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Understanding Sustainability from a Global perspective: Exploring the Role of Education for Sustainable Development within Contemporary Education in Ireland

Helen Foley,

for the degree of

Doctor of Philosophy

2017

Declaration

The author hereby declares that, except where duly acknowledged, this thesis is entirely her own work

_____

Helen Frances Foley

August 2017

Dedication

This research is dedicated to my Daughter Grace Foley Nolan.

This study is also dedicated to my family, to my parents, Bartholomew and Brenda Foley and my siblings, Sean, Roisin, Louise, Barry, Michael, Diane and their families.

Additionally, this study is also dedicated to all who in their work are contributing to the creation of knowledge connectivity, through the pursuit of interdisciplinary and transdisciplinary learning and research relevant to the transition towards sustainable development.

Education for sustainable development is a process of learning how to make decisions for the long term future of the economy, ecology and equity of all communities (UNESCO, 2005). *Education for sustainability holds the promise of a new transformative paradigm for education* (Huckle and Sterling, 2001).

*****

The Supreme Reality of our Time... is the Vulnerability of this Planet.
John F. Kennedy (1963).

*****

Our current rate of consumption is eroding the very fabric of our planet and will ultimately threaten our long-term survival (WWF, 2000, p. 43).

*****

The greatest enterprise has always been and will always be the attempted linkage of the sciences and humanities…the ongoing fragmentation of knowledge and resulting chaos in philosophy are not reflections of the real world but artifacts of scholarship (Wilson, 1999, pp. 5-6).

*****

If it is to fulfil its potential as an agent of change towards a more sustainable society, sufficient attention must be given to education as the subject of change itself (Sterling, 1996, p. 18).

*****

Ultimately, sustainability will depend on changes in behaviour and lifestyles, changes that will need to be motivated by a shift in values and rooted in the cultural and moral precepts upon which behaviour is based (UNESCO, 2002).

Abstract

Understanding Sustainability from a Globally Perspective: Exploring the role of Education for Sustainable Development within Contemporary Education in Ireland?

Helen Foley

Sustainable Development is one of the greatest challenges of our time, which is relevant both globally and locally. Consequently, this research focused on sustainable development and education for sustainable development. Two research questions were addressed in this study, what are the challenges relevant to achieving sustainability and how can these challenges be more clearly understood? Globally, key challenges include anthropogenic climate change, resource overuse, wealth inequality and water stress. In addition, this research asked, what is the role of Education for Sustainable Development within contemporary education in Ireland and how can this role be developed? In terms of addressing these questions, from a macro perspective, this study aimed to advance understanding of sustainable development and education for sustainable development, through the development of a conceptual framework for sustainability. From a micro perspective this research aims to explore education for sustainable development barriers and opportunities relevant to the formal education system in Ireland. In compliance with the critical and interpretive paradigms, in this study the primary research was guided by ontological realism and epistemological interpretivism. A qualitative exploratory strategy was utilised to explore the research questions, aims and objectives. A total of 404 people participated in this study, facilitated by, forty-nine interviews, six group interviews and four surveys. Primary research findings showed that although the *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland, 2014-2020* was welcomed by the Irish expert panel, this panel also found this new strategy was short on accountability, aspiration and specific goals. From a national perspective, overall the role of education for sustainable development within the formal educational system in Ireland is inadequate, where education for sustainable development tends to be marginalised within the formal curriculum. Key education for sustainable development barriers include, the dominance of subject disciplinarity (functional specialisation), resistance to educational reform and adherence to the historically developed main curriculum. These education for sustainable development barriers are particularly evident at the post primary and tertiary education levels. Recommendations made in this study build on the recommendations advanced in *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland, 2014-2020*. Across the three educational levels opportunities for integrating education for sustainable development have been advanced. At the tertiary education level, sustainability issues should be integrated into teacher training and business and management education. Additionally, interdisciplinary teaching and research need to be prioritised and resourced at the tertiary education level in Ireland. Overall, the integration of education for sustainable development within contemporary education in Ireland is important, especially within the context of achieving a low carbon, climate resilient and environmentally sustainable economy.

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LIST OF ABBREVIATIONS

AEGEE	*Association des Etats Généraux des Etudiants de l'Europe*
CSPE	Civic Social and Political Education
DESD	Decade of Education for Sustainable Development
DSP	Dominant Social Paradigm
EFA	Education for All
FAO	Food and Agricultural Organisation
GTCS	General Teaching Council for Scotland
ICCS	International Civic and Citizenship Education Study
ICSU	International Council for Science
IGBP	International Geosphere-Biosphere Programme
IFAD	International Fund for Agricultural Development
INSEAD	*Institut Européen d'Administration des Affaires*
IHDP	International Human Dimensions Programme
ISSC	International Social Science Council
IPCC	Intergovernmental Panel on Climate Change
IUCN `	International Union for the Conservation of Nature
LPI	Living Planet Index
MDGs	Millennium Development Goals
NCCA	National Council for Curriculum and Assessment
NESC	National Economic and Social Council
NUS	National Union of Students
OECD	Organisation for Economic Co-operation and Development
PRME	Principles for Responsible Management Education
QOL	Quality of Life
RAP	Report on an Action Project
SDGs	Sustainable Development Goals
TALIS	Teaching and Learning International Survey
TNCs	Transnational Corporations
UNCED	United Nations Conference on Environment and Development
UNCSD	United Nations Commission on Sustainable Development
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP FI	United Nations Environment Programme Finance Initiative
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNLD	United Nations Literacy Decade
UN PRI	United Nations Principles for Responsible Investment
WB	World Bank
WCRP	World Climate Research Programme
WCED	World Commission on Environment and Development
WFP	World Food Programme
WEFSN	Water, Energy and Food Security Nexus
WHO	World Health Organisation
WWF	World Wildlife Fund

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CHAPTER ONE
INTRODUCTION TO THE RESEARCH

1.0 Introduction

This chapter provides an introduction to the research. The chapter will begin by providing a background to the research. The research justification, research questions, aims and objectives are then presented. Consideration is then directed towards the methodology employed in this study and the structure of this thesis by chapter, followed by a chapter summary.

1.1 Background to the Research

Over the last number of decades increasing attention has been directed to achieving sustainability through the pursuit of sustainable development. The focus on the importance of a transition to a sustainable path was highlighted on the 25th of September 2015 at the United Nations General Assembly in New York, where 193 member states ratified the new Sustainable Development Goals (Ford, 2015). These goals became applicable in January 2016 until 2030 (United Nations Department of Economic and Social Affairs, 2014). It is expected that United Nations member states will use the Sustainable Development Goals to frame their agendas and political policies regarding sustainable development.

The top global risk in 2016 was found to be a failure of climate change mitigation and adaptation (World Economic Forum, 2017). The importance of anthropogenic climate change was also highlighted in France in 2015, where the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change, commonly known as COP 21 met in Paris in December 2015. At COP 21 representatives from 200 countries adopted an agreement on climate change that it is hoped will avert some of the worst effects of global warming and shift economies around the world to cleaner energy sources (Zavis *et al.*, 2015).

Although, sustainable development and education for sustainable development have received much attention and debate in the last few decades, confusion still exists regarding the meaning of sustainable development. The most widely known definition of sustainable development more commonly known as the Brundtland definition was

proposed in 1987 by the United Nation's World Commission on Environment and Development (WCED) in *Our Common Future* which stated:

> *"Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs"*, (Brundtland Commission, 1987 p. 43).

The World Conservation Union (IUCN), the United Nations Environmental Programme (UNEP) and the World Wide Fund for Nature (WWF), have stated Sustainable Development is concerned with:

> *"Improving the quality of life while living within the carrying capacity of supporting ecosystems"*, (IUCN/UNEP/WWF, 1991 p. 10).

Dobson (1996) has outlined, there are 300 definitions of sustainability, leading to confusion regarding the meaning of sustainable development. Consequently, the ambiguity associated with sustainable development, by proxy also contributes to a lack of understanding regarding education for sustainable development. The confusion associated with sustainable development is seen as problematic, where it is believed, a more accurate definition and conceptualisation of sustainable development could contribute to more sustainable policies and may also contribute to the advancement of education for sustainable development.

The decision to focus on sustainable development and education for sustainable development was influenced by the author's interest in education, global governance, equality, human development, ecology and the behavioural, climate and political sciences. From her work experience as a third level lecturer, anecdotally, students' awareness of climate change and sustainable development for the most part seem absent or inadequate.

Although, there is evidence of good education for sustainable development practice in Ireland, questions remain regarding the barriers and opportunities relevant to the integration and implementation of education for sustainable development within the contemporary education system in Ireland. In Ireland a historic development relevant to education for sustainable development occurred on the 4th of July 2014 with the publication of *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland, 2014-2020* (Department of Education and Skills, 2014). This is Ireland's first National Strategy on Education for Sustainable

Development. A more detailed justification of this research is outlined in the following section.

1.2 Justification for the Research

Sustainable development is the most urgent challenge facing humanity (Sacks, 2015). Casteo (2004) has indicated, the concept of sustainable development has become one of the most ubiquitous, contested and indispensable concepts of our time. The Global Footprint Network (2015) has indicated that concerns are increasing regarding the impact of the present development path, resulting in collapsing fisheries, diminishing forest cover, depletion of fresh water systems and the build-up of carbon dioxide emissions. According to Oxfam (2014), inequality is impacting social stability within countries and threatening security on a global scale.

As UNESCO (2014) and Sarabhai (2013) have posited, there is a need to transition to a sustainable path through the pursuit of sustainable development, where education for sustainable development is now seen as a key enabler for sustainable development. Sarabhai (2013) has highlighted the connection between education and development as critical and in discussing this connection the United Nations Secretary General (2007-2016) Ban Ki-moon stated:

> "*Our international agreed development goals are a complex tapestry and education is the indispensable thread*", (Sarabhai, 2013 p. 1).

A key challenge regarding sustainable development concerns the ambiguity and confusion associated with the meaning of sustainable development (Farley and Smith 2014; Berke and Conroy, 2000; UNESCO, 1997). UNESCO (1997) has highlighted, the simplification of complex issues is irresponsible, where UNESCO has suggested the complexity associated with sustainable development must be understood and communicated (UNESCO, 1997). Timpson *et al.*, (2006), support the view that research on sustainable development and education for sustainable development has overlooked the interdependent nature and complexity of sustainable development, it is hoped that this study will contribute to this important research gap.

Within the context of the present unsustainable path, according to Orr (1992), the Euro-American culture does not question whether it is educating for an active, ecologically competent citizenry, where we still educate at all levels as if no crisis

existed. Similarly, Huckle and Sterling (2001) have posited, there are strong pressures on education to comply with a weak sustainability (business as usual) perspective. Whilst Scott *et al*., (2012) have indicated, sustainability needs to be embedded in all learning programmes. Although, by March 2015 over 497 university presidents, chancellors and rectors representing over fifty countries had signed the Talloires Declaration (TD)[1], Cebrián and Junyent (2015) have posited, at the national, regional and international level, little has been achieved in terms of embedding education for sustainable development holistically in the curriculum.

Consequently, important questions remain regarding the barriers preventing the integration of education for sustainable development into formal education both in Ireland and internationally. UNESCO (2012) and Goncalves *et al.*, (2012) have indicated, although there are many challenges on the path towards sustainability without learning, sustainable development will not be realised. Whilst, Huckle and Sterling (2001) have posited, education for sustainable development holds the promise of a new transformative paradigm for education, it is hoped that this research can contribute to this emerging paradigm.

In Ireland, research commissioned by Comhar in 2007 stated, education for sustainable development should:

> "*Be given priority in all levels and forms of education – formal and informal*" where "*Education for Sustainable Development principles and approaches should be embedded in the formal curriculum in a cross-cutting, holistic way"*, (ECO-UNESCO, 2007 pp. 4-5).

Ireland's first National strategy, *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland, 2014-2020* (Department of Education and Skills, 2014) was published in July 2014, within the context of education for sustainable development provision in Ireland, the publication of this strategy is an important policy development, consequently gaining expert insight regarding this strategy is relevant to this study.

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[1] Composed in 1990 at an international conference in Talloires, France, the Talloires Declaration (TD) is a ten-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations and outreach at colleges and universities. See appendix L for more detail regarding the number and location of Universities who have signed this declaration.

Critical to realising the potential of education for sustainable development at the primary level is the identification of key issues concerning the implementation of the Green-Schools programme in Ireland. This research has not been conducted before and is addressed in this study.

The Civic, Social and Political Education programme in Ireland is the only compulsory educational programme specifically related to sustainable development at the post primary level. Question remain regarding how key stakeholders view the Civic, Social and Political Education programme and the impact this may or not have on the implementation of the Civic, Social and Political Education programme at the post primary level in Ireland, these questions will also be elucidated.

At the tertiary level, business students' awareness and knowledge of sustainable development and how this can be advanced will also be explored in this study.

1.3 Research Questions

This research will endeavour to answer the following research questions.

(1) What is the role of Education for Sustainable Development within contemporary education in Ireland and how can this role be developed?

(2) What are the challenges relevant to achieving sustainability and how can these challenges be more clearly understood?

The research questions will be answered by addressing the following research aims and objectives, outlined in sections 1.4 and 1.5 respectively.

1.4 Research Aims

Within the context of the research justification and research questions, this study will address two research aims:

(1) From a micro perspective this research aims to explore education for sustainable development barriers and opportunities relevant to the formal education system in Ireland.

(2) From a macro perspective this research aims to advance the understanding of sustainable development and education for sustainable development, through the development of a conceptual framework for sustainability.

1.5 Research Objectives

The first research aim will be achieved by addressed the first and second research objectives, where this research will:

(1) Examine sustainable development and education for sustainable development within the Irish context, with particular emphasis on the role of government policy on the provision of education for sustainable development within the formal educational system.

(2) Explore the institutional and political barriers and opportunities relevant to the implementation of education for sustainable development at the primary, post primary and tertiary levels of education in Ireland.

The second research aim will be achieved by addressing the third and fourth research objectives, where this research will:

(3) Explore and synthesise the meaning, relevance and complexity of sustainable development and how sustainable development has been influenced historically.

(4) Explore the emergence, importance and transformative potential of education for sustainable development and explore key barriers preventing the implementation of education for sustainable development.

1.6 Methodology

Guided by the interpretivist and critical realist philosophical perspectives, in terms of addressing the research questions, aims and objectives, a qualitative research approach was used in this study. More specifically a case study methodology was employed in this research. A variety of data collection methods including semi-structured interviews, group interviews, documentation and qualitative surveys were used in this study. Participants involved in this research included students across the three educational levels, primary and post primary teachers, school principals, lecturers and other stakeholders associated with education for sustainable development at the primary, post primary and tertiary levels of formal education in Ireland. Research was also conducted with an expert panel from Harvard University, Trinity College Dublin, Maynooth University, National University of Ireland Galway and the Dublin Institute of Technology. Thematic analysis facilitated the data analysis process.

1.7 Structure of the Thesis

This thesis is composed of eight chapters. Chapter one provides an introduction to the research. Opening with an introduction, the background to the research and the justification for the research are also highlighted. The research questions, aims and objectives, methodology employed in this study and the structure of the thesis are then presented. Chapter one concludes with a brief chapter summary.

Chapter two outlines the explanatory pathway which facilitated an exploration of sustainable development. This chapter explores the definitional diversity associated with sustainable development. The relevance of sustainable development is also explored through examining the components of sustainable development. Complex Adaptive Systems Theory is utilised to understand the complexity of sustainable development. While the impact of education, culture and society and its negative impact on education for sustainable development is explored using Bourdieu's Social Theory. The principles of sustainable development and the sustain-centric paradigm are also explored. This chapter concludes by exploring sustainability from the business perspective.

Chapter three is comprised of two sections. The first section explores the emergence of education for sustainable development, by highlighting some of the global initiatives relevant to the emergence of education for sustainable development. In the second section, education for sustainable development will be explored in more detail, concluding with an examination of the transformational potential of education for sustainable development. Chapter four focuses on education for sustainable development barriers, including the dominant social paradigm, education as a sustainable development barrier, the challenge of interdisciplinarity and the pedagogic norms of disciplinarity.

Chapter five explores the policy framework relevant to education for sustainable development in Ireland**.** Particular attention is given to the *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland, 2014-2020*, published in July 2014. The chapter will conclude by considering education for sustainable development provision within the formal education system in Ireland. Chapter six describes and justifies the philosophical and methodological foundation of the chosen research strategy. This chapter also details the case study methodology, data collection and analysis employed in this study. In addition focus is also given to validity and reliability issues. This chapter concludes by presenting the limitations of the research.

Chapter seven presents the key case findings that have surfaced during this enquiry. Guided by the conceptual framework for sustainability developed in this study, the chapter focuses on findings relevant to education for sustainable development across the primary, post primary and tertiary educational levels. Expert panel research findings are also presented in this chapter.

Within the context of the overall research questions, aims and objectives, chapter eight presents the key conclusions of this study. Consideration is firstly directed to conclusions relevant to the role of education for sustainable development within contemporary education in Ireland. Challenges relevant to achieving sustainability and Irish Policy Implications of this study are also outlined. A number of opportunities relevant to strengthening the provision of education for sustainable development within contemporary education in Ireland are then presented. Focus is then directed towards this study's contribution to knowledge, followed by a number

of suggestions for further research, and the research conclusion.

1.8 Summary

This chapter provided a brief introduction to this research, having outlined the research background, a justification for this research was presented. The research questions, aims and objectives were detailed and the methodology employed in this study was also highlighted. An outline of this thesis by chapter was then presented, followed by a brief chapter summary.

CHAPTER TWO
EXPLORING SUSTAINABLE DEVELOPMENT

2.0 Introduction

This chapter addresses the third research objective by exploiting and synthesising the meaning, relevance and complexity of sustainable development and how sustainable development has been influenced historically. This chapter begins by considering different definitions and representations of sustainable development. Focus is then directed towards the components of sustainable development, where issues relevant to wealth inequality and environmental degradation are examined.

The complexity of and historical influence on sustainable development is explored using complex adaptive systems theory and Bourdieu's social theory respectively. Focus is then directed to linking the principles relevant to sustainable development and the sustain-centric paradigm. The chapter concludes by exploring sustainable development from a business perspective, where the weak and strong sustainability perspectives are considered.

2.1 Understanding Sustainable Development

With the aim of providing a clear understanding of sustainable development from a holistic perspective and utilising the explanatory pathway presented in Figure 2.1, this chapter explores the diverse meanings, models, components, key principles and business perspectives relevant to sustainable development. Bourdieu's social theory and the dominant social paradigm provide insights regarding how history has influenced development.

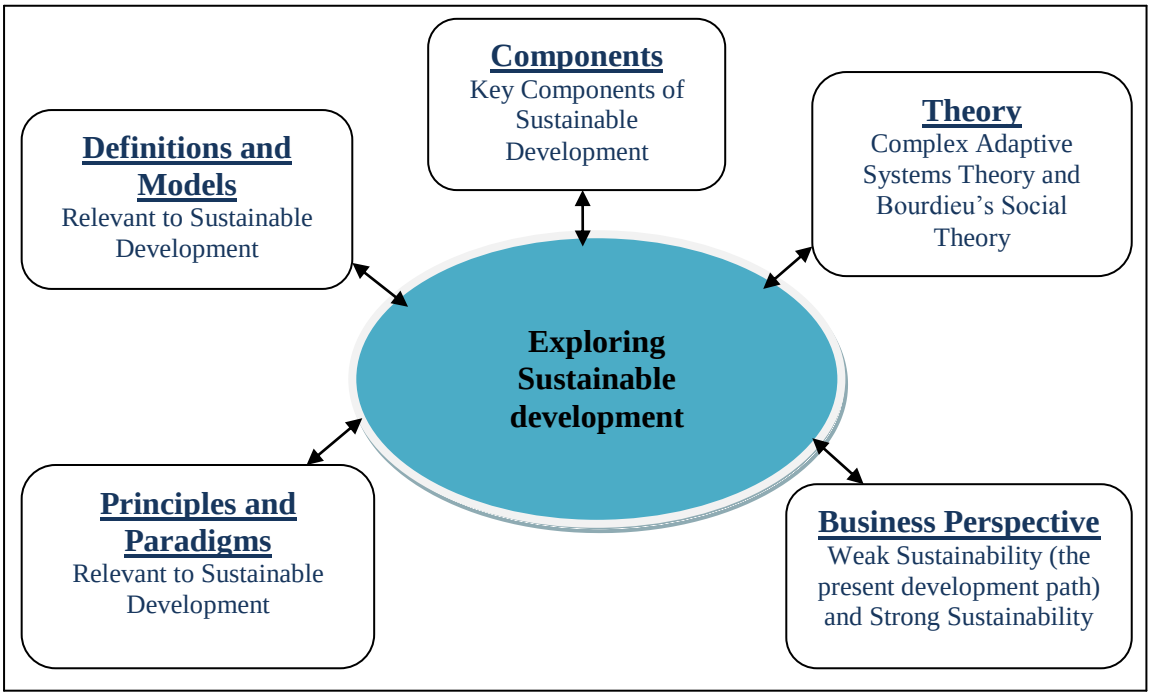


Figure 2.1 Explanatory Pathway for Exploring Sustainable Development
Source Developed by the author (2014)

2.2 Definitions and Representations of Sustainable Development

The term sustainable development was brought into prominence by the Brundtland commission (World Commission on Environment and Development, 1987). White (2013) and Becker (2012) have indicated, since the publication of the Brundtland report in 1997, the term sustainability has accumulated hundreds of definitions, which has led to general confusion or lack of cohesion about the meaning of sustainability. DuPuis and Ball (2013, p. 64) have posited, confusion regarding sustainable development still exists where, *"the concept has escaped definition"*. While Farley and Smith (2014) contend that the lack of clarity regarding sustainability can result in sustainability becoming everything and in essence becoming nothing.

Diagrammatically, sustainable development is illustrated in different ways. The International Union for Conservation of Nature (2006) has posited, there is consensus that economic, environmental and social issues together with intergenerational and intragenerational equity ought to be considered within the framework of sustainable development. According to the World Conservation Union (2006), the three pillars of sustainable development outlined in Figure 2.2 focus on economic development, environmental protection and social equity.

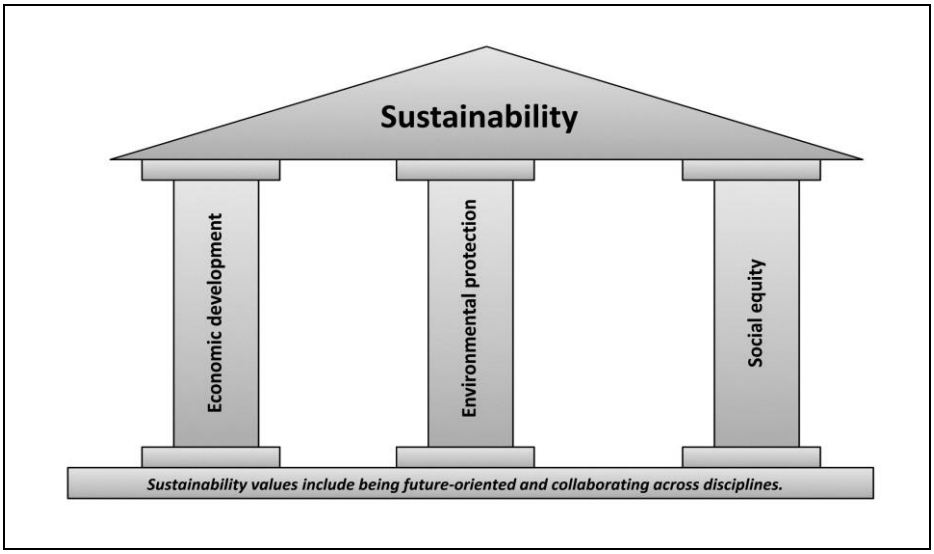


Figure 2.2 Three Pillars of Sustainable Development
Source World Conservation Union (2006)

The three pillars model is an important tool for understanding sustainability, since if one pillar is weak, the system as a whole becomes unsustainable. The International Union for the Conservation of Nature (IUCN) Programme 2005-8, adopted in 2005, used the interlocking circles model (see Figure 2.3) to demonstrate the integration between the three components of sustainable development (Adams, 2006). Figure 2.3 is a development of the three pillars of sustainable development, as supported by complex adaptive systems theory, Figure 2.3 emphases the essential interdependence between the three core components of sustainable development.

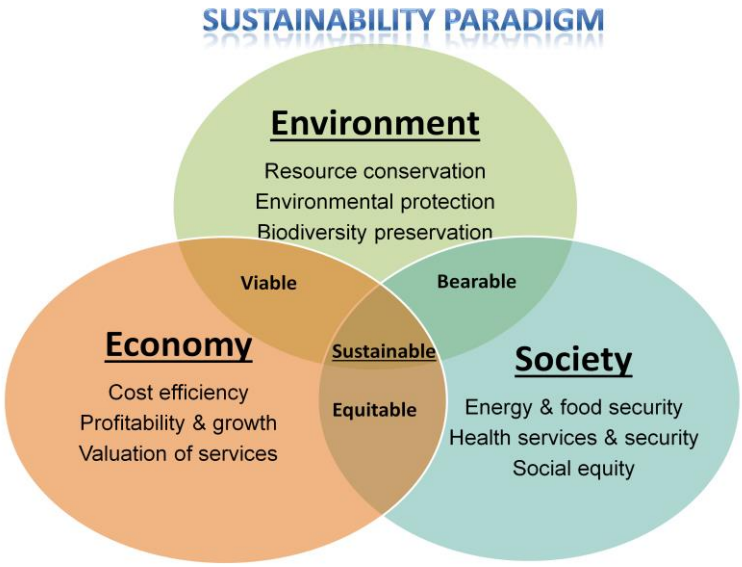
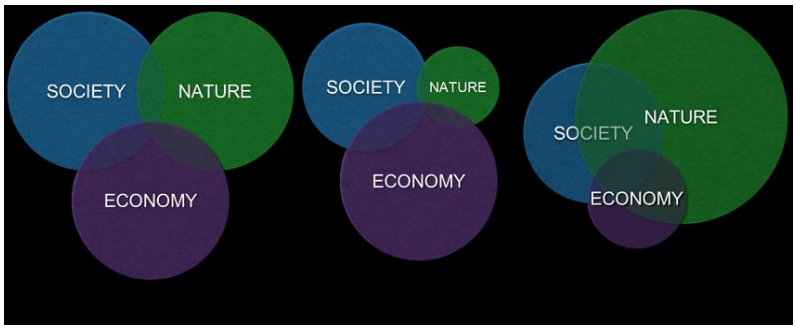


Figure 2.3 Sustainable Development: at the Confluence of Three Constituent Parts
Source (Adams, 2006; World Conservation Union, 2006)

Building on Figure 2.3, Figure 2.4 is an important diagram, since it illustrates the theory relevant to sustainable development, (where each component should be addressed equally) the present situation, (where there is an over emphasis on the economic component) and finally, Figure 2.4 shows that changes are required regarding the social and especially the environmental components of sustainable development to re-establish balance between the three components of sustainable development, where the three components are equally addressed (World Conservation Union, 2004).



Theory Now Change required

Figure 2.4 Sustainable Development represented as Overlapping Circles
Source World Conservation Union (2004)

Onwueme and Borsari (2007) have posited, for any system or practice to be considered truly sustainable, all three factors should be achieved simultaneously, while failing to meet even one of these renders the system unsustainable. The concentric circles representation of sustainable development (Figure 2.5), illustrates the critically important hierarchical relationship between the three core elements of sustainable development (Ott, 2003).

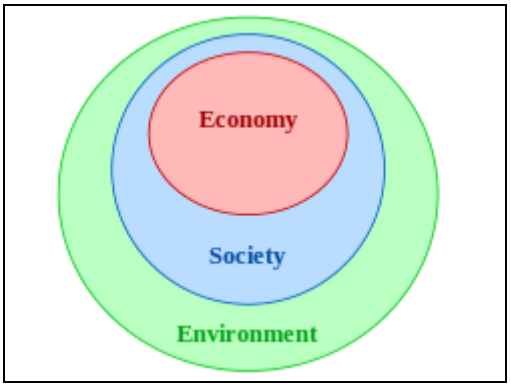


Figure 2.5 Sustainable Development as represented as Concentric Circles
Source (Ott, 2003)

The depiction of sustainable development in Figure 2.5 reflects the fundamental importance of the environment, (there is no life without planet Earth), society is totally dependent upon the environment, and the economy is a subsystem of the social sphere. As indicated by Costanza *et al.*, (2010), the human economy is a subsystem of the global ecosystem.

In the course of evaluating the progress of implementing Agenda 21, the Commission on Sustainable Development of the United Nations defined sustainable development as having not three but four dimensions, where the institutional component was identified as a fourth dimension of sustainable development (Spangenberg, 2002). In the Prisim of Sustainability (Figure 2.6) Spangenberg and Valentine (1999) describe the dimensions as follows: the environmental dimension describes the need to reduce the pressure on the physical environment to within ecological system limits. An economic system is environmentally sustainable only as long as the amount of resources utilised to generate welfare is permanently restricted to a size and quality that does not overexploit the sources or overburden the sinks provided by the ecosphere.

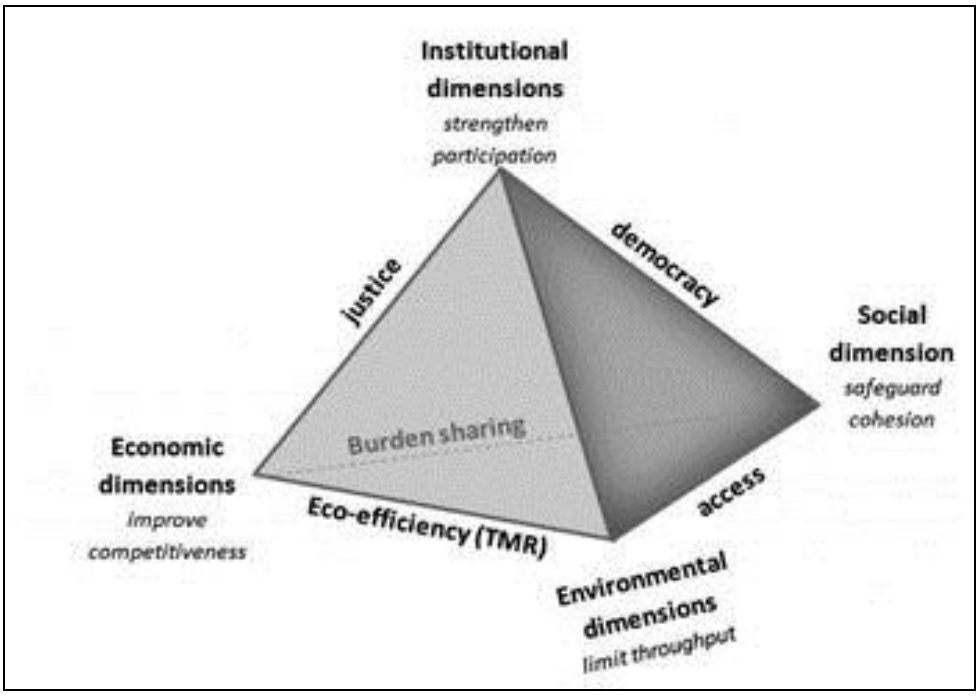


Figure 2.6 Prism of Sustainability
Source Valentin and Spangenberg (2000)

The social dimension demands that all individuals have access to the resources and facilities they need to live a dignified and healthy life. For Valentin and Spangenberg

(2000) institutions refer to political science, including not only organisations but also mechanisms and orientations for strengthening people's participation in political governance. Sacks (2010) and Birdsall (2006) have outlined since institutions shape development, the addition of the institutional component was a significant development and contributed towards a more accurate understanding of sustainable development. In support of the addition of the institutional component of sustainable development, at the annual lecture of the United Nations University, World Institute for Development and Economics Research, Nancy Birdsall stated:

> *"A major challenge of the twenty-first century will be to strengthen and reform the institutions, rules and customs by which nations and peoples complement the global market with collective management of the problems, including persistent and unjust inequality"* (Birdsall, 2006 p. 36).

As President of the Centre for Global Development in Washington, Birdsall (2006) also stated:

> *"Global and regional institutions need to be reformed. To play their role in managing a global social contract the World Bank and the IMF need to become more representative and accountable to those most affected by their programmes"* (Birdsall, 2006 p. 34).

Jeffery Sachs (2010), Director of the Earth Institute at Columbia University has posited, the world is facing truly global challenges that cut across national boundaries, to address these global challenges Sachs (2010) believes, better functioning institutions are required. Sachs (2010) has posited, that many of these institutions were formed after the Second World War and have not been modernised since. Sachs (2010) has also outlined, political institutions have failed to understand and to acknowledge the un-sustainability of our present course and to deal seriously with these global challenges.

The Five Capitals Model developed by Forum for the Future (2015) in the 1990's also provides an important basis for understanding sustainability in terms of the economic concept of wealth creation or capital. Essentially, there are five types of capital (Table 2.1) from which humankind derive the goods and services needed to improve the quality of our lives (Forum for the Future, 2015). The Five Capitals also implies a hierarchy, since a capital which is lower down the list is dependent on the capitals listed previously. Natural capital is the basis not only of production but of life itself. Consequently, it is the first capital listed of the Five Capitals (Forum for the Future,

2015). The hierarchy of the Five Capitals is explained in Table 2.1 and the Five Capitals Model is illustrated in Figure 2.7.

Table 2.1 Hierarchy of the Five Capitals

Natural capital[2] is any stock or flow of energy and material that produces goods and services. Natural capital includes: (1) RESOURCES – renewable and non-renewable materials. (2) SINKS – that absorb, neutralise or recycle waste and (3) PROCESSES – climate regulation. **Human capital** consists of people's health, knowledge, skills and motivation. All these things are needed for productive work. Enhancing human capital through education and training is central to a flourishing economy. **Social capital** consists of the institutions that help maintain and develop human capital in partnership with others, for example families, communities, businesses, trade unions, schools and voluntary organisations. **Manufacturing capital** consists of material goods or fixed assets which contribute to the production process rather than being the output itself, for example tools, machines and building. **Financial capital** plays an important role in our economy, enabling the other types of capital to be owned and traded. But unlike the other types of capital, financial capital has no value itself but is representative of natural, human, social or manufactured capital, for example shares, bonds or banknotes.

Source Johnson, *et al.*, (2004, p. 11)

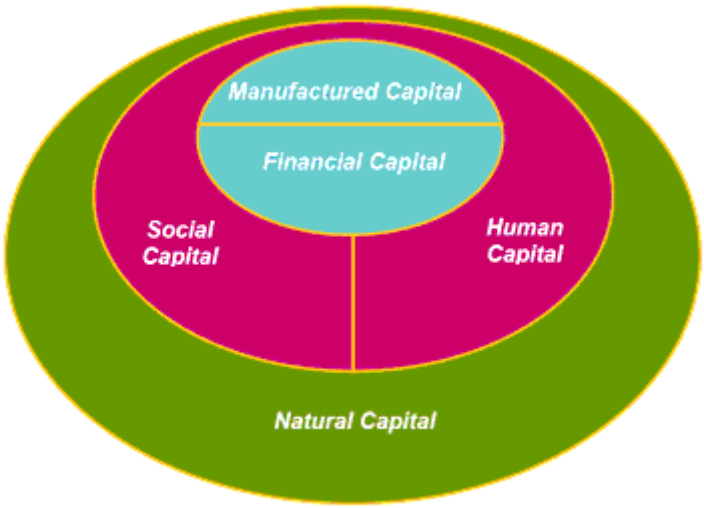


Figure 2.7 Five Capitals Model
Source Forum for the future (2015)

Hawkens (2001) posited, sustainability has four dimensions, the fourth pillar of sustainability being *culture*, the glue that holds the social, economic and environmental pillars steadfast, a position also supported by Oxfam (2014). Oxfam

[2] The natural capital concept provides a functional link between ecological production, economic production and human wellbeing. Taking natural capital into account leads to a broadening of perspective on economy and economic growth from a narrow focus on Gross Domestic Product (GDP) to a more holistic focus on human wellbeing. Growth is generated by assets in the economy as well as by technology, innovations and social institutions, and by the links between them (Natural Capital Initiative 2015, p. 13).

(2014) also extend this view to include the link between global citizenship and political systems.

A more holistic definition of sustainable development was articulated by UNESCO (2002a), where the *interdependence* between social, economic, political and environmental objectives was emphasised[3]. Bedrick Moldan the former Chair of the United Nations Commission on Sustainable Development highlighted, when understanding sustainable development, one must take a global perspective, because it facilitates global commitment of the international community (Moldan, 2000). Thus, the pursuit of sustainable development must be global (Moldan 2002), all the dimensions of sustainable development must be achieved simultaneously (Onwueme and Borsari, 2007) otherwise the system *is* unsustainable, where there is interdependent pursuit of the social, environmental and economic (Krajnc and Glavic, 2005; Bell and Morse, 2000; Elkington, 1997), political (Sacks, 2010; UNESCO 2002a) and institutional (Sacks, 2010; Birdsall, 2006; Spangenberg, 2002) dimensions of sustainable development. Buchan, *et al.,* (2007) have also suggested, sustainability is a condition; sustainable development is the means by which we achieve sustainability. Drawing on this section, in terms of reducing confusion (DuPuis and Ball, 2013; White, 2013; Becker, 2012) and bringing clarity (Farley and Smith, 2014) to the meaning of sustainable development, sustainable development could be defined as:

> *"The global, simultaneous and interdependent pursuit of equitable socio-cultural, environmental, economic, political and institutional goals, relevant to achieving sustainability"* (Foley, *et al.*, 2016 p. 7).

2.3 Challenges and Risks relevant to Sustainable Development

This section will consider the complexity and challenges relevant to the components of sustainable development. This section draws attention to some important global risks relevant to sustainable development, including the challenges of species decline, resource overuse, wealth inequality and climate change.

In 2016 Klaus Schwab Founder and Executive Chairman of the World Economic Forum stated, *"We witness the effects of climate change in the rising frequency and*

[3] Definitions of Sustainable Development: Table 1, Appendix G, p. 287.

intensity of water shortages, floods and storms worldwide. Stable societies are becoming increasingly fragmented in many regions of the world, and we note a weak global economy that is again facing headwinds"…"Across every sector of society, decision-makers are struggling to find common ground as they are faced with heightened volatility, uncertainty, interconnectedness and pace of change" (Schwab, 2016, p. 4). When considering the social component of sustainable development, the World Economic Forum (2013) outlined, widening income disparities was the second greatest worldwide risk in 2014 (Table 2.2).

Table 2.2 Top Trends for 2014 of Greatest Worldwide Risk, ranked by Global Significance

1	**Rising societal tensions in the Middle East and North Africa:** the 2 most important regional challenges are political instability (45%) and unemployment (27%) [all SD components]	4.07
2	**Widening income disparities**: poverty needs to be addressed in an integrated way. % who say the economic system in their country favours the wealthy (Greece, 95%; Ghana, 94%; Spain, 89%; Italy, 86%; Chile, 86%; Europe 78%; Sub-Saharan Africa, 77%; Middle East and North Africa, 70%; Asia, 64%; N America, 60%; Australia, 44%) (see Tables 2.4 & 2.5) [all SD components].	4.02
3	**Persistent structural unemployment:** unless we address chronic joblessness, we will see an escalation in societal unrest (Shibulal, 2013).	3.97
4	**Intensifying cyber threats:** attempt to use computer vulnerabilities to affect physical results.	3.93
5	**Inaction on climate change:** 'we are losing the battle on climate change- the sense of urgency we had two years ago has disappeared'. If we do not take action on climate change in a timely fashion, at the scale that we need, climate has the potential to wipe out the progress we have made in economic development, in social development, in environmental protection. It is the major 'wipe out factor'. (See table 2.7) [all SD components].	3.81
6	**The diminishing confidence in economic policies:** Percentage who state economic situation in their country is bad, Greece (99%), UK (83%), Egypt (76%), Japan (71%), Indonesia (62%), US (65%), Russia (61%), Brazil (41%), Canada (32%), Australia (30%) (Pew Research Centre Global Attitudes Project 2013) [all SD components].	3.79
7	**A lack of values in leadership:** Chair of the World Economic Forum, Japan office Sadako Ogata stated, 'it is not a lack of values that we should be worried about, rather it's the kind of values. It has to be something that is not just about self-interest' … 'we need a global vision that takes into account not only those who benefit, but also those groups that are negativity affected, and make the negative impacts as limited as possible'. 'The values conversation is the future of the business conversation' [all SD components].	3.76
8	**The expanding middle class in Asia:** currently the Asian middle class is 500 million and will mushroom to 1.75 billion by 2020- a threefold increase in 7 years, which will put enormous stress on global resources. If this rising middle class all aspire to the western living standards the strain on our global environment could prove disastrous.	3.75
9	**The growing importance of megacities:** By 2025 there will be 35 megacities in comparison to 22 in 2011 [all SD components].	3.48
10	**The rapid spread of misinformation online:** Any online information is part of a larger and more complex ecology, with many interconnected factors. It's therefore very difficult to fully map the processes involved in the rapid spread of misinformation or to identify where this information originates. Moreover, we should endeavour to look beyond the specific medium and consider the political-cultural setting in which misinformation spreads and is interpreted (Vls, 2013).	3.35

Source World Economic Forum (2013) 1.00- Not significant at all 2.00- Not very significant 3.00-Somewhat significant 4.00- Very significant 5.00- Extremely significant

(Note) Global Risk 2014 has been developed with expert contributions from Marsh and McLennan Companies, Swiss Re, Zurich Insurance Group, the Oxford Martin School (University of Oxford), the National University of Singapore, and the Wharton Risk Management and Decision Processes Centre (University of Pennsylvania).

In *The Global Risks Repost 2016*,[4] when the likelihood and impact of global risks are considered together[5], the top global risk in 2016 was found to be a failure of climate change mitigation and adaptation (World Economic Forum, 2017). The top global risks[6] over 18 months and ten year time frames are presented in Table 2.3. This is the first time since the report was published in 2006 that an environmental risk has topped the ranking. This year, it was considered to have greater potential damage than weapons of mass destruction (2nd), water crises (3rd), large-scale involuntary migration (4th) and severe energy price shock (5th).

Table 2.3: The Top Five Global Risks of Highest Concern for the Next 18 Months and 10 Years

For the next 18 months		For the next 10 years	
1	Large-scale involuntary migration	1	Water crisis
2	State collapse or crisis	2	Failure of climate-change mitigation & adaption
3	Interstate conflict	3	Extreme weather events
4	Unemployment and underemployment	4	Food crisis
5	Failure of national governance	5	Profound social instability

Source: Global Risks Perception Survey (2015)

The Global Risks Report exists to raise awareness about global risks and their potential interconnection; *The Global Risks Report 2016* indicates that, social instability is again the most interconnected global risk (World Economic Forum, 2016d).

2.3.1 Resource Overuse

Costanza (2014) has posited, all economic activities ultimately depend on ecological assets, but concerns are increasing regarding the impact of resource overuse, where we have now reached global ecological overshoot (Global Footprint Network, 2015). The Living Planet Index (LPI) which measures more than 10,000 representative populations of mammals, birds, reptiles, amphibians and fish, declined by 58 percent between 1970 and 2012 (World Wildlife Fund, 2016). Marco Lambertini, Director General of the World Wild Life Fund International, has stated:

[4] Academic Advisers: National University of Singapore, Oxford Martin School, University of Oxford and the Wharton Risk Management and Decision Processes Centre, University of Pennsylvania.
[5] For *The Global Risks Report 2016* almost 750 experts assessed 29 separate global risks for both impact and likelihood over a 10-year time horizon.
[6] *The Global Risks Report 2016* defines a "global risk" as an uncertain event or condition that, if it occurs, can cause significant negative impact for several countries or industries within the next 10 years.

> "*These are the living forms that constitute the fabric of the ecosystem which sustains life on earth – and the barometer of what we are doing to our planet, our only home, we ignore their decline at our peril*" (World Wildlife Fund, 2014, p. 4). "*The picture is now clearer than ever: humanity is collectively mismanaging the ocean to the brink of collapse"…"the situation is urgent and the moment to act is at hand*" (Lambertini, 2015 p. 3).

The Global Footprint Network (2015), argues that today humanity uses the equivalent of 1.5 planets to provide the resources we use, this means it now takes the Earth one year and six months to regenerate what we use in one year. Moderate UN scenarios[7] suggest that if current population and consumption trends continue, by the 2030s, we will need the equivalent of two Earths (see Figure 2.8).

