	0	1	Thought-provoking + Fresh + Fun x2 Fresh + Fun x1
Stakeholder Analysis [lecture, role play & workshop]						
Institution A 16 students	1	5	8	0	0	Thought-provoking + Fun x1 It's okay x1
Institution B (pilot) 7 students	0	3	4	0	0	-
Institution B 5 students	0	0	3	0	0	Very comprehensible x1 Fresh + Fun + Confusing x1
STEEP Analysis [Workshop]						
Institution A 13 students	3	4	3	0	0	Fresh + It's okay x1 It's okay x1

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
						Energising x1
Institution B (pilot) 7 students	0	2	4	0	0	Experiential x1
Institution B 5 students	0	0	3	0	0	Thought-provoking + Fresh x1 Fresh + Fun x1
Institution E 13 students	9	2	2	0	0	-
Design Futuring VS Design Defuturing with Sustainable Design Case Studies [lecture]						
Institution A (pilot) – Design Futuring VS Design Defuturing lecture only 22 students	4	5	7	1	0	Thought-provoking + Fresh + Fun x2 Thought-provoking + Fun x1 Fresh + Fun x1 Good x1
Institution A (pilot) – Sustainable Design Case Studies only 22 students	6	4	9	1	0	Good x1 It's okay x1
Institution A 15 students	4	4	4	0	0	Thought-provoking + Fresh + Fun x1 Fresh + Fun x1 Thought-provoking + Fun x1

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
Institution C – Sustainable Design Case Studies only	3	5	4	1	0	Fresh + Good x1 Fun + Confusing x1
Institution H 19 students	7	7	0	0	1	Thought-provoking + Fresh + Fun x3 Fresh + Fun x1
Mini Design Charrette						
Institution A 16 students	6	0	7	0	0	Thought-provoking + Fresh + Fun x1 Thought-provoking + Fun x1 Thought-provoking + Fresh + Confusing x1
Institution I 25 students	11	8	3	1	0	Thought-provoking + Fresh + Fun x2
New Product Development for Sustainability [class activity/group tutorial]						
Institution A (pilot) 22 students	2	6	9	1	1	Fresh + Fun x1 Good x1 It's okay x1
Institution A 16 students	4	2	3	0	4	Thought-provoking + Inspiring x1 Fresh + Confusing x2

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
Eco Shop Visit [field study]						
Institution A	1	2	7	0	0	Thought-provoking + Fun x4 Fresh + Fun x1
Exhibition on New Product Development for Sustainability						
Institution A (pilot) 22 students	7	3	7	1	0	Fresh + Fun x2 Good x1
Institution A 13 students	0	5	6	0	0	Fresh + Fun x1 Tiring x1
Design & Localism [lecture with case study]						
Institution A 14 students	3	5	2	1	0	Packed with new knowledge x1 Thought-provoking + Fresh + Fun x1 Thought-provoking + Fun x1 Fresh + Confusing
Institution B 5 students	0	0	3	0	0	Thought-provoking + Fresh x1 Thought-provoking + Fun x1
Design & Localism [discussion]						
Institution A (pilot - optional) 17 students	8	2	4	0	0	Thought-provoking + Fresh + Fun x1

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
						Thought-provoking + Fresh x1 Thought-provoking + Fun x1
Institution A 14 students	4	3	4	0	3	Boring + Confusing x1
Institution B (pilot) 7 students	3	2	2	0	0	-
Small is Beautiful & Buddhist Economics [lecture]						
Institution A (pilot) 21 students	5	6	4	2	1	Fresh + Fun x1 Fresh + Confusing x1 Good x1
Institution A	3	4	1	3	0	Sleepy x2
Group Tutorial 1 for "Resolving Local Unsustainability Issues by Design" Project						
Institution A (pilot) 8 students	3	4	0	1	0	-
Institution A	10	1	3	0	0	Fresh + Fun x1
Institution B (pilot) 7 students	2	1	2	0	1	Ace! I love it! x1
Institution B 5 students	3	0	0	0	1	Fresh + Confusing x1

	Number of students who think the session was ...					
	Thought-provoking	Fresh	Fun	Boring	Confusing	Others
Group Tutorial 2 for “Resolving Local Unsustainability Issues by Design” Project						
Institution A	4	2	3	1	1	It’s okay. x3 Sleepy x1 Dissatisfied x1
“Resolving Local Unsustainability Issues by Design” Project Presentation						
Institution A (pilot) 21 students	6	3	5	1	0	Thought-provoking + Fresh x1 Thought-provoking + Fun + Confusing x1 Fresh + Fun x3 Interesting x1
Institution A	4	3	8	1	0	-