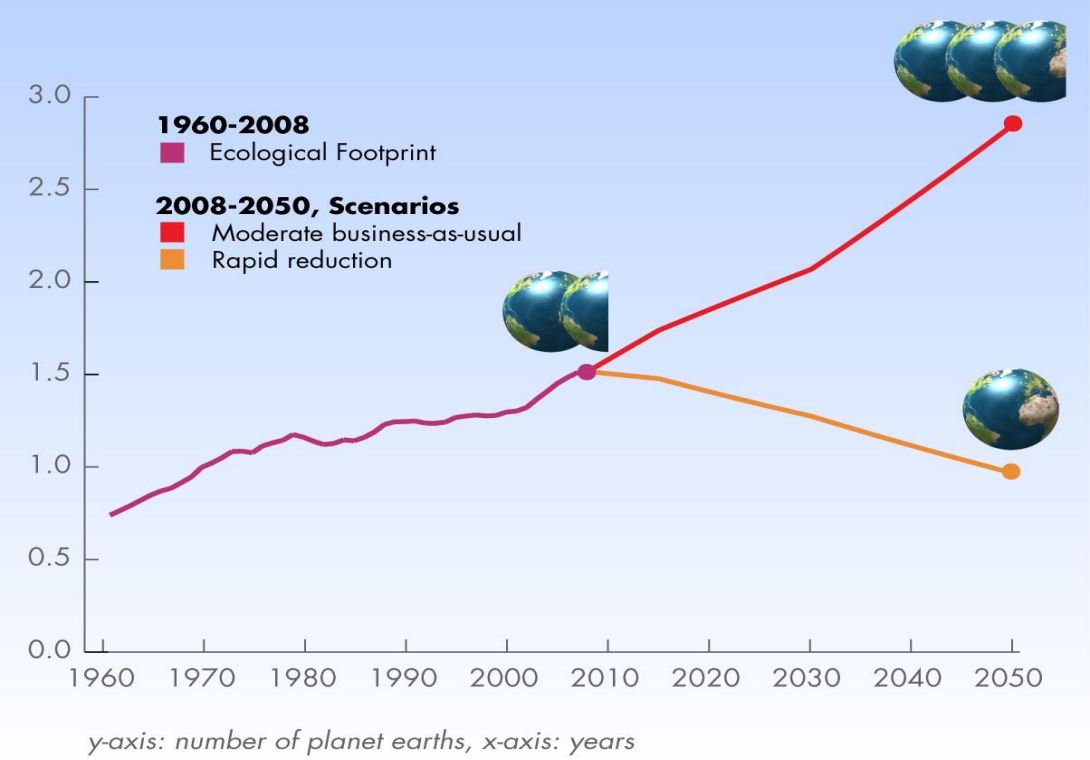


Figure 2.8 Ecological Footprint
Source Global Footprint Network (2015)

Simply put, turning resources into waste faster than waste can be turned back into resources is global ecological overshoot, depleting the resources on which human life and biodiversity depend (Global Footprint Network, 2015). Research conducted by the Global Footprint Network (2015) has demonstrated: the most noticeable effects of

[7] Scenarios are alternative images of how the future might unfold and are appropriate tools with which to analyse how driving forces may influence future emissions outcomes and to assess the associated uncertainties (Intergovernmental Panel on Climate Change, 2000).

overshoot are collapsing fisheries, diminishing forest cover, depletion of fresh water systems, and the build-up of carbon dioxide emissions, which is creating global climate change. The Global Footprint Network (2015) have highlighted, overshoot also contributes to resource conflicts and wars, mass migrations, famine, disease and other human tragedies which disproportionately impacts on the poor, who cannot buy their way out of the problem by getting resources from somewhere else (Global Footprint Network, 2015).

2.3.2 Wealth Inequality

According to the World Economic Forum (2016b), deepening income inequality was identified as the most significant trend of 2015. A summary of wealth inequality indicators are presented in Table 2.4.

Table 2.4 Indicators of Wealth Inequality

Almost a billion people suffer from hunger (Water, Energy and Food Security Nexus, 2011)	
The world produces more than enough food to feed everybody – global per capita food supply today is around 2,800kcal per day. Nutritional experts recommend an average daily intake of 2,500kcal for men or 2,000kcal for women (FAO, 2013). However, much of this food is unevenly distributed and up to a third is wasted.	(FAO, 2013; FAO, 2011)
Global freshwater demand is projected to exceed current supply by more than 40 per cent by 2030	(Water Resources Group, 2009)
By 2030, almost half of the world's population will be living in areas of high water stress	(OECD, 2008).
768 million people are living without a safe, clean water supply	(WHO/UNICEF 2013)
1.4 billion lack access to a reliable electricity supply and 2.7 billion depend on traditional sources of bioenergy such as wood as their main fuel for cooking and heating.	(WWF, 2011)
Forest loss and degradation is estimated to cost the world economy US$2-4.5 trillion annually.	(Sukhdev, 2010)
The annual cost of pollution, greenhouse gas emissions, waste and depleted resources could reach US$28.6 trillion by 2050.	(UNPRI and UNEPFI, 2010).
At least $21 trillion (possibly $32) of unreported private financial wealth was owned by wealthy individuals via tax havens at the end of 2010	Tax Justice Network (2016)
Three private banks, UBS, Credit Suisse and Goldman Sachs handle most assets offshore on behalf of the global super rich. Ten banks alone commanded over half the top fifty's asset total.	Tax Justice Network (2016)
Almost half of the world's wealth is now owned by one percent of the population.	(Oxfam, 2014)
The wealth of one percent of the richest people in the world amounts to $110 trillion. That is 65 times the total wealth of the bottom half of the world's population.	(Oxfam, 2014)
In 2014 85 people held the same amount of wealth as the half of the world's populations, this figure dropped to 62 in 2016. Seven out of ten people live in countries where economic inequality has increased in the last 30 years	(Oxfam, 2014) (Oxfam, 2016)
The richest 1% > their share of income in 24 out of 26 countries between 1980-2012.	(Oxfam, 2014)
The vulnerability of people who are socially, economically and politically marginalised is further exacerbated by changes in water resources and crop yields.	Bergman *et al.*, (2016)
In 2016, 17% of the world's adult populations were illiterate, two thirds are women. 775 million adults and 122 million youth globally are illiterate. In developed countries, 160 million adults are functionally illiterate (UN, 2013a).	(UNESCO, 2016)
In terms of adults globally, .7 percent (32,931) own 45.6 percent of total wealth, while 73.2 percent (3,545,853) own 2.4 percent of total wealth.	Credit Suisse (2016)

Source Adapted from different sources by the Author (2016)

Wealth concentration is also an indicator of inequality, figures published by the World Bank (2016a, 2016b and 2016c) (see Table 2.5) indicate that in some developing countries more than 50 percent of the country's wealth is held by 20 percent of its people, while in developed countries wealth held by the top 20 percent ranges from 36 to 46 percent. Whilst, in Brazil the income share of the lowest 20 percent is 3.6 percent.[8]

Table 2.5 Income Share held by Highest 20%

	2011 income share of highest 20 %	2012 income share of highest 20 %	2013 income share of highest 20 %	2014 income share of highest 20 %	2014 income share of lowest 20 %
Colombia	-	-	-	58.1	3.4
Brazil	57.6	57.2	57.4	56.3	3.6
Honduras	61.2	61.1	57.7	55.1	3.5
Paraguay	56.9	52.9	53.2	56.5	3.9
Ecuador	51.3	51.6	52.7	51	4.8
Chile	57	-	56.7	-	-
Dom Rep	53	51.6	53.1	-	-
Peru	50.3	49.9	49.7	49.2	4.6
China	57	-	56.7	-	-
Russian Fed	47.8	48.3	-	-	-
Poland	40.9	40.7	-	40.2	8
United States	-	-	46.4		-
Greece	41.1	42.3	-		-
Luxemburg	40	41.9	-		
Italy	41.3	41.7	-		
France	41.4	41.2	-		
United Kingdom	40.9	40.1	-		
Ireland	40.3	40.6	-		
Germany	-	38.6	-		
Denmark	37.6	37.8	-		
Finland	37.1	36.7	-		
Belgium	36.9	36.4	-		

Source World Bank (2016a, 2016b and 2016c)

Note: Data is based on primary household survey data obtained from government statistical agencies and World Bank country departments. Data for high-income economies is from the Luxembourg Income Study database**.** World Bank (2016a), data for 2011, 2012 and 2013: World Bank (2016b), data for 2014, income share of highest 20 %, World Bank (2016c), data for 2014, income share of lowest 20 %.

The Tax Justice Network (2012),[9] has posited, global financial inequality is much greater than suspected. De la Peña (2014) has outlined, transnational corporations

[8] In developed and developing countries alike, the poorest half of the population often controls less than 10% of its wealth (World Economic Forum 2016).

[9] The Tax Justice Network (TJN) is an independent international network launched in 2003. The TJN conduct high-level research, analysis and advocacy on international tax; the international aspects of financial regulation; the role of tax in society; and the impacts of tax evasion, tax avoidance, tax 'competition' and tax havens. The TJN seek to create understanding and debate, and to promote reform, especially in poorer countries. The TJN are not aligned to any political party.

(TNCs) operating in the global economy have a wide range of possibilities to avoid their responsibility to pay taxes. In addition, according to former chief economist with McKinsey and Co. James Henry, excluding real estate, yachts and other non- financial assets, at least US$21 trillion (possibly US$32 trillion) of unreported private financial wealth was owned by wealthy individuals via tax havens at the end of 2010 (Tax Justice Network, 2012). James Henry indicated, this sum is equivalent to the size of the United States and Japanese economies combined (Tax Justice Network, 2012). The Tax Justice Network (2016) also indicated, the offshore sector is facilitated by the world's largest private banks, law firms, and accounting firms, headquartered in first world capitals including London, New York, and Geneva.

James Henry has also argued that it is unacceptable that official institutions including the Bank for International Settlements, International Monitory Fund, World Bank, Organisation for Economic Cooperation and Development, and the G20, in addition to leading central banks, have devoted so little research to this sector (Tax Justice Network, 2016). Whilst, according to the Tax Justice Network (2016), studies which focus on economic inequality have to date failed to account properly for this missing wealth.

Food security is also connected to wealth inequality. The FAO, IFAD and WFP (2014)[10] have indicated, the trend in global hunger reduction continues, since 1990–92, 63 developing countries have reached the MDG hunger target (this goal focused on halving hunger by 2015) (FAO, IFAD and WFP, 2014). From 2012 to 2014 about 805 million people were estimated to be chronically undernourished, down by more than 100 million over the last decade and by 209 million since 1990–92 (FAO, IFAD and WFP, 2014). The vast majority of hungry people live in developing regions, particularly in Sub-Saharan Africa, Eastern Asia, South-Eastern Asia, Southern Asia, Caribbean and Oceania. These regions saw a 42 percent reduction in the prevalence of undernourished people between 1990–92 and 2012–14. Despite this progress, about one in eight people or 13.5 percent of the overall population, remain chronically undernourished in these regions (FAO, IFAD and WFP, 2014).

[10] Food and Agricultural Organisation of the United Nations (FAO), International Fund for Agricultural Development (IFDA), and the World Food Programme (WFP).

Water stress is related to social wellbeing, in the *Outlook on the Global Agenda 2015*, increasing water stress was identified as the ninth global trend for 2015 (World Economic Forum, 2016). As outlined by the World Economic Forum (2016), due to a combination of problems including rapid population growth, constrained water supplies and high levels of poverty, countries such as India, Indonesia, Bangladesh and Nigeria will be hit the hardest by this trend. Resource-constrained water stress will be the norm for many countries in Asia, while finance-constrained water stress will be the norm for many countries in Africa. This is reflected in the fact that experts surveyed by the World Economic Forum (2016b) expect Sub-Saharan Africa to be the most affected region, closely followed by Asia.

2.3.3 Climate Change

Three viewpoints are associated with climate change. Ivar Giaever Nobel Prize winner in physics and climate change sceptic has posited, climate change orthodoxy has become a new religion for scientists, where the data is not nearly as compelling as it should be (Morano, 2015; Plimer, 2009). In contrast, the Union of Concerned Scientists (2017) support the view that climate change is real. The Intergovernmental Panel on Climate Change (2013), support this view and suggest that climate change is unequivocal, climate change is a global challenge which has both social and environmental consequences. The IPCC is associated with the climate change consensus (see Table 2.6)[11][12] The third perspective regarding climate change suggests, scientists have been conservative in their projections regarding the impacts of climate change, including the IPCC (Bryssea *et al.,* 2013).

In relation to public discourse on climate change, Shah (2013) has argued that despite the strong consensus from climate scientists of man-made global warming, mainstream media and the public remain sceptical regarding anthropogenic climate change.

[11] Key Factors Influencing Global Temperature, see Figure 1 A and B, Appendix I, p. 292.
[12] Land and Ocean Temperature Percentiles December 2016, Figure 2, Appendix I, p. 293. Source NOAA (2017) (National Oceanic and Atmospheric Administration).

Table 2.6 Key findings of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change

1) Atmosphere: Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850. In the Northern Hemisphere, 1983–2012 was likely the warmest 30-year period of the last 1400 years (medium confidence). Global surface temperature change for the end of the 21st century is likely to exceed 1.5°C relative to 1850 to 1900 for all Representative Concentration Pathway (RCP) scenarios except RCP 2.6. It is likely to exceed 2°C for RCP 6.0 and RCP 8.5, and more likely than not to exceed 2°C for RCP 4.5. Warming will continue beyond 2100 under all RCP scenarios except RCP 2.6. Warming will continue to exhibit inter annual-to-decadal variability and will not be regionally uniform.
2) Atmosphere: Water Cycle: Changes in the global water cycle in response to the warming over the 21st century will not be uniform. The contrast in precipitation between wet and dry regions and between wet and dry seasons will increase, although there may be regional exceptions.
3) Ocean: Ocean warming dominates the increase in energy stored in the climate system, accounting for more than 90% of the energy accumulated between 1971 and 2010 (high confidence). It is virtually certain that the upper ocean (0−700 m) warmed from 1971 to 2010, and it likely warmed between the 1870s and 1971. The global ocean will continue to warm during the 21st century. Heat will penetrate from the surface to the deep ocean and affect ocean circulation.
4) Cryosphere: Over the last two decades, the Greenland and Antarctic ice sheets have been losing mass, glaciers have continued to shrink almost worldwide, and Arctic sea ice and Northern Hemisphere spring snow cover have continued to decrease in extent (high confidence). It is very likely that the Arctic sea ice cover will continue to shrink and thin and that Northern Hemisphere spring snow cover will decrease during the 21st century as global mean surface temperature rises. Global glacier volume will further decrease.
5) Sea Level: The rate of sea level rise since the mid-19th century has been larger than the mean rate during the previous two millennia (high confidence). Over the period 1901 to 2010, global mean sea level rose by 0.19. Global mean sea level will continue to rise during the 21st century. Under all RCP scenarios, the rate of sea level rise will very likely exceed that observed during 1971 to 2010 due to increased ocean warming and increased loss of mass from glaciers and ice sheets.
6) Carbon and Other Biogeochemical Cycles: The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years. Carbon dioxide concentrations have increased by 40% since pre-industrial times, primarily from fossil fuel emissions and secondarily from net land use change emissions. The ocean has absorbed about 30% of the emitted anthropogenic carbon dioxide, causing ocean acidification. Climate change will affect carbon cycle processes in a way that will exacerbate the increase of CO2 in the atmosphere (high confidence). Further uptake of carbon by the ocean will increase ocean acidification.
7) Drivers of Climate Change: Total radiative forcing is positive, and has led to an uptake of energy by the climate system. The largest contribution to total radiative forcing is caused by the increase in the atmospheric concentration of CO2 since 1750.
8) Detection and Attribution of Climate Change: Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes. This evidence for human influence has grown since AR4. It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century
9) Future Global and Regional Climate Change: Continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system. Limiting climate change will require substantial and sustained reductions of greenhouse gas emissions
10) Of all the top 10 trends respondents are least satisfied with the level of attention the world is currently giving to **action on climate change**.
11) Sectors responsible for the **greatest level of greenhouse gas emissions**, Energy (26%), Industry (19%), Forestry (17%), Agriculture (14%), Transport (13%), Residential & Commercial Buildings (8%) and Waste & waste water (3%). 11. Note figures for 2004

Sources (1-9) (Intergovernmental Panel on Climate Change, 2013): (10) (World Economic Forum, 2013) and (11) (Intergovernmental Panel on Climate Change, 2007).

This section will conclude by highlighting the connection between sustainability climate change and peace. The Nobel Peace Prize was awarded to the IPCC because the Norwegian Noble Committee viewed climate change as a threat to peace (Pachauri, 2007). In the publication, *Climate Change as a Security Risk*, a key contribution to the relevance of climate change was put forward by the German Advisory Council on Global Change (GACGC) an independent scientific advisory

body to the German Federal Government set up in 1992. According to Schubert *et al.,* (2008), the core message of the GACGC is relevant here, since it reinforces the need for human kind to pursue sustainability.

> *"Without resolute counteraction, climate change will overstretch many societies' adaptive capabilities within the coming decades"…"in-action could result in destabilisation and violence, jeopardising national and international security to a new degree"* (Schubert *et al.,* 2008 p. 1).

The United Nations Development Programme (2009) has outlined, since the end of the Cold War, at least eighteen violent conflicts have been driven by the exploitation of natural resources. Addressing sustainability is also an opportunity, the German Advisory Council on Global Change has posited:

> *"Climate change could also unite the international community*", provided the international community "*recognise climate change as a threat to humankind and soon sets the course for the avoidance of dangerous anthropogenic climate change by adapting a dynamic and globally coordinated climate policy*" (Schubert *et al.,* 2008 p. 1).

If the international community fail to adapt a dynamic and globally coordinated climate policy, the German Advisory Council on Global Change has indicated:

> *"Climate change will draw even deeper lines of division and conflict in international relations, triggering numerous conflicts between and within countries over the distribution of resources, especially water and land, and the management of migration"* (Schubert *et al.,* 2008 p. 1).

2.4 The Complexity of Sustainability

This section will focus on the complex and interdependent nature of the components of sustainable development. According to Wuelser *et al.,* (2012), complexity is inherent in the concept of sustainable development, even an aspect of sustainability - environmentalism has increasingly grown more complex (McGrail *et al.,* 2011). If education for sustainability is to be transformational, the complexity of sustainability needs to be recognised (Jones *et al*., 2010; Stibbe, 2009). UNESCO (1997) has posited, the complexity associated with sustainable development must be understood and communicated, even though to do so is not easy or necessarily palatable.

In *A Tran-disciplinary Vision for Concerted Action* UNESCO stated:

> *"The simplification of complex issues - so often observed today - is not only fraudulent in that it misrepresents reality, but is also irresponsible on the*

> *part of those who understand these issues. It is here that the scientific and intellectual communities bear a particular responsibility: to ensure that decision makers as well as the public are fully cognizant of the multiple dimensions of the problems they face"* (UNESCO, 1997 paragraph 107).

Timpson *et al.,* (2006) have posited, a salient weakness of the scholarship on sustainability in general and education for sustainability in particular, is the lack of multifaceted theorising and the tendency to overlook the multidisciplinary and complex nature of sustainability. The influential report from the World Commission on Environment and Development (1987) *Our Common Future* stated:

> "*From space we can see and study the Earth as an organism whose health depends on the health of all of its parts*" (World Commission on Environment and Development 1987, p. 1).

Human social systems and ecological systems are complex adaptive systems (Gunderson and Holling, 2002; Reeves, 1999). Levin (2006, p. 328) has also stated, "*Most fundamentally, ecological and socio-economic systems are complex, adaptive systems, integrating phenomena across multiple scales of space, time and organisational complexity*". While Dale and Newman, (2005) have argued that, human societies and ecological systems are so interconnected that they are co-adaptive; reacting to each other and to previous interactions and reactions in a network of feedbacks, therefore the study of sustainable development must be grounded in complex adaptive systems epistemology.

The interconnectivity of sustainable development issues was also reinforced in 2011, when the World Economic Forum Water Initiative published a widely recognised report entitled, *'Water Security: the Water-Food-Energy-Climate Nexus'* (World Economic Forum Water Initiative, 2011). Jaeger *et al.,* (2011) have argued that, mainstream scientific methodologies are often poorly equipped to deal with complex sustainability problems. The complexity of sustainability is also reflected in the focus on trans-disciplinary sustainability studies (Klein, 2014). Grounded in complexity and systems theory, interdisciplinary research and processes are critical domains of education for sustainable development (Dale and Newman, 2005), where climate change has become the prime example of interconnectedness to the world and its leaders (Sarabhai, 2013).

2.5 Bourdieu's Social Theory

The creation of a habitus of sustainability embedded within Bourdieu's social theory is also relevant to the understanding and advancement of education for sustainable development and is outlined in this section.

The influential French sociologist Pierre Bourdieu (1930–2002) was interested in the ways in which society is reproduced. Bourdieu's work exposes the mechanisms behind and within the reproductive tendencies of education, society and culture, which by extension, reproduce essentially unsustainable practices (Karol and Gale, 2004).

Bourdieu (1991) argued, the field of education, in particular teacher education, is an important site for the accumulation of environmental capital, since through producing a habitus of sustainability within teacher training, this will influence environmental awareness of their future students.

For Bourdieu (1991), field is:

> "*Seen as a structured space of positions in which the positions and their interrelations are determined by the distribution of different kinds of resources or capitals",* (Bourdieu, 1991 p. 14).

Bourdieu (1991) has posited, an unsustainable habitus is effectively the product of total human history from which the environment has been viewed as a place to visit, or a resource, and not a living organism whose balance must be maintained for our survival. According to Suzuki (1990), for sustainability to become an accepted part of family life, many changes are required in education, in cultures and the capitalist doxa of our society. Bowers (2003) and Kennedy (1994) have indicated, education is the essential process to realising such change. But realising change is a challenge, for Bourdieu (1996), it is the inculcated, durable, structured, transposable dispositions which constitute the habitus that are to a large extent responsible for the reproduction of culture [the beliefs attitudes and assumptions that are deeply rooted] that are responsible for our unsustainable society. Bourdieu (1991) has also stated:

> *"To view action as the outcome of conscious calculation … is to neglect the fact that, by virtue of the habitus, individuals are already predisposed to act in certain ways, pursue certain goals, avow certain tastes, and so on"* (Bourdieu, 1991 p.16).

In line with Bourdieu, Fien has posited:

> *"The transition to an ecological sustainable society will involve a historically unprecedented revolution in institutions, systems, lifestyles and values. Much of Western culture has to be totally reversed in a few decades. We have to replace a long list of cultural traits by their opposites, particularly obsessions with material affluence, getting richer, competing, winning, exercising power and controlling nature"* (Fien, 1993 p. 39).

Fien (1993) also highlighted, transition towards an ecological sustainable society will require the development of environmental capital. Environmental capital involves the development of an understanding of the interdependence of all life on Earth, and an awareness of how individuals are also complicit in contributing to both positive and negative environmental consequences (Fien, 2012). Fien (2012) has also indicated that, environmental capital requires an understanding of the interconnectedness of the social, cultural, political, technological and economic systems and the effects these have on the environment. In line with Fien and Bourdieu, Orr (2002) has stated:

> "*Sustainability is about the terms and conditions of human survival, and yet we still educate at all levels as if no crisis existed*" (Orr, 2002 p. 82).

In terms of educations role in promoting environmental capital for a habitus of sustainability, it is not enough to educate students about the environmental crisis. What is needed is educating students about value change, skill provision and a sustainable environment (Fien, 1993). This raises important issues for education for sustainable development, where Gurova (2002) has affirmed, there is not enough environmental education in schools, teacher education or university courses, and the type of education that is taking place is reinforcing a fragmented world view, being single disciplinary and uncritical of culture and society (Fien, 1997).

2.6 Linking the Principles relevant to Sustainable Development and the Sustain-centric Paradigm

In terms of achieving sustainability, this section will draw attention to the key principles underpinning sustainable development and the criticality of a transition towards the sustain-centric paradigm away from the dominant social paradigm. Gladwin *et al.*, (1995) have suggested it is possible to deduce some principle components of the ideas that are generally shared by the majority of conceptions

and/or definitions of sustainable development. Detailed in their article, '*Shifting Paradigms for Sustainable Development: Implications for Management Theory and Research',* Gladwin, *et al.,* (1995) have posited, sustainable development is a process of achieving human development in an inclusive, connected, equitable, prudent and secure manner[13]. Where, *Inclusiveness:* implies human development over time and space**.** *Connectivity:* entails an embrace of ecological, social and economic interdependence. *Equity:* suggests intergenerational, intragenerational and interspecies fairness. *Prudence:* emphasises duties of care and prevention: technologically, scientifically and politically. Finally, *Security:* demands safety from chronic threats and protection from harmful disruption (Gladwin, *et al.,* 1995).

At a paradigmatic level, within these five constraints Gladwin *et al.,* (1995) dialectically examined three world views or paradigms relevant to sustainable development namely, the conventional techno-centric world view (dominant social paradigm, see Section 4.1), the eco-centric and sustain-centric world views (see Table 2.7, p. 31). A number of researchers support the view that the techno-centric/dominant social paradigm has shaped present development (Milbrath, 1989; Perlmutter and Trist, 1986; Cotgrove, 1982) and education (Bourdieu, 1991) over time.

Gladwin *et al.,* (1995), support the argument that, the conventional techno-centric paradigm views humans and nature as being disassociated, whilst the sustain-centric perspective assumes that nature and humans are interdependent. When considering the environment, the techno-centric paradigm views the human role as one of dominance, whilst the sustain-centric paradigm assumes the human role is one of stewardship of the environment.

From an economic perspective, Gladwin *et al.,* (1995) believe, the sustain-centric paradigm favours the green economy over the free market, and equal opportunity as opposed to growth trickle. Scientifically, from the sustain-centric perspective we are approaching carrying capacity limits. As an alternative Gladwin *et al.,* (1995) have posited:

> *"Sustain-centrism represents the perspective that is most congruent with the representations of sustainable development"* (Gladwin *et al.,* 1995 p. 894).

[13] Principle Components of Sustainable Development, Table 1, Appendix A, p. 251.

A transition from the techno-centric/ dominant social paradigm (DSP) towards the sustain-centric paradigm is viewed as fundamental to achieving sustainable development (Gladwin *et al.,* 1995). The transition from the DSP towards the sustain-centric paradigm therefore became an important part of the conceptual framework for sustainability (see Figure 4.1 p. 76).

Table 2.7 Alternative Environmental Paradigms

Key Assumptions	**Techno-centrism/ Dominant social paradigm**	**Sustain-centrism**	**Eco-centrism**
A. Ontological and Ethical			
1. Metaphor of earth	Vast machine	Life support system	Mother/web of life
2. Perception of earth	Dead/passive	Home/managed	Alive/sensitive
3. System composition	Atomistic/parts	Parts and wholes	Organic/wholes
4. System structure	Hierarchical	Holarchical	Heterarchical
5. Humans & nature	Disassociation	Interdependence	Indisassiciation
6. Human role	Domination	Stewardship	Plain member
7. Value of nature	Anthropocentrism	Inherentism	Intrinsicalism
8. Ethical grounding	Narrow homocentric	Broad homocentric	Whole earth
9. Time/space scales	Short/near	Multiscale	Indefinite
10. Logic/reason	Egoistic/rational	Vision/network	Holism/spiritualism
B. Scientific and Technological			
1. Resilience of nature	Tough/robust	Varied/fragile	Highly vulnerable
2. Carrying capacity limits	No limits	Approaching	Already exceeded
3. Population size	No problem	Stabilize now	Freeze/reduce
4. Growth pattern	Exponential	Logistic	Hyperbolic
5. Severity of problems	Trivial	Consequential	Catastrophic
6. Urgency of solutions	Little/wait	Great/decades	Extraordinary/now
7. Risk orientation	Risk taking	Precaution	Risk aversion
8. Faith in technology	Optimism	Skepticism	Pessimism
9. Technological pathway	Big/centralized	Benign/decoupled	Small/decentralised
10. Human vs. natural capital	Full substitutes	Partial substitutes	Complements
C. Economic and Psychological			
1. Primary objective	Efficient allocation	Quality of life	Ecological integrity
2. The good life	Materialism	Post materialism	Anti-materialism
3. Human nature	Homo economicus	Homo sapient	Homo animalist
4. Economic structure	Free market	Green economy	Steady state
5. Role of growth	Good/necessary	Mixed/modify	Bad/eliminate
6. Poverty alleviation	Growth trickle	Equal opportunity	Redistribution
7. Natural capital	Exploit/convert	Conserve/maintain	Enhance/expand
8. Discount rate	High/normal	Low/complement	Zero/inappropriate
9. Trade orientation	Global	National	Bioregional
10. Political structure	Centralised	Devolved	Decentralise

Source Gladwin *et al.,* (1995, p. 883)

2.7 Business Sustainability Perspectives

This section will focus on the discussion around wider interpretations of sustainable development, which is often simplified into two distinct viewpoints, weak sustainability and strong sustainability. While strong sustainability supports conserving the irreplaceable stocks of critical natural capital for the sake of future generation (Mancebo, 2013), weak sustainability assumes that natural capital and manufactured capital are essentially substitutable where there is no essential differences between the kinds of well-being they generate (Neumayer, 2012). Pelenc and Dedeurwaerdere (2015) have posited, the fundamental debate regarding sustainable development is whether we choose to adopt a strong or a weak conception of sustainability.

2.7.1 Weak Sustainability approach to Development

Weak sustainability is underpinned by the belief that manmade capital is more important than natural capital and is based on the work of two neoclassical economists, Robert Solow (1974; 1986; 1992; 1993) and John Hartwick (1977; 1978; 1990). From a weak sustainability perspective Solow (1993) has argued, the only thing that matters is the total value of the aggregate stock of capital, which should be at least maintained or ideally increased for the sake of future generations. As posited by Ekins *et al.,* (2003), from a weak sustainability perspective, technological progress is assumed to continually generate technical solutions to the environmental problems caused by the increased production of goods and services.

Historically, the present development path has been influenced by ideas advanced by the Scottish economist and moral philosopher Adam Smith in an inquiry into the nature and causes of *The Wealth of Nations,* published in 1776 (Smith, 1910). Whilst, Senker (2015) has posited, the fundamentals of a pro-capitalist ideology and the predominant strands of orthodox economic theory have remained essentially unchanged for about 300 years.

The present economic development path began with the Industrial Revolution, and from this time massive expansion of economic activity has transformed the planet. From 1820 to 2003 the world gross domestic product (GDP) increased nearly 60-fold in real terms (Maddison, 2007). Steffen, *et al.,* (2015), the Intergovernmental Panel on

Climate Change (2014), the *National Climate Assessment (2014)* and the Millennium Ecosystem Assessment Panel (2005), concur that although this economic expansion significantly increased the average standard of living, this expansion has come with large costs. Where global environmental changes and further population expansion, possibly reaching 9.7 billion people by 2050 (Wilmoth, 2015) threaten to undermine future prosperity.[14]

Senker (2015) has argued that, neoclassical economic analysis is deeply flawed, where he stated, *"Corporations dependence on states has been pervasive for at least 100 years. They lobby international organizations, as well as states, to create conditions more favourable to their own individual interests"* (Senker, 2015 p. 97). As an alternative Senker (2015) has suggested, rather than using obsolete theories, an alternative approach to studying the dynamics of the modern world economy, is to view the world economy as a complex networks of interlocking systems.

As referred to earlier in this chapter, under the present development path wealth inequality prevails across developed and developing nations (Section 2.3.2, Tables 2.4 and 2.5). While the United Nations have estimated, it would cost US$30 billion a year to address would hunger (FAO, 2008; Rosenthal and Martinjune, 2008), this seems small when one considers that one of the most profitable company in the world, ICBC in China, had profits of US$44 billion in 2015 (Forbes, 2015b). As shown in Table 2, Appendix A, in 2015 the top five companies in the world had combined profits totalling US$158.3 billion (Forbes, 2015a)[15].

The call to move from the present development path is not new, according to von Weizsäcker, *et al.*, (1998), for those that embody a weak sustainability perspective, the prevailing way of living is mainly left unquestioned. Luke (2015) has posited, it is evident that far more favour is being given to utterly weak sustainability in today's

[14] Since 1990 the World population has increased by 2 billion, since 2003 the world population has increased by 1 billion, in 2015 the World population was 7.3 billion, and is estimated to reach 9.7 billion by 2050 (Department of Economic and Social Affairs, 2015).

[15] The FORBES Global 2000, is a comprehensive list of the world's largest, most powerful public companies, as measured by revenues, profits, assets and market value According to Forbes (2015b), in 2015 the Global 2000 companies, from 60 countries, accounted for combined revenues of $39 trillion, profits of $3 trillion, with assets worth $162 trillion, and a market value of $48 trillion (Table 2, Appendix A, p.252).

policy debates, while sustainability management issues have gained minor attention from company boards of directors (Bergman *et al.,* 2016).

2.7.2 Strong Sustainability approach to Development

In contrast to the weak sustainability perspective, strong sustainability argues that humans are an integral part of nature. According to Dryzek (1997) and Daly and Cobb (1989), the strong sustainability perspective approaches sustainability from an eco-centric viewpoint, placing the biosphere at the centre. Whereby humankind should not attempt to manage nature, but try to live in harmony with the other species and the ecosystem in general (Shrivastava 1994). Bebbington (2001) and Dryzek (1997) have suggested, strong sustainability regards social aspects as being an integral part of sustainable development, and considers both intragenerational and intergenerational equity as important issues.

Koller *et al.,* (2015) have posited, politicians and commentators are pushing for more regulation and fundamental changes in corporate governance. Academics and even some business leaders have called for companies to change their focus from increasing shareholder value to a broader focus on all stakeholders, including customers, employees, suppliers, and local communities. A stakeholder perspective is particularly relevant in relation to corporate value chains, as suggested by Mitchell *et al.,* (2009), the position of poor people in value chains needs to be enhanced. In terms of responsible supply chains, according to the World Economic Forum (2015), we are in the middle of a paradigm shift. Slowly, wages and working conditions are improving in pockets around the world. But to continue to make progress, trust and collaboration between corporations, governments and NGOs needs to strengthen further (World Economic Forum, 2015).

Leading companies have made the first step by moving from pure efficiency or service-driven supply chain strategies to more holistic concepts, which drive profitability and socio-environmental benefits simultaneously. Today, implementing responsible supply chains is a must for all companies as well, which promises significant competitive advantage and higher business performance (World Economic Forum, 2015). As argued by Virakul (2015), embedding corporate social responsibility, corporate governance and sustainability concepts at a strategic level

can sustain long-term organizational performance while maintaining their position in societies on good terms with all stakeholders.

The embodiment of strong sustainability is an opportunity for business, where it is closely linked with the green economy[16]. The GLOBE Foundation (2010)[17] has outlined, the green economy is an economic model which focuses on the creation of green jobs, real sustainable economic growth, the prevention of environmental pollution, global warming, resource depletion and ecological degradation (GLOBE Foundation, 2010). According to Maclean *et al.*, (2013), transitioning to a 'green economy' is more than a short-term response to current global crises. It can be a long-term strategy for sustainable development and poverty alleviation. A 'green economy' has four interconnected and mutually dependent goals: increasing economic growth, alleviating poverty by reducing unemployment, increasing social inclusion and equity, and reducing greenhouse gas emissions (Maclean *et al.*, 2013).

The GLOBE Foundation (2010) has indicated, the green economy is worth $5.2 trillion. During 2008 in British Columbia alone, the six key sectors of the green economy were worth $15.3 billion to the provincial gross domestic product and responsible for the creation of 166,000 direct and indirect full time equivalent jobs, where jobs are expected to grow to 225,000 by 2020 (GLOBE Foundation, 2010). In 2014 the low carbon and renewable energy (LCRE) economy in the United Kingdom had a turnover of GBP46.2 billion, employing 238,500 full-time equivalent (FTE) workers (Office for National Statistics, 2014).

The European Commission (2012) has estimated, 20 million jobs could be created between 2013 and 2020 in the green economy. In 2012, the European Commission (2012) encouraged governments to exploit this potential by re-focusing their training efforts and including green employment as a key target of their National Job Plans.

[16] According to Angel Gurría OECD Secretary-General, green growth can contribute to the successful implementation of sustainable development through concrete policy action by governments and stakeholders. Green growth is a practical and flexible approach for making progress along the economic and environmental dimensions of sustainable development, while taking full account of the social consequences of greening the growth dynamics of our economies (Gurría, 2012).

[17] Formed in 1993, the GLOBE Foundation is a Vancouver-based, not-for-profit organization dedicated to finding practical business-oriented solutions to the world's environmental problems.

2.8 Summary

This chapter has contributed to addressing the second research question by drawing attention to some of the key challenges relevant to achieving sustainable development and how these challenges can be more clearly understood. Addressing the third research objective, this chapter explored and synthesised the meaning, relevance and complexity of sustainable development and how sustainable development has been influenced historically.

Section 2.2 highlighted the need to move beyond simplistic representations of sustainable development, where a clearer understanding of sustainable development requires broadening the components of sustainable development beyond the environmental, social and economic components to also include institutional and political as critical components of sustainable development.

Additionally, since there is no life without planet Earth, the five capitals model prioritises natural capital over human, social, manufactured and financial capital. Drawing on complex adaptive system's theory, a more holistic understanding of sustainable development also requires understanding the interdependency of the components of sustainable development. Key global issues relevant to sustainable development were also highlighted in this chapter, where the top global challenge in 2016 was a failure of climate change mitigation and adaption. Related to the latter, ecological overshoot and wealth inequality were also highlighted as significant challenges fundamentally linked to sustainable development.

As emphasised by Bourdieu's social theory, the strength of the present development path is reinforced due to historical, cultural and educational practices in society. Overall, the present development path emphasises a weak sustainability perspective, where economic consideration is emphasised over environmental and social issues. It was highlighted in this chapter that there is a need to transition to a sustain-centric paradigm, where development needs to embody a strong sustainability perspective.

CHAPTER THREE
EDUCATION FOR SUSTAINABLE DEVELOPMENT

3.0 Introduction

This chapter addresses part of the fourth research objective which is concerned with exploring the emergence, importance and transformative potential of education for sustainable development. This chapter firstly considers the origins of education for sustainable development, commencing with an exploration of five global initiatives that have influenced the development of and need for education for sustainable development. These global initiatives include the Education for All (EFA) movement, the United Nations Literacy Decade (UNLD), the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs). The importance of Chapter 36 of Agenda 21 and education for sustainable development as transformative education and as capacity development for sustainable development are also examined.

3.1 The Origins of Education for Sustainable Development

From 1987 to 1992 the concept of sustainable development matured as committees discussed, negotiated, and wrote the 40 chapters of *Agenda 21*. The initial thoughts concerning education for sustainable development were captured in chapter 36 of *Agenda 21*, promoting the need for education, public awareness, and training (UNESCO, 1992). In 1992, the UN Conference on Environment and Development held in Rio de Janeiro was influential in linking the challenge of sustainability to education and learning (UNESCO, 1992).

The idea of education for sustainable development as a movement that coordinates and integrates forerunning educational initiatives and programmes characterises the international normative model of education for sustainable development as presented in various UNESCO publications (UNESCO 2005a, 2005b; 2004; Fien, 2004). In the Decade of Education for Sustainable Development (DESD) International Implementation Scheme, the Education for All (EFA) movement, the United Nations Literacy Decade (UNLD) and the Millennium Development Goals (MDGs) were listed as complementary to the Decade of Education for Sustainable Development (DESD) (UNESCO, 2005b).

Agenda 21 identified school age to adult education as critical for promoting

sustainable development issues (UNCED, 1992). A clearer role for the tertiary sector was articulated 12 years later, through the launch of the United Nations Decade of Education for Sustainable Development (DESD), where higher education was identified as having a particular role to play. In 1992 UNESCO was named to lead the education effort. It is important to note that UNESCO's role is not to implement education for sustainable development within nations, but rather to be a partner in furthering education for sustainable development, where the implementation of education for sustainable development is the responsibility of each nation that signed *Agenda 21*.

3.1.1 Education for All (EFA)

The Education for all (EFA) programme was established in 1990. Education is a right; this is enshrined in Article 26 of the 1948 Universal Declaration of Human Rights. Education as a right, is also a development imperative because EFA was a foundation for reaching all of the Millennium Development Goals adopted in 2000 (UNESCO, 2008).

The Education for All movement is a global commitment to provide quality basic education for all children, youth and adults. The programme was launched at the World Conference on Education for All in 1990 by UNESCO, UNDP, UNFPA, UNICEF and the World Bank. Participants at the World Conference on Education for All in 1990 endorsed an expanded vision of learning and pledged to universalise primary education and reduce illiteracy by the end of that decade (UNESCO, 2008).

With many countries far from reaching the Education for All goal, the international community met again in Dakar in 2000 and affirmed their commitment to achieving Education for All by 2015. In Dakar the international community identified six key education goals (see Table 3.1 p. 39) which aimed to meet the learning needs of all children, youth and adults by 2015 (UNESCO, 2008). The EFA Global Monitoring Report made it clear that achieving universal primary education by 2015 would not be achieved (UNESCO, 2015). UNESCO (2014) also highlighted, achieving universal primary education would require an additional 1.6 million teachers. This EFA Global Monitoring Report 2015 makes a powerful case for placing education at the heart of the global development agenda after 2015 (UNESCO, 2015).

Table 3.1 Education for All- Six Key Education Goals

Goal 1	Expanding and improving comprehensive early childhood care and education, especially for the most vulnerable and disadvantaged children.
Goal 2	Ensuring that by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to, and complete, free and compulsory primary education of good quality.
Goal 3	Ensuring that the learning needs of all young people and adults are met through equitable access to appropriate learning and life-skills programmes.
Goal 4	Achieving a 50 per cent improvement in levels of adult literacy by 2015, especially for women, and equitable access to basic and continuing education for all adults.
Goal 5	Eliminating gender disparities in primary and secondary education by 2005 and achieving gender equality in education by 2015, with a focus on ensuring girls' full and equal access to and achievement in basic education of good quality.
Goal 6	Improving all aspects of the quality of education and ensuring excellence of all so that recognised and measurable learning outcomes are achieved by all, especially in literacy, numeracy and essential life skills.

Source (UNESCO, 2008)

The *EFA Global Monitoring Report 2015* stated:

> *"There are still 58 million children out of school globally and around 100 million children who do not complete primary education. Inequality in education has increased, with the poorest and most disadvantaged shouldering the heaviest burden. The world's poorest children are four times more likely not to go to school than the world's richest children, and five times more likely not to complete primary school. Conflict remains a steep barrier, with a high and growing proportion of out-of-school children living in conflict zones"* (UNESCO, 2015 p. i).

As outlined by Irina Bokova Director-General of UNESCO, all governments must invest in education as an accelerator of inclusive development, if you educate mothers, you empower women and save children's lives, if you educate communities, you transform societies and grow economies. This is the message of the *EFA Global Monitoring Report* (UNESCO, 2014). In support of a transition towards Education for All, Irina Bokova also stated:

> *"New education targets must be specific, relevant and measurable"* (UNESCO, 2015 p. i). "*There must be stronger action on financing across the board. While the bulk of costs will be borne by governments, the international community must step up, to sustain and increase aid to education - especially in low and lower middle income countries where needs are greatest. The future agenda will also need ever-stronger monitoring efforts, including data collection, analysis and dissemination, to hold all stakeholders to account*" (UNESCO, 2015 p. ii).

3.1.2 United Nations Literacy Decade (UNLD)

In recognition of the centrality of literacy to Education for All (EFA) and sustainable development, the United Nations Literacy Decade (UNLD, 2003-2012) was proclaimed by the United Nations General Assembly in 2001, as a global framework to ensure focused and sustained collective efforts for the promotion of literacy and literate environments for children, young people and adults (UNESCO, 2013b). The United Nations Literacy Decade (UNLD, 2003-2012) was implemented by member states and development partners, guided by their own plans and global frameworks, notably the United Nations Literacy Decade International Plan of Action (2002) and the United Nations Literacy Decade International Strategic Framework for Action (2009) (UNLD, 2006).

Positively, according to UNESCO (2013b), the United Nations Literacy Decade (UNLD, 2003-2012) was marked by steady progress towards Education For All goal 3, on meeting learning needs of young people and adults, and Education For All goal 4, which focused on achieving a 50 percent reduction in the adult illiteracy rates, despite population growth. The adult literacy rate rose from 82 percent in 2000 to 84 percent in 2011, whilst, the youth literacy rate has risen gradually from 87 percent in 2000 to 90 percent in 2011 (UNESCO, 2013a). Although progress has been made challenges remain, according to UNESCO (2016) literacy for all remains elusive, in 2016, nearly 17 percent of the world's adult population were illiterate, two thirds of the illiterate adult population are women, making gender equality even harder to achieve.

UNESCO (2016) has highlighted, 775 million adults lack minimum literacy skills, while an estimated 122 million youth globally are illiterate, of which young women represent 60.7 percent. The 67.4 million children who are not in school are likely to encounter great difficulties in the future, as deficient or non-existent basic education is the root cause of illiteracy (UNESCO, 2016).

The UNESCO Institute for Statistics data showed that, South and West Asia is home to more than one-half of the global illiterate population (51 percent). While, 25 percent of all illiterate adults live in sub-Saharan Africa, 12 percent in East Asia and the Pacific, 7 percent in the Arab States and 4 percent in Latin America and the Caribbean. It is estimated that less than 1 percent of the global illiterate population

live in the remaining regions combined (UNESCO, 2015). The UNESCO Institute for Statistics also showed that, the lowest national literacy rates are observed in sub-Saharan Africa and in South and West Asia. Adult literacy rates were below 50 percent in the following 14 countries: Afghanistan, Benin, Burkina Faso, Central African Republic, Chad, Côte d'Ivoire, Ethiopia, Guinea, Haiti, Liberia, Mali, Mauritania, Niger, Senegal, Sierra Leone and South Sudan (UNESCO, 2015). Since most countries failed to reach the Education for All literacy goal, a new literacy target was formed, which is even more ambitious in its current framing within the Sustainable Development Goals (UNESCO, 2015) (for SDGs detail see Table 3.3 p. 44).

3.1.3 Millennium Development Goals

The adoption of the Millennium Declaration in 2000 by 189 Member States of the United Nations General Assembly, including 147 Heads of State, was a defining moment for global cooperation in the 21st Century (UNDP, 2010a). The Declaration captured previously agreed goals on international development and gave birth to a set of concrete and measurable development objectives, known as the Millennium Development Goals (UNDP, 2010a).

The United Nations Development Programme posited that collectively, the Millennium Declaration represented the most important promise ever made to the world's most vulnerable people (UNDP, 2010). The UNDP (2010) also outlined, the promise of the Millennium Declaration was not based on pity or charity, but on solidarity, justice and the recognition that we are increasingly dependent on one another for our shared prosperity and security. The MDGs were crucial stepping stones towards equitable and sustainable development for all (UNDP, 2010) (Table 3.2).

Table 3.2 Millennium Development Goals

1	To eradicate extreme poverty and hunger [achieved (UN, 2014)]
2	To achieve universal primary education
3	To promote gender equality and empowering women
4	To reduce child mortality rates
5	To improve maternal health
6	To combat HIV/AIDS, malaria, and other diseases
7	To ensure environmental sustainability
8	To develop a global partnership for development

Source UNDP (2010)

The *Millennium Development Goals Report 2014* indicated that the 1st MDG, to eradicate extreme poverty and hunger has been achieved. In 1990 almost half of the population in developing regions lived on less than $1.25 a day. This rate dropped to 22 per cent by 2010, reducing the number of people living in extreme poverty by 700 million (United Nations, 2014). Progress has also been made regarding the 3rd MDG. By 2012 all developing regions achieved or were close to achieving gender parity in primary education. Improvements were also evident regarding the 6th MDG, between 2000 and 2012 an estimated 3.3 million deaths from malaria were averted due to the substantial expansion of malaria interventions (United Nations, 2014a).

The target of halving the proportion of people without access to an improved drinking water source was achieved in 2010, five years ahead of schedule. Over 2.3 billion people gained access to an improved source of drinking water between 1990 and 2012. Although, over a quarter of the world's population gained access to improved sanitation since 1990, a billion people still resorted to open defecation. In terms of the 7th MDG, major trends that threaten environmental sustainability still continue (United Nations, 2014a). Referring to the achievement of the Millennium Development Goals in the *State of the Planet 2010* address, Ban Ki-moon (2010) stated:

> *"Adoption to climate change and low carbon growth are central to achieving the Millennium Development Goals"…"Achieving the Millennium Development Goal's is a practical necessity"…*[and] *"A moral imperative*" (Ki-moon, 2010, pp. 2-3).

Ban Ki-moon continued:

> *"We do not need new promises. Current commitments are already sufficient for success, in terms of keeping the promise of the Millennium Development Goals we only have to deliver on them. We only have to honour our pledges. Next to the more than $3 trillion mobilised for stimulus in response to the financial crisis, the amounts needed for the Millennium Development Goals are modest indeed. Governments need to say no to protectionism, subsidies and unfair practices. In short, we have the wealth to achieve the Millennium Development Goals. We just need the political will"* (Ki-moon, 2010, pp. 2-3).

The Millennium Development Goals ended in 2014 and were replaced by the Sustainable Development Goals in 2015, the 2030 Development Agenda. The Sustainable Development Goals (SDGs) are explored in the following section.

3.1.4 Sustainable Development Goals

The United Nations Department of Economic and Social Affairs (2014) has posited, a key outcome of the Rio+ 20 conference was the agreement by member states to launch a process to develop a set of Sustainable Development Goals (SDGs) which would build upon the Millennium Development Goals (MDGs). At the Rio+ 20 conference it was also agreed that these goals would be action-oriented, concise, easy to communicate, limited in number, aspirational, global in nature and universally applicable to all nations, realities, capacities and levels of development while respecting national policies and priorities (United Nations Department of Economic and Social Affairs, 2014).

On the 25th of September 2015 at the United Nations general assembly in New York, 193 countries ratified the Sustainable Development Goals (Ford, 2015). These goals became applicable in January 2016 and are now a new, universal set of goals, targets and indicators that United Nations member states are expected to use to frame their agendas and political policies regarding sustainable development (United Nation Development Programme, 2016).

The United Nation Development Programme (2016) has highlighted, there are three fundamental differences between the 2030 Development Agenda (Table 3.3 p. 44) and the MDGs (Table 3.2 p. 41), which have a bearing on development cooperation. Overall, the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development are wider in scope, more ambitious and apply to all countries.

Firstly, the 2030 Development Agenda has a much wider scope, going beyond the 'social' goal of the MDGs. The 2030 Development Agenda takes into full consideration the need for economic, social and environmental sustainability and includes a wide range of aspirations, from sustainable modes of production and consumption to peaceful and inclusive societies (United Nation Development Programme, 2016).

Secondly, the 2030 Development Agenda is much more ambitious, not content with reducing poverty, the SDGs push for the elimination of poverty. The SDGs have more ambitious targets regarding health, education and the environment. Thirdly, the 2030

Development Agenda is universal, applying to all countries, to all people, with an implicit recognition that international collective action beyond national policy-making is required (United Nation Development Programme, 2016). The Sustainable Development Goals are presented in Table 3.3.

Table 3.3 Sustainable Development Goals

1	End poverty in all its forms everywhere
2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3	Ensure healthy lives and promote well-being for all at all ages
4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5	Achieve gender equality and empower all women and girls
6	Ensure availability and sustainable management of water and sanitation for all
7	Ensure access to affordable, reliable, sustainable and modern energy for all
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10	Reduce inequality within and among countries
11	Make cities and human settlements inclusive, safe, resilient and sustainable
12	Ensure sustainable consumption and production patterns
13	Take urgent action to combat climate change and its impacts
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development

Source United Nations (2015)

The annual estimated investment required for achieving the SGDs is 3.9 Trillion USD, current investment is 1.4 Trillion USD. The annual investment gap for implementing the SDGs is in the region of 2.5 trillion USD per annum (World Economic Forum, 2016). It has been proposed that blended funding (blended finance investment solutions capitalise on partnerships among diverse actors, including international organisations, development cooperation agencies and private enterprise) could address this annual investment gap (World Economic Forum, 2016c).

A scientific report which reviewed the Sustainable Development Goals (SDGs) conducted by the International Council for Science (ICSU) and the International Social Science Council (ISSC) (ICSU and ISSC, 2015) has indicated, the SDGs offer

a major improvement over their predecessors, the MDGs. However, this report also indicated, of the 169 targets beneath the 17 draft goals, just 29% are well defined and based on the latest scientific evidence whilst, 54% need more work and 17% are weak or non-essential. Commentating on this scientific report Costanza (2014) stated, *"A 'narrative of change' is missing, both in terms of how the pursuit of specific goals would lead to broader outcomes of social change and in terms of how this change actually takes place"* (Costanza, 2014 p. 8).

Concerns regarding the inter-linkages and integration of the SDGs were also highlighted by the ICSU and ISSC (2015) who outlined, although the SDGs framework contains elements of integration, the level of integration is far lower than justified from a science perspective. Expanding on the lack of integration and inter-linkage of the SDGs, the International Council for Science (ICSU) and the International Social Science Council (ISSC) have stated:

> *"The goals are presented using a 'silo approach', that is, they are addressed as separate elements, mostly in isolation from each other. However, it is clear from systems science that goal areas overlap, that many targets might contribute to several goals, and that some goals may conflict. The goals are also addressed without reference to possible links with other goals. Since the SDG framework does not reflect interlinkages and cannot ensure that development takes place within sustainable levels of resource use at either the global or regional scale, it is possible that the framework as a whole might not be internally consistent - and as a result not be sustainable"* (ICSU and ISSC, 2015 p. 9).

The German advisory council on global change (2014b) emphasised, the SDGs should address all dimensions of sustainable development stating, "*Global environmental change must be incorporated, otherwise even poverty eradication will become impossible*" (German advisory council on global change, 2014b p. 3). The German advisory council on global change have identified recommendations on how planetary boundaries or guard rails for global environmental problems should be incorporated in the SDGs and operationalised by means of corresponding targets. Details of these guard rails are outlined in Table 1, Appendix N, p. 306.

SDG 4 focuses on education, the specific targets relevant to this goal are shown in Table 3.4. As highlighted by the United Nation Development Programme (2016), the 2030 Development Agenda is universal; applying to all countries, therefore education

for sustainable development is relevant in all countries both in developing and developed countries. Of concern in terms of SDG 4, no specific target focuses on the need for Institutes of Higher Education in the developed world, to increase their integration and implementation of education for sustainable development.

Table 3.4 Sustainable Development Goal four and specific targets

SDG 4 specific targets	SDG 4: Ensure inclusive and equitable quality education and promote life-long learning opportunities for all.
4.1	By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.
4.2	By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education.
4.3	By 2030, ensure equal access for all women and men to affordable quality technical, vocational and tertiary education, including university.
4.4	By 2030, increase by x% the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.
4.5	By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples, and children in vulnerable situations.
4.6	By 2030, ensure that all youth and at least x% of adults, both men and women, achieve literacy and numeracy.
4.7	By 2030, ensure all learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and nonviolence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development.
4.a	Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all.
4.b	By 2020, expand by x% globally the number of scholarships for developing countries in particular LDCs, SIDS and African countries to enrol in higher education, including vocational training, ICT, technical, engineering and scientific programmes in developed countries and other developing countries.
4.c	By 2030, increase by x% the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially LDCs and SIDS.

Source United Nations (2015)

3.1.5 Agenda 21: Earth Summit-Declaration on Environment and Development

Agenda 21, the Rio Declaration on Environment and Development and the Statement of principles for the Sustainable Management of Forests were adopted by more than 178 Governments at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janerio, Brazil in 1992 (UNCED 1992).

This agreement was historic and is fundamental to achieving sustainability, "*Agenda 21 addresses the pressing problems of today and also aims at preparing the world for the challenges of the next century. It reflects a global consensus and political commitment at the highest level on development and environment cooperation*"

(UNCED, 1992 p. 3). The United Nations Department of Economic and Social Affairs, Division for Sustainable Development (2012) has posited, *Agenda 21* is a comprehensive plan of action to be taken globally, nationally and locally by organisations of the United Nations System, Governments and Major Groups in every area in which humans impact the environment. The United Nations Department of Economic and Social Affairs (2012) has highlighted, the key issues found in *Agenda 21* are the heart of education for sustainable development and should be included in any program related to educating for sustainability. These issues include:

> Section 1 ***Social and Economic Dimensions:*** International cooperation, combating poverty, changing consumption patterns, population and sustainability, protecting and promoting human health, sustainable human settlements and making decisions for sustainable development.
>
> Section 2 ***Conservation and Management of Resources:*** Protecting the atmosphere, managing land sustainably, combating deforestation, combating desertification and drought, sustainable mountain development, sustainable agriculture and rural development, conservation of biological diversity, management of biotechnology, protecting and managing the oceans, protecting and managing fresh water, safer use of toxic chemicals, managing hazardous wastes, managing solid waste and sewage and managing radioactive wastes.
>
> Section 3 ***Strengthening the Role of Major Groups:*** Women in sustainable development, children and youth, Indigenous people, partnerships with NGOs, local authorities, workers and trade unions, business and industry, scientists and technologists, and strengthening the role of farmers.
>
> Section 4 ***Means of Implementation Financing Sustainable Development:*** Technology transfer; science for sustainable development; education, awareness and training; creating capacity for sustainable development; organising for sustainable development, international law; and information for decision making (United Nations Department of Economic and Social Affairs, 2012).

Chapter 36 of *Agenda 21* is dedicated to discussing the importance of education, training and public awareness in terms of addressing the challenges of sustainable development (United Nations, 1992). As highlighted by UNESCO (2012), education was also a crosscutting theme in the remaining chapters of *Agenda 21*.

Within the National context in Ireland, the Local Agenda 21 Environmental Partnership Fund has operated since 1997. Supported by the Department of Housing, Planning, Community and Local Government. The Local Agenda 21 Environmental Partnership Fund promotes sustainable development by assisting small-scale environmental projects at local level. These projects involve partnership arrangements between local authorities and various local groups including community groups, schools and environmental NGOs (Department of Housing, Planning, Community and Local Government, 2016).

In 2015 the Local Agenda 21 Environment Partnership Fund provided €390,000, which supported 770 projects around the country. A wide variety of projects and schemes have been supported under this fund in previous years including community gardens, allotments, compost schemes, rainwater harvesting systems, educational initiatives and environmental exhibitions (Department of Housing, Planning, Community and Local Government, 2016). Overall, 23 percent or 175 projects supported under this fund in 2015 were specifically related to training, education and awareness-raising initiatives aimed at the primary and post primary education levels in Ireland. Funded by Local Agenda 21 Environment Partnership Fund, GrassRoots Education is an organisation that facilitates a variety of workshops and programmes in Environmental Education since 2000 to date. The principal projects of GrassRoots Education are aimed at primary and post primary school children, to bring the importance of the environment and nature into the classroom[18]. Although, these educational initiatives are not part of the formal educational curriculum, these educational initiatives do make a small contribution to education for sustainable development in Ireland[19].

3.2 Education for Sustainable Development

Education for sustainable development and the potential transformative potential of education for sustainable development are considered in the final section of this chapter. Sarabhai (2013) has posited, education for sustainable development is defined very broadly and consists of formal, non-formal and informal learning. Education for sustainable development is also inclusive of training, capacity building and public awareness (Sarabhai, 2013). Whilst, Huckle (2010) has posited, the core business of education for sustainable development is that of encouraging learners to critically seek out and reflect on those forms of political economy, democracy and citizenship that may enable the world's people to live sustainably with one another and the rest of nature.

The interconnectivity of the components of sustainable development was illustrated in Figures 2.2-2.7 and explored in Sections 2.3 and 2.4. In line with the latter, the

[18] GrassRoots Education: Environmental Education Workshops 2000-2016, Table 6, Appendix J, p. 301.
[19] A representation of Local Agenda 21 Environmental Partnership Fund education projects is presented in Table 5, Appendix J, p. 302.

interconnectedness of natural and socioeconomic systems is fundamental to thinking on sustainability and sustainable development (Schoolman *et al.*, 2011). Consequently, the principle of interdisciplinarity is equally crucial to the study of sustainability, where researchers have been encouraged to focus on the dynamic interactions of the global, human, and social (Komiyama and Takeuchi, 2006) or social and ecological systems (Ostrom 2009; Clark and Dickson 2003). Research conducted by Schoolman *et al.*, (2011) support the view that institutional obstacles to interdisciplinary work have had an impact on the structure of sustainability science (key barriers relevant to interdisciplinary education relevant to sustainable development are considered in detail in chapter four).

The World Commission on Environment and Development (1987) describe education for sustainable development as sustainability science, where sustainability science aims to:

> "*Address the challenge to – make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs*" (World Commission on Environment and Development 1987, p. 8).

While Kates (2010) has outlined, sustainability science is concerned with advancing scientific understanding of human-environment systems: improving linkages between research and policy communities; and building capacity for linking knowledge with action to promote sustainability. Sustainability science was introduced in Amsterdam at the *World Congress, Challenges of a Changing Earth 2001*, organised by the International Council for Science (ICSU), the International Geosphere-Biosphere Programme (IGBP), the International Human Dimensions Programme on Global Environmental Change (IHDP) and the World Climate Research Programme (WCRP) (Kates, 2010). It is accepted in this study that education for sustainable development and sustainability science are the same, since both are concerned with linking knowledge with action to promote sustainability.

Table 3.5 lists major topics to be addressed by education for sustainable development as highlighted in the final Decade of Education for Sustainable Development (DESD) international implementation scheme (UNESCO, 2005a, 2005b).

Table 3.5 Sustainability Issues in the International Implementation Scheme: Major Topics to be addressed by Education for Sustainable Development

1	Social Sphere	Employment Human Rights Gender Equity Peace and Human Security
2	Environmental Sphere	Water Waste
3	Economic Sphere	Poverty Reduction Corporate Responsibility And Accountability
4	Cross Sectional	HIV/AIDS Mitigation Climate Change Urbanisation

Source (UNSECO, 2005a, 2005b)

Dale and Newman (2005) have posited, education for sustainable development must focus on processed based as well as traditional facts based knowledge (see Table 3.6) so that students will be capable of understanding and developing novel responses to dynamically evolving and changing situations.

Table 3.6 Sustainable Development Literacy skills

Fact Based Skills	**Processed Based Skills**
Systems Theory Related Disciplinary based knowledge pertaining to Ecological, Social and Economic imperatives Natural and Social Science Research Methodologies Action Research Governance	Systems Thinking Interdisciplinary and Transdisciplinary methods[20] Perspective taking and Perspective making Contextual application and analysis Back casting and Scenario analysis Multi Stakeholder analysis Values Articulation

Source Dale and Newman (2005)

Warburton (2003) has argued, when developing fact based and process based skills, educators must provide a wide range of conceptual and material content, in addition to illustrating the interconnections and interdependence of the components of sustainable development[21]. Robert Kates (2010), one of the founders of the sustainability science movement, and leader of the United States National Academy of Sciences seminal study, *Our Common Journey: A transition toward sustainability*, and author of the *Reader in Sustainability Science and Technology* outlined, sustainable development is

[20] Transdisciplinary research transgresses boundaries between scientific disciplines and between science and other societal fields and includes deliberation about facts, practices and values (Wiesmann *et al.*, 2008).

[21] The interconnections and interdependence of the components of sustainable development was highlighted through the lens of Complex Adaptive Systems Theory in Section 2.4, p. 26.

about the dual goals of the promotion of human development and well-being while protecting the Earth's life support systems (Kates, 2010).

Regarding sustainability science and education for sustainable development it is necessary to understand the current status, long-term trends and impacts of the nine essentials for human well-being and seven of the essential life support systems as presented in Table 3.7.

Table 3.7 Current Status, Long-term Trends, and Impacts of Nine Essentials for Human Well-being and Life Support Systems

Essentials for Human Well-being	Essential Life Support Systems
1. Population	1. Global climate and Stratospheric ozone
2. Health and Well being	2. Land
3. Poverty and Affluence	3. Atmosphere
4. Habitation and Transportation	4. Water
5. Peace and Security	5. Oceans
6. Energy and Minerals	6. Biodiversity
7. Food and Fibre	7. Ecosystem Services
8. Water and Sanitation	
9. Disasters	

Source Kates (2010)

The *Reader in Sustainability Science and Technology* also highlighted the relevance of analysing values and attitudes and linking knowledge systems and actions which provide solutions to real world problems (Kates, 2010).

The demand for education for sustainable development is coming from students themselves. A three-year longitudinal study conducted by the National Union of Students (NUS) and the Higher Education Academy in the United Kingdom, over three years (2010 to 2012) found, over two-thirds of students surveyed (10,369 students) believed sustainable development should be covered in their degree courses (5,763 responses in 2010; 3,193 in 2011; and 6,756 in 2012) (Drayson, *et al.*, 2013). The transformational potential of education for sustainable development is considered in the following section.

3.2.1 Education for Sustainable Development as Transformative Education

This section will explore the transformational potential of education for sustainable development. UNESCO (2012) has posited, education for sustainable development is far more than teaching knowledge and principles related to sustainability. In its broadest sense education for sustainable development is education for *social transformation* with the goal of creating more sustainable societies.

As highlighted by UNESCO (2012), education for sustainable development touches every aspect of education including: planning, policy development, programme implementation, finance, curricula, teaching, learning, assessment and administration. Essentially, education for sustainable development aims to provide a coherent interaction between education, public awareness and training with a view to creating a more sustainable future (UNESCO, 2012).

Table 3.8 ESD is Holistic and Transformational Education

Learning Content:	Integrating critical issues, such as climate change, biodiversity, disaster risk reduction (DRR), and sustainable consumption and production (SCP), into the curriculum (UNESCO, 2014).
Pedagogy and Learning Environments:	Designing teaching and learning in an interactive, learner-centred way that enables exploratory, action oriented and transformative learning. Rethinking learning environments – physical as well as virtual and online – to inspire learners to act for sustainability (UNESCO, 2014).
Learning outcomes:	Stimulating learning and promoting core competencies, such as critical and systemic thinking, collaborative decision-making, and taking responsibility for present and future generations (UNESCO, 2014).
Societal Transformation:	Empowering learners of any age, in any education setting, to transform themselves and the society they live in. • Enabling a transition to greener economies and societies. – Equipping learners with skills for 'green jobs'. – Motivating people to adopt sustainable lifestyles. • Empowering people to be 'global citizens' who engage and assume active roles, both locally and globally, to face and to resolve global challenges and ultimately to become proactive contributors to creating a more just, peaceful, tolerant, inclusive, secure and sustainable world (UNESCO, 2014).
International Understanding	The challenge of ESD and education for international understanding is that they are both about understanding and transforming the world in which we live, as well as reforming and transforming formal education (UNESCO, 2012).
Capacity Development	ESD is about capacity development at different levels for improving ways of managing a country's or region's natural and human resources in order to raise living standards and enhance quality of life (UNESCO, 2012). ESD is about capacity building at: (1) the individual level (2) the organisational/institutional level (revision of institutional mandates) and (3) the systemic level (development of policies to encourage individuals, groups and institutions to act in accordance with sustainability principles) (UNESCO, 2005b).
Process of learning	ESD is a process of learning how to make decisions for the long term future of the economy, ecology and equity of all communities (UNESCO, 2005c).
The breath of ESD	The breadth of ESD is also evident in seven interlinked strategies proposed for the Decade of Education for Sustainable Development (DESD): advocacy and vision building; consultation and ownership; partnership and networks; capacity building and training; research and innovation; information and communication technologies; and monitoring and evaluation (UNESCO, 2005b).
Addressing Local Realities	There is consensus that, *"Education in sustainable development must be rooted at the local level - starting from and aiming to address grassroots realities"* (UNESCO Bangkok, 2005, p. 7).
Schools and Universities	For schools and universities, the redesign spans curriculum, campus operations, organisational culture, leadership and management, community relations, research and assessment (UNESCO, 2014).

Source complied from different UNESCO sources by the author (2017)

Writing on lessons learnt over ten years UNESCO (2002a) has highlighted that, eight fields of education for transformation require special attention in reorienting

education towards a sustainable future: education for gender equality, education for citizenship and democratic societies, education for a culture of peace and respect for human rights, health education, population education, education for the world of work, education for protecting and managing natural resources, and education for sustainable consumption.

In the Roadmap for Implementing the Global Action Programme on Education for Sustainable Development (Table 3.8 p. 52), education for sustainable development is considered to be both holistic and transformational education (UNESCO, 2014). Cranton (1994) has posited, education for sustainable development is transformative learning, where individual and social change may result due to transformative group learning. Education for sustainable development as transformative learning can also empower individuals to change their world view or frames of reference; this is known as perspective transformation (Moore, 2005). Cranton (1994) has argued, if basic assumptions are not challenged, change will not take place. Likewise, Sipos *et al.*, (2008) have posited, in identifying all sustainability education to have a common vision of perspective transformation, we need to encourage and enable all participants of education to challenge and be open to change in their own minds, beliefs and behaviors.

Developed by Bloom *et al.*, (1964), head, hands and heart is shorthand for engaging cognitive, psychomotor and affective learning domains. Transformative sustainability learning is a series of learning objectives corresponding to cognitive (head), psychomotor (hands) and affective (heart) domains of learning. This facilitates personal experience for participants resulting in profound changes in knowledge, skills and attitudes related to enhancing ecological, social and economic justice.

Uniting the pedagogies that inform both sustainability and transformative education, learning in tertiary institutions can enact personal and societal transformations to sustainability. In contributing to the set standards for sustainability education, integrating the transformative sustainability learning objectives across curricula will help inform rethinking of higher education (Sipos *et al*., 2008).

As the United Nations Decade of Education for Sustainable Development (DESD) came to an end in 2014, the UNESCO report *Shaping the Education of Tomorrow*

highlighted, every day education for sustainable development becomes more relevant, as we are a long way from turning around negative trends (e.g. ecosystem degradation and growing social and economic inequities (UNESCO, 2012). In addition, UNESCO (2012) posited:

> "*Increasingly as a means to renew education, teaching and learning in ways that allow schools, universities, vocational education and training institutes, communities and businesses to face challenges to sustainability. These challenges demand we learn to deal with change, complexity, controversy and uncertainty*" (UNESCO, 2012 p. 65). *"Governments and stakeholders must further ESD's development as a catalyst for innovation and transformation"* (UNESCO, 2012 p. 67).

Realising whole institution approaches or whole system approaches to education for sustainable development and sustainable development will only occur:

> *"When existing practices, goals and values are questioned and new ones created with broad participation"…"This breakthrough can best be achieved when multiple actors engage in a whole-system redesign",* (UNESCO, 2012 p. 67).

Worldwide interest is moving towards sustainable 'green' growth, which holds the promise of a major reorientation of our economies and societies. Education for sustainable development is well-positioned to play a key role in such a transition (UNESCO, 2012). Irina Bokova the Director-General of UNESCO has stated:

> *"Today's interconnected global challenges demand responses that are rooted in the spirit of our collective humanity. I believe that the risks and opportunities we face call for a paradigm shift that can only be embedded in our societies through education and learning"* (Bokova, 2014 p. 3).

> *"There is now a growing international recognition of education for sustainable development as an integral element of quality education and a key enabler for sustainable development"* (UNESCO, 2014 p. 9).

A comprehensive approach to the problem in the education sector requires questioning the existing mental models and societally engineered expectations that have lead contemporary societies to unsustainability (Tilbury (2007a). With the aim of transforming society UNESCO (2004) has emphasised, education for sustainable development is fundamentally about values and it is about learning the values, behaviour and lifestyles required for a sustainable future and for positive societal transformation. Whilst, Sterling (1996) has posited, education must itself be transformed if it is to be transforming, where education for sustainability holds the

promise of a new transformative paradigm for education. More specifically, in terms of education, Sterling (1996) and Scott *et al.*, (2012) have stated:

> *"If it is to fulfil its potential as an agent of change towards a more sustainable society, sufficient attention must be given to education as the subject of change itself"* (Sterling, 1996, p. 18). *"Higher education needs to transform itself if it is to assist societal transformation for a more sustainable future"* (Scott *et al.*, 2012 p. 5).

UNESCO (2014) has also highlighted, political agreements, financial incentives or technological solutions alone will not address the challenges of sustainable development. To create a world that is more just, peaceful and sustainable, all individuals and societies must be equipped and empowered by knowledge, skills and values as well as being instilled with a heightened awareness to drive such change. This is where education for sustainable development has a critical role to play (UNESCO, 2014).

3.3 Summary

This chapter addressed the first part of the fourth research objective, which aimed to explore the emergence, importance and transformational potential of education for sustainable development. The emergence and establishment of the Education for All Goals, the United Nations Literacy Decade, Agenda 21 and the Millennium Development Goals (MDGs) have highlighted the importance of sustainable development and need for these critical initiatives. Over the last twenty five years these initiatives have established the critical link between education and the challenge of sustainability, where these initiatives have been an important stepping stone towards realising equality and sustainable development.

This chapter highlighted that while progress has been made, significant educational challenges still require political support. More specifically, achieving universal primary education will require an additional 1.6 million teachers. In 2015 globally 58 million children do not attend primary school, while 100 million children do not complete primary education. Additionally, illiteracy still prevails, where 17 percent of the global adult population are illiterate. South and West Asia needs to be particularly prioritised, since 51 percent of the illiterate population live in these regions.

Within the context of addressing these challenges, the 2030 Development Agenda in the form of the sustainable development goals (SDGs) was ratified in 2015 and became applicable in January 2016. While the SDGs build on the MDGs, reflective of the increasing concerns regarding the need to achieve sustainable development, the SDGs are wider in scope, more ambitions and apply to all counties. The SDGs have more specific targets regarding the environment, health and education. Of particular concern the SDG4 which specifically focuses on education, makes no reference to the role of Higher Educational Institutions in the developed world regarding the integration and implementation of education for sustainable development.

Given the interdependency of the components of sustainable development, education for sustainable development requires an interdisciplinary approach. Since sustainable development is concerned with protecting the Earth's life support systems and the promotion of human well-being, education for sustainable development must focus on the current status, long-term trends and impacts of the essential requirements relevant to human well-being and the systems that support life on Earth. In addition, both facts based and processed based skills are fundamental to the development of sustainable development literacy skills.

Moreover, education for sustainable development is about societal transformation, where perspective transformation can enable learners to change their understanding of the world. Perspective transformation is imperative, since challenging assumptions is fundamental to realising a sustainable future. In terms of achieving sustainability, it is now imperative that political and educational actors prioritise education as an accelerator of inclusive development, which is specific, relevant and measurable. Key education for sustainable development barriers are explored in the following chapter.

CHAPTER FOUR
EDUCATION FOR SUSTAINABLE DEVELOPMENT BARRIERS

4.0 Introduction

This chapter addresses part of the fourth research objective which aimed to explore key barriers preventing the implementation of education for sustainable development. The chapter begins by focusing on a key education for sustainable barrier, the dominant social paradigm. Other barriers preventing the integration of education for sustainable development highlighted in this chapter include, education itself and the pedagogic norms of disciplinarity. In addition, consideration is also directed to the challenge of interdisciplinarity and a number of additional education for sustainable development barriers.

4.1 Dominant Social Paradigm

This section addresses an important education for sustainable development barrier, the dominant social paradigm. As outlined in the methodology section, the author adheres to a critical realist philosophical perspective. It is accepted in this study that the majority if not all education for sustainable development barriers are rooted and influenced by the dominant social paradigm.

Critical realism suggests, our concepts and beliefs are historically generated and conditioned therefore, a prerequisite for understanding the barriers relevant to education for sustainable development lies in examining the factors that shape people's beliefs and perceptions about how society functions. The philosopher and historian of science Thomas Kuhn (1962) has illustrated the way scientific disciplines or communities are dominated by an acceptable belief paradigm which shapes the way people participating in that discipline think about their subject matter (Milbrath, 1989). Milbrath (1989) defined the dominant social paradigm as:

> "*A society's belief structure that organises the way people perceive and interpret the functioning of the world around them"* (Milbrath, 1989 p. 116).

The prevailing dominant social paradigm is that which was engendered during the Enlightenment and has informed both scientific and social analysis since that time (Milbrath, 1989). Similarly, Perlmutter and Trist (1986) have posited, the dominant social paradigm is a social construction so widely held that individuals are only

vaguely aware of the direction it gives to their behavior, where the dominant social paradigm provides legitimisation and justification for the institutions of society and as such acts as an ideology. Cotgrove (1982) has stated:

> *"[A paradigm] is dominant not in the statistical sense of being held by most people, but in the sense that it is the paradigm held by dominant groups in industrial societies; and in the sense it serves to legitimate and justify the institutions and practices of the market economy"…"It is the taken-for-granted common-sensical view which usually determines the outcome of debates on environmental issues"* (Cotgrove, 1982, p. 27).

> *"Paradigms are not only beliefs about what the world is like and guides to action; they also serve the function of legitimating or justifying courses of action. That is to say, they function as ideologies"…"Hence, conflicts over what constitutes the paradigm by which action should be guided and judged to be reasonable is [sic] itself a part of the political process. The struggle to universalise a paradigm is part of the struggle for power"* (Cotgrove, 1982, p. 88).

This paradigm struggle is still evident (Marquardt, 2017; Jakobeit *et al.*, 2014), as outlined by Jakobeit *et al.*, (2014), there has been a constant struggle over concepts, new orientations and paradigm shifts. This struggle is elucidated by Marquardt (2017) who indicated, the field of development theory is more diverse than ever before, with constant debates, reinventions and paradigm shifts still to come.

Fundamental to the dominant social paradigm is western neoliberal economy. Harvey (2005) has broadly defined neoliberalism as, a theory of political economic practices which proposes that human well-being can best be advanced by the maximisation of entrepreneurial freedoms within an institutional frame-work characterised by private property rights, individual liberty, free markets and free trade (Harvey, 2005). More recently, critical scholars dispute whether the neoliberal development path is adequate in addressing social and environmental challenges (Kopnina, 2014).

Aside from the corporate sector, according to Kopnina (2012) and Crist (2012), social scientists are also influenced by the dominant neoliberal ideology of anthropocentrism. Whilst, an analysis of the literature supporting the United Nations Decade of Education for Sustainable Development (DESD) suggests that the DESD failed to acknowledge or challenge neoliberalism as a hegemonic force blocking transitions towards genuine sustainability (Huckle and Wals, 2015).

The starting point for a critical theorisation of education for sustainability is the

ideological concept that un-sustainability, in all its manifestations, arises from the social, economic and political systems of the dominant social paradigm (Milbrath, 1989). The formal education system in general has played a key role in reinforcing societal hegemony, leading to the acceptance and reproduction of the dominant social paradigm (Apple, 2004). Likewise, Sterling (1996) has highlighted, higher education follows rather than challenges the rationality of the dominant social paradigm.

Writing in the *International Journal of Innovation and Sustainable Development*, Dobers *et al.,* (2008 p. 212) concluded it is important, *"To reframe and analyse the role of universities in a broader socio-cultural and historical perspective if universities are to be agents in the paradigm shift to sustainability"*. The barriers preventing education for sustainable development are influenced by the dominant social paradigm, as shown in the conceptual framework for sustainability (Figure 4.1 p. 76). A summary of education for sustainable development barriers considered in this chapter is presented in Table 4.1.

Table 4.1 Summary of Education for Sustainable Development Barriers

Dominant Social Paradigm	(Marquardt 2017; Huckle and Wals 2015; Jakobeit *et al.,* 2014; Kopnina 2014; Crist 2012; Dobers *et al.,* 2008; Apple, 2004; Sterling, 1996; Callicott 1999; Forum for the Future, 1998; Gladwin *et al.,* 1995; Roome, 1994; Milbrath, 1989; Cotgrove, 1982; Kuhn, 1962).
Education as an ESD Barrier	(Lambrechts,. *et al.,* 2017, in press; Verhulst and Lambrechts, 2015; Koehn and Uitto, 2014; Wei Quan, 2013; Winter and Cotton, 2012; Scott *et al.,* 2012; McArdle-Clinton, 2010; McMillin and Dyball, 2009; Holdsworth *et al.,* 2008; Thomas, 2004; Jackson, 1968).
Teacher Education	(Hyseni Spahiu and Lindemann-Matthies, 2015; Babiuk, 2014; Borga *et al.,* 2014; Yavetz *et al.,* 2013; AEGEE, 2013; UNESCO, 2005b, pp. 31-32) Table 4.2. p. 61.
Business and Management Education	(AdomBent *et al.,* 2014; Nelson, 2014; Mayer, 2013; Smith, 2013; Godemann, *et al.,* 2011; Waddock *et al.,* 2011; Alcaraz and Thiruvattal, 2010; UN PRME, 2008 Appendix K; Gladwin *et al.,*1995) Criticisms of Business and Management Education, Table 10, Appendix E.
CSPE Barriers	(NCCA, 2010b, 2011b; State Examinations Commission, 2009; Murphy, 2008; Jeffers, 2008; Jeffers and O'Connor, 2008; Wilson, 2008; Redmond and Butler, 2003)
Pedagogic Norms of Disciplinarity	(Littledyke and Manolas, 2011; Chettiparamab, 2007; Selby, 2006; Arum, 2004; Klein 2004; Wilson, 1999; Kuhn, 1962) Table 4.3 p. 66.
The Challenge of Interdisciplinarity	(Biberhofer and Rammel, 2017; Aktas, 2015; Meyer *et al.,* 2015; Spangenberg, 2011; Klein, 2006; Wilson, 1999; Klein and Newell, 1997).
Curriculum Overload	(Banaji, *et al.,* 2013; Jucker, 2011; NCCA, 2010, 2008, Cambridge Primary Review, 2009; Breiting, 2007; Puk and Makin, 2006; UNESCO, 2003).
Resistance to Change	(Chen and Komph, 2012; Vales, 2007; Fullan, 2001; Greenberg and Baron, 2000; Grundy and Hatton, 1995).

Source Adapted from different sources by the Author (2016)

4.2 Education as an Education for Sustainable Development Barrier

Although, Universities should function as places of research and learning for sustainable development (Koehn and Uitto, 2014), Scott *et al.,* (2012) have posited, there is a lack of commitment to education for sustainable development in Higher Education, where the implementation of education for sustainable development is poor (Wei Quan, 2013). Wei Quan (2013) also highlighted, the critical challenge is to obtain support and commitment from top level management so the necessary resources and incentives are provided.

In the Higher Education for Sustainable Development (HESD) literature, much attention has focused on barriers to change, preventing a systemic integration of sustainable development in higher education (Lambrechts *et al.,* 2017, in press). Verhulst and Lambrechts (2015) have indicated that barriers to change preventing a systemic integration of sustainability education in higher education include: (1) barriers related to the lack of awareness of sustainability (2) barriers related to the structure of higher education and (3) barriers related to the lack of resources available.

Knowledge of sustainable development may also be influenced by the hidden curriculum. Jackson (1968) outlined, the hidden curriculum refers to the messages sent by an individual teacher, lecturer or institution to students, often unconsciously and covertly about what they ought to think and how to behave. Jackson (1968) has suggested, the integration of sustainability into education can be influenced by the hidden curriculum. A key way in which the hidden curriculum is made manifest is through the ethos and values of the educational institution (Jackson, 1968). More recently, despite strong political support for the development of sustainability literacy amongst graduates in the United Kingdom, Winter and Cotton (2012) have indicated, embedding sustainability in the higher education curriculum in the United Kingdom has met with widespread indifference and in some cases, active resistance.

In the introduction to an article titled, 'Consumer Experience of Higher Education: The Rise of Capsule Education', McArdle-Clinton (2010) posited:

> *"The concept of education as product and students as consumer impacts on education, on students and educational practitioners. Education conceived as product, makes for pedagogy of confinement which limits the creativity of students and inhibits any achievement by them beyond the limits which have been set for them. Such an education has at its roots, society's desire to*

> *control and to ensure that everyone fits into allotted places in its plan. This ideological intent shapes education as an industry - the largest single industry in the world - where students are processed as inputs and awarded a qualification, the educational value of which is in serious doubt" (McArdle-Clinton, 2010 p. 1-2).*

Within the Irish context, Ruairi Quinn the then Minister for Education from 2011 to 2014, has criticised the educational system describing it as "*malevolently dysfunctional*" where there was a perception across the sector that the Department of Education and Skills was the, "*Department of schools and teachers*", with little "*engagement in higher education*", (Flynn, 2011). In addition, Ruairi Quinn was critical of the points system driven by the university sector and how this points system impacts post primary education in Ireland. In 2015 Ruairi Quinn stated:

> *"It's going to take eight to ten years to implement changes in the junior cycle*" … "*the present junior cycle is rigid*" … "*it is academic based and system based, where students learn stuff by rote*" … "*the leaving certificate has been corrupted by the points system*" … "*manipulated by the universities for talent, which works its way down to the junior cycle*" where "*teachers are obliged to teach to the test in the junior cycle*" (Quinn, 2015 radio interview).

4.2.1 Teacher Education

In 2014, the United Nations Decade of Education for Sustainable Development came to an end, an integrative part of this decade focused on reorienting teacher education towards sustainability. Babiuk (2014) has posited, there is no research to date claiming mainstreaming education for sustainability in a pre-service teacher education programme in any jurisdiction. Babiuk (2014) also indicated, reorienting teacher education towards sustainability requires overcoming three challenges: (1) an unfavorable view of the role of education for sustainability, (2) the silo-ing within faculties of education and (3) lack of leadership.

Utilising a paired pre-post design with 215 student teachers Yavetz *et al.*, (2013) found that, student teachers did not demonstrate an adequate understanding of the concept environment, where humans were not viewed as part of the environment nor was the environment understood as a complex web of interactions among people, man-made systems and natural ecosystems.

> *"The fact that toward the end of studies, student teachers' understandings of environment remained essentially basic, indicates the necessity to reorient teacher-education programs toward EE. The various ways in which*

students' perceived the relevance of environment to their teaching area are the starting points for this change" (Yavetz *et al.*, 2013 p. 354).

Also research conducted by Borga *et al.*, (2014), based on a study of 3299 secondary school teachers in Sweden found that although teachers were aware of the relevance of the three dimensions of sustainable development to various degrees, secondary school teachers in Sweden do not generally have a holistic understanding of sustainable development especially as it relates to the economic dimension. This study highlighted the need for further training in sustainable development, since more than 70% of teachers stated, they needed training in sustainable development (Borga *et al.*, 2014).

The most comprehensive overview of barriers or challenges regarding the reorienting of teacher education towards education for sustainability was articulated by a number of reports by members of the International Network of Teacher Education Institutions (UNESCO, 2005b, pp. 31-32), see Table 4.2.

Table 4.2 Challenges for Reorienting Teacher Education to Address Sustainability

Institutional Awareness, Support and Resources
Official national and provisional curriculum rarely mandate sustainability
Teacher certification guidelines do not mention sustainability
Lack of or inadequately trained professionals who are knowledgeable about ESD
Lack of or inadequate funding and material resources
Lack of or inadequate institutional climate that supports the creativity, innovation, and risk-taking necessary to support transformative efforts to reorient education to address sustainability
Lack of or inadequate reward for institutions or faculty members who under-take ESD programs
Prioritising Sustainability in the Educational Community
Lack of inadequate awareness of the importance of ESD
Lack of knowledge of ESD, complicated by the lack of access to in-service training related to ESD
Lack of support from the Ministers of Education
Reframing Education Systems and Structures
ESD is not part of ongoing educational reform
Prevalence of traditional disciplinary curriculum frameworks makes incorporating sustainability, which is transdisciplinary, arduous.
Establishing and Sustaining
ESD programs are often developed without local community participation or involvement of other stakeholders leaving the program without local context or relevance
Lack of coordination of efforts between ministers of environment, education, health, agriculture, etc.

Source UNESCO (2005b, pp. 31-32).

AEGEE (2013) (*Association des Etats Généraux des Etudiants de l'Europe*) Europe's biggest interdisciplinary student organisation, urged the relevant authorities to integrate education for sustainable development into teacher education and training, equipping current and future teaching staff with the required competences for delivering education for sustainable development, and preparing and supporting them

for the shift towards integrated complexity studies rather than the current model of separated disciplines. With the aim of enhancing teachers' knowledge of sustainable development, Hyseni Spahiu and Lindemann-Matthies (2015) have posited, continuous teacher education is a key aspect in terms of obtaining greater education for sustainable development effectiveness.

4.2.2 Business and Management Education

A college education has historically been one of the key approaches to preparing concerned and involved citizens (McBee, 1980) while, Pascarella *et al.*, (1988) have indicated, fostering moral and social responsibility in addition to intellectual development have long been goals of a college education. Also, critical management theorists have strongly questioned traditional theory and practice and the role of business education in promoting the values of the dominant social paradigm (Alvesson and Deetz, 2000; Orsato and Clegg, 1999)[22].

In the article, *Shifting paradigms for sustainable development: Implications for management theory and research*, Gladwin, *et al.*, (1995) questioned, if the shared unwritten rules of management theory reflect an overarching anthropocentric paradigm. Gladwin *et al.*, (1995) have posited, modern management theory is constricted by a fractured epistemology, which separates humanity from nature and truth from morality.

Colin Mayer (2013) Professor of Management Studies at the University of Oxford has posited, the prevailing view in business schools has been that a primary function of corporations is to further the interests of their shareholders. Similarly, Professor Craig Smith of Insead has stated:

> "*Students come in with a more rounded view of what managers are supposed to do but when they get out, they think it's all about maximising shareholder value*" (Smith, 2013 p. 12).

AdomBent *et al.*, (2014) have posited, the transformation of management education to meet the increasing societal demands for responsible business has been reinforced in light of the current economic situation.

[22] Criticisms of Business and Management Education, Table 10, Appendix E, p. 278.

Parker (2011) has posited, compared to the traditional focus on economic development and financial management, social and environmental accounting research is still marginalised by the majority of accounting researchers. Extending this view Sundin and Wainwright (2010) have emphasised, an important reason for the slow change in accounting education for sustainable development is the lack of professional accreditation requirements for knowledge in sustainability.

AdomBent *et al.,* (2014), Godemann, *et al.,* (2011) and Waddock *et al.,* (2011) support the view that business and management education should be more reflective of sustainability issues. The UN PRME (2008)[23] has indicated that business and management education should embody the Principles for Responsible Management Education The United Nations' Principles for Responsible Management Education (PRME) is:

> *"A global call to embed business education in international values such as those portrayed in the Global Compact Framework on Human Rights, Labour, Anti-Corruption and the Environment. This initiative is an urgent call to modify business education in light of changing ideas about corporate citizenship, corporate social responsibility, and sustainability. It aims to provide the framework required to adapt management education to the new after-crisis realities- in terms of curriculum, research, and learning methodologies"* (Alcaraz and Thiruvattal, 2010 p. 542).

As articulated by Alcaraz and Thiruvattal (2010):

> *"Sustainability has not yet become embedded in the mainstream of business related education"* (Alcaraz and Thiruvattal, 2010, p. 542).

Nelson (2014 p. 473) has stated, "*Through education, interdisciplinary collaboration, research and community and industry engagement, sustainability can become firmly established within the existing value structure of business schools*". Sahadath (2010) and Gareis (2010) have posited, the change to embedding education for sustainable development will require educational leaders to commit to a change agenda.

[23] Principles of Responsible Management Education, Appendix K, p. 303.

4.2.3 Civic Social Political Education Barriers

Bryan and Bracken (2011) have posited, the post-primary school system in Ireland is still generally characterised as being examination based, with a strong emphasis on academic achievement and competitive entry to third level education (commonly known as, 'the points race'). The NCCA (2010b) have also outlined, the extensive use of traditional approaches to teaching in Ireland may be a consequence of the strong focus on examinations in the Irish educational system (NCCA, 2010b).

In Ireland within the formal educational system at the post primary level, the Civic Social and Political Educational Programme (CSPE) is the only educational programme which specifically focuses on sustainable development (National Council for Curriculum and Assessment, 2014). Barriers relevant to the CSPE programme include issues relating to the CSPE curriculum (Jeffers, 2008), time table allocation (NCCA, 2010b) and lack of teacher development (Redmond and Butler, 2003).

Jeffers (2008) has criticised the CSPE syllabus for being too safe, where the key concept of power is an omission. Jeffers (2008) also noted that there is a lack of cross-curricular work in schools and argued that this is primarily a cultural issue (e.g. relating to the strong focus on the Junior Certificate Examination in general) that needs to be addressed.

It is specified in the syllabus that one class period per week should be allocated to CSPE during first, second and third year (NCCA, 2011b). Based on research conducted with student-teachers of CSPE, Jeffers and O'Connor (2008) found that one class per week is insufficient for students and teachers to engage in meaningful teaching and learning, *Trócaire* also support this view (NCCA, 2011a). One class allocation also serves to marginalise the subject and was a major source of frustration among interested students and teachers (Jeffers and O'Connor, 2008).

According to Murphy (2008) and Redmond and Butler (2003), the marginalisation of the CSPE programme is further compounded by a lack of initial and on-going teacher development, and the 'uninvited guest' of CSPE on many teachers' timetables which has resulted in high teacher turnover in this subject area.

The State Examinations Commission (2009) has posited, CSPE differs from other

Junior Certificate subjects in two important respects, since, it is examined using a common level examination paper (which accounts for 40% of the total marks) plus a Report on an Action Project (RAP) (which accounts for 60% of the total marks). From research conducted on the RAP, Jeffers (2008) emphasised, a minimalist approach is usually adopted, where Jeffers (2008) has stated:

> *"The trend towards having visiting speakers and fundraising may be indicative of a tendency to adopt a safe minimalist approach rather than a creative developmental one"* (Jeffers, 2008, p. 15).

Similarly, the Chief Examiner's report on the 2009 CSPE examinations and project work (State Examinations Commission, 2009) noted, while some candidates undertook individual action projects with great enthusiasm and success, the most popular type of action project undertaken, as in previous years, was the single action project completed by an entire class.

The OECD (2009b) indicated, the low average number of continuing professional development days attended by Irish teachers at lower-secondary level found in the Teaching and Learning International Survey programme (TALIS), suggested that access to and participation in appropriate courses for CSPE teachers should be closely monitored to ensure teachers are adequately equipped to teach the subject. TALIS also suggested, consideration might also be given to addressing these needs by providing quality Internet-based courses (OECD, 2009b).

4.3 Pedagogic Norms of Disciplinarity

Influenced by the dominant social paradigm, according to Chettiparamab (2007), Selby (2006) and Arum (2004), subject disciplinarity is a strong education for sustainable development barrier. The term discipline originates from the Latin word *disciplina* (instruction), from the root *discere* (to learn). According to Arum (2004), discipline has been used since the middle ages to represent a way of ordering knowledge for teaching and learning.

Selby (2006) has posited, disciplines form the organising framework in higher education, as is reflected in the structures of faculties and schools. Whilst, Chettiparamab (2007) has outlined, externally disciplines maintain rigor and thoroughness and provide knowledge necessary for society and the labour market.

Internally, disciplines provide academics with a framework for their professional engagement, identity and advancement and perpetuate disciplinary intellectual paradigms (Kuhn, 1962).

Chettiparamab (2007) has also suggested, deep engagement with a discipline can limit reflexivity, which can result in a lack of engagement with real life problems, where critical questioning may be suppressed. Littledyke and Manolas (2011) have posited, the roots of subject disciplinarity can be trace back to epistemology and ideology which consequently influence pedagogy.

Table 4.3 highlights different educational approaches which are supportive and unsupportive of education for sustainable development. Table 4.3 shows the link between epistemology, ideology and pedagogy as it relates to education for sustainable development.

Table 4.3 Summary of the Link between Epistemology, Ideology and Pedagogy relevant to ESD

	Unsupportive of ESD	**Supportive of ESD**
Epistemology	Embodies a positivist epistemology: where the approach to knowledge results in a *fragmented, subject dominated curriculum* (Eagen and Orr, 1992)	Embodies a post-positivist epistemology: where knowledge is constructed in a social context, which influences that knowledge (Medawar, 1979; Kuhn, 1970), emphasising *interdisciplinary study and knowledge connectivity*
Ideology	**Instrumental**	**Reconstructivist**
Focus	Improving the efficiency of existing organizations and structures (Oliver, 1982)	Emphasises education as a process of social change, which is central to ESD (Littledyke and Manolas, 2011).
Dominance	Instrumental ideology is dominant and is not supportive of ESD (Littledyke and Manolas, 2011)	Reconstructivist ideology is much less dominant
Curriculum is shaped by	The 'objectives' model of curriculum planning (Littledyke and Manolas, 2011; Hirst 1974)	The 'process model' of curriculum planning (Littledyke and Manolas, 2011; Blenkin and Kelly, 1987)
Influence on pedagogy	*Knowledge centered*: transmitted through instruction (Lawton, 1973) Teaching as a *transmission process* and the learner as recipient of knowledge (Littledyke and Manolas, 2011)	*Learner centered*: teachers are facilitator of the learning process (experiential learning). With cognitive and affective integration. The learner actively interacts with the curriculum in order to construct meaningful understanding (Littledyke and Manolas, 2011)
Impact	Maintaining the status quo	Challenging the status quo

Source Adapted from different sources by the Author (2016)

Within the context of the pedagogic norms of disciplinarity a positivist epistemology is dominant, resulting in a subject dominant, fragmented curriculum (Eagen and Orr, 1992). This approach embodies an 'objectives' model of curriculum planning (Littledyke and Manolas, 2011; Hirst, 1974) that is knowledge centered, utilising a

transmission through instruction process (Lawton 1973) where the learner is a recipient of knowledge (Littledyke and Manolas, 2011).

Re-constructivist ideology sees education as a process of social change, embodying a process (as opposed to objectives) model of curriculum planning (Littledyke and Manolas, 2011; Blenkin and Kelly, 1987), which is learner (as opposed to knowledge) centered. Utilising a process model of curriculum planning the teacher or lecturer is seen as a facilitator (as opposed to a transmitter) of the learning process.

This re-constructivist ideology is important since education for sustainable development is interdisciplinary. As stated by Klein (1990 p. 11), *"All interdisciplinary activities are rooted in the ideas of unity and synthesis, evoking a common epistemology of convergence"*. If the embodiment of education for sustainable development within education is to be realised, the pedagogic norms of disciplinarity need to be challenged (Tilbury and Wortman, 2004).

When considering epistemology, ideology and pedagogy, this section highlighted the dominance of subject disciplinarity and emphasised the importance of interdisciplinarity in terms of advancing education for sustainable development.

4.4 The Challenge of Interdisciplinarity

The challenge of interdisciplinarity is explored in this section. Klein and Newell (1997) have defined interdisciplinarity as:

> *"A process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with adequately by a single discipline or profession"* (Klein and Newell, 1997, p. 393).

Moving towards an increased emphasis on sustainability is a profound challenge to all systems of education, especially in higher education (HE) (Aktas, 2015). According to Aktas (2015), "*A viable way to increase the role of sustainability in higher education is to foster interdisciplinary research and teaching*", (Aktas, 2015, p. 354). Similarly, Klein (2006) has posited, interdisciplinarity is the key to universities rethinking their purposes and practices at a fundamental level.

> *"Ultimately, interdisciplinary raises the most fundamental question of all. What is the purpose of education? In its highest form, interdisciplinarity is not a finite set of skills, a simple add-on, or an adjustment in the schedule. The*

> *ultimate goal is to reconstruct what is taught and how it is taught"* (Klein, 2006, p. 16).

Importantly, the respected biologist and Father of sociobiology and biodiversity, Edward Osborne Wilson advocated, unity of knowledge when he stated:

> *"The greatest enterprise has always been and will always be the attempted linkage of the sciences and humanities" ... "the ongoing fragmentation of knowledge and resulting chaos in philosophy are not reflections of the real world but artifacts of scholarship"* (Wilson, 1999, pp. 5-6).

As posited by Meyer *et al.,* (2015) becoming a sustainability scientist requires specialised training that addresses the complex boundaries implicit in sustainability science approaches to solving social-ecological system challenges.

Spangenberg (2011) has distinguished between science for sustainability (mono-disciplinary) and science of sustainability (inter- and transdisciplinary) and suggested inter and transdisciplinary research has received much less attention. Whilst, Lang *et al.,* (2012) have emphasised, there is an ever increasing call for transdisciplinary approaches to tackle fundamental societal challenges, especially those related to sustainability. Research completed by Biberhofer and Rammel, (2017) has shown the potential benefits of transdisciplinary learning and teaching when identifying real answers to sustainability challenges.

4.5 Curriculum Overload

In this section focus is directed to the educational barriers of curriculum overload. Overload has been defined as too great a load or an excessive load (Random House, 2009; Collins, 1995).

Research conducted by the National Council for Curriculum and Assessment in Ireland showed that primary teachers in Ireland have insufficient time to fully implement curriculum subjects or to address all subject objectives (National Council for Curriculum and Assessment 2005; 2008). Teachers and principals in Ireland also highlighted the challenges associated with: (1) meeting the growing range of children's learning needs in larger classes and (2) the lack of time and difficulties in assessing pupils' progress (National Council for Curriculum and Assessment, 2010). According to O' Brien (2016), in response to the proposal to introduce new religion, beliefs and ethics classes at the primary educational level, the Irish National Teachers'

Organisation (INTO) was adamant that, there was no room in the current curriculum for additional content or subjects.

In Ireland since 1999 to date, the primary school curriculum is comprised of 11 curriculum subjects, where the critical value of each subject is emphasised. Fifty-two percent of total teaching time (10.5 of 20 hours weekly) is directed towards English, *Gaeilge* and Mathematics, the remaining eight subjects (History, Geography, Science, Physical Education, Visual Arts, Music, Drama and Social, Personal and Health Education) compete for the remaining 9.5 hours (48%) of teaching time.

It is relevant to highlight that the remaining 9.5 hours includes two hours accorded for discretionary curriculum time, when these hours are removed, only 7.5 hours are provided for the remaining eight subjects (National Council for Curriculum and Assessment, 2010).

The National Council for Curriculum and Assessment (2010) also indicated, initiatives outside the core curriculum are also causing curriculum overload (initiatives include child protection, Green Schools and various fitness programmes and sports).

In European counties content-heavy and overloaded curricula, which leave little time for thoughtful discussion and critical processes or innovative approaches are widespread in Northern Europe/Scandinavian countries, and particularly in Western, Southern, Central and Eastern Europe (Banaji, *et al.*, 2013).

Whilst, Jucker (2011) has highlighted, results of recent research exploring the implementation of education for sustainable development at the lower secondary education level in three countries (Germany, Mexico and Romania), found that education for sustainable development continues to exist as (hyper-) specialised add on knowledge in an overcrowded curriculum.

4.6 Resistance to Change

According to Vales (2007), resistance to change is one of the main obstacles to implementing organisational change. Similarly, as indicated by Chen and Komph 2012), the main reason curriculum change is a failure or only accomplishes surface change is due to teacher resistance to the change. One of many barriers relevant to both individual and organisational change is a failure to recognise the need for change (Heifetz and Linsky, 2002). If educators do not understand and appreciate the need for change, their interest in maintaining the status quo will take precedence over their willingness to accept change (Greenberg and Baron, 2000).

Both Fullan (2001) and Greenberg and Baron (2000) support the view that, habit, past experience, a sense of security from doing things in familiar ways, disrupting well-established professional and instructional patterns can also result in a fear of the unknown. Rather than working to develop new skills/strategies, it is simply easier to continue teaching in the same ways (Greenberg and Baron, 2000).

In Ireland, the recommendation to introduce a component of school-based assessment in the new Junior Cycle Student Award, was resisted by teachers through their unions. Humphreys (2015) indicated, resistance to junior cycle reform has resulted in two one day strikes by the Association of Secondary Teachers Ireland (ASTI) and the Teacher's Union of Ireland (TUI) which together represent 27,000 post-primary teachers in Ireland. Although, the then Minister of Education Jan O' Sullivan stated, the second strike day was disproportionate and unnecessary, teachers unions outlined, the second strike day had conveyed to the Minister the strength of opposition to plans to have teachers assess their own students for examination purposes (Humphreys, 2015).

4.7 Theoretical and Conceptual Frameworks relevant to this study

This section outlines the theoretical framework which provided insight and explanation for the development of a new conceptual framework for sustainability. This section highlights how Bourdieu's social theory, complex adaptive systems theory and orthodox economic theory contribute to understanding sustainability.

Initially this research identified an important research question, what is the role of Education for Sustainable Development within contemporary education in Ireland and

how can this role be developed? A prerequisite to addressing this question necessitated understanding sustainable development itself. Having completed a review of the relevant literature, it became evident that clarity regarding the interrelationship of the factors that shape development was ambiguous in the literature. Consequently, this led to the formation of a second research question which asked, what are the challenges relevant to achieving sustainability and how can these challenges be more clearly understood? In terms of answering this second question from a macro perspective, this research aims to advance the understanding of sustainable development and education for sustainable development, through the development of a conceptual framework for sustainability. Detailed later in this section, the conceptual framework was developed through synthesising the interdependence of the components relevant to achieving sustainability.

Overall, the reality of our time is that the present economic development model is unsustainable. More specifically, humanity has moved beyond one planet living, where the present development path is now in geological overshoot, resulting in continuous and increasing environmental degradation and wealth inequality. Within this context achieving sustainable development is now an urgent global strategic goal for mankind. It is now imperative that sustainable development is strategically prioritised by economic, institutional, political and educational leaders.

A key challenge in a transition to a sustainable path is unearthing and acknowledging the historically developed paradigm, which holds the present development path steadfast. Presently, the economic component of sustainable development is given precedence over social and environmental considerations. As highlighted in Section 2.7.1 orthodox economic theory has remained essentially unchanged for the last 300 years. Importantly, the dominance of economic pursuit which embodies a neoclassical shareholder short term perspective is central to the present dominant social paradigm. Of concern, the formidable influence of the dominant social paradigm (Section 4.1) on development is usually ignored in much of the sustainable development and education for sustainable development literature.

Bourdieu's social theory brings clarity to the strength of the dominant social paradigm, since it is the reproductive tendencies of education, society and culture which have created and sustains unsustainable practices (Section 2.5). As emphasised

by Bourdieu's social theory, our unsustainable habitus is effectively the product of total human history where the environment is viewed as a resource and not a living organism whose balance must be maintained for our survival. It is because of the habitus that individuals are already predisposed to act in certain ways, which are usually left unquestioned. This perceptive is also supported by critical realism which proposes that we will only be able to understand – and so change the social world if we identify the structures at work that generate these events and discourses. Consequently, addressing the deeply rooted assumptions of the dominant social paradigm is a prerequisite in the transition towards sustainability.

The dominant social paradigm has also impacted ontology, although education is considered to be fundamental to realising sustainability, education itself is a strong barrier to realising sustainability, since education has historically embraced subject disciplinarity. The dominance of knowledge fragmentation is reinforced institutionally through the structure of departments and schools especially within higher education institutions. From a philosophical perspective, education must move away from an instrumental ideology and embrace a reconstructivist ideology. Fundamental to effective education for sustainable development is a shift from the dominant epistemology of positivism, which generally emphasises knowledge fragmentation, to a post-positivist epistemology, where the emphasis is on knowledge connectivity and interdisciplinary study. Overall, if education for sustainable development is to be effective, the complexity of sustainable development must become a central focus of education. Developing environmental literacy is now a strategic requirement, where the embodiment of interdisciplinary learning into formal education is a prerequisite in the shift to increasing awareness and understanding of sustainable development.

The complex nature of sustainable development makes transitioning to a sustainable path all the more challenging. Since complexity is inherent in the concept of sustainable development, a fundamental prerequisite in the movement towards sustainability is therefore understands this complexity. From a theoretical perspective complex adaptive systems theory outlines the interconnections and interdependency of both ecological and human social systems, which is often ignored (Section 2.4). Importantly, the simplification of complex issues is irresponsible and misrepresents

reality. Essentially, accurate understanding of sustainable development must be grounded in complex adaptive systems epistemology. Therefore, understanding sustainability requires understanding the interdependency of the environmental, economic, social, institutional (big business and banks) and political (world governments) components of sustainable development. Consequently, in terms of answering both research questions it is necessary to give consideration to these five perspectives.

More specifically, in terms of identifying the challenges relevant to achieving sustainability and how these challenges can be more clearly understood, it is necessary to capture the key global issues and actions required from the ecological, social, economic, institutional and political perspectives.

As referred to in Section 2.4, there is a tendency to overlook the multidisciplinary and complex nature of sustainability. Outlined in Figure 4.1 p. 76, the inside of the framework captures the interconnectivity of the components of sustainable development and identifies the Key Issues and Required Actions needed in the transition from the Dominant Social Paradigm (Section 4.1) towards the Sustain-centric Paradigm (Section 2.6).

The inside of the conceptual framework is made up of three columns which are interconnected, indicated by arrows pointing from left to right. All arrows connect the internal columns with the external structure of the conceptual framework, which converge into increasing awareness and knowledge of sustainable development, thereby contributing to a shift towards a sustain-centric paradigm. The first column of the conceptual framework for sustainability lists the five components under each other, each component is then linked to the global issues and actions required to address that component. The components listed in the conceptual framework include:

> **The Ecological (Environmental Protection) component; *Key issues:*** climate change, ecosystem decline and resource overuse (Sections 2.3.3 and 2.3.1) which have been influenced by the DSP (Section 4.1). Required action includes: move to a low carbon society, the need to embody the green economy and comply with COP 21 (Section 2.7.2).
>
> **The Social/Cultural (Social Well Being) component; *Key issues:*** poverty, inequality, illiteracy, children not in school and water stress (Sections 2.3.2, 3.1.1 and 3.1.2), which have been influenced by the DSP (Section 4.1). ***Required action:*** implementing the Sustainable Development Goals (SDGs) (Section 3.1.4).

The Economic Development component; *Key issues:* dominance of economic short term goals, neoclassical theory which is shareholder focused, with an emphasis on a win /lose perspective (Section 2.7.1), shaped by the DSP (Section 4.1). ***Required action:*** addressing the Triple bottom line, the implementation of fair value chains, the adoption of stakeholder theory in corporate strategy, embodying a positive mind-set win/ win perspective and shifting to a green economy (Section 2.7.2).

The Political (World Governments) component; *Key issues:* lack of political will regarding the millennium development goals (Section 3.1.3) (now replaced by the sustainable development goals) and the Kyoto protocol (now replaced by COP 21) also influenced by the DSP (Section 4.1). ***Required action:*** Governments and global institutions working together, facilitated by better regulation in terms of achieving the required global action relevant to the components of sustainable development.

The Institutional (Big Business including banks) component; *Key issues:* wealth concentration, weak contribution to ecological and social wellbeing (Section 2.3.2), influenced historically and presently by the DSP (Section 4.1). ***Required action:*** move away from the neoclassical approach, and proactively contributing to the achievement of the sustainable development goals (Section 3.1.4).

All the required actions feed into the external framework, which is concerned with increasing awareness and knowledge of sustainable development, regarding the five components and associated issues and actions required, thereby enabling a shift from the dominant social paradigm towards the sustain-centric paradigm (Figure 4.1). It is emphasised in the framework that the shift towards sustainability will not occur without political and institutional acceptance and commitment to implementing the required actions, utilising integrative systems of management, enabled by institutional governance and global partnership (external framework, Figure 4.1)[24].

[24] This Conceptual Framework for Sustainability was published by the Royal Irish Academy in the *Irish Studies in International Affairs* in 2016. This article is included in Appendix O, p. 308.

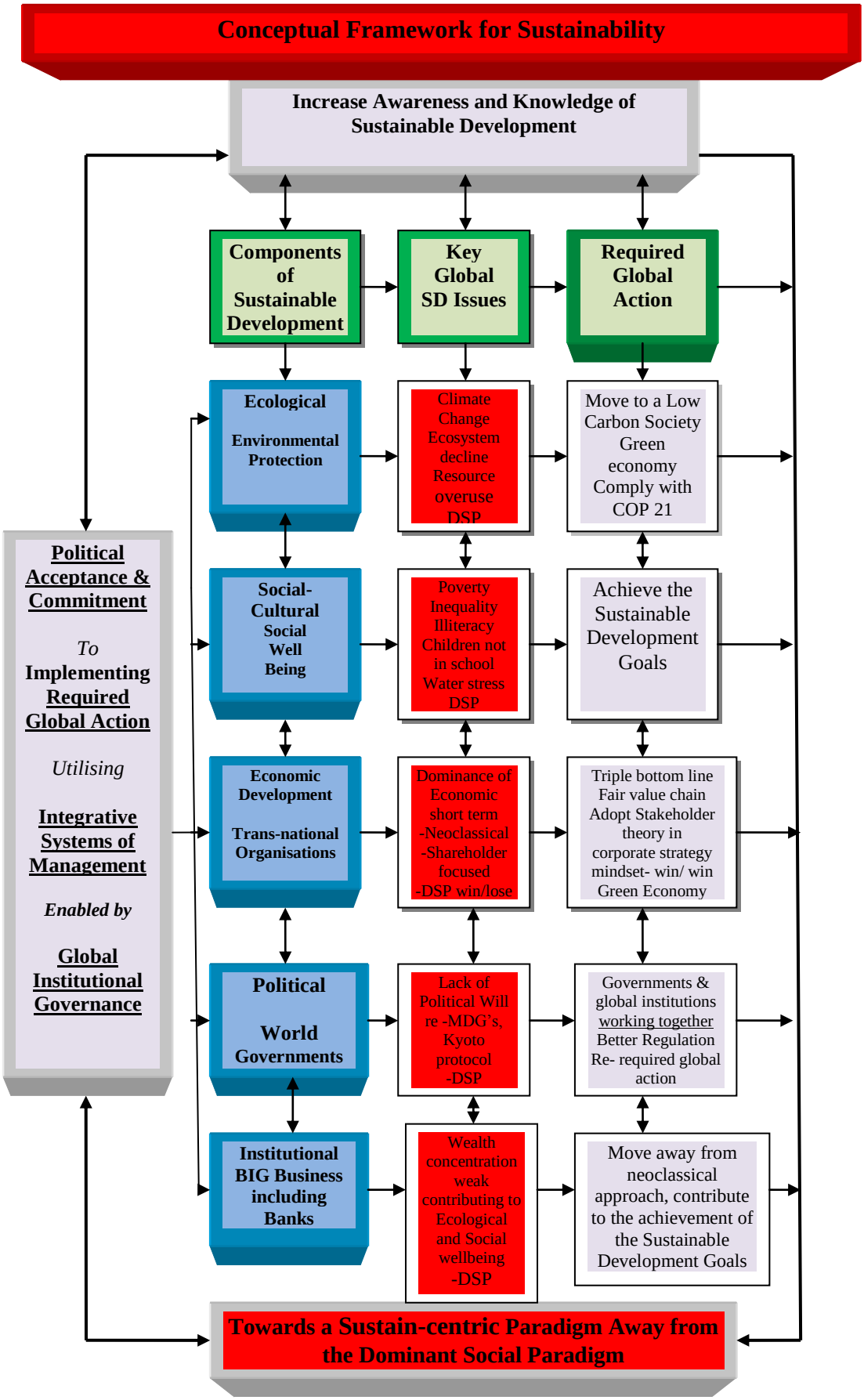


Figure 4.1 ©
Source Foley *et al.*, (2016)

The first research question of this study asked, what is the role of Education for Sustainable Development within contemporary education in Ireland and how can this role be developed? In terms of answering this question from a micro perspective this research aims to explore education for sustainable development barriers and opportunities relevant to the formal education system in Ireland.

In relation to exploring the role of Education for Sustainable Development within contemporary education in Ireland and how this role can be developed, the conceptual framework for sustainability guided and enabled the researcher to capture the national issues and actions required associated with key education for sustainable development programmes from the ecological, social, economic, institutional and political perspectives (Chapter 7, Section 8.4 and Figures 8.1-8.3).

As referred to earlier in this section, the second research question asked, what are the challenges relevant to achieving sustainability and how can these challenges be more clearly understood? In terms of answering this question from a macro perspective, this research aims to advance the understanding of sustainable development and education for sustainable development, through the development of a conceptual framework for sustainability.

Research conducted with the expert panel confirmed the relevance of key challenges and actions required in the transition towards sustainability (Section 7.14) thereby contributing to the validation of the conceptual framework for sustainability.

4.8 Summary

This chapter addressed the fourth research objective through exploring key barriers preventing the implementation of education for sustainable development. The chapter showed that the historically developed dominant social paradigm (DSP) is a strong education for sustainable development barrier. The strength of the DSP is maintained since the DSP is for the most part unquestioned and has influenced the development of other education for sustainable development barriers considered in this chapter. In addition to the dominant social paradigm, education was also highlighted as an education for sustainable development barrier. Given the predominance of knowledge fragmentation, the pedagogic norm of disciplinarity was highlighted as an important barrier to the integration of education for sustainable development into the

curriculum. Essentially, all the components of sustainable development are interrelated consequently; interdisciplinary learning is a prerequisite to effective education for sustainable development. This chapter also highlighted that a transition to interdisciplinary learning is a significant challenge, which is related to the dominance of subject disciplinarity.

Other education for sustainable development barriers considered in this chapter included curriculum overload and resistance to change within the educational sector. The integration of education for sustainable development is particularly important within teacher education and business and management education, where resistance to change is prevalent. The chapter concluded by outlining the theoretical and conceptual frameworks relevant to this study, where Bourdieu's social theory, complex adaptive systems theory and orthodox economic theory provided insight into the development of a conceptual framework for sustainable development (Figure 4.1) which was utilised to guide the primary research process.

CHAPTER FIVE
SUSTAINABLE DEVELOPMENT AND EDUCATION FOR SUSTAINABLE DEVELOPMENT WITHIN THE IRISH CONTEXT

5.0 Introduction

From a micro perspective this research aims to explore education for sustainable development barriers and opportunities relevant to the formal education system in Ireland. In terms of contributing to this second research aim, this chapter addresses the third research objective which aimed to explore sustainable development and education for sustainable development within the Irish context, with particular emphasis on the role of government policy on the provision of education for sustainable development within the formal educational system.

Within this context contributions of the National Economic and Social Council (NESC) and the Department of Environment, Community and Local Government will be advanced in the sub sections of this chapter. Attention will also be directed towards the policy framework relevant to education for sustainable development in Ireland**.** Here particular consideration will be directed towards the Department of Education and Skills, *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland, 2014-2020* which was published in July 2014. The chapter will conclude by considering education for sustainable development provision within the formal education system in Ireland.

5.1 Political Context shaping Sustainable Development and Education for Sustainable Development in Ireland

This section provides an insight into the key strategies and organisations that have influenced the context and development of sustainable development and education for sustainable development in Ireland. The work of many Irish organisations have shaped the political and policy framework influencing sustainable development and education for Sustainable Development in Ireland, including the Irish Research Council, Comhar, the National Economic and Social Council (NESC) the Department of Environment, Community and Local Government and the Department of Education and Skills. Key policy, publications and developments relevant to sustainable development in Ireland are summarised in Table 5.1.

Table 5.1 Policy, Publications and Developments relevant to Sustainable Development in Ireland

1990	*Environmental Action Programme* was adopted by the Irish Government
1997	*Sustainable Development: Strategy for Ireland* ((Department of the Environment, 1997).
2002	*Making Ireland 's Development Sustainable: Review, Assessment and Future Action*[25] (Department of the Environment and Local Government, 2002).
2010	*Creating Green Infrastructure for Ireland: Enhancing Natural Capital for Human Wellbeing* (Comhar , 2010).
February 2011	*Sustainability Assessment (SA) A methodological proposal for Ireland* (Comhar , 2011) (the previous Sustainable Development Council).
June 2012	*Our Sustainable Future, a framework for Sustainable Development for Ireland* (Department of Environment, Community and Local Government, 2012).
December 2012	*Ireland and the Climate Change Challenge: Connecting 'How Much' with 'How To' 2012* (National Economic and Social Council, 2012).
June 2013	*Greening the Economy: Challenges and Possibilities for Integrating Sustainability into Core Government Policy*, National Economic and Social Council (NESC).
June 2013	Irish Presidency secures agreement on the European Union's 7th Environmental Action Programme (EAP)[26] (Department of Housing, Planning, Community and Local Government, 2013).
2013	*Progress Report on Growth and Employment in the Green Economy in Ireland* (Department of Jobs Enterprise and Innovation, 2013).
January 2015	*Climate Action and Low Carbon Development Bill 2015* (Department of Environment, Community and Local Government, 2015).

Source Adapted from different sources by the Author (2015)

5.1.1 Sustainable Development: A Strategy for Ireland

In 1997 the inaugural National Sustainable Development Strategy was published (Hogan, 2012). This strategy titled, *Sustainable Development: A Strategy for Ireland* recognised that:

> *"Progress in solving environmental problems depends fundamentally on the values, attitudes and behaviours of individuals in relation to their environment"* (Department of the Environment, 1997, p. 164).

This strategy also highlighted, the formal education system:

> *"Has a crucial role in prompting environmental awareness"…"Environmental education can provide a sound basis for sustainable development and should be integrated into all educational systems. Environmental education can also be effectively implemented through integrating environmental concepts, skills and strategies throughout the existing curriculum" …"Consideration will be given to appropriate measures relating to curriculum, teacher training (both pre- and in-service)"… In particular, educational boards and schools will be directed by the Minister of Education to include in their educational Plans and School Plans,*

[25] *Making Ireland's Development Sustainable Review* concluded: in Ireland more real integration of environmental considerations into the activities of the economic sectors and into individual life styles was required. This review also recognised the growing pressure on the environment, due to the increasing volumes of waste being generated, growing energy consumption, rising greenhouse gas emissions and threats to water quality, biodiversity and natural resources.

[26] The 7th Environment Action Programme: *Living well, within the limits of our planet*, builds on the achievements of previous programmes which have been a key vehicle for advancing environmental improvements in the European Union.

> *required by the new Education Bill, an environmental policy statement in relation to the content of educational programmes"* (Department of the Environment, 1997 p. 165-166) .

The key contribution of this inaugural National Sustainable Development Strategy was the introduction of *An Taisce's* Green-Schools award scheme in 1997.

5.1.2 Irish Research Council

Professor Orla Feely (Chair) and Dr. Eucharia Meehan (Director), highlighted, the Irish Research Council plays a distinctive role in the research ecosystem (Feely and Meehan, 2014). The Irish Research Council is a sub-board of the Higher Educational Authority. The mission of the Irish Research Council is to enable and sustain a vibrant research community in Ireland. The Irish Research Council was established in 2012, through the merging of the Irish Research Council for Humanities and Social Sciences (IRCHSS) and the Irish Research Council for Science, Engineering and Technology (IRCSET). This Council also act as a policy advisory body on graduate education and research nationally and internationally. This Council believes in the importance of research and scholarship for all aspects of cultural, economic and societal development (Irish Research Council, 2012).

According to Mr. Damien English (2014), the then Minister of State for Skills, Research and Innovation, one of the Irish Research Council's principal mandates is to fund excellent research across all disciplines and in doing so, to enhance Ireland's international reputation as a centre for research and learning. In line with this aim, in 2014 a total of 1,146 post graduates scholars and 272 postdoctoral fellows were funded (English, 2014). In addition, Professor Orla Feely (Chair) and Dr. Eucharia Meehan (Director) highlighted that the Irish Research Council, empower creative and innovative people who can translate new ideas and knowledge into benefits for the economy and for society, both in Ireland and globally (Feely and Meehan, 2014).

In 2015, the Council launched a pilot Research for Policy and Society Programme. This programme aimed to build partnerships with government departments and agencies in order to enable peer-reviewed research/initiatives to underpin policy decisions, and to assist cultural and societal development (Irish Research Council, 2015b). In 2016 the Irish Research Council (2015a) aimed to embed interdisciplinary thinking in the Irish research system at all levels.

5.1.3 Comhar the Sustainable Development Council

Comhar, the Sustainable Development Council was established in 1999 by the Minister for the Environment, Heritage and Local Government as the forum for national consultation and dialogue on all issues relating to sustainable development (National Economic and Social Council, 2012). From 1999 to 2012 Comhar's mandate was to: (1) advance the national agenda for sustainable development, (2) evaluate progress for achieving sustainable development in Ireland, (3) research and make recommendations tailored to national conditions, on specific approaches to, or instruments for sustainable development, (4) advise on raising public awareness of sustainable development and environmental issues, and encourage positive behaviour at individual, community and sectoral levels and (5) contribute to the formation of a national consensus on sustainable development. In January 2012 the sustainable development role performed by Comhar was integrated into the work of the National Economic and Social Council (NESC). According to the National Economic and Social Council (2012), the NESC have developed Comhar's work in a way that integrates sustainable development issues into its analysis of significant national challenges.

5.1.4 National Economic and Social Council (NESC)*: Ireland and the Climate Change Challenge: Connecting 'How Much' with 'How To'*

In December 2012 the National Economic and Social Council (NESC)[27] published an important document, *Ireland and the Climate Change Challenge: Connecting 'How Much' with 'How To'*. Core to this publication is the vision that Ireland will be a carbon-neutral society by 2050. In realising this vision, this report adopts a pragmatic approach involving simultaneous action along three tracks.

According to the National Economic and Social Council (2012), the Vision that Ireland will be a carbon-neutral society by 2050 will only be realised if this "*vision*" is, "*combined with action and learning. All three* (vision, action and learning) *are required to take us from the past to a better future*" (National Economic and Social

[27] The National Economic and Social Council (NESC) was established in 1973 and advises the *Taoiseach* (Prime Minister) on strategic policy issues relating to sustainable economic, social and environmental development in Ireland.

Council, 2012, p. 4). Ireland's vision for a carbon neutral society, the three track approach and the five strategic building blocks for achieving this vision are detailed in Table 5.2.

Table 5.2 Vision for Ireland in 2050: Ireland will be a Carbon-Neutral Society by 2050

Ireland is a carbon-neutral society, based on an approach to economic development that is socially and environmentally sustainable. We have a vibrant enterprise sector developing green jobs and economic opportunities. Our secure energy system draws heavily on renewable electricity. As a highly energy-efficient and resilient society, we use less energy and fewer resources in how we live, work and travel, across the public sector. We enjoy the benefits of a low-carbon environment, enhanced for future generations, in terms of better public health and quality of life.
Three- Track Approach (Achieving the Vision for Ireland 2050 emphasises the need for action on many fronts)
Track 1: Strategic and Institutional- including Ireland's engagement with the UN and EU climate policy processes, new institutional structures and five strategic building blocks (see below); **Track 2: Exploration and Experimentation**- to consciously build policy and organisational networks in specific areas and push these to ever greater decarbonisation; and **Track 3: Design and Implementation-** focuses on where early action makes sense and is feasible, and measured to meet Ireland's 2020 targets.
Five Strategic Building Blocks to achieving carbon neutrality by 2050 we must act now to create: 1. An energy system built on wind and other renewables, using a smart grid and integrated into a clean EU energy system; 2. An energy-efficient society that uses renewable forms of energy for heating; 3. A sustainable transport system which serves economic, social and environmental needs; 4. A world class agri-food sector working with a carbon –neutral system of agriculture, forestry and land use: and 5. An approach to resource management that provides a competitive and comparative advantage in international trade and factor flows.

Source (National Economic and Social Council, 2012 p. 4)

5.1.5 Our Sustainable Future, a Framework for Sustainable Development for Ireland 2012- 2020

Our Sustainable Future, a Framework for Sustainable Development for Ireland was published by the Department of Environment, Community and Local Government in 2012. In this framework document *An Taoiseach* Enda Kenny stated *Our Sustainable Future:*

> *"Sets out a medium to long-term framework for advancing sustainable development and the green economy in Ireland*" (Kenny, 2012 p. 2).

This framework is designed to deliver an effective transition to an innovative, low carbon and resource efficient future. In the foreword of *Our Sustainable Future* in 2012, Phil Hogan, T.D. the then Minister for the Environment, Community and Local Government stated:

> *"Decoupling environmental degradation and resource consumption from economic and social development is an enduring challenge in Ireland as elsewhere and requires* a *paradigm shift in our approach to future development*"…"*We need a more developed "green economy" focus, achieving a more mutually supportive interface between environmental protection and economic development, while also*

> *ensuring that our approaches are socially sustainable*" (Hogan, 2012 foreword in *Our Sustainable Future, a Framework for Sustainable Development for Ireland 2012*).

Present social, economic and environmental indicators relevant to Ireland are highlighted in Table 2, Appendix N, p. 307.

In the foreword of *Our Sustainable Future* in 2012, Phil Hogan, T.D also outlined, education for sustainable development plays a critical role in strengthening the capacity of individuals, businesses and the government to make judgements and decisions that take account of environmental protection. Therefore, "*Education for sustainable development needs to be embedded at every level of the formal and informal education system"* (Department of Environment, Community and Local Government 2012, p. 77).

The implementation plan of *Our Sustainable Future, a Framework for Sustainable Development for Ireland 2012,* outlines 70 measures in terms of achieving our sustainable future. Measures relevant to communication, behavioural change and education for sustainable development included: the publication of *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland, 2014-2020* (led by the Department of Education and Skills), and encouraging behavioural change, (led by the Department of Environment Community and Local Government) (Department Education and Skills, 2014).

Measures relevant to research and innovation included, focused research on sustainable development (led by the Environmental Protection Agency) and postgraduate training (led by the Department of Education and Skills) (Department Education and Skills, 2014).

5.1.6 Climate Action and Low Carbon Development Bill 2015

The *Climate Action and Low Carbon Development Bill 2015,* published on the 19th January 2015, sets out the national objective of transitioning to a low carbon, climate resilient and environmentally sustainable economy in the period up to and including the year 2050. This Bill gives a solid statutory foundation to the institutional arrangements necessary to enable the State to pursue and achieve the national transition objective (Department of Environment, Community and Local Government 2015). More specifically, this bill is:

> *"An Act to provide for the approval of plans by the Government in relation to climate change for the purpose of pursuing the transition to a low carbon, climate resilient and environmentally sustainable economy; to establish a body to be known as … the National Expert Advisory Council on Climate Change; and to provide for matters connected therewith"* (*Climate Action and Low Carbon Development Bill, 2015* p. 3).

In addition, in terms of pursuing and achieving a low carbon transition, the *Climate Action and Low Carbon Development Bill 2015* states:

> *"(1) For the purpose of enabling the State to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050 (in this Act referred to as the "national transition objective") the Minister shall make and submit to the Government for approval—*
>
> *(a) a national mitigation plan, and*
>
> *(b) a national adaptation framework.*
>
> *(2) When considering a plan or framework, referred to in subsection (1), for approval, the Government shall endeavour to achieve the national transition objective within the period to which the objective relates and shall, in endeavouring to achieve that objective, ensure that such objective is achieved by the implementation of measures that are cost effective and shall, for that purpose, have regard to—*
>
> *(a) the ultimate objective specified in Article 2 of the United Nations Framework Convention on Climate Change done at New York on 9 May 1992 and any mitigation commitment entered into by the European Union in response or otherwise in relation to that objective,*
>
> *(b) any existing obligation of the State under the law of the European Union or any international agreement referred to in section 2, and*
>
> *(c) the most recent national greenhouse gas emissions inventory, and projection of future greenhouse gas emissions, prepared by the Agency* (*Climate Action and Low Carbon" Development Bill, 2015* p. 5-6).

The Department of Environment, Community and Local Government (2015) outlined that, each successive National Mitigation Plan will specify the policy measures that will be required to be adopted by each relevant Minister of the Government to reduce greenhouse gas emissions in their sectors and to enable a whole-of-Government approach towards achieving the National Transition Objective (Department of Environment, Community and Local Government, 2015).

Importantly, the Environmental Protection Agency (2014) have indicated, there is a significant risk that Ireland will not meet its 2020 EU targets even under the most ambitious emission reduction scenario. These projections show a cumulative distance to target of 1-17 Mt CO2eq for the period 2013-2020 with Ireland breaching its annual limits in 2016-2017.

5.2 Policy Framework for Education for Sustainable Development in Ireland

This section and additional sub sections detail the policy framework for education for sustainable development in Ireland. Important developments concerning the development of a policy framework relevant to education for sustainable development are explored in this section and summarised in Table 5.3.

Table 5.3 Publications, Strategy documents and Consultation Processes relevant to Education for Sustainable Development in Ireland

2007	Education For Sustainable development public consultation process organised by the then Department of Education and Science, completed by UNESCO.
2007 November	National Strategy on Education for Sustainable Development – Discussion paper prepared by UNESCO and presented at a National conference on Education for Sustainable Development held in Croke Park on 7 December 2007.
2011 Jan	National Strategy for Higher Education to 2030 .
2013(6/8/2013 to 27/9/2013)	Public consultation on the development of a National Strategy on Education for Sustainable Development in Ireland.
2013 Jan	National Survey of Third Level Students on Global Development.
2014 4th July	Publication of 'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland, 2014-2020.

Source Adapted from different sources by the Author (2015)

In November of 2007 the *Developing a National Strategy on Education for Sustainable Development – Discussion paper* was prepared to inform the development of a National Strategy for Education for Sustainable Development in Ireland as part of the UN Decade for Education for Sustainable Development (2005-2014). This discussion paper was presented at a national conference on education for sustainable development held in Croke Park on 7th of December 2007.

Although, a comprehensive education for sustainable development public consultation process was organised in 2007 by the Department of Education and Science and completed by UNESCO, in light of the changes that occurred since 2007 and the publication of *Our Common Future*, the then Minister for Education and Skills Ruairi Quinn, believed a new consultation process was necessary. A two-month public consultation process commenced in 2013 from the 6th of August to the 27th of September, nine months after this process, the first National Strategy for Education for Sustainable Development in Ireland was published on the 4th of July 2014.

5.2.1 Higher Education Authority (HEA): The National Strategy for Higher Education to 2030

The Higher Education Authority (HEA) is the statutory planning and development body for higher education and research in Ireland, and in that respect, it advises the Government and the Minister for Education and Science. The Higher Education - Research and Finance Section of the Department of Education and Skills is responsible for formulating and reviewing budgetary allocation for the provision of higher education in Ireland. The funding of the Universities, Institutes of Technology and other Higher Education Authority (HEA) designated institutions is made via the HEA, under the terms of the Higher Education Authority Act, 1972 (Higher Education Authority, 2012).

The policy and strategic planning work carried out by the HEA feeds into broader national and international education, teaching and learning and research areas. The *National Strategy for Higher Education to 2030,* published in 2011, sets out a number of key challenges for Ireland's Higher education sector in the coming years. The vision for higher education in Ireland states:

> *"In the decades ahead, higher education will play a central role in making Ireland a country recognised for innovation, competitive enterprise and continuing academic excellence, and an attractive place to live and work with a high quality of life, cultural vibrancy and inclusive social structures. At its heart, however, it will still be about people and ideas: higher education institutions will have a strong engagement with individual students, communities, society and enterprise, will give students a sense of Irish place and identity, and will equip them with the skills to play a strong part on the world stage; they will be the source of new ideas through excellent research.*
>
> *The nature of the learning community and the modes of teaching and learning will also change significantly over the coming years. These changes will be supported through innovative approaches to research-led teaching and learning, programme design, student assessment and a quality assurance system – all of which will reflect a new emphasis on nurturing creative and innovative minds. Irish higher education will have a strong international presence, attracting overseas students and academics, and across all disciplines it will engage in high-quality research that will distinguish Ireland internationally"* (Higher Education Authority, 2012 p. 3).

The HEA's Strategic Plan 2012 – 2016 accepts this ambitious vision for the future of Irish higher education and sets out the Higher Education Authority's intended contribution to underpin that vision with a clear roadmap regarding how this is going to be achieved (Higher Education Authority, 2012). *The Plan* seeks to ensure that the Higher Education Authority's own policy and planning, governance and operational arrangements are up to the task of leading this transformation (Higher Education

Authority, 2012). Although, no specific reference to education for sustainable development is made in the *National Strategy for Higher Education to 2030*, this strategy has outlined, higher education institutions should offer broad-based courses and more interdisciplinary learning opportunities for students in the first year of their undergraduate studies (Higher Education Authority, 2012 p. 18-21). This is important since, as highlighted in Section 4.5, *"a viable way to increase the role of sustainability in higher education is to foster interdisciplinary research and teaching*", (Aktas, 2015, p. 354).

The *National Strategy for Higher Education to 2030*, also outlined, focused research funding should be based on national priority-setting exercises. Such exercises should identify a number of thematic areas in which Ireland can excel, make its mark internationally and maximise economic and social return (Higher Education Authority, 2012 p. 18-21).

5.2.2 Department of Education and Skills: 'Education for Sustainability', National Strategy on Education for Sustainable Development in Ireland, 2014-2020

The Irish Department of Education and Skills is responsibility for education and training in Ireland. The mission of this Department is to enable learners to achieve their full potential and contribute to Ireland's economic, social and cultural development. Ireland's first national strategy on education for sustainable development was published on the 4th of July 2014, titled *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland, 2014-2020* (Department of Education and Skills, 2014).

Within an International context, this strategy was developed against a background of growing recognition regarding the importance of 'education' in achieving sustainable development. This strategy also emerged from a specific commitment in *Our Sustainable Future* and from Ireland's obligation to produce a national strategy on education for sustainable development as part of the overall Decade of Education for Sustainable Development (Department of Education and Skills, 2014).

The main objective of *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland, 2014-2020* is to:

> *"Ensure that education contributes to sustainable development by equipping learners with the relevant knowledge (the 'what'), the key dispositions and skills (the 'how') and the values (the 'why') that will motivate and empower them throughout their lives to become informed active citizens who take action for a more sustainable future"* (Department of Education and Skills, 2014, p. 4).

This strategy emphasises the need for education for sustainable development to be an agent for positive change. Education for sustainable development is viewed in this strategy as being proactive and transformational. The *'Education for Sustainability' National Strategy on Education for Sustainable Development for Ireland 2014-2020* states:

> "*The integration of education for sustainable development into the curriculum is more difficult at post primary level due to the silo-isation of subject areas, different teachers teaching different subjects* (Nevin, 2008, p. 13) *and a focus on state examinations, and in particular the CAO 'points race' at senior cycle*" (Department of Education and Skills, 2014 p. 13).

The strategy suggests that a significant opportunity exists to promote education for sustainable development through the new Framework for Junior Cycle that is to be rolled out by the Department of Education and Skills on a phased basis from September 2014 (Department of Education and Skills, 2014).

This new framework is underpinned by eight core principles that are intended to be embedded across curricular and subject areas. A number of these principles are relevant to education for sustainable development. The National Strategy on Education for Sustainable Development for Ireland 2014-2020 statements of learning in the Junior Cycle, relevant to education for sustainable development are outlined in Table 5.4.

Table 5.4 National Strategy on Education for Sustainable Development for Ireland 2014-2020 Statements of Learning in the Post Primary Junior Cycle

Statement 6	[the student] appreciates and respects how diverse values, beliefs and traditions have contributed to the communities and culture in which she/he lives
Statement 7	[the student] values what it means to be an active citizen, with rights and responsibilities in local and wider contexts
Statement 9	[the student] understands the origins and impacts of social, economic, and environmental aspects of the world around her/him
Statement 10	[the student] has the awareness, knowledge, skills, values and motivation to live sustainably

Source (Department of Education and Skills, 2014 p. 13)

The *'Education for Sustainability' National Strategy on Education for Sustainable Development for Ireland, 2014-2020* indicates, there is a major emphasis in the new Junior Cycle Framework on ensuring that students develop the type of key skills that have been identified as being central to sustainable development. These include critical thinking, analytical skills, and creativity in addressing problems, communicating effectively, respecting diversity, and valuing heritage (UNECE, 2009; UNESCO, 2012).

This strategy indicates that another positive development associated with the Junior Cycle Framework is the new 'short course' format which will afford opportunities for NGOs in particular (but also schools and teachers) to develop education for sustainable development resources for junior cycle students.

One of the first short courses to be developed by the National Council for Curriculum and Assessment is Civic, Social and Political Education. This short course was intended to be available to schools to implement, should they wish to do so, from September 2014 (Department of Education and Skills, 2014).

The National Council for Curriculum and Assessment has developed a draft syllabus for a new 'Politics and Society' subject that is proposed as an optional examinable full subject in the Leaving Certificate. In this strategy document the Minister for Education and Skills has prioritised the introduction of this subject, where the availability of the new 'Politics and Society' subject would strengthen education for sustainable development in senior cycle and complement the Blue Star Programme at primary level and the CSPE short course in the Junior Cycle (Department of Education and Skills, 2014).

In relation to strengthening education for sustainable development principles into the curriculum at the primary and post primary levels, *'Education for Sustainability' The National Strategy on Education for Sustainable Development for Ireland 2014-2020* makes five recommendations, outlined in Table 5.5.

Table 5.5 National Strategy on Education for Sustainable Development for Ireland 2014-2020 selected Recommendations for Strengthening Education for Sustainable Development Principles into the Curriculum at the Primary and Post primary levels

Recommendation 6: The NCCA should be asked to audit, from a sustainable development perspective, the primary and post primary curriculum by 2017. The audit should identify opportunities for building on existing practice and should identify potential linkages between different subject areas in primary and post primary schools. The results of the audit should be published by the Department of Education and Skills.
Recommendation 7: The DES and NCCA should ensure that education for sustainable development principles are integrated into all relevant primary and post primary curriculum areas as the curriculum is reviewed, where this is appropriate. This includes the primary school curriculum, the new specifications for the Junior Cycle Student Award, and the senior cycle curriculum.
Recommendation 8: The Department of Education and Skills should work with the Department of the *Taoiseach* to support the expansion of the Blue Star programme at primary level and to explore the potential for introducing a similar programme at post primary level.
Recommendation 9: The NCCA should support schools, NGOs, and other interested stakeholders who wish to develop Junior Cycle short courses or Transition Units on issues relevant to education for sustainable development through templates, guidelines and other support material, and also promote awareness of existing materials that have already been developed.
Recommendation 10: 'Politics and Society' should be introduced as a new Leaving Certificate subject when the NCCA has provided advice to the Minister for Education and Skills on a number of technical issues.

Source (Department of Education and Skills, 2014, p. 15)

The strategy suggested, as in the school sector, higher education should equip students with the knowledge, skills and values to motivate and empower them to live sustainably (UNECE, 2009).

This strategy identifies engineering, architecture, development studies, environmental science and geography as examples of education for sustainable development provision. This new National Strategy on education for sustainable development in Ireland 2014-2020 highlighted that the Department of Education and Skills is also, supporting two PhD programmes relevant to sustainable development: The Earth Systems Institute PhD programme and the TCD-UCD Engineering Structured PhD programme. Both these programmes are intended to produce a critical mass of graduates with strong technical and entrepreneurial skills to drive economic growth and sustainability.

Facilitated by the Springboard programme, which provides free part-time higher education courses to the unemployed, more than 1,212 places have been filled on courses related to sustainable development (Department of Education and Skills, 2014, p. 21). The *'Education for Sustainability' National Strategy on Education for Sustainable Development in Ireland 2014-2020* indicates that, there is an opportunity to build on progress in the higher education sector. At the tertiary level, this strategy

makes six recommendations, two of these recommendations (18 and 19, Table 5.6) relate to education for sustainable development provision and four recommendations (20-23, Table 5.7) relate to education for sustainable development research.

Table 5.6 National Strategy on Education for Sustainable Development in Ireland 2014-2020 - Recommendations related to Education for Sustainable Development provision at the Tertiary Educational Level

Recommendation 18: The Higher Education Authority should be asked to report to the Department of Education and Skills by 2016 on the extent of current sustainable development related provision in third level institutions. The report should be considered by the education for sustainable development Advisory Group with a view to setting targets for the future and monitoring progress towards their achievement.
Recommendation 19: Higher Education institutions should seek to introduce more undergraduate and post-graduate programmes that are relevant to sustainable development. They should also explore the potential for introducing principles of sustainable development into existing disciplines.

Source (Department of Education and Skills, 2014, p. 22)

Table 5.7 National Strategy on Education for Sustainable Development for Ireland 2014-2020 Recommendations related to Education for Sustainable Development Research

Recommendation 20: The HEA should be asked to report to the Department of Education and Skills on the research that is currently underway, or has been conducted in the past three years, in relation to sustainable development, and the results of this research should be made publicly available. This process could be supported by a forum to disseminate research findings in this area.
Recommendation 21: The Department of Education and Skills should work with the HEA to ensure that sustainable development is one of the priority areas reflected in future calls for research programmes that are funded by the Department.
Recommendation 22: Third level institutions should continue to seek collaborations with industry and other stakeholders through strategic clusters and centres of excellence for sustainable development. Any opportunities for international cooperation between academic institutions at EU level or beyond should also be promoted.
Recommendation 23: The Department of Education and Skills should continue to implement its commitments in relation to research and development that are contained in *Our Sustainable Future*.

Source (Department of Education and Skills, 2014, p. 24)

Although a number of agencies are active in relation to the research agenda, (EPA, the Irish Research Council, SEAI, IDA, *Teagasc*, Science Foundation Ireland, the Marine Institute, Enterprise Ireland and *FORFÁS*), the education for sustainable development public consultation process conducted in August of 2013, identified:

> *"A perceived lack of awareness of, and accessibility to, high-quality education for sustainable development - focused research, and a disconnect between education for sustainable development research and the needs of industry*" … "*It is important that such collaboration between academic researchers and industry, and other stakeholders, is promoted and any scope for international cooperation in this area should also be encourage*" (Department of Education and Skills, 2014, p. 23).

5.3 Education for Sustainable Development Provision in Formal Education in Ireland

The provision of education for sustainable development across the formal educational sector in Ireland is outlined in this section. The provision of education for sustainable development within the formal educational sector in Ireland is presented in Table 5.8.

Formal Tertiary level courses in Ireland relevant to at least one component of sustainable development are shown in Table 5.9. Tertiary Level courses and course content specifically related to sustainable development are detailed in Tables 1-4, Appendix J, p. 294.

Table 5.8 Summary of Education for Sustainable Development within the Formal Education Sector in Ireland

Primary Education Level	*An Taisce's* Green-Schools Programme	Section 5.3.1 Green Schools Ireland (2016) Eco Schools (2014)
	Training, Education and similar Awareness-Raising Initiative supported by Local Agenda 21	Table 5 Appendix J Department of Housing, Planning, Community and Local Government (2016)
	Environmental Education Workshops : GrassRoots	Table 6 Appendix J GrassRoots Education (2016)
Post Primary Education Level	Civic Social and Political Education	Section 5.3.2
	An Taisce's Green-Schools Programme	Section 5.3.1 Green-Schools Ireland (2016) Eco Schools (2014)
Tertiary Education Level	Formal Tertiary level courses in Ireland relevant to at least one component of sustainable development	Table 5.9 p. 86
	Tertiary Level Masters and PhD level Courses specifically related to Sustainable Development	MSc in Sustainable Development[28] MSc Sustainable Development[29], Masters in Development Practice Trinity[30]and PhD in Sustainable Development University College Dublin[31]

Source Adapted from different sources by the Author[32](2016)

[28] MSc in Sustainable Development, Dublin Institute of Technology, Table 1, Appendix J, p. 294.
[29] MSc. Sustainable Development, Dublin City University Table 2, Appendix J, p. 295.
[30] Masters in Development Practice Trinity College Dublin, University of Dublin, Table 3, Appendix J, p. 297.
[31] PhD in Sustainable Development University College Dublin, Table 4, Appendix J, p. 298.
[32] Education initiative's which contribute to education for sustainable development: Eco UNESCO all-Ireland environmental awards programme, Young Social Innovators and The President's Award, Table 7, Appendix J, p. 302.

Table 5.9 Formal Tertiary Level Courses in Ireland relevant to at least One Component of Sustainable Development

Tertiary Level	
University College Cork	Cert/Dip in Development and Global Human Rights Studies (part time) Cert/Dip in Social Enterprises and Community Development Practice (part time) BSc in International Development and Food Policy Masters in Engineering Science and Sustainable Energy MA in Sociology of Development and Globalisation MBS in Co-operative and Social Enterprise PG Dip in Co-operative Organisation, Food Marketing and Rural Development
University College Dublin	MSc(Agr) Sustainable Agriculture and Rural Development MSc in Sustainable Energy and Crops PhD in Sustainable Development (Table 4 Appendix J) PhD Programme in Earth and Natural Sciences (Collaborating Institutions: University College Dublin, Trinity College Dublin, Queen's University Belfast, the National University of Ireland, Galway and the University of Limerick) (Table 4 Appendix J)
Dublin City University	BSc in Environmental Science and Health MSc Sustainable Development (Table 2 Appendix J)
National University of Ireland Maynooth	Diploma/BSc in Rural Development (distance learning) NUI Universities: Cork, Dublin, Galway, and Mynooth BA in International Development Main Community ED Equality and Social Activism PG Cert in Anthropology and Development Master of Arts degree in Anthropology and Development MSc in Climate Change
University of Limerick	Bachelor of Science in Environmental Science MA in International Studies MA in Peace and Development Studies MSc in Sustainable Resource Management: Policy & Practice (UL and NUIG) Module: Interdisciplinary Module on Sustainable Development in the Bachelor of Science in Energy
National University of Ireland Galway	Bachelor of Science (Earth and Ocean Sciences) Bachelor of Science (Environmental Science) Bachelor of Arts with Human Rights MA (Environment, Society and Development) MA in Gender, Globalisation and Rights MA in Rural Sustainability
Trinity College Dublin	BA in Environmental sciences BA in Philosophy, political science, economics and sociology Masters in Development Practice (MDP) Joint masters offered by TCD and UCD (see Table 3 Appendix J)
Cork Institute of Technology	BA in Community Development BEng in Environmental Engineering BEng in Sustainable Energy Engineering BSc in Environmental Science & Sustainable Technology
Waterford Institute of technology	BEng (Hons) in Sustainable Energy Engineering PG cert in Sustainable Energy Engineering PG Dip in Sustainable Energy Engineering MSc in Sustainable Energy Engineering
Carlow Institute of Technology	BSc in Environmental Science
Blanchardstown	Bachelor of Arts in Social and Community Development

Institute of Technology	Bachelor of Science in Sustainable Electrical Technology
Limerick Institute of Technology	BSc in Environmental & Natural Resource Management (Thurlas) BSc in Sustainable Building and Renewable Energy BA programme in Rural Development (Tipperary)
Sligo Institute of Technology	BSc in Environmental Science (longest running environmental course in Ireland, established in 1975) BSc in Energy, Sustainability and the Environment Master of Science in Environmental, Health and Safety Management BEng in Environmental Engineering BSc in Advanced Wood and Sustainable Building Technology
Tralee Institute of Technology	BSc in Advanced Wood Technology for Sustainable Construction
Galway Mayo Institute of technology	BSc in Rural Enterprise and Environmental Management Master of Science in Environmental Systems Bachelor of Science in Sustainable Building Technology(Mayo)
Dundalk Institute of Technology	BSc in Sustainable Agriculture BEng in Engineering in Sustainable Design Engineering BSc in Environmental Biology BSC in Environmental Bioscience
Dublin Institute of Technology	MSc in Sustainable Development (Table 1 Appendix J)
All High Education institutions	All business and management graduate and post graduate programmes are relevant to the Economic component of sustainable development and are therefore relevant to education for sustainable development.

Source Adapted from different sources by the Author (2015)

5.3.1 Green-Schools Programme

The Green-Schools programme is the main programme relevant to education for sustainable development at the primary level in Ireland. The Green-Schools programme[33], known internationally as Eco-Schools, is an international environmental education programme, environmental management system and award scheme that promotes and acknowledges long-term, whole school action for the environment. Eco-Schools is operated by the Foundation for Environmental Education (FEE) whose main partners include the United Nations Environment Programme (UNEP) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) (Green Schools Ireland, 2016).

In 2014, 48,000 schools in 58 countries were participating in the Eco-Schools programme (Eco Schools, 2014). Eco-Schools is a fundamental initiative which encourages young people to engage in their environment by allowing them the opportunity to actively protect it. Eco-Schools begins in the classroom and expands to

[33] The Green-Schools Programme was explored in this study, Case One, Chapter 7, p. 133.

the school and eventually fosters change in the community at large. Through this programme, young people experience a sense of achievement at being able to have a say in the environmental management policies of their schools, ultimately steering them towards certification and the prestige which comes with being awarded a Green Flag (Eco Schools, 2014).

In Ireland Eco Schools is known as the Green-Schools programme. The aim of the Green-Schools programme is to increase students' awareness of environmental issues through classroom studies and to transfer this knowledge into positive environmental action in the school and also in the wider community. Schools that have successfully completed all the elements of the programme are awarded the 'Green-Flag'. This award has now become a well-recognised Eco-Label. The award has to be renewed every two years (Green Schools Ireland, 2016).

In 1997 the inaugural National Sustainable Development Strategy, *Sustainable Development: A Strategy for Ireland*, was published. An important contribution of this inaugural National Sustainable Development Strategy was, the introduction of the Green-Schools award scheme in 1997 (Department of the Environment, 1997). Since 1997 to date the Green-Schools programme has been run by *An Taisce*. This programme is commensurate with sustainable development since, *An Taisce's* Green-Schools programme employs a holistic, participatory approach, combining learning and action, thus providing an effective method for improving the environments of schools and producing actual awareness raising and behavioural change in young people, school staff, families, local authorities, and so on, having significant repercussions in the local communities (Green Schools Ireland, 2016).

The Green-Schools programme also fosters a strong sense of citizenship and leadership among participants that spreads far outside the school into the wider community. In addition, this programme, promotes a strong sense of teamwork among teachers, students and the wider community to reach a common high level goal. It flattens and democratises school management structures. It brings children into the decision-making process and makes them responsible for their decisions and actions (Green Schools Ireland, 2016).

According to Eco-Schools Ireland (2016), the Green-Schools programme could be best described as being 'more than the sum of its parts' (Eco Schools, 2010). The Green-Schools themes include: (1) Litter and Waste, (2) Energy, (3) Water, (4) Travel, (5) Biodiversity, (6) Global Citizenship – Litter and Waste, (7) Global Citizenship – Energy and (8) Global Citizenship – Marine Environment. Moreover, the Green-Schools programme is primarily focused on the development of environmental awareness (Green Schools Ireland, 2016).

5.3.2 Civic Social and Political Educational Programme

In Ireland within the formal educational system at the post primary level, the Civic Social and Political Educational Programme (CSPE)[34] is a three year compulsory programme which commenced in 1999. It is the only educational programme which specifically focuses on sustainable development at the post primary educational level in Ireland. The CSPE Junior Certificate Programme is compulsory for first, second and third year students at the post primary level. The general aims and principles of CSPE comply wholly with those of the Junior Certificate programme. In particular, the CSPE Junior Certificate programme aims to develop students' personal and social confidence, contribute to their moral development, and prepare them for the responsibilities of citizenship (National Council for Curriculum and Assessment, 2014).

The CSPE course incorporates four units of study: (1) the Individual and Citizenship, (2) the Community, (3) the State – Ireland and (4) Ireland and the World. The central concept of the CSPE course is citizenship, which according to the National Council for Curriculum and Assessment (2014), is the realisation of the civic, social and political dimensions in the life of the individual person through active participation in society. Seven themes are used to inform and clarify the concept of citizenship (National Council for Curriculum and Assessment, 2014). The CSPE programme is composed of seven themes: (1) Rights and Responsibilities (2) Human Dignity (3) Stewardship (4) Democracy (5) Law (6) Development and (7) Interdependence. These concepts are evaluated using a written examination format and a group project. The examination accounts for 40% of the marks, whilst the remaining 60% of marks are

[34] The Civic Social and Political Educational Programme was explored in this study, Case Two, Chapter 7, p. 146.

allocated to the completion of a group project (National Council for Curriculum and Assessment, 2014).

5.4 Education for Sustainable Development in Scotland

Scotland is one country that is taking a lead in the provision of education for sustainable development. This section provides a brief outline of the Scottish approach to education for sustainable development. The United Kingdom National Commission for UNESCO (2013) has highlighted, across the United Kingdom the emphasis on education for sustainable development is strong in Scotland. Scotland has set ambitious targets for reductions in greenhouse gas emissions through the Climate Change (Scotland) Act 2009. The Scottish Government has emphasised the importance of societal change towards a sustainable future and highlighted the role of education in informing that process (UNESCO, 2013). In England and Northern Ireland, there is currently less policy emphasis on sustainable development and this has inhibited the wider adoption of good practice in education for sustainable development.

In Scotland, sustainable development is one of the government's key national performance outcomes and features in many aspects of government policy where, a 'greener' and 'fairer' nation is one of their overarching strategic objectives. Importantly, in August 2013, the General Teaching Council for Scotland (GTCS), the regulatory body for teachers, revised their Professional Standards to include education for sustainable development. As a result of successive Scottish Governments commitment to the Decade of Education for Sustainable Development (DESD), Scotland's Curriculum for Excellence has sustainable development, global citizenship and outdoor learning identified as important cross-contextual themes. In 2012, thirty-one policy recommendations to further embed these themes in school education were made by a working group convened by the Scottish Government, where all recommendations were accepted in March 2013. As part of this, sustainable development education, global citizenship and outdoor learning were brought together under the name, Learning for Sustainability and made an entitlement for all learners (Learning and Teaching Scotland, 2011; Donaldson, 2011).

In order to teach at a Scottish school, a teacher must be registered with the General Teaching Council for Scotland (GTCS). In order to register, a teacher must

demonstrate they meet the Professional Standards. All teachers must maintain their registration by re-accrediting every five years. As a result, all teachers are expected to actively embrace and promote the principles and practices of sustainability in all aspects of their work (GTCS, 2012). At the tertiary level seven universities in Scotland offer teacher education programmes and these teacher education programmes must be accredited by the GTCS in order for graduates to be eligible for registration as teachers. These courses have to seek re-accreditation every five years by demonstrating how they equip their graduates to meet the Professional Standards.

5.5 Summary

This chapter addressed the third research objective which aimed to explore sustainable development and education for sustainable development within the Irish context, with particular emphasis on the role of government policy on the provision of education for sustainable development within the formal educational system. The inaugural National Sustainable Development Strategy, *Sustainable Development: A Strategy for Ireland* was published in 1997. According to this strategy the formal education system has a crucial role to play in promoting environmental awareness. This chapter highlighted that in more recent times a number of policy documents have been published relevant to sustainable development and education for sustainable development in Ireland. In 2012, *Our Sustainable Future, a Framework for Sustainable Development for Ireland* was published, highlighting 70 measures relevant to sustainable development in Ireland. The vision that Ireland will be a carbon-neutral society by 2050 is an important vision, detailed in *Ireland and the Climate Change Challenge: Connecting 'How Much' with 'How To'*. In 2014 Ireland's first strategy on education for sustainable development, *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland 2014-2020* was published. This publication contains some important recommendations that were highlighted in this chapter. The *Climate Action and Low Carbon Bill 2015,* was also outlined. This chapter also detailed the provision of education for sustainable development in Ireland and presented information pertaining to the Green Schools and Civic Social and Political Education programmes. Brief consideration was also given to education for sustainable development provision in Scotland, where education for sustainable development is prioritised.

CHAPTER SIX
RESEARCH METHODOLOGY

6.0 Introduction

This chapter will detail the research methodology utilised in this study. The first section highlights the philosophical and methodological foundation of the chosen research strategy. The research overview, case study methodology and qualitative sequential design are then presented. Details regarding the programme and participant selection procedures, data collection and sampling procedures are then outlined. Focus is then given to the rating scale for understanding sustainable development and pilot testing of the sustainable development module. The ideological, epistemological and pedagogical approach to sustainable development module delivery is also outlined. Data analysis, internal validity, internal and external reliability and the research limitations of this study are then outlined.

6.1 Philosophical Assumptions of Three Research Paradigms

Jackson (2013) has argued it is beneficial within the unique context of the research, for the researcher to carefully consider the conceptual background, including ontological and epistemological perspectives in order for informed decisions to be made regarding the methodology most suitable in seeking answers to the research questions, aims and objectives. This is relevant since, awareness of the philosophical underpinning of the research can secure the quality of the research produced (Snape and Spencer, 2003).

The development of knowledge is still an old and ongoing philosophical debate. Philosophical assumptions or theoretical paradigms about the nature of reality are important in terms of understanding the overall perspective from which research is designed and conducted. A paradigm can be defined as the "*basic belief system or world view that guides the investigation*" (Guba and Lincoln, 1994, p. 105). Scotland (2012) has posited, every paradigm is based upon its own ontological and epistemological assumptions, therefore different paradigms have differing assumptions of reality and knowledge which underpins their particular research approach.

The roots of the divergent perspectives on ontology can be traced back to 450BC. Heraclitus (*c.535-c.475*BC), who placed an emphasis on a changing and emergent world, while Parmenides (*c.515-c.445*BC) who succeeded him, emphasised a permanent and unchanging reality. At this time the seeds of two divergent perspectives on ontology were framed, the Heraclitean ontology of *becoming* and the Parmenidean ontology of *being*. In western philosophy it is the Parmenidean ontology of *being* that has prevailed (Gray, 2009).

Different philosophical and methodological approaches have been classified by Habermas (1972) as empirical-analytic, interpretative and critical. Crotty (1998) has posited, the two most distinguished research philosophies are positivism and interpretivism (phenomenology).

Drawing on the range of philosophies, strategies and choices depicted in the research onion (Saunders *et al.,* 2003), the philosophical approach adopted by the author is ontological realism and epistemological interpretivism, utilising a qualitative research design, case study strategy and multi method approach.

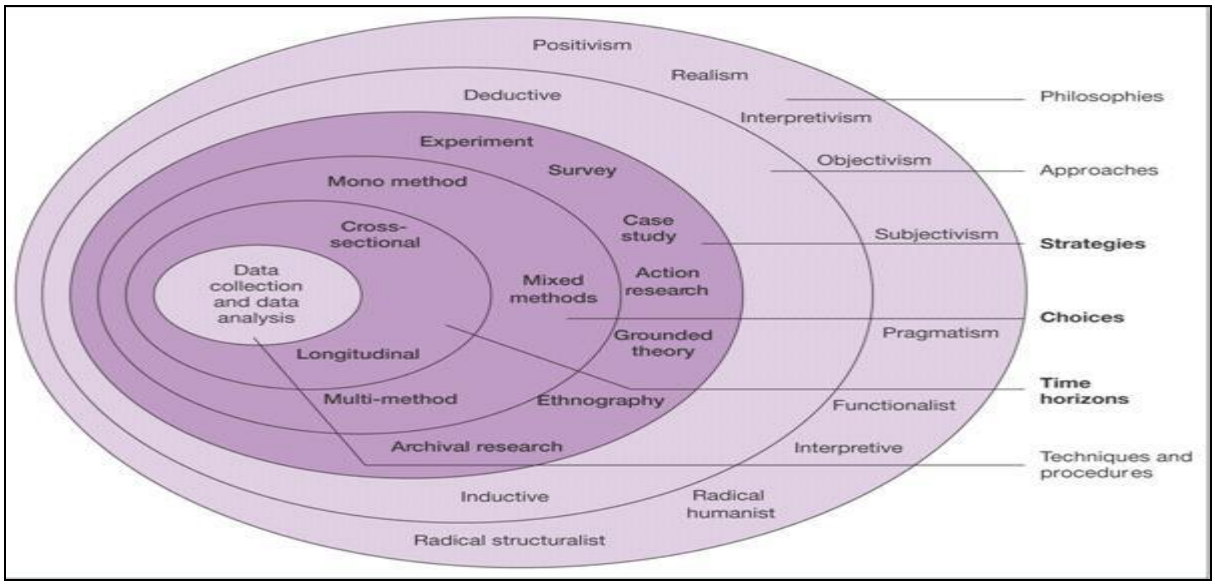


Figure 6.1 Research Onion
Source Saunders *et al.,* (2003)

6.1.1 Scientific Research Paradigm

Positivism is a research philosophy adopted from the natural sciences. An early proponent of positivism, Auguste Comte believed there can be no real knowledge but that which is based on observed facts (Comte, 1853). The positivist epistemology is one of objectivism, where the researcher and the researched are independent entities, who conduct research impartially, discovering absolute knowledge about an objective reality. From a positivist epistemological perspective meaning solely resides in objects, not in the conscience of the researcher, and it is the aim of the researcher to obtain this meaning (Scotland, 2012).

Positivists attempt to explain relationships through identifying causes which influence outcomes (Creswell, 2009). A deductive approach is undertaken, which is normative in the sense that positivist methodology utilises an approach which is characterized by procedure and methods which are designed to discover general laws (Creswell, 2009). Post-positivists also seek to understand causal relationships utilising experimentation and correlation studies (Creswell, 2009).

A positivist philosophical perspective was not adopted here since understanding sustainable development and therefore education for sustainable development requires going beyond reducing the social and ecological world to simple elements. As highlighted in Section 2.3, both human social systems and ecological systems are complex adaptive systems (Gunderson and Holling, 2002; Reeves, 1999) and consequently cannot be reduced to simple elements. Due to the complexity of sustainable development the study of sustainable development and education for sustainable development must be grounded in complex adaptive systems epistemology (Dale and Newman, 2005). The study of sustainable development and education for sustainable development should be rooted in the science of complexity, where accurate study of economics, societies and ecosystems requires a holistic approach (Gasparatos *et al.,* 2007) as opposed to a positivist reductionist approach.

6.1.2 Interpretive Research Paradigm

The ontological position of the interpretive paradigm is relativism. Relativism is the view that reality is subjective and differs from person to person (Guba and Lincoln, 1994, p. 110). This paradigm supports the belief that, "*reality emerges when*

consciousness engages with objects which are already pregnant with meaning" (Crotty, 1998, p. 43). Within the interpretive paradigm, reality is individually constructed. According to Frowe (2001 p. 185), "*There are as many realities as individual's, language does not passively label objects but actively shapes and moulds reality*". The interpretive epistemology is one of subjectivism which is based on real world phenomena. Interpretive epistemology suggests that, "*The world does not exist independently of our knowledge of it*" (Grix, 2004, p. 83). As Habermas (1972) stated, human interests not only channel our thinking, but also guide how we investigate the world. With the aim of gathering thick description, from different stakeholder perspectives, the interpretivist or phenomenology approach (Saunders *et al*., 2003; Miles and Huberman, 1994) which uses a qualitative approach was emphasised in this study.

6.1.3 Critical Research Paradigm

Critical realism has emerged as a new direction in the philosophy of science and social science, offering an alternative to both positivism and postmodernism. The ontological position of the critical paradigm is historical realism. Historical realism supports the view that reality has been shaped by social, political, cultural, economic, ethnic, and gender values (Guba and Lincoln, 1994, p. 110). Critical epistemology is one of subjectivism which is based on real world phenomena and linked with societal ideology. Knowledge is both socially constructed and influenced by power relations from within society. According to Cohen *et al.*, (2007), what counts as knowledge is determined by the social and positional power of the advocates of that knowledge.

The critical realist (CR) approach to social science is a movement in the philosophy of science, starting with the British philosopher Bhaskar (1978, 1979). It was also developed for and employed in social theory by Bhaskar (1989). Critical realists recognise the reality of the natural world as well as the events and discourses of the social world.

According to Bhaskar (1989), we will only be able to understand - and so change - the social world if we identify the structures at work that generate those events and discourses. In other words, critical realism distinguishes between a reality independent of what we think of it (the intransitive dimension) and our thinking of it

(the transitive dimension). Bhaskar (1989 p. 14) has stated to believe, "*what we think is all what is*", is to commit the "*epistemic fallacy*".

While positivism is value free and interpretivism is considered value laden (Lincoln and Guba, 1985) realism is instead value cognizant, where realists are conscious of the values of human systems and of researchers. The critical realist agrees that our knowledge of reality is a result of social conditioning and thus, cannot be understood independently of the social actors involved in the knowledge derivation process, consequently an interpretivist epistemology is also relevant in this study (Dobson, 2002).

6.1.4 Philosophical Orientation of the Research

This study is influenced by the interpretative and critical paradigms. More specifically, the researcher complies with the ontology of critical theory, since she complies with the view that reality is shaped by social, political, cultural, economic, ethical, and gender values which are crystallized over time. The interpretivist ontology, which suggests, "*the world does not exist independently of our knowledge of it*" (Grix, 2004, p. 83) is only partially accepted, since she believes that truth, understanding and knowledge can exist regardless of whether individuals are aware of same or not. For example, within the context of education for sustainable development, unawareness and lack of knowledge of anthropogenic climate change does not negate the existence of anthropogenic climate change.

An interpretive epistemological perspective is adhered to in this study, in the sense that she accepts that reality is individually constructed, a person's view of reality *is* shaped by their perception of reality. It is accepted here that reality is subjective and differs from person to person (Guba and Lincoln, 1994). Consequently, the philosophical approach adopted by the researcher integrates ontological realism and epistemological interpretivism, which is suitable when using a qualitative methodology (Miles and Huberman, 1994).

6.2 Research Overview

The overview of the research completed in this study is outlined in Figure 6.2

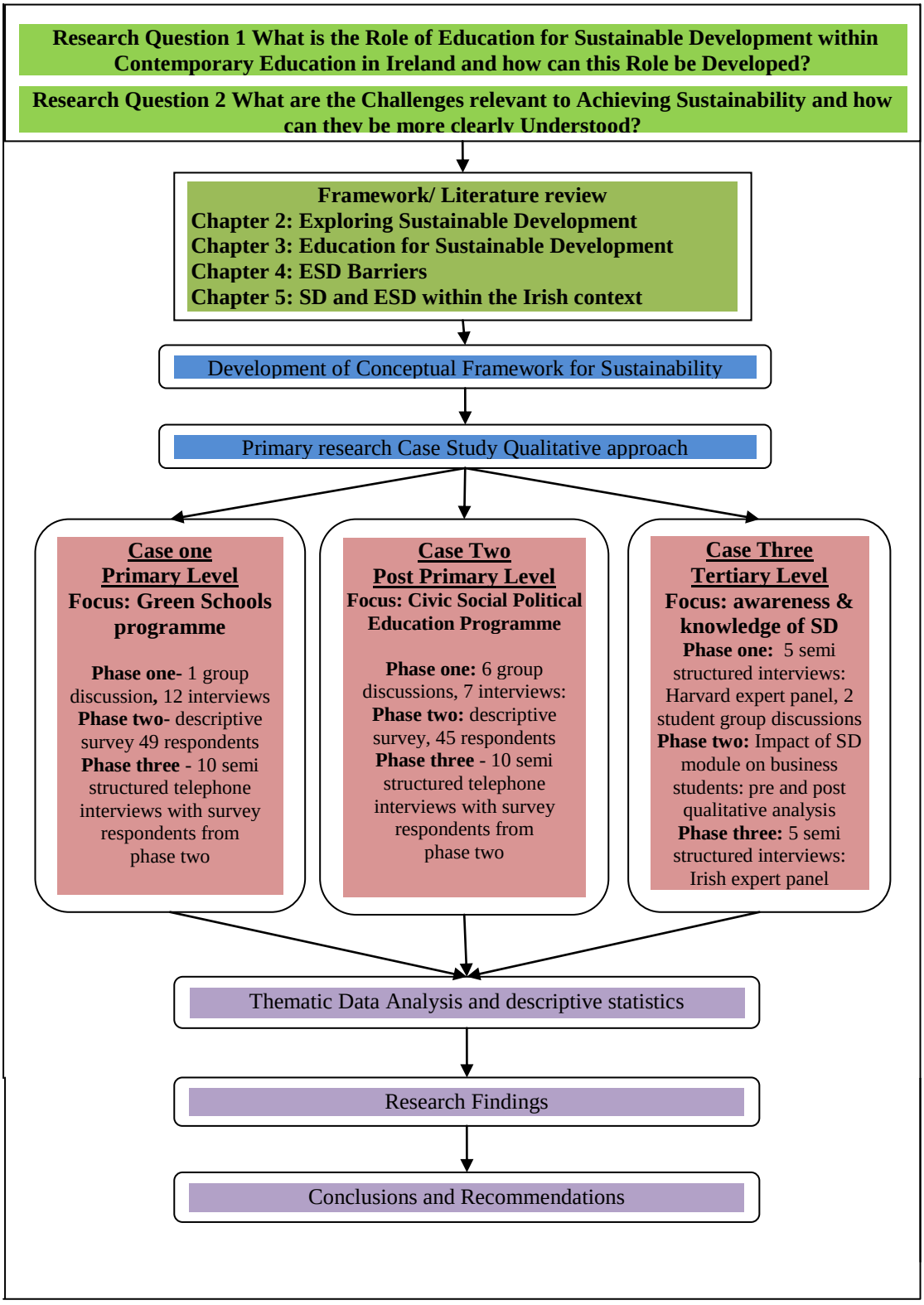


Figure 6.2 Research Overview
Source Developed by the Author (2014)

6.3 Case Study Methodology

Denzin and Lincoln (2000) posited that, qualitative research methods have faced acceptance problems and academic and disciplinary resistances, nonetheless Stake (2000 p. 435) indicated that case studies have become, "*one of the most common ways to do qualitative inquiry*", where there is growing confidence in the case study as a rigorous research strategy in its own right (Hartley, 2004).

Case study as a research strategy has been explored in depth by three writers in particular, including Stake (2008, 2005, 2000, 1995, 1994), Merriam (1998) and Yin (2005, 2003, 1999, 1994, 1984, 1981). The case study approach was utilised in this study since it offers the distinct benefits of facilitating understanding, focus on context and flexibility in the research process. This approach was selected since case study research comprises an all-encompassing method (Yin, 2009). According to Yin (2009, p. 18), *"a case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident"*. Consequently, case study was suitable for exploring the role of education for sustainable development within contemporary education in Ireland.

Three educational case studies were completed in this study. The case study approach was utilised in this study since many support the case study as an excellent approach when conducting educational research (Yin, 2006; Stake, 1995; Platt, 1992; Lincoln and Guba, 1985).

Case study was used here since this approach allowed the researcher to illuminate a decision or set of decisions, why they were taken, how they were implemented and with what results (Schramm, 1971). Miles and Huberman (1994 p. 25) have outlined, the case is, *"in effect, your unit of analysis"*. In terms of addressing the research questions, aims and objectives, this study necessitated exploring stakeholders experience of specific education for sustainable development programmes, drawing on internal and external stakeholder individuals and groups across three educational levels (see case study time lines Tables 6.1, 6.2 and 6.3). In this study, in line with Feagin *et al.*, (1991), a holistic, in-depth investigation was used where accuracy issues were addressed using and triangulating multiple perspectives, methods and information sources. Multiple data collection and analysis were also used to further

develop and understand the cases, shaped by context and emergent data (Stake, 1995) (Chapter 7, Tables 7.1-7.8).

In this study the context of the different educational programmes studied was important. The case study approach adopted in this research complies with the guidance of Stake (1995), where attention was given to the practical programme concerns of stakeholders in the immediate context. Stake (1995) argued that by responsively focusing on the priority issues of practitioners within a given programme or bounded case, one can construct rich understandings of the case. Stake (1995) also posited, such understanding in turn not only provides powerful information for programme improvement but also constitutes a basis for natural generalisations.

Creswell (2013) and Stake (1995) highlight the importance of case study rigour, in terms of ensuring good methodological rigor and case study quality, the framework proposed by Stake (1995) was utilised. In line with Stake (1995), the cases had a conceptual structure, guided by key themes and issues where addition quotations were used effectively. Sound assertions were made, sufficient raw data was presented and headings, figures, tables and appendices were effectively utilised.

With the aim of enhancing the study's quality or trustworthiness, as suggested by Russell *et al.,* (2005): (a) the case study research question was clearly written, (b) the case study design was appropriate for the research question, (c) purposeful sampling strategies appropriate for case study were applied, (d) data was collected and managed systematically and (e) the data was analysed correctly. A hallmark of case study research is the use of multiple data sources, a strategy which also enhances data credibility (Yin, 2003; Patton, 1990).

6.4 Qualitative Sequential Design

Utilising a qualitative sequential exploratory strategy, in this study data from the second qualitative strand (phase two) was used to assist in the interpretation of the qualitative themes derived from the first qualitative strand (phase one) (see Figure 6.1, 6.2 and 6.3). The conclusions based on the results of the first strand lead to the formulation of the modalities for the data collection and data analysis for the next strand (Maxwell and Loomis, 2003).

Timing refers to the sequence of the data analysis (Creswell and Plano Clark, 2011). In this study the sequence of data analysis was sequential as opposed to concurrent (Creswell, 2009; Morse, 1991). In this research the data was collected over three phases, where one source of data was collected, analysed, and interpreted before the collection, analysis, and interpretation of the other source of data (Creswell and Plano Clark, 2011).

The theoretical perspective was explicit. The audit trail concerning the three phases across the three educational levels are depicted in Tables 6.1, 6.2 and 6.3 respectively, where participants, data collection methods, participant codes and time lines relevant to each case are presented. Chapter 7 details the case study approach across the three phases of the three cases at the primary, post primary and tertiary education levels in Ireland.

Table 6.1 Case Study One: Primary Educational level

Qualitative Phase 1	**Primary Educational level**	**Green Schools Programme**	**Research timeline**
Participants	**Data collection methods and location**	**Participant/s Code**	**Research Date**
Twenty-three, female 11 year old green school participants attending a Model Green School (received 7 green flag awards)	Group discussion and Survey using open-ended questions, relevant to 5 green flag awards :St Ursula's Primary school, Waterford City	**GD1, P23 SR1, P23**	March 2012
Principal of model green school	Semi-structured Interview: St Ursula's Primary school, Waterford City	**IP 1**	March 2012
Green Schools Coordinator of a model green school	Three semi-structured Interviews :St Ursula's Primary school, Waterford City	**IP 2**	March 2012, Aril 2012, June 2012
Deputy Principal of a model green school	One semi-structured Interview :St Ursula's Primary school, Waterford City	**IP 3**	April 2012
Deputy Principal of a girls post primary school and two post primary teachers.	Three informal telephone Interviews (20 mins 3) = 60 min	**IP 4-6**	April 2012
Environmental Awareness officer from Waterford City council	One informal interview and one semi-structured Interviews St Ursula's Primary school, Waterford City and offices of Waterford City Council.	**IP 7**	May 2012, June 2012
Five Primary School Principals Age group 45-60 years :	Five semi-structured telephone interviews :Located in Cork, Wexford Meath, Galway and Sligo	**IP 8-12**	May 2012
Qualitative Phase 2			
Forty-nine Green-School coordinators/ teachers	Descriptive online survey :proportionally representative of the four provinces	**SR2, P49**	February 2013 To March 2014
Documentation relevant to *An Taisce* Green school registration and compliance	Quantitative analysis of raw data from *An Taisce* (using Microsoft excel)	**Data Analysis Table 9 Appendix C**	March 2016
Qualitative Phase 3			
Ten Green- School coordinators from survey respondents SR2, P49	Ten semi-structured telephone interviews	**IP 13-22**	April/ May 2016

Source Developed by the Author (2016)
Note GD = Group Discussion; IP = Interview Participant; Participant/s number = P (number) SR = Survey Respondents DA = Document Analysis
Note: Document analysis was also important in terms of addressing the research questions, aims and objectives; this is detailed in Section 6.11.
Note: Raw data from *An Taisce* was also analysed to establish the national level of green-school participation and compliance.

Table 6.2 Case Study Two: Post Primary Educational Level

Qualitative Phase 1	**Post Primary Educational level**	**Civic Social and Political Education Programme**	**Research timeline**
Participants	**Data collection methods and location**	**Participant number/s**	**Research Date**
120 Post Primary transition year students. Age group 15 to 16-year-old. All participants had completed the Civic Social and Political Education programme during the previous three years	Four Group discussions Data was collected from students attending: (1) **St Angela's Ursuline Convent**, Post Primary School, Waterford City. Total students, 890: Transition students, 170 (2) **Our Lady of Mercy Secondary School,** Waterford City. Total students, 525: Transition students 24 (3) **Presentation Secondary School**, Waterford City. Total students, 430: Transition students 60 (4) **De La Salle College** Waterford City. Total students, 1168: Transition students 120	**GD2, P 120**	February 2011
Four Female CSPE Teachers Age group 35-55 years: from three different post primary schools in Waterford City	Four semi-structured Interviews conducted in: (1) St Angela's Ursuline Convent, Post Primary School :2 interviews (2) Presentation Secondary School :1 interview (3) De La Salle College Waterford :1 interview	**IP 23-26**	March 2012
Mr. Aiden Clifford, Director of the Curriculum Development Unit, Department of Education and Skills	Two semi-structured telephone Interviews	**IP 27**	April 2011 and April 2015.
Mr. John Halbert, Junior Cycle Curriculum Development, National Council for Curriculum and Assessment (NCCA).	One semi-structured telephone Interview	**IP 28**	April 2012
Ms. Deirdra Hogan, Co-ordinator of the Ubunto Network based in the University of Limerick	Two Semi-structured telephone interviews	**IP 29**	19th June 2012 and 1st April 2015
70 1st year Bachelor of Business Studies students	Two Group discussions (35x2) Data was collected from students attending: The Waterford Institute of Technology	**GD3, P70**	October 2012
Qualitative Phase 2			
Forty-five CSPE Teachers representative of forty five post primary schools in Ireland	Descriptive CSPE Teacher Survey (proportionally representative of the four provinces) 45 participants	**SR3, P45**	February to May 2013
Qualitative Phase 3			
Ten CSPE teachers from SR3, P45	Ten semi-structured telephone interviews	**IP 30-39**	September 2013

Source Developed by the Author (2015)
Note GD = Group Discussion; IP = Interview Participant; Participant/s number = P (number) SR = Survey Respondents

Table 6 .3 Case Study Three: Tertiary Educational Level

Qualitative Phase 1	**Tertiary Educational level**	**Exploring knowledge SD**	**Time Line**
Participants	**Data collection methods and location**	**Participant number/s**	**Research Date**
Professor John G. Ruggie	Semi-structured interview :Harvard University	**IP 40**	August 2009
Professor Daniel Schrag	Semi-structured interview :Harvard University	**IP 41**	August 2009
Ms. Nancy Dickson	Semi-structured interview :Harvard University	**IP 42**	August 2009
Professor Robert N. Stavins	Semi-structured interview :Harvard University	**IP 43**	August 2009
Mr. Mark Kramer	Semi-structured interview :Harvard University	**IP 44**	August 2009
Final year students reading for a BSc in International Development and Food Policy	Group discussion : University College Cork : International / Development group	**GD4, P22**	October 2009
Final year students reading for a BA (Hons) in Accounting	Group discussion :Waterford Institute of Technology :Business Accounting group	**GD5, P32**	November 2009
Document Analysis	Analysis of undergraduate Business Degree courses in Ireland for SD content. Analysis of HEI's provision of courses relevant to ESD	**Summary of document analysis Table 6.11**	January 2015 March 2016
Qualitative Phase 2			
Tertiary level students, composed of business students reading for a Bachelor of Business degree, Year four.	Exploring the impact of a sustainable development module on the awareness and knowledge of final year business students SD Module was pilot tested in 2014 with 16 business students	**GD6, P14 Pre elective analysis SR 4, P11 Post elective analysis**	January 2016 May 2016
Qualitative Phase 3			
Dr. Susan Murphy, School of Natural Sciences, Trinity College Dublin.	Semi-structured telephone interview	**IP 45**	February 2015
Dr. Ken Boyle, Dublin Institute of Technology, chair of the MSc in Sustainable Development.	Semi-structured telephone interview	**IP 46**	February 2015
Dr. Shane Darcy Centre for Human Rights, National, University of Ireland, Galway.	Semi-structured telephone interview	**IP 47**	February 2015
Professor John Sweeney, National University of Ireland Maynooth.	Semi-structured interview :Maynooth University	**IP 48**	May 2015
Dr. Tadhg O' Mahoney Bolton Street, DIT	Semi-structured interview :Bolton Street, DIT.	**IP 49**	June 2010

Source Developed by the Author (2016)
Note: GD = Group Discussion; IP = Interview Participant; Participant/s number = P (number); GI = Group Interviews (written responses to open-ended questions questions)

6.5 Programme Selection Process

When addressing the third and fourth research objectives, it was necessary to select courses and programmes which were relevant to education for sustainable development across the three levels of formal education in Ireland. Programme selection at the primary, post primary and tertiary educational levels was guided by a three stage selection process. The programme selection process commenced with the establishment of programme requirements, the completion of curriculum reviews and the examination of course or program aims, outlines and or themes (Table 6.4).

Table 6.4 Programme Selection Process

(A) Programme selection criteria As stated in Section 2.1, dominant models of sustainable development embody three key components: the social, environmental and economic components of sustainable development. At the primary and post primary educational levels, programmes were required to be reflective of at least two components of sustainable development. At the tertiary level, courses or programmes were required to be reflective of at least one of the key components of sustainable development.
(B) Curriculum Review At the primary, post primary and tertiary educational levels, programme selection commenced with: (a) a careful examination of the primary, post primary and tertiary curricula, with the specific aim of identifying subjects and /or programmes relevant to education for sustainable development across the formal educational system in Ireland.
(C) Examination of course/ program aims, outline and/or themes Programme selection also involved evaluating programme description, aims, and course outline or theme focus of programmes.

Source Developed by the Author (2011)

Having reviewed educational provision across the formal education system in Ireland, it is important to highlight that at the tertiary level, an undergraduate Degree in Sustainable Development is not available. On completion of the selection processes, five educational programmes, highlighted in Table 6.5 were selected as suitable for inclusion in this study.

Table 6.5 Educational Programmes Selected for Inclusion in this Study

Primary Level	(1) Green-Schools programme
Post Primary Level	(2) Civic Social and Political Educational Programme
Tertiary Level	(3) BSc in International Development and Food Policy
	(4) BA in Accounting
	(5) Bachelor of Business Studies Degree

Source Developed by the Author (2011)

6.6 Participant Selection Process

As outlined by Creswell (2009), subject selection in qualitative research is purposeful; where participants are selected who can best inform the research questions thereby enhancing understanding of the phenomenon under study. The participant selection

process commenced with the identification of expert panel members. Expert panels are most suitable when, "*An issue is complex and contentious*", thereby allowing the researcher, "*to provide a credible alternative opinion, based on credible expertise*" (Department of Sustainability and Environment, 2005 p. 36).

The expert panel used in this study was composed of ten members, five from Harvard University and five from four Institutes of Higher Education in Ireland. Sustainable development is interdisciplinary; therefore it was important to ensure that panel members reflected expertise commensurate with the five components of sustainable development. Consequently, prior to contacting expert panel members, research was conducted on panel members experience and/or publications. Harvard University was selected since it is perceived to be one of the world's top universities. In 2015 Harvard University was ranked 4th in the world behind MIT (1st), the University of Cambridge (2nd) and the Imperial College London (3rd) (QS Top Universities, 2015).

As highlighted in chapter two, the economic component of sustainable development is emphasised more than social and environmental components (Figure 2.4 p. 13), therefore, business and management studies are particularly important regarding the achievement of sustainability (Section 4.2.2 p. 62). The Harvard Business School was ranked second globally, after the London Business School (QS Top Universities, 2015) and located in the United States, the biggest global producer of CO2 emissions per capita (EPA, 2014).

Due to the publication of Ireland's first national strategy on Education for Sustainable Development in July 2014, the expert panel was expanded to include experts in Ireland, who had expertise in education for sustainable development. The process of identifying the expert panel was a gradual one, employing judgement and snow ball sampling techniques. The criterion for selecting participants for the expert panel is outlined in Table 6.6 and the expert panel members are listed in Table 6.7.

Table 6.6 Criterion for selecting participants for the expert panel

(1) Individuals who had work experience and/or publications in their area of expertise relevant to sustainable development.
(2) Individuals who were presently involved in research or lecturing relevant to sustainable development.
(3) Persons working in a University or/Institute of Technology in Ireland or a University in the United States.

Source Developed by the Author (2011)

Table 6.7 Expert Panel Members

Harvard University expert panel members (five members)
Professor John Ruggie is the Berthold Beitz Professor in Human Rights and International Affairs at the Harvard Kennedy School, Affiliated Professor in International Legal Studies at Harvard Law School, and Faculty Chair of the Corporate Social Responsibility Initiative. Dr. Ruggie was previously Kofi Annan's advisor in the United Nations and was very involved in the development of the Global Compact initiative.
Professor Daniel Schrag is a paleoclimatologist and Professor of Earth and Planetary Science and Director of the Harvard University Centre for the Environment (HUCE). Daniel Schrag is also Director of the Science, Technology, and Public Policy Program. In addition, Professor Schrag was advisor to the Obama Administration on climate change.
Ms. Nancy Dickson is Co-director of the Sustainability Science Program in Harvard University and presently working in the Centre for International Development. Nancy Dickson is also a senior research associate at Harvard's Kennedy School of Government.
Professor Robert Stavins is Albert Pratt Professor of Business and Government, Director of Graduate Studies for the Doctoral Programs in Public Policy and in Political Economy and Government, and Director of the Harvard Environmental Economics Program. He is also former Chair of the U.S. Environmental Protection Agency's Environmental Economics Advisory Board.
Mr. Mark Kramer is a senior fellow working with Professors John Ruggie and Jane Nelson at the Corporate Social Responsibility Initiative. Mr. Kramer is currently Managing Director and Founder of the Foundation Strategy Group, LLC in Boston, as well as Chairman and Founder of the Centre for Effective Philanthropy, Inc. in Cambridge.
National expert panel (five members)
Dr. Susan Murphy is Assistant Professor, in Development Practice, School of Natural Sciences, Trinity College Dublin and programme coordinator for the joint TCD UCD Masters in Development Practice (MDP). Dr. Murphy lectures on Gender, Climate Justice, and Development Research and Practice.
Dr. Ken Boyle is chair of the MSc in Sustainable Development. He lectures on Environmental Management, Natural Resource Management and Conservation Management in the Dublin Institute of Technology.
Dr. Shane Darcy is a lecturer at the Irish Centre for Human Rights and Director of the PhD Programme in the Irish Centre for Human Rights, University of Ireland, Galway**.**
Professor John Sweeney works in the National University of Ireland Maynooth: area of expertise climate science. Employed in Maynooth University since 1978, Professor Sweeney contributed to the reports of the Intergovernmental Panel on Climate Change, which was awarded the Nobel Peace Prize in 2007. He was President of *An Taisce*, the National Trust of Ireland in 2014.
Dr. Tadhg O'Mahoney holds a PhD from Dublin Institute of Technology, in 2010 he completed his research at the Futures Academy on scenarios of the Irish energy system. Two times a Marie Sklodowska Curie postdoctoral fellow, he is now postdoctoral fellow at the Finland Futures Research Centre in Helsinki.

Source Developed by the Author (2016)

The participant selection and permission process relevant to phase one, two and three at the primary, post primary and tertiary levels of education in Ireland is outlined below.

Primary Educational Level: Phase One

Criteria for selecting participants for phase one at the primary level included:-

(1) An experienced green school's coordinator, where the primary school had completed the Green-Schools programme and had been awarded at least five green flags (a model green school).

(2) Principal and deputy principal within the same model green school.

(3) An environmental awareness officer employed by the local City Council who was responsible for assessing the Green-Schools programme and recommending the school for award status.

(4) A member of *An Taisce*, the co-ordinators of the Green-School Programme.

Due to the researcher's personal knowledge combined with publications of green school awards in the local press, a primary school in Waterford city was identified as suitable for inclusion in this study. An appointment was made with the school principal by telephone. During this appointment the research was outlined and discussed and permission to conduct research was willingly given. During this visit the researcher was introduced to a key informant, the green school's coordinator by the principal, who also expressed her interest in participating in this study. As the case progressed, the deputy principal also consented to be interviewed. The Environmental Awareness Officer with Waterford City Council, who is responsible for supporting and evaluating the Green-Schools programme, was contacted by telephone and also agreed to participate in a semi-structured interview.

Primary Educational Level: Phase Two

Criteria for selecting participants suitable for participation in the on-line Green-Schools descriptive survey included: -

(1) A proportionately representative sample of primary school from the four provinces.

(2) Respondent should be the green school coordinator and/or teacher or principal within the primary school.

(3) Sample size required a minimum of forty participants representing a minimum of forty primary schools.

The data base of all primary schools listed on schools.ie was used to gain access to participants who complied with the selection criteria. A letter was sent by email, to each school in the sample, outlining the research question and objectives. This letter also contained a link to the online Computer Assisted Self Completion Interview (CASI) questionnaire.

Primary Educational Level: Phase Three

Criteria for selecting participants suitable for phase three at the primary level:-

(1) A minimum of 10 Participants who completed the on line Green-Schools survey during phase two.

Every fourth Green-Schools survey participant was telephoned and asked to participate in a semi-structured interview to discuss some of their survey responses in more detail.

Post Primary Educational level: Phase One

Criteria for selecting participants for phase one at the post primary level included: -

(1) Transition year students who had completed the three-year Civic Social and Political Education (CSPE) Junior Certificate programme at the post primary educational level, where participants were representative of at least three post primary schools in Waterford city.

(2) Teachers who delivered the Civic Social and Political Education (CSPE), Junior Certificate Programme, representative of at least three post primary schools in Waterford City.

(3) A senior member of the Curriculum Development Unit working within the Department of Education. This unit is responsible for the development of the CSPE programme.

With the aim of facilitating the first phase at the post primary education level, telephone contact was made with six post primary schools in Waterford city, four schools gave their permission to conduct group discussions with their civic social and political education (CSPE) students, the CSPE teachers in these post primary schools also agreed to participate in a semi-structured interview.

Post Primary Educational Level: Phase Two
Criteria for selecting participants suitable for participation in the on-line Civic Social and Political Education descriptive survey included: -
(1) A representative sample of post primary school from the four provinces
(2) Survey participants who were involved in the implementation of the Civic Social and political education programme
(3) Sample size required a minimum of forty participants thereby representing a minimum of forty post primary schools

The data base of all post primary schools listed on schools.ie was used to facilitate this process. A letter was emailed to each school in the sample, outlining the research and requesting the school to participate. The letter also contained a link to the online Computer Assisted Self Completion Interview (CASI) questionnaire.

Post Primary Educational Level: Phase Three
Criteria for selecting participants suitable for phase three at the post primary level:-
(1) A minimum of 10 Participants who completed the on line Civic Social Political education survey during phase two.

Every fourth Civic Social Political education survey participant was telephoned and asked to participate in a semi-structured interview to discuss some of their survey responses in more detail.

Tertiary Educational Level: Phase One
Criteria for selecting participants for phase one at the tertiary level included: -
(1) A class group who were in the final year of completing a third level course reflective of the economic component of sustainable development and
(2) A class group who were in the final year of completing a third level course reflective of the social and or environmental components of sustainable development

Permission to conduct research with the BSc in International Development and Food Policy in University College Cork was obtained from one of the course lecturers. The BSc in International Development and Food Policy students were also asked if they were willing to participate in a group discussion, students willingly gave their consent to participate in this study. Permission to conduct a discussion group with final year BA in Accounting students in the Waterford Institute of technology was obtained from the Head of Department of Economics and Accounting and from the students themselves.

Tertiary Educational Level: Phase Two
Criteria for selecting participants for phase two at the tertiary level included: -
(1) Students who were in their final year of a bachelor of business degree.
(2) Final year business students who elected to complete an elective module on sustainable development.

The head of Department of Management and Organisation in the Waterford Institute of Educational gave permission to explore the impact of the elective module on sustainable development on the awareness and knowledge of participating business students. In addition, students who enrolled for the module on sustainable development also consented to participate in this study.

6.7 Data Collection Procedures

With the aim of addressing the first research question: what is the role of Education for Sustainable Development within contemporary education in Ireland and how can this role be developed? data was gathered from 404 participants. The interview protocol and support information relevant to the data collection process are presented in Tables 1-4 Appendix H. In line with the data collection procedures suggested by Creswell and Plano Clark (2011, p. 173), it is important to indicate the extent of data collection. Overall, three cases were conducted, in terms of confirming and strengthening the validity of research findings, each case was composed of three phases.

During case one, at the primary education level, data was collected from 84 participants, in case two at the post primary education level, data collection involved 242 participants, whilst in case three at the tertiary education level, data was collected from 78 participants. During phase one individual and group interviews were utilised, this allows one to optimise the strengths of both (Cohen, 2006) since interviewing is one of most common and powerful ways in terms of understand our fellow human beings (Fontant and Frey, 2000).

Overall, forty-nine individual interviews, six group discussions and four surveys were conducted in this study. At each educational level, qualitative research was conducted with internal and external stakeholders at the primary, post primary and tertiary educational levels. At the primary and post primary levels thematic data analysis of the qualitative data from phase one was used to develop an online survey, which was administered during the second research phase. At the tertiary level, as part of the

second qualitative phase, an online survey was administered to evaluate the impact the sustainable development module had on participants' awareness and knowledge. The online surveys were distributed facilitated by survey monkey at the primary, post primary and tertiary education levels. To further confirm and validate research findings a third qualitative phase was used across the three cases[35].

6.7.1 Group Interviews

As part of the first qualitative phase, nine group interviews were held with students across three educational levels. Group interviews or focus groups are suitable when the topic being explored is not so sensitive that respondents will temper responses or withhold information and when the topic is such that most respondents can say all that is relevant or all that they know in a short time span (Frechtling and Sharp, 1997). Note taking was used in three group interviews, the remaining group interviews were recorded. One group interview was conducted at the primary level with twenty-three green school participants (GD1, P23), four group interviews were conducted at the post primary level with transition year students from three different schools (GD2, P120).

In terms of strengthening the validity of findings from transition year students (GD2, P120), two group discussions were conducted with 70 1st Year business students (GD3, P70). At the tertiary level, as part of phase one, two group interviews were conducted with final year BSc in International Development and Food Policy students (GD4, P22) and final year BA (Hons) in Accounting students (GD5, P32). Permission to conduct group interviews for the duration of one class or lecture was obtained from the school principals or lecturers associated with these courses. In all cases these group interviews were conducted during school or college time in the primary, post primary and third level institutions attended by participating students.

[35] Details regarding the audit trail, data collection timelines, participants, durations and locations relevant to group interviews and semi-structured interviews across the three cases are presented in Tables 6.1-6.3 pp. 109-111.

6.7.2 Interviews

Cooper and Schindler (2008) have posited, although in-depth interviews can be expensive and time-consuming, in-depth interviewing allows topics to be explored in great depth. While telephone interviews are lower in cost than the personal interview, telephone interviews reduce interviewer bias and allow for repeated call backs (Cooper and Schindler, 2008).

At the primary level twenty-two interviews were conducted. During phase one, twelve interviews were conducted, made up of nine semi-structured interviews and three informal interviews. The majority of the interviews (except one) were conducted with an internal stakeholder group working within the formal education system, including the principal of a model green school (IP1), a green school coordinator (IP2), a deputy vice principal (IP3) one deputy principal of a post primary and two post primary teachers (IP4-6) and the environmental awareness officer from Waterford City Council (IP7). Interviews were also held with five primary school principals, (IP8-12) from different primary schools. In addition, during the third qualitative phase telephone interviews were also conducted with ten green school coordinators, who had completed the Green Schools survey (IP13-22) (Table 6.1 p.109).

At the post primary level, a total of seventeen semi-structured interviews were conducted. During the first qualitative phase seven semi-structured interviews were completed. The majority of the interviews (four) were conducted with an internal expert group working within the formal post primary educational system. Four semi-structured interviews were conducted with CSPE teachers (IP23-26). In addition, primary research were also conducted with external stakeholders, where interviews were conducted with Mr. Aiden Clifford**,** Director of the Curriculum Development Unit**,** Department of Education and Skills (IP27), Mr. John Halbert, Junior Cycle Curriculum Development, National Council for Curriculum and Assessment (NCCA), (IP28) and Ms. Deirdra Hogan, Co-ordinator of the Ubunto Network based in the University of Limerick (responsible for the integration of education for sustainable development into teacher training education) (IP29). During phase three, ten telephone interviews were also conducted with CSPE teachers (IP30-39) who had completed the CSPE survey during phase two (Table 6.2 p. 110).

At the tertiary level ten interviews were conducted, five expert panel in-depth interviews were conducted in Harvard University during phase one (IP40, IP41, IP42, IP43 and IP44). As part of phase three, five expert panel interviews were conducted with individuals from four Institutes of Higher Education in Ireland (IP45, IP46, IP 47, IP48 and IP49) (Table 6.3 p. 111).

The interviews conducted in Harvard University were conducted from a global perspective, whilst interviews conducted with the expert group in Ireland were reflective of both global and local perspectives. Within the context of the first research question, what is the role of education for sustainable development within contemporary education in Ireland and how can this role be developed, interviews with the Irish expert panel were conducted later in this case since the inaugural National Strategy on education for sustainable development was not published until July 2014. In all cases background information was studied regarding each interviewee and interview questions were carefully planned. In all semi-structured interviews, the researcher used introductory questions in addition, follow up, probing, direct, open-ended, indirect and structuring questions (Kvale, 1996) were also utilised.

6.7.3 Surveys

In this study 128 participants completed one of four surveys, participants included, 23 Green-School participants from a girls primary school in Waterford City, 49 Green-School coordinators (primary education level), 45 Civic Social and Political Education teachers (post primary education level) and 11 final year business students who completed the sustainable development module (tertiary education level). As part of the first qualitative phase at the primary level, in addition to a group discussion, 23 female 11-year-old Green-School participants also completed five short surveys containing open-ended and dichotomous questions, relevant to the five green flag programmes they had experienced. In total 115 surveys were completed by green school participants (SP1, P23, Table 6.1) in their school.

At the primary level, 49 Green-School coordinators and/or teachers and/or principals completed the online Green-Schools survey (SR2, P49, Table 6.1). At the post primary level 45 Civic Social and Political Education teachers completed the CSPE online survey (SR3, P45, Table 6.2). At the tertiary level, 11 final year business students completed the sustainable development module survey (SR, P11, Table 6.3).

Internet-based survey research was used in this study since on line surveys can save time (Taylor, 2000) and are generally considered more cost effective (Llieva *et al.*, 2002). In this study survey responses were transmitted to the researcher immediately (Llieva *et al*., 2002) facilitated by survey monkey. With the aim of fostering good will between survey respondents and the researcher, all survey participants were asked if they would like to receive the results of the study (Wright, 2005).

The online Green-Schools survey and the CSPE survey were composed of three question types, including multiple choice, positioning statements and open-ended questions. In case one and two, multiple choice questions were used to identify the gender of the teacher, and demographic information to ensure equal area representation in terms of school location, number of students, urban versus rural and the socio economic grade (SEG) of parents. In terms of exploring the level of agreement or disagreement with key themes identified in phase one, positioning statements (Likert scales) were also used. The exploration of key themes from phase one was predominately facilitated by the use of open-ended questions.

In case one and two, in terms of confirming and further exploring findings from phase one, open-ended questions were used in the online survey with the aim of obtaining richer responses. For over fifteen years it is accepted that the relative ease of typing a longer response, as compared to handwriting, made researchers believe web /email surveys would generate richer open-ended responses, a hypothesis which has also been empirically proven (Kwak and Radler, 1999; Sturgeon and Winter, 1999; Willke *et al.,* 1999; Mehta and Sivadas, 1995). The Green-Schools Coordinator survey contained seven open-ended questions, whilst the Civic Social and Political Education teacher survey contained five open-ended questions (see Appendix B, p. 253).

6.7.4 Achieving Data Saturation

As highlighted at the beginning of this section, forty-nine individual interviews, nine group discussions and four surveys were conducted in this study. It is believed that data saturation was achieved in this study. From a sample of 560 PhD studies using qualitative approaches and qualitative interviews as the only data collection method, in terms of the number of interviews conducted the median and mean were 28 and 31 respectively (Mason, 2010). Bowen (2008) outlined, failure to reach data saturation has an impact on the quality of the research conducted and hampers content validity.

When considering data saturation, Guest *et al.,* (2006) have posited researchers do agree on some general principles and concepts: no new data, no new themes, no new coding, and the ability to replicate the study. Guest *et al.,* (2006) noted that data saturation may be attained by as little as six interviews depending on the sample size of the population.

Whilst Dibley (2011) has outlined, it may be better to think of data in terms of rich and thick. According to Fusch and Ness (2015), the easiest way to differentiate between rich and thick data is to think of rich as quality (many-layered, intricate, detailed, and nuanced) and thick as quantity (a lot of data). Moreover, according to Fusch and Ness (2015), if one has reached the point of no new data, one has also most likely reached the point of no new themes; therefore, one has reached data saturation.

6.8 Sampling Procedures

The sampling frame is a list or set of directions for identifying the target population (Malhotra, 1999). A summary of the sampling techniques used in this study are outlined in Tables 6.8 and 6.9. In terms of the expert panel, the researcher wished to elicit the views of persons who have specific expertise in sustainable development, where these participants would most likely provide relevant and valuable information (Maxwell and Loomis, 2003; Malhotra, 1999) snowball and judgement (or purposive) sampling techniques were therefore utilised for expert panel selection.

As depicted in Table 6.8 at the primary, post primary and tertiary educational levels, during phase one, purposeful and convenience sampling was used, where the researcher purposefully selected individuals and sites that could provide the necessary information (Creswell, 2011).

Table 6.8 Summary of Sampling Techniques used in this Study

Case one: Primary educational level	**Phase one:** ***Purposive and Convenience sampling:*** Local Primary School: A Model Green School **Phase two:** ***Probability: Proportionate stratified sampling:*** Harvested email addresses of primary schools were utilised from the schooldays.ie website. Area sampling: proportionally drawn from different geographical areas, the four provinces **Phase three:** ***Systemic sampling:*** using 4 as a random number, every fourth respondent, who had completed the online survey from phase two was selected.
Case two: Post Primary educational level	**Phase one:** ***Purposive and Convenience sampling:*** Four Post primary Schools in Waterford City. **Phase two:** ***Probability: Proportionate stratified sampling:*** Harvested email addresses of post primary schools were utilised from the schooldays.ie website. Clusters: urban and rural schools. Area: proportionally drawn from different geographical areas, the four provinces. **Phase three:** ***Systemic sampling:*** using 4 as a random number, every fourth respondent, who had completed the online survey from phase two was selected.
Case three: Tertiary educational level	**Phase one:** ***Snowball sampling and judgement or purposive sampling*** was used to select the Expert panel from Harvard University. ***Purposive, convenience sampling:*** two group discussions with students who had completed specific courses which complied with the course selection criterion. **Phase two:** ***Purposive sampling, convenience sampling:*** two group discussions with business degree students who elected to enrol in an elective module on sustainable development in the Waterford Institute of Technology in 2014 and 2016. **Phase three:** ***Judgement or purposive sampling:*** used to select the Irish Expert panel

Source Developed by the Author (2016)
Note Schooldays.ie is the official Department of Education and Skills website, which contains a complete listing of all primary and post primary schools, by county in the Republic of Ireland

Participants who had experienced the central phenomenon of education for sustainable development at the primary, post primary and tertiary levels within the formal education system were intentionally selected. For example, at the primary and post primary education levels, during phase one purposeful and convenience sampling were utilised. At the primary level, surveys were administered face to face to 23 green school participants. This class attend a local school which is one of only 103 or 3.1 percent of primary schools in Ireland who have been awarded seven green flags.

During phase two at the primary and post primary levels, proportionate stratified samples were drawn from the website schooldays.ie. Drawing the samples from this website was considered ideal since it contained a complete and correct list (Cooper and Schindler, 2008) of all primary and post primary schools in Ireland. Proportionate stratified sampling was utilised, employing area sampling to identify a representative sample of primary and post primary schools, across the four provinces, so the sample drawn from the stratum (province) was proportionate to the stratums share of the total population (Cooper and Schindler, 2008). Within each province systemic sampling

was employed, where every fifth school was included in the sample. As shown in Table 6.9, the number of schools included at the primary and post primary levels were proportionally representative of the number of schools within each province.

Table 6.9 Purposive and Proportionate Stratified Sampling- Primary and Post Primary levels: Phase two

Case One: Survey administered face to face in class to 23 female green school participants, only 3.1% of primary schools have achieved 7 green flag awards, sample size 23, response rate 100% Purposeful sampling				
Case One: Online survey Total Number of Primary Schools 3372, s ample size 150, response rate 33 %, 49 primary schools: Proportionate stratified sampling				
No of primary schools by province	Leinster no of schools 1394 (41%) of total	Munster no of schools 1022 (30.6%) of total	Connaught no of schools 634 (18.6%) of total	Ulster no of schools 322 (9.8%) of total
Proportionate Area sampling	21 schools (42%)	14 schools (29%)	9 schools (18.3%)	5 schools (10.2%)
Case Two: Online survey Total Number of Post Primary Schools 733, Sample size 150 , response rate 30 % 45 primary schools: Proportionate stratified sampling				
No of post primary schools by province	Leinster no of schools 358 (48.8%) of total	Munster no of schools 220 (30%) of total	Connaught no of schools 106 (14.4%) of total	Ulster no of schools 49 (6.68%) of total
Proportionate Area sampling	21 schools (46.6%)	13 schools (29%)	7 schools (15.5%)	4 schools (8.88%)

Source compiled by the author (2014)

6.9 Rating scale for Categorising Participants' understanding of SD

As part of case three, at the tertiary level, in terms of analysing participants understanding of sustainable development, a rating scale was developed based on an analysis of definitions and meanings of sustainable development (Section 2.2 and Table 1, Appendix G). The rating scale is shown in Table 6.10. As part of phase one and two at the tertiary level, students' explanations of sustainable development were read and categorised.

Depending on the complexity and detail of respondents' explanations, each response was given a rating commensurate with the rating scale. The overall rating for participants was achieved by adding the individual score from the groups and dividing the total by the number of participants in each group (see Chapter 7, Tables 7.5-7.7).

Table 6.10 Rating scale for Categorising Participants' Understanding of Sustainable Development: Rating scale ranged from 1= Excellent to 6= Very Poor

Rating	Category	Explanation of rating scale
1	Excellent	Comprehensive explanation /reflective of definitions of SD
2	Very good	Comprehensive / reference one a definition
3	Good	Reference to three components of SD or good explanation
4	Adequate	Reference to two components of SD or key issue
5	Poor	Reference to one component of SD
6	Very Poor	Inaccurate explanation

Source Developed by the Author (2010)
Note based on definitions and representations of sustainable development

6.10 Pilot Testing of Sustainable Development Module in 2014

As part of the second phase at the tertiary level, the impact of a sustainable development module was explored with business students in 2016. Prior to module exploration in 2016 the module was pilot tested with 16 business students in 2014. After pilot testing this module in 2014, with the aim of improving the effectiveness of the sustainable development module, three changes were made to the content and pedagogical approach to module delivery. Module changes included:

(1) Students were required to make a 10-minute presentation on the benefits of integrating sustainability into an organisations business strategy.
(2) Students were required to complete a written academic essay which focused on the benefits of including sustainability into an organisations corporate strategy.
(3) In terms of pedagogy, a stronger emphasis was placed on utilising a learner centred approach.

6.10.1 Ideological, Epistemological and Pedagogical approach to SD Module delivery

At the tertiary level phase two, in relation to the delivery of the sustainable development module a re-constructivist approach was employed. This ideology emphasises education as a process of social change. In line with Littlewood and Manolas (2011) and Blenkin and Kelly (1987), during module delivery a process approach was used, where students used a reflective learning journal throughout the twelve week module.

Guided by Medawar (1979) and Kuhn (1970) a post positivist epistemology was utilised, emphasising interdisciplinary study and knowledge connectivity. In terms of module delivery, two pedagogical approaches were combined, including a knowledge centred approach (Lawton, 1973) and a learner centred approach (Littlewood and Manolas, 2011).

6.11 Document Analysis

Corbin and Straus (2008) have outlined, document analysis is a systematic procedure for reviewing or evaluating documents, either printed or in electronic material. In terms of addressing the first research question, what is the role of Education for Sustainable Development within contemporary education in Ireland and how can this role be developed. As detailed in Chapter 5, in this study in terms of gaining meaning and understanding, documents relevant to the political context shaping sustainable development and education for sustainable development (Section 5.1), documents relevant to the policy framework for education for sustainable development (Section 5.2) and documents relevant to the provision of education of education for sustainable development in Ireland (Section 5.3) which aided the course selection process were examined.

Document analysis was fundamental to addressing the second research question, what are the challenges relevant to achieving sustainability and how can these challenges be more clearly understood? Document analysis particularly facilitated the aim of advancing understanding of sustainable development and education for sustainable development, through the development of a conceptual framework for sustainability, detailed in Section 4.7 p. 71. A summary of document analysis completed as part of this study is outlined in Table 6.11

Table 6.11 Document Analysis Completed as part of this Study

Analysis of raw data from *An Taisce* to identify the number of Green-Schools Flags Awarded at the Primary and Post primary Educational Levels Table 9 Appendix C.
Review of Undergraduate Business Degree courses in 18 Higher Education Institutions in Ireland to determine (1) Sustainable Development Modules content or (2) content relevant to Sustainable Development specifically Business Ethics Modules (electronic documentation) Table 9 Appendix E.
Review of 18 Higher Education Institution's provision of courses relevant to at least one component of sustainable development (electronic documentation) Table 5.9 p. 86. Review of curriculum content at the primary and post primary educational levels to identify ESD content Table 5.8 p. 85.
Review of documents relevant to the political context shaping sustainable development and education for sustainable development Ireland (Section 5.1 p.71).
Review of documents relevant to the policy framework for education for sustainable development (Section 5.2 p 78.).
Review of Professional Masters in Education

Source Completed by the Author (2016)

6.12 Thematic Data Analysis

Although thematic analysis is rarely-acknowledged, it is a widely-used qualitative analytic method (Roulston, 2001; Boyatzis, 1998). Braun and Clarke (2006) have posited, a lot of analysis is essentially thematic, as indicated by Meehan, *et al.*, (2000), thematic analysis is sometimes claimed as discourse analysis or even content analysis. This study was guided by the Miles and Huberman (1994) interactive model, which consists of three linked stages: data reduction, data display and data conclusion-drawing/verifying (see Figure 6.3).

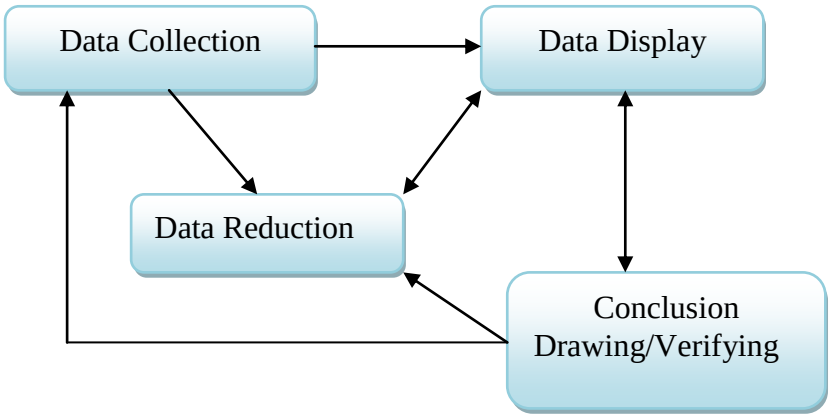


Figure 6.3 Component of data analysis: interactive model
Source Miles & Huberman (1994, p. 12)

As outlined by Miles and Huberman (1994), data reduction is concerned with the process of choosing, focusing, simplifying, building and transforming data (Miles and Huberman, 1994). During this stage, new thoughts and ideas are developed in terms of what should be included in the data display. According to Miles and Huberman (1994) data display is an organised, compressed, assembly of information that permits conclusion drawing and action. According to Yin (2014) and Miles and Huberman (1994), these stages focus on visualising the data by using a number of different display techniques, such as, quotations, narrative text, figures, tabulating differences and similarities and clarifying the relationship including its associated complexity of data. Presenting different quotations provides evidence, support and validates interpretations (Miles and Huberman 1994; Gibbs 2002; Patton, 1990).

The data corpus refers to all data collected for a particular research project, whilst data set refers to all the data from the corpus that is being used for a particular

analysis (Braun and Clarke, 2006). Data extract refers to an individual coded chunk of data, which has been identified within, and extracted from, a data item (Braun and Clarke, 2006). As presented in Figure 6.2 p. 105, in this study the data corpus was composed of three data sets. Marks and Yardley (2004) have indicated, thematic analysis allows the researcher to understand the potential of an issue more widely. Whilst, Namey *et al.,* (2008) have posited, "*Thematic analysis moves beyond counting explicit words or phrases both implicit and explicit ideas. Codes developed from ideas or themes are then applied or linked to the data as summary markers for later analysis*", (Namey *et al.,* 2008 p. 138).

During the three phases, in the three cases, across the three educational levels, thematic analysis allowed the researcher to draw interpretations which were consistent with the data collected. Thematic analysis allowed the researcher to identify factors or variables that influenced key themes generated by participants (Creswell, 2003). In case one and two, the core themes and relevant variables identified during the first qualitative phase then formed the basis of the descriptive questionnaires, which were administered during the second qualitative phase, utilising online surveys facilitated by survey monkey.

Thematic analysis was also employed for analysing open-ended questions in the survey data. In this study analysis started with precise content, moving to broader generalisations, this tends to ensure that the themes were effectively linked to the data (Patton, 1990). Thematic analysis also allowed the researcher to code and categories the data into themes (Braun and Clark, 2006).

The data reduction followed three phases, after collecting the data, the researcher tabulated the data using Microsoft word. The data was then ready to be analysed word-by-word, using tables to show any significant patterns or themes (Miles and Huberman, 1994). The data was read a number of times (Bogdan and Biklen, 2007), this enabled the researcher to get a feel for the text by handling the data multiple times (Ryan and Bernard, 2003). The second phase involved highlighting the sentences from each participant that could be used, to answer the study's questions by taking excerpts from the participant's full text.

The next phase focused on using the highlighted sentences and then breaking the data into smaller segments or themes. This procedure made the themes clearer and more understandable in terms of the researcher's focus. One important step in thematic analysis is to ensure that the themes are evaluated to ensure they represent the whole of the text. Miles and Huberman (1994) suggest that validating themes in the early and late stages of data analysis is essential. To test if the themes the researcher identified were compatible with the whole of the text or not, an independent reviewer and an outsider were asked for their feedback, allowing the researcher to compare the two sets of feedback (Miles and Huberman 1994).

Hosmer (2008) outlined, this procedure builds reliability in the themes analysis coding process. Both sets of feedback confirmed that the themes did represent the text. Attention was then given to data display, which cannot be separated from data reduction since data reduction complements data display (Miles and Huberman, 1994). Data display is the organised, compressed assembly of information. In this study data display aimed to make sense of the data that was collected and helped to arrange concepts and thoughts (Miles and Huberman, 1994).

With the aim of gaining conceptual coherence, data display was descriptive. In addition, tables which summarised themes and the issues relevant to key themes were utilised (Miles and Huberman, 1994). Data reduction was described in detail (Braun and Clarke, 2006). Utilizing different data display techniques and gradually framing it, enabled the researcher to focus and organise her thoughts by linking and comparing the information to reach conclusions (Gibbs, 2002).

Data analysis and conclusions involved focusing on any patterns or themes and the relevance of any statement especially if similar or contrasting and through cross case analysis grouping or establishing categories of information that went together. Thereby, identifying interrelations among factors and variables and building conceptual coherence and consistency, which further contributed to the validity of the research findings (Miles and Huberman 1994)[36].

[36] Additional tables outlining key themes and factors shaping these themes relevant to case exploration at the primary, post primary and tertiary levels of formal education are presented in Appendices C, D and E.

6.13 Internal Validity

Internal validity is concerned with the congruence of the research findings with the reality and the degree to which the researcher observes and measures what is supposed to be measured (Zohrabi, 2013). In this study, triangulation, respondent validation, peer examination and utility criterion contributed to strengthening the internal validity of this study. While data obtained through one technique can be questionable and biased, in terms of strengthening the internal validity of the research data and instruments, triangulation was used in the three cases where data was collected through several sources, teachers, principals and students and documentation, utilising a variety of techniques including individual and group interviews and online surveys. In addition, member checks were also used, where results and interpretations were taken back to the participants or communicated by telephone or email in order to confirm and validated results and interpretations.

Zohrabi (2013, p. 259) has stated, the plausibility of data analysis and interpretations by peer examination, "*can tremendously augment the validity of the research*". In this study two nonparticipants who were knowledgeable about sustainable development and education for sustainable development, reviewed and commented on the interview, open-ended survey data and findings. In term of content validity, based on the feedback of two reviewers, unclear questions were reworded and non-functioning questions were deleted. At all times the author aimed to collect, analyse and interpret data as impartially as possible, the researcher was mindful about being as non-judgmental and clear as possible throughout the research process.

The utility criterion can also contribute to the validity process (Lynch, 1996) where the findings and conclusions provide enough proper and ample information from different stakeholders. When considering external validity Nunan (1999, p. 17) has posited, *"Is the research design such that we can generalize beyond the subjects under investigation to a wider population?"*. It is the contention of the researcher that the findings are generalizable in Ireland. For example, at the post primary level, a key finding indicated that for the majority of teachers and students, the Civic Social and Political Education programme is perceived negatively and is less important that other curriculum subjects. It is believed that this finding can be generalised nationally at the post primary educational level.

6.14 External and Internal Reliability

External reliability is concerned with the consistency, dependability and replicability of "*the results obtained from a piece of research*" (Nunan, 1999, p. 14). According to Burns (1999, p. 21-20), "*could an independent researcher reproduce the study and obtain results similar to the original study?*". Whilst, Lincoln and Guba (1985) have posited, instead of obtaining the same results, it is better to think about the dependability and consistency of the data. In this case, the purpose is not to attain the same results, rather it is to agree that based on the data collection processes, the findings and results are consistent and dependable. In general, Lincoln and Guba (1985) and Merriam (1998) suggest that the dependability of the results can be ensured through the use of three techniques: the investigators position, triangulation and audit trial.

In line with Lincoln and Guba (1985) and Merriam (1998), in order to increase the reliability of the research, the different processes and phases of the inquiry were explained explicitly (Tables 6.1 to 6.3, pp. 109-111). The rationale of the study, design of the study and the participants involved were described in detail. Utilising triangulation, the researcher used different procedures, (1) individual and group interviews, (2) online surveys (3) and document analysis, where this information was obtained through different sources including, a US based and Irish based expert panel, a primary school Principal and Deputy Principal, post Primary and primary teachers and students across three education levels.

6.15 Limitations of the Research

This study may have been impacted by three limitations, where the sample size utilised in this study, self-reporting bias and the specific focus of case three may have influenced the findings of this study. The sample sizes utilised during phase two in cases one and two, may have been too small. It is often suggested that small sample size typical of qualitative studies limits generalizations and external validity of the findings. In terms of overcoming this limitation, key questions on both online surveys were open-ended questions, where the focus in this study was on depth as opposed to breath. In addition, during phase three at the primary and post primary levels semi-structured interviews were also conducted with ten survey respondents in each case.

Self-reporting bias is a concern for researchers when using self-report survey data, where respondents may withhold information or provide responses they believe the researcher wants to obtain. Semi-structured interviews with twenty survey respondents in cases one and two served to address this self-reporting bias. As explained in case three, education for sustainable development can positively impact the awareness and knowledge of business students. A relevant question which was not addressed in this case is therefore, does education for sustainable development impact the decision making and behaviour of business students? This is an important question which may be of interest to other researchers in Ireland or elsewhere.

6.16 Summary

This chapter began by giving an overview of the qualitative research process, the rational for using a critical ontology and an interpretative epistemology was also outlined. Details concerning the qualitative approach, the data collection methods, sampling procedure and the programme and participant selection processes utilised in this study were provided. Document and data analysis employing thematic analysis was also outlined. The chapter concluded by considering validity and reliability issues relevant to this study.

CHAPTER SEVEN
RESEARCH FINDINGS

7.0 Introduction

This chapter presents the results of this study and addresses the first research question which asked, what is the role of education for sustainable development within contemporary education in Ireland and how can this role be developed? In terms of answering this question this chapter focused on the second research objective, which aimed to explore the institutional and political barriers relevant to the implementation of education for sustainable development at the primary, post primary and tertiary levels of education in Ireland. The second research question asked, what are the challenges relevant to achieving sustainability and how can these challenges be more clearly understood? Findings relevant to this question are presented towards the end of this chapter in Section 7.14, p. 170.

The chapter commences by presenting results pertaining to case one, which explored *An Taisce's* Green-Schools programme at the primary educational level. Consideration is then directed to the findings of case two, which explored the Civic Social and Political Education Programme (CSPE) at the post primary educational level. The latter part of this chapter presents findings relevant to case three, which explored awareness and knowledge of sustainable development, the impact of a sustainable development module on business students at undergraduate level and sustainable development content in undergraduate business education. The chapter concludes by presenting findings from the sustainable development expert panel. Across the three education levels, cases findings will commence by providing an overview of key case findings. Attention is then directed to phases one, two and three across each case.

7.1 Case One: Overview of Case Findings: Green Schools programme

Green-Schools, known internationally as Eco-Schools, is an international environmental education programme, environmental management system and award scheme that promotes and acknowledges long-term, whole school action for the environment. In 1997 the inaugural National Sustainable Development Strategy, *Sustainable Development: A Strategy for Ireland*, was published. An important

contribution of this strategy was the introduction of the Green-Schools award scheme in 1997.

The first research question asked, what is the role of Education for Sustainable Development within contemporary education in Ireland and how can this role be developed? Within the context of this question, this case aimed to explore the barriers and opportunities relevant to *An Taisce's* Green-Schools programme at the primary education level in Ireland. Case exploration was conducted over three phases, where results from phase one were explored further during the second and third phase of this case. Almost all green school coordinators believe the Green-Schools programme is an important educational programme. In addition, case exploration showed that commitment to *An Taisce's* Green-Schools programme positively contributes to the ecological, social and economic components of sustainable development.

Case exploration across phase one and two showed that green school coordinators had concerns regarding the time required for Green-Schools implementation and the information requirements of the Green-Schools programme. More specifically, 43 percent of green school coordinators agreed that some of the detail required regarding Green-Schools compliance is more suitable for older secondary school students. In terms of the time required for Green-Schools programme implementation, 70 percent of green school coordinators indicated, projects and paper work were quite time consuming (48 percent) or very time consuming (28 percent).

Within the context of these concerns, the Green-Schools survey indicated that the educational importance of *An Taisce's* Green-Schools programme was not in doubt, where 97.62 percent of green school coordinators agreed that the Green-Schools programme is an important educational programme. The positive perception of the Green-Schools programme was reinforced since the majority (59 percent) of green school coordinators support the view that the Green-Schools programme should be integrated into the formal school curriculum.

When exploring non-participation in *An Taisce's* Green-Schools programme, thematic analysis of five semi-structured interviews with primary school principals indicated: lack of time; commitment to the present curriculum; cuts in teaching resources; and

the time consuming nature of the Green-Schools programme contributed to non-participation in the Green-Schools programme[37].

7.2 Green-Schools Programme Primary level: Phase one

The case commenced by conducting research with key stakeholders in a model green school. This model green school was distinct, since it was one of only 103 primary schools in Ireland who have been awarded seven green flags. Only 3.1 percent of primary schools in Ireland have achieved this level of success regarding the implementation of *An Taisce's* Green-Schools programme[38]. Due to the success of Green-Schools implementation in this school, the author believed that exploratory research in this school would provide important information regarding key institutional factors influencing successful programme implementation.

7.2.1 Ecological and Economic Perspectives

As highlighted in Section 7.1, commitment to *An Taisce's* Green-Schools programme does result in positive ecological and economic benefits. Together twenty three female fifth class students participated in a group discussion and completed five short surveys relevant to each green flag. Thematic analysis of the group discussion and 115 surveys showed that activities completed relevant to each green flag were commensurate with activities which contributed to environmental protection.[39] Typical comments from young green school participants regarding class activities included:

> "*We created and tidied compost bins*" (GD1, P13). "*Created a little vegetable and flower garden*", (GD1, P16). *"We should walk and not drive, this will help the environment",* (GD1, P7). "*We now use Economy / Short Flush in our toilets*", (GD1, P21).

Within this model green school, in terms of positive ecological and financial outcomes savings were made in terms of electricity and water. The green school coordinator stated, due to the first, second and fourth green flag programmes:

> "*The school achieved an 80 percent reduction in its electricity bills"…"A significant reduction in water usage was recorded*"…"*We achieved a 95 percent reduction in the use of plastic bags*" (IP, 2).

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[37] Audit Trail/ Research time line, Case Study One: Primary Educational Level, Table 6.1, p. 109.
[38] Number of Green-Schools Flags Awarded at the Primary and Post primary education levels in Ireland 2016, Table 9, Appendix C, p. 266.
[39] Class Activities relevant to five green flag programmes, Tables 1-5, Appendix C, pp. 261-263.

This model green school is one of the many schools involved in *An Taisce's* Green-Schools programme. Utilising data provided by *An Taisce*, from 1997 to 2016 nationally 83.7% (2,730) and 70% (2,295) of primary schools have received one and two green flag awards respectively. Whilst, 55% (1,806) and 42% (1,367) of primary schools have been awarded 3 and 4 green flags respectively. In one academic year from 2013-2014, *An Taisce's* Green-Schools programme diverted 5,200 tons of waste from landfill, saved 384 million tons of water, 17.7 million units of electricity, 1.27 million tons of petrol and diesel, saving an estimated €8 million (Green Schools Ireland, 2014)[40].

7.2.2 Socio-cultural Perspective

Exploring Green-Schools participants' perspective was important in this case, since students are tomorrow's decision makers and are the primary stakeholder of the Green-Schools programme. In this study results from the group discussion with green school participants and thematic analysis of questionnaires completed by the same participants relevant to the five green flags showed, the Green-Schools programme did improve the environmental literacy of these eleven-year-old female students. Comments from green school participants reflective of this view included:

> "*If people see that we have five green flags, it might encourage other schools to become greener*", (GD1, P1). "*Our school sets a good example for other schools and the community*", (GD1, P12).

During the group discussion, these eleven-year-old, fifth class female students confidently displayed awareness and knowledge across the green school themes where participants stated:

> *"It's important to recycle and care for the environment",* (GD1, P1). *"We use the green bins and brown bins much more",* (GD1, P4). *"In our school we have a flower and vegetable garden",* (GD1, P7). *"We play more in the playground because we painted games in the playground",* (GD1, P10). *"Hop scotch is the best",* (GD1, P13). *"We save more energy",* (GD1, P16). *"We turn off lights more often",* (GD1, P13). *"Now we only use the heating when it is colder",* (GD1, P20). *"We now plug out the computers and the TV, when we are finished",* (GD1, P21).

[40] Saving generated by the Green-Schools programme from 2013-2014, Table 6, Appendix C, p. 263.

Thematic analysis of five short questionnaires indicated that these young students were able to articulate the activities associated with each green flag and what they learned from these activities[41].

7.3 Institutional Perspective

In this study, successful green school implementation was defined as a school who had received four green flag awards. Utilising information provided by *An Taisce*, results of data analysis showed nationally, 42% or 1,367 primary schools and 17% or 128 post primary schools in Ireland have been awarded four green flag[42]. Key to the to the successful implementation of the Green-Schools programme within this model green school was the engagement of school management, staff and students within the school, resulting in a strong green school ethos. Successful implementation of the Green-Schools programme within this model green school was underpinned by the enduring dedication of the green school's coordinator.

7.3.1 Creating a Green Schools Ethos: Management Commitment

The commitment of management and the green school's coordinator was reinforced by strongly held beliefs school management held regarding the educational importance and value of *An Taisce's* Green-Schools programme. In this model green school commitment of the school principal and deputy principal to the Green-Schools programme was evident. Communicated with enthusiasm, comments from the school principal and deputy principal supportive of this view included:

> "*The Green-Schools programme is a very important aspect of the educational experience in this school"…"this is why we became involved in the Green-Schools programme when it was introduced*", (IP, 1).
>
> "*The management and staff in this school are very committed to the Green-Schools programme"…"Some of our staff have completed additional qualifications relevant to ecology and the environment*", (IP, 3).

Reflecting this commitment at the launch of the Biodiversity open day, the female principal and deputy principal stated with enthusiasm:

> *"Our school have been involved in the Green-Schools programme for thirteen years, if you could bottle the enthusiasm it would be priceless*", (IP, 1). "*Green-Schools has become an important part of the education experience in this school*", (IP, 3).

[41] Thematic Analysis of Green School Participants, Tables 1-5, Appendix C, pp. 261-263.
[42] Number of Green-Schools Flags Awarded at the Primary and Post primary Educational levels in Ireland 2016, Table 9, Appendix C, p. 266.

The environmental awareness officer from Waterford City Council confirmed the strength of the school ethos and management commitment when she stated:

> "*This school have been committed to the Green-Schools programme for over twelve years, management support within this school is fundamental to the success of this programme*"…"*In this school the implementation of the Green-Schools programme is successful because the Green-Schools approach within this school has become part of the ethos of the school",* (IP, 7).

The value school management placed on the importance of the Green-Schools programme was an important institutional factor, which over time has contributed to the development of a positive green school ethos within the school, which in turn positively contributed to the continued successful implementation of *An Taisce's* Green-Schools programme within this all girls primary school in Waterford.

7.3.2 The Role of the Green-School Coordinator

Although school management support is necessary, and some political support is provided by the environmental awareness officer employed by the local council, an important institutional factor relevant to the successful implementation of *An Taisce's* Green-Schools programme within this model green school was the enduring dedication of the green schools coordinator. Comments commensurate with this view from the environmental awareness officer, school principal and deputy principal included:

> *"This primary school goes over and beyond the time required for Green-School implementation"…"the support from the principal is very evident but the work of the Green-Schools coordinator is fundamentally important"…"She drives the Green-Schools programme in this school",* (IP, 7). *"We are so lucky to have such a dedicated Green-Schools coordinator ... she is the driving force behind Green-Schools in our school",* (IP, 1). *"The commitment of our Green-Schools coordinator is enduring" … "she is fundamental to the success of Green-Schools in St. Ursula's",* (IP, 3).

A summary of the key factors contributing to the successful implementation of the Green-Schools programme within this model green school is presented in Table 7.1.

Table 7.1 Key Interrelated Institutional Factors contributing to the Successful Implementation of the Green-Schools programme within a Model Green School

Key interrelated factors contributing to the successful implementation of the Green-Schools programme	**Multiple data sources contributing to triangulation and explanation building of key factors.**
Commitment of the Principal, Deputy principal and Staff within the school	Environmental Awareness Officer, (IP, 7) Principal (Observation and Interviews) (IP, 1) Deputy Principal (Interview) (IP, 3) Green Schools Coordinator (Observation and Interviews) (IP, 2)
Dedication and enduring efforts of the Green-Schools Coordinator underpinned successful Green-Schools implementation	Environmental Awareness Officer (Interview, IP, 7). Principal (observation and Interview, IP, 1) Deputy Principal (Interview IP, 3) Green Schools Coordinator (Observation and Interviews IP, 2)
Enduring Leadership and Staff Commitment has resulted in Green School Culture and Ethos becoming part of the Educational Experience within this primary school.	23 Green School participants (green flag surveys and group discussion) GD 1, P 23 and SR 1, P 23 Environmental Awareness Officer (Interviews (IP, 7) Principal (Interview (IP, 1) Deputy principal (Interview (IP, 3) Green-Schools Coordinator (Interview IP, 2). Observation of project and poster presentation at the Green-School Biodiversity open day (Documentation)

Source Developed by the Author (2014)

7.3.3 Non-participation in the Green-Schools programme

Understanding why primary schools did not participate in the Green-Schools programme was also relevant in this case. With the aim of exploring the reasons and barriers influencing Green-Schools non-participation during phase one, semi-structured telephone interviews were conducted with five primary school principals. Non-participation in the Green-Schools programme was influenced by five factors: (1) lack of time due to the work load of running the school, including fundraising (2) commitment to the present curriculum (3) cuts in teaching resources (4) the time consuming nature of the Green-School programme and (5) the view that schools can still focus on green issues even though they are not registered on the Green-Schools programme. A sample of comments made by primary school principals commensurate with these factors included:

> *"Being responsible for the running of a school is challenging and time consuming",* (IP, 8). *"Most of my time is spent on scheduling classes, fundraising and teaching"…"The curriculum is already very full"…"Teachers are very busy with their classes, playground supervision and extra-curricular activities",* (IP, 10). *"Because you are not registered on the Green-Schools programme does not mean that green issues are not focused on in the school, we have been highlighting green issues for years, and will continue to do so",* (IP, 12).

During an open-ended question, the environmental awareness officer from Waterford City Council made reference to poor Green-Schools programme participation at the

post primary level. Based on her work experience over seven years the environmental awareness officer outlined:

> *"It is more difficult to get secondary schools involved in the Green-Schools programme"…"teenagers are more cautious about getting involved"…"timetabling is an issue",* (IP, 3).

Poor Green-Schools programme participation at the post primary level was confirmed by a male deputy principal of an all-girls post primary school in Tipperary and two female post primary teachers from Wexford who stated:

> *"Time is an issue at the secondary level"…"Green-Schools commitment is poor at the secondary level because of an already full timetable",* (IP, 4). *"Green-Schools participation is low at the secondary level due to the challenge of getting through course work combined with exam pressure",* (IP, 5). *"It's easier to get primary school children involved in Green- Schools, in secondary the students are older, so it's more difficult to motivate their interest in Green-Schools",* (IP, 6).

7.3.4 Time and Information Requirements

During phase one of this case, important concerns regarding the successful implementation of the Green-Schools programme were highlighted by an experienced and dedicated green school coordinator, who has been involved in this programme for thirteen years. It was stated with sincerity that:

> *"The work involved in complying with An Taisce guidelines and paper work in terms of implementing the Green Flag programme is substantial"…"very time consuming and too detailed"…"Where the paper work requirements actually disincentives schools continuing with the Green-Schools Programme itself both at primary and secondary educational levels",* (IP, 2).

This green school coordinator also stated:

> *"The detail required goes beyond the level suitable for many junior classes, except for perhaps fifth and sixth class"…"the level and detail required in some cases is beyond the level of understanding of younger students. In some cases the detail required is more suitable for older secondary level students",* (IP, 2).

Additionally, this coordinator clearly outlined:

> "*These comments have been sent to An Taisce, with the hope that this feedback might influence the level of detail presently demanded for Green-Schools compliance. Aside from the enormity of An Taisce requirements, Green-School compliance at the secondary level is also additionally challenging due to the level of course work and the examination pressures which exist at the secondary level*", (IP, 2).

Emergent institutional themes from phase one were subsequently explored in phase two and three of this case, these results are outlined in the following section.

7.4 Green-Schools Programme Primary level: Phase two and three Institutional Perspective

Key issues identified during phase one were explored further during phase two, this exploration was enabled by an online Green-Schools survey, completed by a geographically representative sample of 49 green school coordinators. Key issues were explored utilising open-ended and closed questions. During phase three, telephone interviews were also conducted with ten survey respondents. The results of phase two and three have been integrated into this section.

7.4.1 The Importance of the Green-Schools programme and Rational for Programme Participation: Teachers' Perspectives

As shown during phase one (Section 7.2), all stakeholders within the model green school believed the Green-Schools programme was an important educational programme. Consequently, green school coordinators' views regarding the Green-Schools programme were also explored. Almost all Green-Schools survey respondents (97.62 percent) believe Green-Schools is an important educational programme. Thematic analysis of an open-ended question revealed, two dominant themes and one minor theme which contributed to why teachers believed *An Taisce's* Green-Schools was an important educational programme[43]. The dominant theme concerned: the development of environmental awareness, responsibility and life skills. Typical comments from survey respondents reflective of this theme stated the green schools programme:

> *"Highlights environmental issues and creates awareness about the importance of protecting our environment*", (SR2, P17). *"Green-Schools gives the children the opportunity to learn about the environment, to ensure it is there for generations to come",* (SR2, P2). *"Green-Schools ties together life skills and essential awareness about environmental attitudes",* (SR2, P10). *"The Green-Schools programme is hugely important, on this programme the children learn the greatest life shills of all (re biodiversity one student took photographs of changes in the school garden and grounds every week, the photos were uploaded onto the school blog, even I learned a lot about biodiversity from this exercise)",* (SR2, P12).

During phase three, telephone interviews with survey respondents went further suggesting:

> *"Given the environmental issues now, the Green-Schools programme is more important than ever",* (IP, 15). *"It is fundamental that young students are informed about the environment",* (IP, 19). *"Environmental concerns are increasing in importance and therefore should be elevated in the curriculum",* (IP, 21).

[43] The Importance of the Green-Schools programme, phase two, Table 7, Appendix C, p. 264.

The second key theme, from phase two, focused on the importance of bringing environmental awareness into the home and community. Comments from survey respondents commensurate with this theme suggested:

> *"Children are good at talking to adults and so the impact of Green-Schools can be transferred home",* (SR2, P1). *"Children are encouraged to bring the message home and to live a greener lifestyle at home as well as in school",* (SR2, P4.). "*It is a well-structured programme allowing for cooperation between staff, pupils, parents and the local community*", (SR2, P8).

Telephone interviews during phase three, with survey respondents additionally suggested:

> *"Students have told me they talk about Green-Schools at home and this is important",* (IP, 14). *"Student awareness of green issues will have a positive impact at home also"*, (IP, 22).

The third, though minor theme from phase two, highlighted the fit between the Green-Schools programme and the current curriculum, where survey respondents stated,

> *"Green-Schools is linked into all curricular areas",* (SR2, P3). *"Green-Schools ties into the curriculum in Science and Geography in a very practical and hands on way",* (SR2, P4).

The Green-Schools survey also requested green school coordinators to articulate their reasons for green school participation. The dominant reasons given for Green-Schools participation included, developing environmental awareness and achieving behavioural change. Survey respondents also highlighted programme participation allowed them to formalise existing behaviour whilst, other coordinators referred to the development of children's values and skill development, as additional reasons for Green-Schools participation[44].

> *"It's good to give the children a sense of the positive/negative impact on the environment and it reduces the amount of rubbish to be disposed of at serious cost to the school",* (SR2, P12). *"It helps children establish good habits at a young age, it makes them more responsible for their actions"…"We believe it is important to teach the boys about the value to the environment to recycle and conserve natural resources*", (SR2, P1). *"Overall Green-Schools is a good project, this programme makes children aware of waste, litter and best practise in the use of water and electricity in a very practical and hands on way",* (SR2, P11). *"We were always involved in recycling, so we decided to formalise the programme through An Taisce",* (SR2, P2).

7.4.2 Time and Information Requirements

An emergent theme from phase one concerned the time allocated to Green-Schools implementation. When this was explored during the second research phase, 70 percent of green school coordinators indicated, the work load regarding projects and paper work was quite time consuming (48 percent) or very time consuming (28 percent).

[44]Thematic analyses of survey responses: reasons for Green School Participation, Table 8, Appendix C (Primary level: Phase two), p. 265.

Additionally[45], 43 percent of survey respondents also agreed (29 percent) or strongly agreed (14 percent) that some of the detail required regarding green school compliance was more suitable for older secondary school students. Concerns regarding time and information requirements were also explored during phase three, telephone interviews with survey respondents stated:

> *"Yes the paper work can be time consuming",* (IP, 4). *The paper work could be simplified a bit more",* (IP, 7). *"Some of the information should be more in line with the age of the primary school children",* (IP, 10).

7.4.3 The Integration of the Green-Schools programme into the Formal Curriculum

A related theme identified during phase one concerned whether the Green-Schools programme should be integrated into the present curriculum. The majority of green school coordinators, nearly 60 percent, believed the Green-Schools programme should be integrated into the school curriculum [46](SP2, P49). Information provided by the green school survey and telephone interviews with survey respondents stated:

> "*I think environmental awareness is vital to the students' education*", (SP2, P11). "*Green-Schools would be a valuable addition to the curriculum*", (SP2, P23). "*There is already a strong link so making Green-Schools part of the formal curriculum makes a lot of sense*", (IP, 7). "*Although the curriculum is full, important information must be prioritised, children need to understand climate change from a young age, consequently, it needs to be integrated into the curriculum",* (IP, 3). *"A clearer focus on climate change and the environment in geography is very plausible",* (IP, 6). *"A more selective choice of essays in English is an obvious place to start",* (IP, 7). *"The environment and climate change could be integrated into the creative writing activities in fourth class, where there is a focus on newspaper articles and short stories*", (IP, 9).

For 29 percent of respondents, the predominant factor supporting non-integration of the Green-Schools programme centred on the existence of an already overcrowded curriculum. Comments reflective of this view stated:

> *"Curriculum overload is a huge problem",* (SP2, P12). *"Every social/environmental issue seems to be foisted onto schools to solve", (*SP2, P25). *"There is hardly time to follow the curriculum and get everything covered as it is",* (SP2, P42).

Telephone interviews with survey respondents similarly outlined:

> *"We are very busy as it is",* (IP, 10). *"The issues is, how do you make room for more content",* (IP, 8). *"The curriculum is packed as it is now",* (IP, 4).

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[45] Green School compliance is very time consuming and prevents schools committing to the programme after the 1st and/or 2nd green flags have be awarded, Figure 1, Appendix C, p. 266.

[46] Do you believe *An Taisce's* Green Schools programme should be integrated into the school curriculum? Figure 2, Appendix C, p. 266.

7.5 The National Context: Green-Schools Participation and Compliance

As referred to in section 7.2.1, analysis of information provided by *An Taisce* showed that from 1997 to 2016 nationally 83.7% and 70% of primary schools have received one and two green flag awards respectively. Whilst, 55% and 42% of primary schools have been awarded 3 and 4 green flags respectively. The level of compliance with the Green-Schools programme then decreases considerably, where 23% of primary schools in Ireland have been awarded five green flag awards and only 9.9% of primary schools have received six green flag awards.

In Ireland only 3.1 % or 103 out of 3262 primary schools have completed seven green flag awards and 31 primary schools (0.95%) have successfully completed eight green flag awards (see Figure 7.1). A similar trend is evident at the Post Primary level, although 58% or 429 Post Primary schools and 39 % or 290 Post Primary schools have completed one and two green flags respectively. Only 26% and 17% of Post Primary schools have been awarded three and four green flags respectively. In addition, only 8% and 3% of Post Primary schools have been awarded five and six green flag awards respectively (see Figure 7.2).

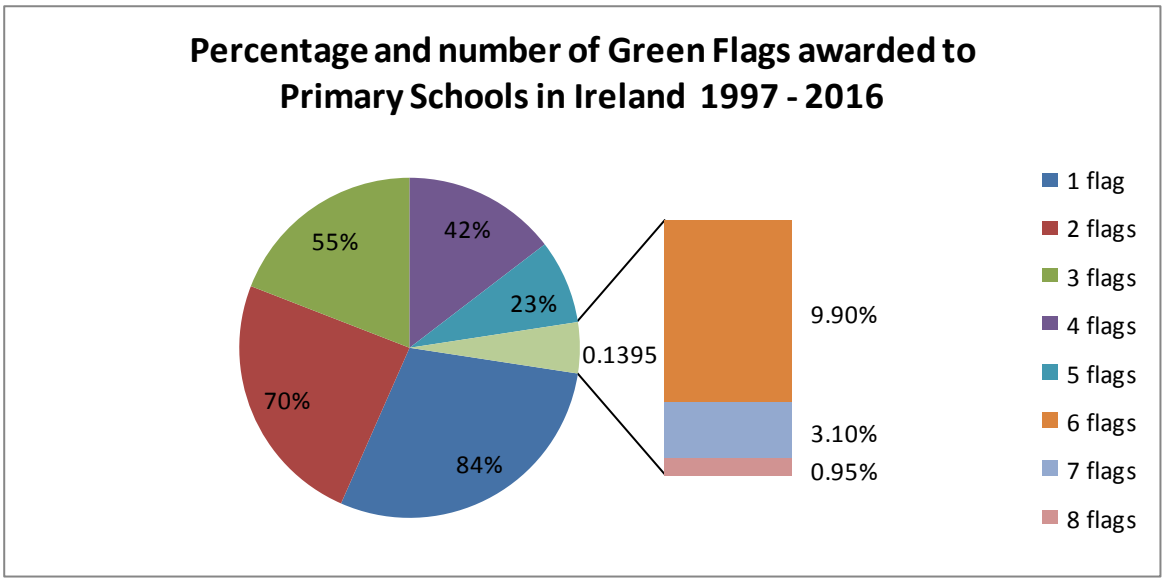

Figure 7.1 Percentage of Green Flags Awarded to Primary Schools 1997- 2016
Source Developed by the Author using information provided by *An Taisce* (2016) and the Department of Education and Skills (2016). Percentages based on total number of primary schools 3262.
Source Developed by the Author (2016)

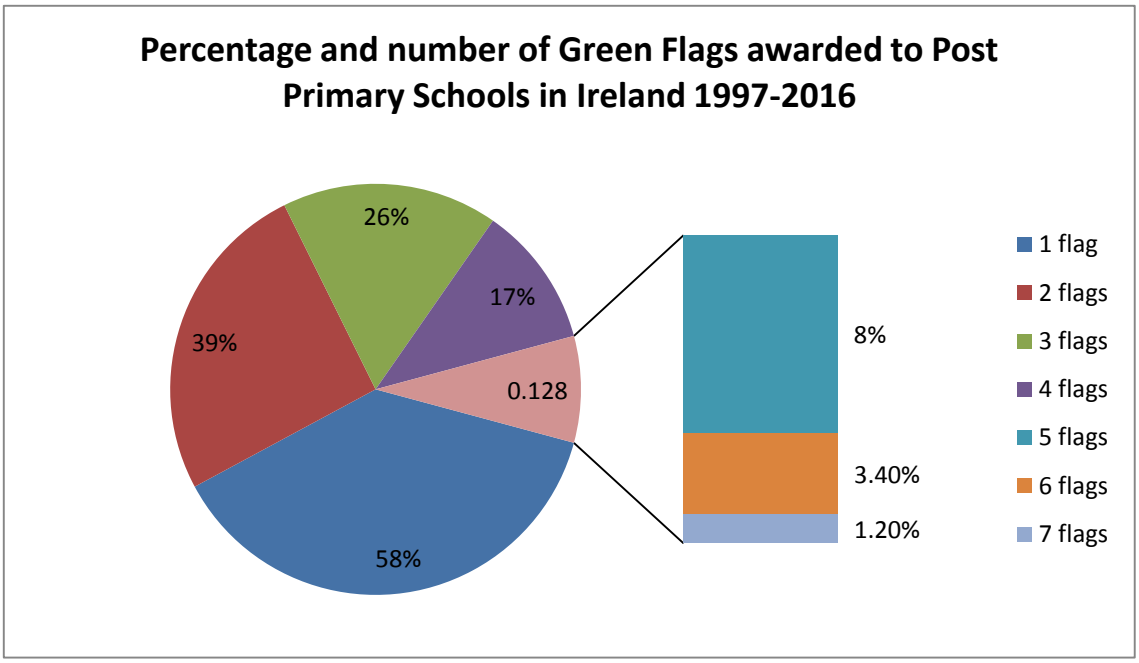

Figure 7.2 Percentage of Green Flags Awarded to Post Primary Schools 1997- 2016
Source Developed by the Author based on information provided by *An Taisce* (2016) and the Department of Education and Skills (2016) Percentages based on total number of post primary schools 735.
Source Developed by the Author (2016)

Overall, at the primary and post primary educational levels in Ireland there is room for greater Green-School compliance. Suggestions for improving Green-School compliance are outlined in Chapter eight.

7.6 Case Summary

The Green-Schools programme is viewed positively at the primary educational level in Ireland. From a representative sample of primary school teachers/green school coordinators, almost all survey respondents viewed *An Taisce's* Green-Schools programme as an important educational programme. The importance of this programme was reinforced since, 59 percent of green school coordinators believed the Green-Schools programme should be integrated into the formal primary school curriculum.

Although, commitment to the Green-Schools programme is adequate, nationally, there is room for greater Green-School compliance at both primary and post primary education levels. In addition, concerns exist regarding the time and information requirements of *An Taisce's* Green-Schools programme. Politically, in terms of education policy, the Green-Schools programme is not part of the official formal curriculum. Consequently, from an institutional perspective the decision to implement

An Taisce's Green-Schools programme is a voluntary decision made within each school. The implementation of *An Taisce's* Green-Schools programme does result in positive economic, social and ecological benefits. Aside from the economic benefit, the Green-Schools programme has the potential to further ecological and social awareness at the primary level within the formal education system in Ireland.

7.7 Case Two: Overview of Case Findings relevant to the Civic Social and Political Education Programme

In Ireland, within the formal educational system at the post primary level, the Civic Social and Political Educational Programme (CSPE) is a three year compulsory programme which commenced in 1999. The CSPE Junior Certificate Programme is compulsory for first, second and third year students at the post primary education level in Ireland. In terms of contributing to the first research question, the aim of this case was to explore the barriers and opportunities associated with the Civic, Social and Political Educational Programme (CSPE) at the post primary educational level in Ireland.

From an institutional perspective, although almost all CSPE teachers value CSPE as an important educational programme[47], and while acknowledging that positive teacher and student CSPE perception exists, within the context of the main curriculum, the majority of teachers[48] and transition year students[49] viewed the CSPE programme negatively. When school management and CSPE teachers valued and prioritised the programme, the implementation of the CSPE programme was enhanced. When these institutional factors were present, student interest in CSPE tended to be higher than in schools where these factors were absent, resulting in higher student CSPE knowledge and awareness.

From an ecological and socio-cultural perspective the impact of the CSPE programme is poor. Within the context of the 'dominant curriculum', for the majority of CSPE teachers and students, CSPE perception was negative, where the core curriculum was

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[47] Summary of Teachers' positive perceptions of the CSPE programme, Table 7.4, p. 154.
Teachers' positive perceptions of the CSPE programme, Table 2, Appendix D, p. 268.
[48] Thematic Analysis of Teachers' negative perception of the CSPE programme, Table 1, Appendix D, p. 267.
[49] Thematic Analysis -Transition Students' Perception of CSPE, Table 7.3, p. 152.

perceived as being more relevant to the leaving certificate and future course selection at the tertiary level.

Thematic analysis of four group discussions with 120 male and female 15 and 16-year-old transition year students, indicated that negative perception of the CSPE programme was influenced by four interrelated institutional factors: (1) the low status of CSPE (2) the unimportance of CSPE, when compared to other junior cycle subjects, (3) the irrelevance of CSPE regarding college choices and (4) lack of teacher interest in terms of CSPE implementation.

Issues underpinning negative teacher CSPE perception included: (1) the dominance of the core curriculum where CSPE had poor status (2) an already overcrowded timetable (3) poor consultation with the Department of Education prior to CSPE implementation and (4) inadequate in-service regarding CSPE training.

Although, the majority of teachers (58.33%) agreed that one class per week was not enough for adequate CSPE implementation, mainly due to curriculum overload and CSPE content, the CSPE survey revealed that 66.67% of CSPE teachers still disagreed that the CSPE programme should be given the same amount of teaching hours as other junior cycle subjects.

Overall, in terms of its place in the formal school curriculum, the CSPE programme is marginalised, which impacts how, CSPE is perceived and implemented. As shown in the CSPE case, the interplay of political and institutional factors does influence the development of positive (see sections 7.8.1, 7.8.2, 7.8.3 and 7.8.4 and 7.9.1) and negative teacher and student CSPE perception (7.9.3, 7.9.4, 7.9.5, 7.9.6.) In understanding the impact of political and institutional factors one must be cognisant of the context of the CSPE programme within the curriculum itself, for it is within this context that negative CSPE perceptions have their origin.

7.8 Civic Social and Political Education (CSPE) Junior Certificate Programme Post Primary level - Phase one

Research in this case involved many stakeholders and was conducted over three phases.[50] In this section key findings identified during the first phase are presented. Overall, two distinctive themes emerged during the first research phase, where both students and CSPE teachers perceived the CSPE programme positively whilst, other students and teachers viewed CSPE from a negative perspective.

7.8.1 Institutional: Positive Perception of the CSPE programme

One of the key themes which emerged during the first qualitative phase concerned the positive perception of the CSPE programme. Overall positive teacher, principal and board of management CSPE perceptions, seemed to impact how CSPE was taught and prioritised at the post primary education level. A key emergent factor contributing to teachers' positive perceptions of the CSPE programme centred on the value and importance teachers placed on the CSPE programme. Typical comments from two of four semi-structured interviews with female CSPE teachers reflective of this view emphasised:

> *"CSPE is a valuable part of the junior cycle curriculum at the post primary educational level"* (IP, 23).

> *"CSPE provides students with awareness and knowledge of relevant issues that are important to the education of students",* (IP, 24).

These teachers spoke with congruence as they communicated without hesitation about the importance and value of the CSPE programme. CSPE was also positively linked to developing responsibility and personal development where during the first phase of this case teachers stated:

> *"CSPE teaches students the importance of working in a team and their responsibility to contribute to society"…"Students learn to value each other",* (IP, 23).

> *"CSPE empowers students to create their own opinions and helps them see beyond their small worlds"..."CSPE helps students understand what people are going through in the world",* (IP, 24).

CSPE was also linked to building awareness and knowledge of the world and the development of citizenship. Reflective of the latter, typical comments from CSPE

[50] Audit Trail/ Research time line, CSPE Case Study Two: Post Primary Educational Level, Table 6.2, p. 110.

teachers included:

> *"CSPE provides students with knowledge they can use in the future"…"Students should know about the world around them",* (IP, 23). *"We place an important emphasis on teaching our students to become active citizens in life",* (IP, 24).

Emergent institutional themes are outlined in the following section.

7.8.2 Institutional: Linking CSPE Perception and Programme Implementation

Thematic analysis of group interviews with transition year students unambiguously indicated that, teachers who held positive CSPE perceptions and attitudes toward the CSPE programme were also more interested and enthusiastic when delivering the CSPE programme. Case exploration showed that when teacher interest and enthusiasm was present in class, students were more positive about the CSPE programme.

The reverse was also evident, teachers with negative CSPE perceptions tended to be less interested in class, which seemed to reinforce students' negative CSPE perceptions. More specifically, in two all-girls post primary schools in Waterford, where teachers valued the CSPE programme, representative comments from female 15 to 16-year-old transition year students stated:

> "*Our teacher is really interested in CSPE*" (GD2, P5) "*because our teacher is interested, it makes the CSPE class a lot more interesting*" (GD2, P18). …"*Our teacher's interest and enthusiasm makes all the difference"* (GD2, P33). *…"Because my teacher is interested in CSPE, it make me more enthusiastic about the topics we cover in class",* (GD 2, P47).

In contrast, to students who held positive CSPE perceptions, comments from 15 to 16-year-old male transition year students, who held negative perceptions of the CSPE programme stated:

> "*The teacher was not interested in the CSPE course*" (GD2, P83). "*Sometimes the teacher used the CSPE class to teach her own subject*" (GD2, P102)."*It was obvious our teacher was not interested in CSPE at all"* (GD2, P96)*."How are we expected to take CSPE seriously when our teacher is not interested in the subject herself",* (GD 2, P108).

Overall, case exploration and analysis showed that of CSPE teachers' attitudes and values towards the CSPE programme was an important factor which was linked to CSPE implementation and the formation of students' attitudes towards the CSPE programme.

7.8.3 Institutional -Teacher Consistency and CSPE Implementation

An emergent factor associated with positive teacher CSPE perception related to the importance of teacher consistency over the delivery of the three year CSPE programme. Typical remarks included:

> "*It is very important that there is consistency in the delivery of the CSPE programme*"*...*"*it is key that the same teacher delivers the programme for the full duration of the three year programme*", (IP, 23).

> *"Teacher consistency over the three years of the CSPE programme, allows the teacher to develop a closer relationship with students in the class"…"Teacher consistency increases students' interest in the CSPE programme*", (IP, 24).

An alternative explanation regarding CSPE teacher allocation was also evident. Mr. Aiden Clifford, director of the Curriculum Development Unit noted:

> "*Often teachers are allocated to teach CSPE just before the timetable is finalised*"…"*Sometimes being allocated CSPE is linked to low teacher status within the school*"…"*Late timetable allocation of CSPE also contributes to the low status teachers have regarding the CSPE programme*"…"*One of the key issues at the secondary education level is that teachers' perception of status is linked to the subject they teach. They are seen to be the mathematics or the English teacher*"…"*In many cases, being allocated CSPE is linked to low teacher status within the school, the low status of CSPE often results in a high level of turnover among CSPE teachers*", (IP, 27).

The low status of the CSPE teacher was confirmed by two female post primary teachers, who were not concerned about the allocation of the CSPE class due to:

> "*The already overcrowded timetable"*, (IP, 25) "*And the importance of the existing curriculum*", (IP, 26).

Some CSPE students also confirmed this view suggesting that they had different teachers for CSPE (GD2, P120).

7.8.4 Institutional and Political: Board of Management and Principal support for the CSPE programme

This section will focus on the attitudes of the board of management and the school principal relevant to the implementation of the CSPE programme. Thematic analysis revealed that the views of the school principal and board of management were influential in terms of how CSPE was perceived and implemented. Teachers who believed the CSPE programme content was important and relevant to the education of the students stated:

> "*The attitude of the board of management and the principal has a significant influence on whether the CSPE programme is prioritised or not*" (IP, 23). "*In our school the board of management and the principal view the CSPE programme as an important part of the students education and this support does influence how the programme is implemented and timetabled*", (IP, 24).

As indicated during semi-structured interviews with CSPE teachers (IP 23-24) and group discussions with transition year students (GD2, P120), positive teacher commitment to the CSPE programme was influenced by two key factors: (1) the school ethos and commitment of the school principal to the CSPE programme and (2) positive teacher attitudes and values towards the CSPE programme.

These factors, especially the values of the teacher towards the CSPE programme positively influenced programme implementation. Thematic analysis of group discussions with transition year students showed that, when these factors were present, student interest in CSPE tended to be higher than in schools where these factors were absent (see Table 7.2).

Table 7.2 Thematic Analysis – Summary of Interrelated Institutional Factors linking Teacher Commitment and Implementation of the CSPE programme

Teacher Commitment to the CSPE programme	Overall, Teachers' commitment and motivation regarding the delivery of the CSPE was higher when two key factors were present: (1) management support for CSPE and (2) teachers who valued the CSPE programme
Higher Teacher Commitment and Motivation regarding the CSPE programme	Higher teacher commitment and motivation was linked to management support and a school ethos that was supportive of the CSPE programme and positive teacher attitude and beliefs towards the CSPE programme
***Impact* of Greater Teacher Commitment and motivation to CSPE awareness**	Higher teacher motivation and commitment of CSPE teachers resulted in higher student interest in the CSPE programme among transition year students.
***Impact* of Lower Teacher Commitment and Motivation to CSPE**	Lower teacher motivation and commitment of CSPE teachers resulted in lower student interest in the CSPE programme among transition year students.

Source Compiled by the author (2016)

7.8.5 Institutional and Political: Negative Perception of the CSPE programme

Case exploration also identified negative CSPE perceptions from both students and teachers, key factors shaping negative CSPE perceptions are outlined below.

7.8.5.1 Institutional and Political: Students' negative perception of CSPE

Over sixty percent of transition year students surveyed did not consider the CSPE programme to be as important as other junior cycle subjects. More specifically, thematic analysis of four group discussions with 15 to 16-year-old male and female transition year students revealed that negative student perception of the CSPE programme was influenced by four interrelated factors. These interrelated factors included: the status of CSPE, the unimportance of CSPE when compared to other

junior cycle subjects (time table allocation), the irrelevance of CSPE regarding college choices and lack of teacher interest (GD2, P120).

When questioned about negative student CSPE perception, two CSPE teachers agreed that, students perceive the CSPE programme as less important than other subjects because it is only allocated one class per week, where the core curriculum is prioritised by students (IP 25-26). Results of the thematic analysis from semi-structured interviews with CSPE teachers were closely aligned with results from transition year students (Table 7.3).

Table 7.3 Thematic Analysis-Transition Students' Perception of the CSPE programme

Key issues influencing negative student CSPE perception	**Thematic Analysis of four group discussions with 120 transition students conducted in four post primary schools in Waterford City (GD2, P120).**
Poor Status of CSPE programme – common classification	CSPE is just a "*common subject, it is not pass or honours like all other junior cert subjects*" (GD2, P65).
CSPE does not receive equal timetable allocation.	In comparison to other subjects "*the CSPE programme was not as important*" (GD2, P93). "*only 35 minutes per week is given to CSPE, 3 /4 hours are given to all the other subjects*" (GD2, P78).
Irrelevance of CSPE regarding college choice	"*You don't need CSPE for your future*" …"*CSPE is not necessary for college*" (GD2, P85). "*It is a doss class*" (GD2, P61) "*The other subjects are much more important for our future*" (GD2, P61).
Poor teacher interest in the CSPE programme	In many cases "*the teacher was not interested in the CSPE course*" (GD2, P83) "*Sometimes the teacher used the CSPE class to teach her own subject*" (GD2, P102).

Source Compiled by the author (2014)

With the aim of strengthening the validity of findings regarding negative student perception of the CSPE programme, group discussions with first year third level business students reinforced transition students' negative CSPE perception. The majority of first year third level business students were even more explicit regarding their negative views concerning the CSPE programme. Representative comments included:

> *"CSPE was not taken seriously in our school"*, (GD3, P20) "*How can a subject that is allocated one class per week be seen as important"*, (GD3, P28) *"In comparison to the other subjects, CSPE was not rated at all"* (GD3, P44).

7.8.5.2 Political: Inadequate Consultation prior to CSPE implementation

As part of the CSPE case during phase one, results from interviews with CSPE teachers also revealed additional concerns regarding inadequate consultation prior to CSPE implementation and inadequate CSPE in-service training, which negatively influenced the implementation of the CSPE programme. More specifically teachers stated:

> *There was inadequate consultation from the Department of Education with teachers and schools prior to the announcement in schools that CSPE was being implemented*" (IP, 25), "*Some teachers did not even attend the in-service training and only received handouts from those that attended this training",* (IP, 26).

7.8.5.3 Institutional: Resistance to Junior Cycle Reform and CSPE

As referred to in *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland, 2014-2020,* junior cycle reform is a goal of government education policy. Under the proposed changes to the junior cycle planned to commence in September 2014, the CSPE was due to become a short course and lose its compulsory status. Junior cycle reform scheduled to be implemented in September 2014 were not achieved as planned, due to resistance from the Association of Secondary School Teachers of Ireland (ASTI) and the Teachers Union of Ireland (TUI). In terms of achieving curriculum change at the junior cycle level, Mr. Halbert responsible for the junior cycle curriculum within the National Council for Curriculum and Assessment (NCCA) stated:

> "*Teachers from all subject areas strongly justify why there subject must be maintained in the curriculum*"…"*This has confounded any kind of curriculum development*", (IP, 28).

When considering the proposed changes to the junior cycle, where the schools themselves will have control over subject and short course choice, guided by 24 statements of learning. Mr. Halbert noted that students:

> "*Will study a maximum of eight subjects or seven subjects and two short courses or six subjects and four short courses"…"The hours allocated to subjects will be reduced from 240 to 200 hours"…"Under the proposed Junior Cycle Reform, the hour allocation for the CSPE programme will increase from 70 to 100 hours",* (IP, 28).

> "*The new junior cycle is guided by 24 statement of learning - one of these statements is about learning how to think and act sustainably*"…"*All schools have to meet these statements of learning, so they will have to select subjects and short courses which address these statements of learning*", (IP, 28).

7.9 Civic Social Political Education (CSPE) Junior Certificate Programme Post Primary level - Phase two and three

Commensurate with the first qualitative phase, CSPE survey responses also reflected both positive and negative CSPE perception. Key findings relevant to both perspectives are presented in this section.

7.9.1 Institutional: Teachers' Positive Perception of the CSPE programme

The importance of the CSPE programme was explored during phase two, where all survey respondents believed CSPE was an important educational programme. In addition, issues identified during semi-structured interviews (phase one) were reiterated by CSPE teachers during the second research strand (see Table 7.4).

Thematic analysis of open-ended responses showed that teachers positively linked the CSPE programme with five key factors which included: building awareness and knowledge (CSPE themes), the enhancement of life skills and citizenship, students' personal development, and the importance of school ethos.

Table 7.4 Summary of Teachers' Positive Perceptions of the CSPE programme

Awareness and knowledge	*"Students need to become aware of the world out there"* (SR3, P3). *"The 7 concepts need to be understood in order to allow the student to look beyond their own narrow experience, to see the bigger picture"* (SR3, P6).
	"CSPE is a preparation for life subject dealing with all areas of student education incorporating real life experiences" (SR3, P8).
Life skills development	*"Each of the themes are present in everyday life so if we can teach the child the underlying principle of each of these themes, educate them on the importance of each and encourage them to promote and develop each theme throughout their lives as teenagers then we are shaping them into better citizen's as adults"* (SR3, P19).
	"Education for life" (SR3, P22).
Citizenship	*"CSPE is important as it gives the students a broad knowledge on a range of issues, good citizenship is a learned skill"* (SR3, P27).
	"CSPE allows for open discussion around relevant parts of their lives, e.g. stewardship, citizenship, rights etc. CSPE also opens their eyes and mind to the wider world, something that Junior Cycle students often do not engage in as they are only concerned about their own world" (SR3, P30).
Personal development	*"CSPE teaches students the importance of working in a team and their responsibility to contribute. They learn to value each other. It empowers them to create their own opinions and helps them see beyond their small worlds. It helps you understand what people are going through in the world"* (SR3, P36).
	"I agree that the many of the concepts of CSPE are not taught elsewhere in the curriculum and do need to be taught to students, the concepts are important in terms of students personal development" (SR3, P38).
School Ethos	*"CSPE is well established in the school and as a subject has been treated with respect from the start. It took a few years to become established and some teachers were not committed to it. However by and large the teachers who are teaching CSPE are committed to it and do it very well. This is the key to giving it the importance it deserves"* (SR3, P41).

Source Compiled by the author (2016)

7.9.2 Institutional - Teacher Consistency and CSPE Implementation

Teacher consistency over the three year CSPE programme was highlighted as important during phase one, research completed during phase two confirmed, that in the majority of cases teacher consistency regarding CSPE implementation was evident, where the majority of CSPE teachers indicated that students had the same teacher for CSPE throughout the three year programme.

Teachers were also asked to indicate how many years they had been teaching on the CSPE programme, overall 26 of 33 CSPE teachers had a minimum of five years teaching CSPE, with 20 teachers or 60.61% implementing the CSPE programme for a minimum of eight years[51].

7.9.3 Institutional and Political: Board of Management and Principal support for the CSPE programme

Although, positive school principal and board of management support was an emergent theme during phase one, the opposite was also evident during the second qualitative phase. In terms of the absence of management support, survey respondents typically stated:

> *"Some members of management do not value CSPE",* (SR3, P9). *"CSPE is not a priority in our school at all",* (SR3, P14). *"CSPE is not a priority with management, and this influences how it is viewed by teachers",* (SR3, P24). *"The core curriculum is the focus in our school",* (SR3, P41).

7.9.4 Institutional and Political: Teachers' Negative Perception of CSPE Programme

Student and teacher negative CSPE perceptions were identified during phase one of this case, where the majority of students did not believe the CSPE programme was as important as other subjects, relevant to the leaving certificate or to the selection of college courses.

When this was explored during the second research phase, as shown in Figure 7.3, from a sample of forty-five CSPE teachers, over three quarters of CSPE teachers agreed that students did not believe CSPE was relevant to the leaving certificate or to the selection of college courses, only one fifth of CSPE teachers disagreed with this statement (SR3, P45).

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[51] Numbers of years teaching on the CSPE programme, Table 3, Appendix D, p. 268.

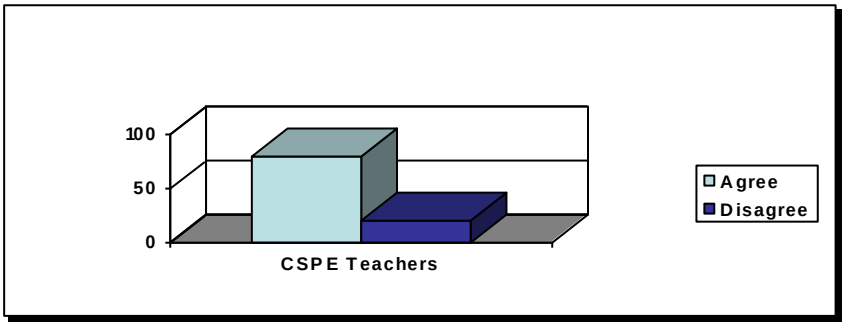

Figure 7.3 CSPE is not relevant to the leaving certificate or the selection of college courses
Source Compiled by the Author (2016)
Note Based on data collected form 45 CSPE Teachers, representing 6.1 percent of CSPE Teachers.

7.9.5 Institutional and Political: CSPE Timetable Allocation in an Over Crowded Timetable

During the first research phase, the time allocation of the CSPE programme was an issue highlighted by transition year students and CSPE teachers. A related issue highlighted by CSPE teachers and other post primary teachers in phase one, concerned the existence of an already overcrowded timetable. When these issues were explored during the second research phase, from a sample of forty-five CSPE teachers, more than half of CSPE teachers (58.33%) agreed (23.33%) or strongly agreed (35%) that the time allocation of one class per week was not enough for adequate CSPE implementation, while 41.67 % of CSPE teachers believed that one class per week was adequate for CSPE implementation (see Figure 7.4).

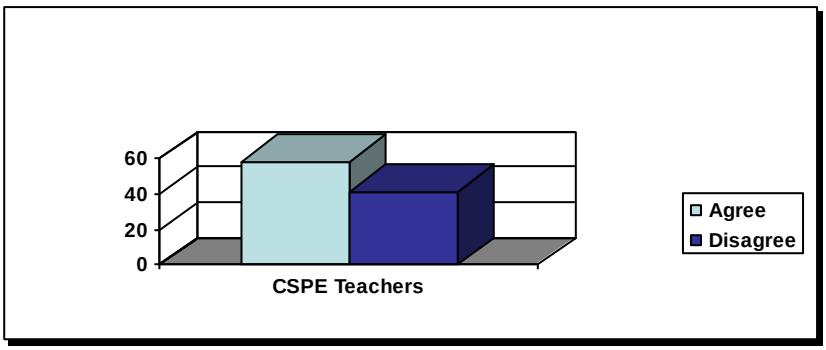

Figure 7.4 The allocation of one class per week is not adequate for CSPE implementation
Source Compiled by the Author (2016)
Note Based on data collected form 45 CSPE Teachers representing 6.1 percent of CSPE teachers.

Only one third of teachers believed the CSPE programme should be given the same amount of time as other junior cycle subjects (SR3, P45). The importance of the

programme and the difficulty of covering the course content properly in one hour per week, were cited as reasons for equal CSPE time table allocation[52]. Likewise, during the third research phase, telephone interviews with CSPE survey respondents outlined:

> *"If the Department of Education want to increase the importance of CSPE on the curriculum, CSPE needs to be given equal time table allocation as other subjects",* (IP, 30).
>
> An experienced 48 year old female teacher from Galway emphasised: *"Reducing time table allocation for religion and transferring this time to CSPE would be an obvious solution to this problem",* (IP, 33).

Similarly, Mr. Clifford Director of the Curriculum Development Unit also believed:

> *"The CSPE programme should be treated equally with other subjects on the junior certificate curriculum"…"presently only one class per week is allocated to the CSPE programme".* Mr. Clifford also believed, *"If change to the secondary curriculum is to be realised, timetable allocation needs to be addressed, if the CSPE programme is to be effective in the future*", (IP, 27).

7.9.6 Political: Inadequate Consultation prior to CSPE Implementation

Concerns regarding CSPE consultation prior to CSPE implementation emerged during phase one of the CSPE case. Similar to findings identified in phase one, in phase two, just over half of CSPE teachers agreed that, the CSPE in-service training was inadequate. In some cases teachers could not attend the in-service due to the unavailability of funds to pay substitute teachers. This resulted in some teachers receiving a CSPE handout instead of attending CSPE in-service training (SR3, P45). Concerns over inadequate consultation and CSPE in-service training were also reinforced during the third qualitative phase, where semi-structured telephone interviews with CSPE survey respondents stated:

> *"It is imperative that CSPE in-service is properly resourced",* (IP, 32). *"Poor in-service reflects badly on how the CSPE programme is perceived in the school, especially for younger teachers",* (IP, 36). *"Without a doubt, poor consultation prior to the introduction of CSPE was a source of annoyance for some teachers",* (IP, 38).

It is likely that the lack of consultation regarding the implementation of the CSPE programme contributed to teachers' negative perception of the CSPE programme.

[52] Reasons why CSPE should receive equal time table allocation as other junior cycle subjects, Table 4, Appendix D, p. 269.

7.9.7 Political and Institutional: Junior Cycle Reform and CSPE

The impact of junior cycle reform on the delivery of the CSPE programme was a theme that emerged during the first qualitative phase, where teachers seemed equally divided regarding the impact junior cycle reform would have on the CSPE programme. The exploration of this issue in phase two revealed similar results, with 40% of CSPE teachers agreeing that when CSPE loses its compulsory status, their school will most likely exclude the CSPE programme from the curriculum. While 60% of CSPE teachers believed that CSPE would continue to be taught after the programme loses its compulsory status. The importance of institutional power within the school was highlighted again in this case by survey respondents. Reflective of this view two respondent stated:

> *"Whether teachers support the delivery of the CSPE programme or not and regardless of the values teachers have for the CSPE programme, whether CSPE is taught or not, depends on school management and timetabling",* (SR3, P14). *"I can't answer if CSPE will be taught or not after the changes to the junior cycle, as I do not plan the timetable",* (SR3, P32).

7.9.8 Institutional and Political: Education at the Post Primary Level

Comments made by members of the expert panel regarding education at the post primary level are relevant to the CSPE case. Dr. Susan Murphy, Assistant Professor in Development Practice in Trinity College Dublin outlined:

> "*The development of environmental awareness is much better at the primary level, the way the curriculum is structured at the secondary level prevents awareness of education for sustainable development*", (IP, 45).

Similarly, Dr. Ken Boyle programme chair of the MSc in Sustainable Development in the Dublin Institute of Technology stated:

> "*Whatever progress has been made regarding education for sustainable development at the primary educational level has been lost at the post primary level*", (IP, 46).

In terms of the integration of education for sustainable development Dr. Boyle also emphasised:

> "*All aspects of the educational process need to be examined*", (IP 46).

7.10 Case Summary

Case exploration showed that due to a number of factors especially the dominance of the core curriculum, the CSPE programme is marginalised within the curriculum at the post primary junior cycle level. For the majority of CSPE teachers and transition year students the CSPE programme is viewed as unimportant in terms of subject choice for the leaving certificate examination and also not relevant to course selection at the tertiary level. Where school management and CSPE teachers truly valued and prioritised the CSPE programme, student interest in CSPE tended to be higher than in schools where these factors were absent, resulting in higher student CSPE awareness.

In relation to education for sustainable development, the marginalisation of the CSPE programme is of concern, since it is the only course at the post primary educational level in Ireland where CSPE themes focus specifically on sustainable development. Under the new junior cycle reform, it is proposed that the CSPE programme will lose its compulsory status and become a short course. Recommendations which may facilitate the integrating of education for sustainable development at the post primary level are outlined in chapter eight.

7.11 Case Three: Overview of Case Findings

Case three, like case one and two, was conducted over three phases. In terms of contributing to the second research question, during the first part of phase one, key theme's relevant to sustainable development were explored with five sustainable experts from Harvard University (see Table 6.7 and Section 7.14)[53].

During phase one, two group interviews were conducted with students in their final year of the BSc in International Development and Food Policy[54] and the BA in Accounting[55]. The BSc in International Development group had excellent to very good knowledge of sustainable development whilst, the BA in Accounting group had poor to inadequate knowledge of sustainable development. The impact of the course of study completed on students' awareness of sustainable development was lower for the business accounting group than for the BSc in International Development group.

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[53] Case Study Three: Tertiary Educational Level Audit Trail, Table 6.3 p.111.
[54] International Development group, Phase one, Group Discussion - 22 participants.
[55] Business Accounting group, Phase one, Group Discussion - 32 participants.

During phase two, the impact of a sustainable development module on the awareness and knowledge of final year business students was explored, utilising pre and post qualitative analysis from January to May 2016. Pre analysis of a group discussion, showed that this business student group had poor knowledge of sustainable development. Whilst, post analysis in May 2016 showed that the sustainable development module positively influenced the awareness and knowledge of the sustainable development module participants.

Business students who completed the sustainable development module believed business and management education should place more emphasis on social and environmental issues. These students also agreed that the content of business and management education should equally reflect shareholder and stakeholder theory. The majority of the business student group who completed the sustainable development module were very positive about their decision to complete the sustainable development elective, and believed other business students should be aware of sustainable development.

7.12 Exploring Awareness and Knowledge of Sustainable Development at the Tertiary Level – Phase one

As part of the first phase of case three, two group discussions were conducted with thirty-two male and female final year students reading for a BA (Hons) in Accounting and twenty-two male and female final year students reading for a BSc in International Development and Food Policy. The BSc in International Development and Food Policy group were referred to as the International Development group (GD4, P22) whilst, the BA (Hons) in Accounting group were referred to as the Accounting Business group (GD5, P32)[56].

7.12.1 Understanding Sustainable Development

Both group discussions commenced by exploring students' understanding of the term sustainable development.[57] The Accounting Business Group had inadequate knowledge of sustainable development (Rating 6) whilst, the International Development group had very good knowledge of sustainable development (Rating

[56] Summary of themes and key findings identified during group discussions at the tertiary level - phase one, Table 1, Appendix E, p. 270.
[57] See Section 6.9, Rating scale for Categorising Participants Understanding of SD, Table 6.10 p. 125.

2)[58]. From the beginning of the group discussion, it emerged that the Business Accounting group were unsure of the meaning of sustainable development, comments reflective of this view included:

> *"Sustainable development is about the ability of an organisation to sustain its development for the long term",* (GD5, P12), *"Sustainable development is about sustaining profits",* (GD5, P23), *"Sustainable development is about sustaining shareholder value into the future",* (GD5, P29).

The International Development group were also asked to explain their understanding of the term sustainable development. In general, the majority of this group tended to be more specific, where most students referred to the three core components of sustainable development, both male and female students stated:

> *"There are three key components of sustainable development",* (GD4, P7). *"Sustainable development is not just about making profit it is also about social and environmental consideration",* (GD4, P14). *"Sustainable development is about addressing the environmental, economic and social aspects relevant to sustainable development",* (GD4, P19).

After a general discussion on the meaning of sustainable developments, the Business Accounting group were told that sustainable development was concerned with the environmental, economic and social dimensions of sustainability, students were then requested to discuss these dimensions. In terms of the economic dimension of sustainable development, the Business Accounting group were more focused in their responses and stated:

> *"It is essential that an organisation creates value for the shareholders",* (GD 5, P2). *"The organisation should focus on maximising profit for the owners",* (GD5, P15).

When discussing the economic dimension of sustainable development, the International Development group adopted a broader perspective and stated:

> *"Although businesses need to be economically viable, consideration must also include the environmental and social aspects of sustainable development",* (GD4, P16). *"It's not just all about making profit",* (GD4, P19).

When discussing the environmental dimension of sustainable development typical comments from the Business Accounting group included:

> *"All management must have a good understanding of the macro and micro business-environments",* (GD5, P12). *"It's about the competitive environment and being able to compete against the firms competitors",* (GD5, P27).

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[58] Rating of International Development and Business Accounting Students' understand of sustainable development is shown in Table 7.5 p. 162.

When exploring the environmental dimension of sustainable development, one female and two male students from the International Development group stated:

> *"The environment is fundamental to our existence"*, (GD4, P8). *"We need to be more proactive in terms of dealing with climate change"*, (GD4, P13). *"Reducing emissions is now very important",* (GD4, P18).

In relation to exploring the social component of sustainable development, two male and one female aged between 21 and 23 years, from the Business Accounting group commented:

> *"It is important to treat employees well"*, (GD5, P11), *"Business should have corporate social responsibility too"*, (GD5, P14), *"The firm should contribute to the employee's social club",* (GD5, P27).

When the social component of sustainable development was explored with the International Development group, two female students aged between 22 and 24 years and one 35 year old male student reflected a broader understanding than the Business Accounting group, where these students stated, the social component of sustainable development was about:

> *"The local community and citizens of the country", (GD4), "How People are treated is central to equality and global poverty is an indicator of inequality"*, (GD4, P5), P12), *"More equal distribution of resources in the world"*, (GD4, P16).

The total average rating of students' understanding of sustainable development for each group is presented in Table 7.5.

Table 7.5: Business Accounting group and the International Development group - Average rating of groups' understanding of Sustainable Development

Understanding SD	Business Accounting group	International Development Group
Average Rating	**6**	**2.75**
Category	**Very poor**	**Good -Very good**

Source Compiled by the Author (2013)
Business Accounting group: 32 students, International Development Group: 22 students

7.12.2 Exploring the Link between Students Course of Study and Awareness of Sustainable Development

The impact of the course of study on students' awareness of sustainable development was also explored with both groups. The International Development group referred to a number of courses they had completed that influenced their understanding of sustainable development. The majority (over 80 percent) of the International Development group indicated that the BSc in International Development and Food

Policy had influenced their awareness and understanding of sustainable development (GD4, P22).

Most of the Business Accounting group (75 percent) outlined that their course had not developed their awareness of sustainable development. Though, some of the Business Accounting group highlighted that, the professional ethics in accounting course in year two had made them more aware of broader societal issues (GD5, P32). Two male Business Accounting students from Waterford and Kilkenny stated:

> *"We did research the importance of the environment as part of a PESTLE analysis in year three",* (GD5, P16). *"The environmental and social aspects were highlighted during the business and corporate strategy modules in the 7th and 8th semesters",* (GD5, P27).

Overall, the Business Accounting group tended to confuse, 'the environment', with the macro and micro business environments.

7.12.3 The Content of Business and Management Education

While many of the International Development group were unsure of the content of business and management education, having outlined the difference between shareholder and stakeholder theory, many of this group agreed that business and management education should equally reflect both shareholder and stakeholder theory (GD4, P22). Representative comments of two female students form Cork suggested:

> "*Of course business education should be reflective of shareholder and stakeholder views",* (GD4, 14). *"The focus is generally on the shareholder view, so it is important to focus on the stakeholder perspective*", (GD4, 17).

Over 50 percent of the Business Accounting group believed that business and management education was reflective of both shareholder and stakeholder theory (GD5, P32). When it was outlined to the Business Accounting group that, business and management education is more shareholder orientated, the majority of this group outlined that business and management education should equally reflect shareholder and stakeholder theory (GD5, P32). Representative comments from two 22 year old male and female students outlined:

> *"Yes management education should represent both views",* (GD5, P21), *"All perspectives should be considered in education, shareholder and stakeholder",* (GD5, P18).

7.12.4 The Link between Education for Sustainable Development and Sustainability

Towards the end of both group discussions, students were asked to discuss the relevance of education in terms of achieving sustainable development, the role of values and ethics was also discussed. The majority of the International Development group and a small number of the Business Accounting group agreed that education was important in terms of achieving sustainable development. Reflective of this view comment from the International Development group included:

> *"Without education, sustainable development will not be realised"*, (GD4, P13), *"Political leaders have an ethical responsibility to address inequality"*, (GD4, P17), "*It is essential that people are educated about climate change",* (GD4, P20).

While the Business Accounting group stated:

> "*Business is about return on investment, it's not about ethics"*, (GD5, P22), *"Generally there is no ethics in business"*, (GD5, P30).

7.13 Exploring the Impact of a Module on Sustainable Development on the Awareness and Knowledge of Business Students at the Tertiary level – Phase two

Case exploration in phase one showed that business accounting students had poor awareness and knowledge of sustainable development. Utilising a qualitative research approach, the second phase of case three at the tertiary level endeavoured to explore the impact a twelve-week module on sustainable development had on the awareness and knowledge of business degree students in their final year of study.

7.13.1 Pre Analysis of Business Students prior to Module Implementation

In line with findings from phase one, analysis of a group discussion with fourteen final year business degree students indicated that the majority of the business student group, were unfamiliar with climate change and the Millennium Development Goals (GD6, P14). Commensurate with the latter students stated:

> *"The Earth's climate has always changed"*, (GD6, P1). *"Climate change is not a topic I have though much about"*, (GD6, P9). *"There seems to be more talk about it now but, to be honest I don't know much about it",* (GD6, P6).

In contrast to most of this business student group, a small number of students outlined that human activity was impacting the environment (GD6, P14), commends commensurate with this view stated:

> *"Co2 emissions are increasing and this is having a negative effect on the health of the environment",* (GD6, P4). *"Human behaviour is impacting the environment in a negative way",* (GD6, P12).

While most students were familiar with the term, 'the green economy', the majority of students did not link the green economy with the strategy of business organisations. In general these business students indicated their business course had not developed their awareness of sustainable development (GD6, P14). While business students who had completed the business ethics elective in the previous semester referred to ethical issues in business, particularly in relation to inappropriate management of value chains (GD6, P14).

Table 7.6 represents the average rating achieved by business students, prior to completing the sustainable development module. In terms of students' understanding of sustainable development, while the majority (79 percent) of the business students groups received a very poor rating, 21 percent of this group, received an adequate rating. All students who received an adequate rating had completed the business ethics elective in the previous semester[59]. For 21 percent of the business students group, awareness of sustainable development was adequate, as outlined by three 22 to 23-year-old female students:

> *"I completed the ethics module in the last semester and we covered topics that were relevant to sustainable development", (GD6, P4). "The ethics module made us think about business from a broader perspective", (GD6, P12). "I completed the business ethics course and this is one of the reasons I choose the sustainable development module for this semester", (GD6, P14).*

Table 7.6: Pre analysis: Average rating of Business Students' Understanding of Sustainable Development

Understanding SD	**Business group 2016**	**Business group 2016**
Average Rating	**6 (79%)**	**4 (21%)**
Category	**very poor**	**Adequate**

Source Developed by the author (2016)

[59] For additional detail of Pre Analysis responses, see Table 3, Appendix E, p. 271.

7.13.2 Post Analysis of Business Students who completed the Sustainable Development Module

When evaluating the impact the sustainable development module[60] had on the awareness of business student participants, an internet survey, containing five open-ended questions[61] completed by 78.5 percent of participants was utilised to gain insight into: (1) students' understanding of sustainable development: (2) students' reflection on the decision to complete the sustainable development module: (3) students' understanding of unsustainable and sustainable business practices: (4) students' reflection regarding the need to inform other business students about sustainability and (5) the impact of different pedagogical approaches on students' learning. Results of the online sustainable development student survey are detailed in the following subsections.

7.13.2.1 Understand of Sustainable Development

The sustainable development module positively impacted business students' understanding of sustainable development. Using the rating scale,[62] overall business students' understanding of sustainable development moved from the very poor to the good category, whilst 21 percent of module participants moved from the 'adequate' to the 'very good' category (see Table 7.7).

Table 7.7: Post Analysis: Average rating of business student group understanding of Sustainable Development

Understanding SD	Business group 2016	Business group 2016
Average Rating	**3 (79%)**	**2 (21%)**
Category	**Good**	**Very good**

Source Developed by the author (2016)

A representative summary of students' understanding of sustainable development from two students stated:

> *"Sustainable Development involves meeting the needs of the current population without adversely affecting future generation's ability to meet their needs. It also involves a balanced view of the various social, economic and environmental aspects involved with Sustainable Development"*, (SR4, P3).

[60] Outline of the Sustainable Development Module, Table 2, Appendix E, p. 270.
[61] Tertiary Level: Sustainable Development Module Survey, Appendix B, 260.
[62] Rating Scale for Categorising Participants' Understanding of SD See Section 6.9 Table 6.10, p.125.

"My understanding of sustainable development is that it is more than just simply being more environmentally minded and friendly, it is more about how to balance the environmental imperatives with the social imperatives and the economic imperatives. However, I also believe in the concentric circles model which stated that we cannot balance these out equally and instead we must put our environmental needs to the foremost of our minds as these are the most important followed by social issues and then economic which are the least important (although currently it seems the other way around). In conclusion, I believe that sustainable development is massively important in today's society and should be looked upon as the only way to develop", (SR4, P4)[63].

7.13.2.2 Reflection on the Decision to complete the Sustainable Development Module

Overall, student feedback regarding the decision to complete the sustainable development module was very positive, two representative comments from 23-year-old female students from Wexford and Waterford stated:

"Yes I am extremely happy I completed the sustainable development module. I can honestly say it is the module I enjoyed most throughout my time in W.I.T. There are many reasons for this. Firstly, this module moves away from traditional learning and focuses more on discussion and debate. I found that I absorbed vast amounts of information thanks to the open, comfortable environment during class. Opinions were always encouraged which helped tremendously with the openness of class discussion. The variety of teaching techniques also contributed to my enjoyment of this module. Classes varied between videos, films, debates, discussions and traditional learning (slideshow /notes). Every class was exciting and I learned something new every day. It also helped to dramatically increase my understanding of sustainable development. I am extremely glad I completed this module", (SR4, P5).

"I personally am immensely glad that I completed the sustainable development module. I believe the sustainable development module has opened my eyes massively about the needs to not only develop, but to develop in an ethical and sustainable way", (SR4, P4)[64].

7.13.2.3 Impact of Sustainable Development Module on Students' Understanding of Unsustainably and Sustainably Business Practice

The sustainable development module positively impacted students' understanding of how business can operate unsustainably and sustainably. A representative comment from two female students and one male student outlined:

"Yes, the module has definitely given me a far greater insight into how a business operates and how they can develop more sustainably", (SR4, P4). *"I found it remarkable to learn of organisations which were looking past their profits to find ways in which they can contribute to sustainable development",* (SR4, P2).*"Before completing this module, I believed that sustainable development was defined by global warming, rising sea levels and CO2 emissions. Although these are fundamental issues which were discussed in class, I never imagined that it is also based on things like paying fair wages across the globe, providing education and*

[63] For more detail see Table 4, Appendix E, p. 272.
[64] For more detail see Table 5, Appendix E, p. 273.

monitoring economic activity. Businesses have a huge role to play in sustainable development which I never realised before", (SR4, P5)[65].

7.13.2.4 Reflection on the need to inform other Business Students about Sustainability

An important way to evaluate the impact of the sustainable development module was to explore if students believed other business students should be informed about sustainable development. In line with the expert panel (see section 7.13), unequivocally, business students who had completed the sustainable development module believed other business students should be informed about sustainable development and sustainability (SR4, P11). Comments commensurate with this view stated:

> *"Yes I believe students in all courses should receive an education involving sustainable development",* (SR4, P2). *"Yes it is my firm belief that every business student should be obligated to complete this sustainable development module. I believe this as it has given me great insight into how to carry on business more ethically and responsibly and I believe we need to show everyone this in order for us to develop",* (SR4, P4).

> *"Yes, I think the SD module should be compulsory for business students in 1st or 2nd year. If I learned what I learned in this module in 1st or 2nd year and not my final year of college my outlook on business and in life in general would be completely different",* (SR4, P7)[66].

7.13.2.5 Impact of Different Pedagogical approaches on Student Learning

During the delivery of the sustainable development module, two pedagogical approaches were combined, utilising knowledge-centred and a learner-centred approaches. As shown in the sustainable development module outline all the components of sustainable development were considered, facilitated by the completion of a reflective learning journal, an academic essay, presentations, videos and group discussions. In terms of which approach was most influential on student learning answers varied, for some students awareness of the social component was most influential, whilst other students highlighted the influence of project work, reflective of these views two students stated:

> *"I was most influenced by the social component of SD. I think before we can consider ourselves as civilised evolved human beings we have to give every single person basic human rights",* (SR4, P1).

> *"The aspect that was most influential in terms of increasing my awareness of SD was the project I completed on exploitative value chains. This helped me to gain in depth knowledge*

[65] For more information see Table 6, Appendix E, p. 274.
[66] For more information see Table 7, Appendix E, p. 275.

> *about businesses, how they are acting unethically and how they must change in order to contribute to the world becoming more sustainable overall", (*SR4, P5).

Student centred learning was also utilised as part of module delivered, where it was important that students voiced their own opinions and learned from each other, in terms of group discussions typical comments suggested:

> *"Class discussions every day were eye opening for me. We would discuss different topics such as child labour, climate change and social inequality. These discussions really helped me to look at things from other peoples' perspectives. We were always entitled to voice our opinions which enabled conversations between all students and the lecturer"…"It was one class that I felt I could express my opinion while also gaining from the opinions of everyone else",* (SR4, P6).

A process base learning approach utilising a reflective learning journal was central to module delivery, in terms of the impact of using the reflective learning journal, one student stated:

> *"Our reflective log books were great as we could look back week on week and see how much we were learning. By completing our own research throughout the module we were able to broaden our knowledge on the subject even further. Unlike other modules, the SD module was completed bit by bit and our opinions and research were so important",* (SR4, P8).

Sustainable development module participants were also required to complete an academic essay relevant to sustainable development on a topic of interest, in terms of their learning one sustainable development student outlined:

> *"Completing my literature review was a difficult task but had I not completed this module I would be completely unaware of what a lit review was, because I did the accounting stream. We were able to complete the lit review on a topic of SD that we were interested in and I learned so much in doing this"…"A lot of the learning came from my own research which helped put what we learned in class into use",* (SR4, P9).[67]

Overall, the Sustainable Development module positively impacted the awareness and knowledge of participating business students, where students were glad they had completed the module and believed other business students should be informed about sustainable development (SR4, P11).

7.13.2.6 Analysis of Sustainable Development Content in Undergraduate Business Degree Programmes

A key barrier preventing the development of awareness and knowledge of sustainable development within business and management education at the tertiary level in Ireland is the absence of sustainable development content on business degree

[67] For more detail see Table 8, Appendix E, p. 276.

programmes. Document analysis[68] of business degree programmes at undergraduate level in Ireland showed that no University or Institute of Technology in the Republic of Ireland provides a mandatory module on sustainable development. The Waterford Institute of Technology is the only Higher Education Institution in the Republic of Ireland who provides an elective module on sustainable development as part of the Bachelor of Business Studies degree programme.

Business ethics is relevant to sustainable development education, the National University of Ireland, Maynooth is the only Higher Education Institutions in Ireland where business students are required to complete business ethics modules in two years of the Business and Management degree programme. In year three of this course, business students in Maynooth can also elect to complete the Global Environmental Change 1 and 2 modules delivered by the Department of Geography. A review of the course content of the Global Environmental Change modules showed that these modules are strongly related to sustainable development.

7.14 Expert Panel Thematic Analysis – Phases one and three

The second research question asked, what are the challenges relevant to achieving sustainability and how can these challenges be more clearly understood? This section contributes to addressing this question. Results from seven themes identified from an analysis of data obtained from the national and international expert panels is outlined in the following sub-sections.

7.14.1 The Concept of Sustainable Development and Sustainability Research

This section addresses the third research objective which involved exploring and synthesise the meaning, relevance and complexity of sustainable development. Although, there are many definitions of sustainable development,[69] Nancy Dickson Co-director of the Sustainability Science Program in Harvard University stated:

> "*Ultimately Sustainable Development is about 'Reducing Poverty, while Protecting the Environment*" … "*Sustainable Development has lost a lot of its meaning"…"The term Sustainability Science is more suitable"… "Sustainability Science is more process focused"…"Sustainability Science is an evolving and important science",* (IP, 42).

[68] Review of Sustainable Development content on Business/Management Undergraduate Degree programmes in Higher Education Institutions in the Republic of Ireland, Table 9, Appendix E, p. 277.
[69] Definitions of Sustainable Development, Table 1, Appendix G, p. 287.

While Daniel Schrag, Professor of Earth and Planetary Science and director of the Harvard University Centre for the Environment (HUCE) outlined:

> *"Sustainable Development is a complicated thing, it means different things to different people and frankly Sustainable Development is a contradiction in terms"…"fundamentally to the economic community, Sustainable Development means being able to sustain development and economic progress. From a climate perspective this development puts a strain on the earth",* (IP, 41).

The interdependent nature of sustainable development was highlighted in Section 2.2, regarding the relationship between the Environmental and Development communities, Dickson emphasised:

> "*These communities are organised very differently, to the point where they almost don't interact, you are either Pro Environmental Conservation or Pro Development and Poverty Reduction*"…"*Sustainability issues (the world's big problems) will not be resolved unless these communities interact with each other*"…"*It is not environmental or development, problem solving in education must focus on both",* (IP, 42).

Inadequate interdisciplinary research was highlighted as an education for sustainable development barrier (see Section 4.4, p. 68). When discussing interdisciplinary research, assistant Professor in Development Practice, Trinity College Dublin, Susan Murphy emphasised:

> *"Interdisciplinary research is a major challenge"…"At third level people do not cross interdisciplinary boundaries"…"When you do conduct interdisciplinary research, both disciplines can be very critical, where dumbing down is then required",* (IP, 45).

In terms of sustainability research, Nancy Dickson, Co-director of the Sustainability Science Program in Harvard University outlined:

> "*Often the use of the research is not considered at all"…"Researchers in many cases do not ask the question, how is this research going to be used or of value on the ground*"…"*Research needs to be problem orientated. The solutions generated need to address a practical problem on the ground, this can then be up scaled*". At the policy level, Dickson suggested, "*Policy makers need to listen more to existing knowledge that is out there, and academics need to listen to the needs of the policy makers more*". *"People who are knowledgeable about sustainability science (sustainable development) are boundary spanners"…"The boundary spanners are very important, they are the disseminators of this information, when budgets get cut, it is the disseminators who often lose out, severing the link between policy makers and academics",*[70] (IP, 42).

[70] For more detail on the Concept of Sustainable Development and Sustainability Research, Table 1, Appendix F, p. 279.

7.14.2 Business and Management Education and Education for Sustainable Development

Relevant to the fourth research objective, business and management education is an important education for sustainable development barrier (see Section 4.2.2, p. 63). Analysis of in-depth interviews showed that all members of the expert panel believed business and management education should be reflective of social and environmental sustainability issues. Elaborating on the latter Professor in Human Rights and International Affairs at the Harvard Kennedy School, John Ruggie suggested:

> "*Management education will change as the regulatory environment changes*", ((IP, 40).

Whilst, Assistant Professor in Development Practice in Trinity College Dublin, Susan Murphy emphasised:

> "*We need to be much more cognisant of the context within which business operates",* (IP, 45).

In terms of examining this issue further Mark Kramer a senior fellow in Harvard University stated:

> "*The norm is that Corporate Social Responsibility is not embedded in Management Education and Business Strategy*"..."*Management education does need to change"…"The role of lectures is a barrier"…"Lecturers only teach what they know and what they know they learned twenty years ago. There is a large gap here and there is also a credibility issue"…"A paradigm shift within management and business education is much needed"…"A shift has to happen within the educational system before there is any long term impact in the world of business*", (IP, 44).

Mark Kramer continued:

> "*Education should be about creating informed citizens and we have lost that within business education*"…"*The calls for management education to be more reflective of sustainability issues are coming from practitioners, not academia"…"It's an opportunity for management education to be reflective of the social, environmental and economic, to emphasise the win-win",* (IP, 44).

In terms of discussing education for sustainable development in Harvard University, Mark Kramer stated:

> *"You are not going to do particularly well at Harvard Business School if your area is Sustainability. You are not going to be taken that seriously frankly*". Kramer continued, *"There is really no serious faculty commitment to sustainability at the Harvard Business School"..."Harvard University and other educational institutions really do need to change quickly, practitioners are changing much more quickly",* (IP, 44).

This is of considerable concern since Harvard Business School is considered to be one of the most prestigious business schools in the world (see Section 6.6 p. 112). The challenge of addressing deep specialisation within business and management education was also highlighted by Mark Kramer who outlined:

> *"It is hard to change deep socialisation. Management education does need to change, but so too do other areas of study"…"If you study social science courses these courses should also look at the impact of business, on society and the environment, so it really goes both ways"* [71] (IP, 44).

In line with the literature, the expert panel supported the view that sustainability issues need to be integrated into business and management education, where this is imperative for sustainability and an opportunity for the business community.

7.14.3 National Expert Panel Critique on 'Education for Sustainability' the National Strategy on Education for Sustainable Development for Ireland 2014-2020

This section addresses the first research objective which aimed to explore the role of government policy on the provision of education for sustainable development within the formal educational system in Ireland. More specifically, drawing on qualitative research with an Irish expert panel, this section explores Ireland's first national strategy on education for sustainable development, **'***Education for Sustainability' the National Strategy on Education for Sustainable Development for Ireland 2014-2020*, published in July 2014. Although, the publication of this first national strategy was welcome, overall the expert panel were critical of this publication, highlighting that this strategy was short on specific in terms of implementation. Dr. Susan Murphy, Assistant Professor in Development Practice in Trinity College Dublin, outlined that although this publication is a shift for the government, she also stated:

> "*This strategy is very much in the realm of aspiration",* it is, *"Short on accountability*", (IP, 45).

Similarly, Aiden Clifford of the curriculum development unit explained:

> *"The National strategy has limited itself in terms of aspiration and specific goals"…"The government are very conscious of lack of money"…"The recommendations made by the curriculum development unit were not reflected in the strategy",* (IP, 27).

While Ms. Hogan, Coordinator of the Ubunto network, University of Limerick welcomed this strategy, where it gets the Department of Education talking about education for sustainable development, Ms. Hogan also highlighted shortcomings of this new strategy, where she stated:

> *"It is vague on specifics"…"There is little reference about resources to support this strategy",* (IP, 29).

[71] For more detail on business and management education and education for sustainable development, see expert panel thematic analysis, Table 2, Appendix F, p. 280.

Dr. Ken Boyle programme chair of the MSc in Sustainable Development, Dublin Institute of Technology also highlighted shortcomings of this new strategy, and stated the National Strategy on Education for Sustainable Development for Ireland 2014-2020:

> "*Is overly general*"…"*The strategy is rooted within the Department of Education and Skills and does not go into how other Departments can feed into it*"…"*Politically education for sustainable development is not identified as an area that's important*". Dr. Boyle continued stating: "*This strategy is not critical of what is going on in the educational system now*"…"*The strategy is overly focused on the green flag rather than rooting education for sustainable development in the curriculum, overall the strategy does not make any attempt to criticise the curriculum*"…"*it's just paying lip service*", (IP, 46).[72]

In terms of creating new synergies relevant to education for sustainable development, Dr. Susan Murphy, Assistant Professor in Development Practice in Trinity College Dublin, outlined:

> "*The proposed advisory group would sit better under the Taoiseach's office rather than in the Department of Education and Skills*"…"*This will facilitate policy consideration that is mainstreamed across the different departments, so you can achieve policy coherence*"…"*In addition, this will provide opportunities to create new synergies*"…"*this type of innovation and creativity is essential going forward*", (IP, 45).

In discussing the interdisciplinary nature of sustainable development, Professor Sweeney Maynooth University, Dr. Boyle Dublin Institute of Technology and Dr. Murphy Trinity College Dublin, all agreed with the view that education for sustainable development is interdisciplinary. More particularly, Dr. Murphy outlined, the interdisciplinary nature of education for sustainable development is:

> *"One of the things that is missing from the new education for sustainable development strategy"…"The strategy should ensure that education for sustainable development is not marginalised*", (IP, 45).

Dr. Boyle posited, at the post primary and tertiary levels:

> "*Education for sustainable development should be in the core curriculum, where it should inform all of the educational process*", (IP, 46).

Whilst, Professor John Sweeney University of Ireland Maynooth stated:

> *"In terms of securing European research funding, programmes are now encouraging interdisciplinary and transdisciplinary research. This is something I am glad to see"…"One of the priorities is to demonstrate that you are using interdisciplinary and transdisciplinary research. This will result in more interdisciplinary and transdisciplinary research which is very positive*", (IP, 48).

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[72] For more detail on key issues and barriers regarding *Education for Sustainability' The National Strategy on Education for Sustainable Development for Ireland 2014-2020*, see expert panel thematic analysis, Table 3, Appendix F, p. 281.

Regarding the integration of education for sustainable development, Dr. Boyle was clear when he outlined:

> "*All aspects of the educational process need to be examined*"…"*Aspects of education for sustainable development can be identified within any discipline*"…"*In terms of education for sustainable development, there is a need to start at the beginning of the educational process"…"Education for sustainable development needs to be rooted in the curriculum"…"we need to go beyond 'bolt on' measures"…"Teachers need to be retrained and educated themselves"…"It is not just about saving water and energy in schools*" [73] (IP, 46).

Related to education for sustainable development, the power of the economic component of sustainable development will be considered in the following section.

7.14.4 The Power of the Economic Component of Sustainable Development

As shown in the conceptual framework for sustainability (Figure 4.1 p. 76) the economic component of sustainable development needs to embody a stakeholder perspective away from a shareholder perspective. The economic component of sustainable development was explored with Mr. Mark Kramer, Professor John Ruggie and Dr. Shane Darcy. In terms of power and size, Mark Kramer, a senior fellow in Harvard University was clear:

> "*Certainly the largest companies are larger than most countries in the world by far*"…"*In a global economy, states and governments really do not have the power to regulate global corporations very effectively"*..."*American legislation is dominated by the lobbyists"…*"*Businesses tend to drive the political agenda. There is no question the power of corporations is a factor*", (IP, 47).

Furthermore, Dr. Shane Darcy working in the Centre for Human Rights, National University of Ireland Galway stated:

> "*Business should take more responsibility for human rights"…"Especially business who work in collaboration with corrupt governments, who are paying for licences to extract precious stones in the developing world*", (IP, 47).

Similarly, John Ruggie, the Berthold Beitz Professor in Human Rights and International Affairs at the Harvard Kennedy School, believes:

> *"The practise of businesses purchasing licences to operate from corrupt Governments is a big problem",* (IP, 40).

Dr. Darcy, National University of Ireland Galway, was more specific in this regard and stated:

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[73] For more information relevant to required action regarding *Education for Sustainability' The National Strategy on education for sustainable development for Ireland 2014-2020*, see expert panel thematic analysis, Table 4 Appendix F, p. 282.

> "*Governments in the developed world should implement legislation preventing big corporations form doing business with corrupt governments and employing sweatshops in their value chains*"…"*Key global organisations like the World Bank, the International Monitory Fund and World Trade Organisation do not take into account the impact of their policies on human rights*", (IP, 47).

On a related issue Professor Ruggie, affiliated Professor in International Legal Studies at Harvard Law School outlined:

> "*Business need to embody CSR simultaneously, but there is no international government in place to implement this",* (IP, 40).

With the aim of encouraging more socially responsible and ethical behaviour, Kramer outlined:

> "*The Global compact initiative and the World Business Council guidelines for multinational businesses are positive but these initiatives and guidelines are voluntary" …"Corporations need a common standard",* (IP, 44).

In terms of key economic drivers shaping the present development path, Kramer also stated:

> "*The Stock Exchange is a major driver of how business function".* The danger with the stock exchange is that it, "*does not encourage business leaders to consider decision relevant to the long term success of their businesses*"…"*The stock exchange makes management focus on the short term*", (IP, 44).

Kramer explained how the stock market incentives business behaviour:

> "*The stock exchange creates the wrong set of incentives for managers, not just every three months but every three minutes*"…"*Share options, incentives managers to work in a certain way that ultimately focused on the share price*". Kramer emphasised: "*There is a need to encourage business leaders to invest with a long term business perspective in mind*", (IP, 44).

When exploring the link between the social and economic components of sustainable development, Professor in Human Rights and International Affairs at the Harvard Kennedy School, John Ruggie explained:

> *"The divide between rich and poor is increasing, 90 million more will live in extreme poverty due to the financial crisis",* (IP, 40).

Professor Ruggie emphasised, in terms of addressing global poverty:

> "*In action could result in destabilisation",* (IP, 40).

Regarding poverty reduction and the millennium development goals, Professor Ruggie believes the MDG's process was as important as getting the targets. Professor Ruggie explained, key problems associated with achieving the MDG's included:

> "*Lack of commitment from Political Leaders"…"Re-cycling the same fund commitment, promising but not giving the funding*"…"*The financial crisis is affecting fund commitment (.7% of GDP)*"…"*Income transfer takes attention away from the need to do things*

differently". Similarly Professor Schrag emphasised, "*the Millennium Development Goals will not be achieved, also due to lack of political will*"[74], (IP, 40).

7.14.5 Political Factors influencing Climate Change Policy

As presented in the conceptual framework for sustainability (Section 4.7 p. 71 and Figure 4.1 p. 76), the need for politicians to take action on climate change was highlighted. John Ruggie, Professor in Human Rights and International Affairs at the Harvard Kennedy School, is supportive of the IPCC findings and acknowledged that:

> "*Climate change is the greatest challenge of our time*"…"*We are affecting the natural systems we depend on*", (IP, 40).

When exploring action on climate change Professor Stavins emphasised:

> *"The United States needs to move in parallel, with commitments from China, in the United States, change regarding climate change is not going to be sudden"…"It would be easy to get an agreement that has un-ambitious targets that does not include China and the United States. This type of agreement would not do much about the problem*". Professor Stavins strongly emphasised "*Bush didn't withdraw from the Kyoto protocol"…"The decision not to participate in the Kyoto protocol was by partisan",* (IP, 43).

Professor Stavins went further and stated:

> "*The United States said we will not ratify an agreement that does not include major developing countries, China, India, Brazil, Mexico, South Korea and South Africa",* (IP, 43).

Similarly, Professor Ruggie indicated:

> "*The US did not commit to the Kyoto Protocol, because no political commitment came from India and China"…"For the world to take action without the developing countries taking action, means you are not addressing the problem",* (IP, 40).

When discussing climate change action, the economy was prioritised, in line with this view Professor Stavins stared:

> *"The US is a democracy, Climate change is not a big issue in the United States like it is in Europe. People in the United States are concerned about, health care, the recession, and the economy is a huge issue",*[75] (IP, 43).

Similarly, the dominance of the economic component of sustainable development over environmental consideration was illustrated when Professor Ruggie stated:

> *"Politically for the United States – the Protocol targets disadvantaged United States industry",* (IP, 40).

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[74] For more detail on The Power of the Economic Component of Sustainable Development, see Table 5, Appendix F, p. 283

[75] For more information on the environmental component of SD: Political factors influencing climate change policy, Table 6, Appendix F, p. 284.

7.14.6 Climate Change: Role of the Media

An emergent theme from the expert panel, preventing the development of awareness and knowledge of climate change concerns the role of the media and climate change deniers. Professor Sweeney, Dr. O' Mahoney, Professor Schrag and Ms. Dickson concur that the media is not reflective of the scientific consensus on climate change. In terms of increasing awareness of climate change, Professor Sweeney, National University of Ireland, Maynooth stated:

> "*The role of the media is very important, but unfortunately the media contributes to the confusion of the public themselves*"…"*97 percent of the evidence supports the reality of anthropogenic climate change and 3 percent does not*", (IP, 48).

Similarly, Dr. O' Mahoney, Dublin Institute of Technology indicated:

> "*There is a high level of acceptance of the IPCC's findings*"…"*895 papers and 2500 scientists support the IPCC findings*"…*"But the media do not want conclusions, regarding the science of climate change, they want debate and argument",* (IP, 49).

Whilst, Dr. Schrag, Professor of Earth and Planetary Science and Director of the Harvard University Centre for the Environment (HUCE) went further and emphasised:

> "*The findings of the IPCC are conservative*"…*"Many journalists, treat climate change like it's a political party"…"Giving equal representation to a small fringe group, 'that's just bad irresponsible journalism",* (IP, 41).

Furthermore, Dr. O'Mahoney, from the Dublin Institute of Technology stated:

> "*For real change to occur regarding sustainability, it is the public acceptance of the science which is the key, this is known as social inertia*" but he emphasised "*Social inertia is being prevented by the media and through funded research negating the IPCC's findings*", (IP, 49).

When discussing anthropogenic climate change denial, Professor Schrag stressed:

> "*I have been dealing with climate change deniers for many years*", Schrag was emphatic here and stated, "*There are three types of climate sceptic, these are sceptics who are ignorant about the reality of Climate Change*", (IP, 41).

Climate change sceptics include deniers, contrarians and those who are paid to confuse. More specifically, the perception of one's academic discipline is relevant here, Professor Schrag explained:

> "*Some experts in theoretical physics regard the Earth Sciences as a lower level field, - it's a form of academic snobbery. They say climate change models are wrong,* but Professor Schrag explained: *"Climate change is based on observations not models"…"These deniers focus on one thing and if their focus does not quite fit into the theory, the whole theory is wrong",* (IP, 41).

Professor Schrag also explained contrarians are another form of climate change denier:

> "*They will oppose the major consensus - just to be controversial"…*"*The third form of climate change sceptics are the deniers*"…"*These sceptics/ deniers are basically paid liars - paid by oil companies and other organisations to just confuse the climate change debate, these deniers are paid to confuse. Payment amplifies them, they become more vocal and write more papers*". Schrag stated "*This is ethically horrible*", (IP, 41).

Regarding education for sustainable development, climate change deniers and the media, Nancy Dickson emphasised:

> "*Present students must be presented with the realities and facts of the IPCC consensus"... "In addition, know your enemy"..."students need to explore who the most articulate objectors are and where their funding comes from*", (IP, 42).

7.14.7 Economic and Social Components of SD - Sustainability/Corporate Social Responsibility as a Business Opportunity

As shown in the conceptual framework for sustainability (Figure 4.1 p. 76), the embodiment of a low carbon economy is considered to be a win/win both economically and socially. According to Mark Kramer, senior research fellow in Harvard University, Sustainable Development can provide valuable opportunities for business, Kramer outlined:

> *"CSR is a business opportunity; there is money to be made in social issues being solved".* Kramer suggested, "*Viewing corporate social responsibility as a win-win and integrating SD into an organisations corporate strategy, can provide business with new and rewarding opportunities*", (IP, 44).

Kramer emphasised, a shift in strategic thinking is now required:

> *"It is through seeing the interrelationship between the components of sustainable development that strategists can identify opportunities*"…"*This requires a shift in thinking, that is the real barrier*". Kramer continued "*With regard to strategy now you have got to think of the social context and the sustainability issues as part of your strategy and that's the shift that has to happen. You need to think of the social context and opportunities as part of you strategy*", (IP, 44).

In the transition towards strong sustainability (see Section 2.7.2 p. 34) Kramer emphasised, the view of key business executives is fundamental, do the key executives take a short term perspective and see CSR as a public relations exercise? or do key executives think about CSR/Sustainability as contributing to the long term success of their business? Kramer explained:

> "*For most companies, CSR is still cut off and separate from the strategy of the company"…*"*CSR is not a public relations exercise, it needs to be embedded into an organisations strategy*". Kramer emphasised, "*CSR is not linked to management incentives programmes' and this is why managers do not pay attention to Corporate Social Responsibility*"…"*Senior executives need to incentivise CSR and view strategy from a long term as opposed to a short term perspective*"… "*Nearly all the companies that produce CSR reports do not tie performance reviews to the CSR report*"…"*What gets measured gets done",* (IP, 44).

In terms of movement towards sustainability, according to Kremer:

> *"Senior managers need to unearth their assumptions and identify what is influencing their socialisation process*"…"*Although there is a movement towards stakeholders, the primary interest is the shareholder*", (IP, 44).

This section has highlighted sustainability issues for most organisations are not integrated into an organisations strategy, this is influenced my managements socialisation and the prioritisation of the economy over action on climate change. The opportunities for sustainability integration into business strategy were also highlighted[76].

7.15 Case Summary

Phase one and two of case three showed that business students have poor awareness of sustainable development. This is most likely due to the absence of sustainable development content on undergraduate business degree programmes provided by the Institutes of Higher Education in the Republic of Ireland. During phase two, this case demonstrated that a twelve week module on sustainable development positively impacted business students' awareness and knowledge of sustainable development. Post analysis showed that these students believed all business students should be informed about sustainable development.

In terms of addressing the first research question, fundamental to the development of the role of education for sustainable development as highlighted by the Irish expert panel, embedding education for sustainable development into the formal education system; especially within teacher training is important. Importantly, from a political perspective, in terms of advancing education for sustainable development, the Irish expert panel also supported the view that the national strategy on education for sustainable development, published in July 2014 needs to be more specific and measurable. Part of the second research question asked, what are the key challenges relevant to achieving sustainability? Both expert panels believed it was imperative that education for sustainable development should be integrated into business and management education. Business opportunities regarding the integration of sustainability into corporate strategy were also outlined. Other key challenges

[76] For more detail see Economic and Social Components of SD - Theme: Corporate Social Responsibility as a business opportunity, Table 8, Appendix F, p. 286.

highlighted by the expert panels associated with the achievement of sustainability focused on the power of big business and the need to address climate change. Contributions from both expert panels helped to verify the conceptual framework for sustainability (Figure 4.1 p. 76).

7.16 Summary

This chapter addressed two research questions. The first research question asked, what is the role of education for sustainable development within contemporary education in Ireland and how can this role be developed? Overall, the role of education for sustainable development within contemporary education in Ireland is poor. At the primary educational level, while the Green-Schools programme is considered to be an important environmental education programme, this programme is not part of the official curriculum, which negatively influences green school compliance. In addition, the completing the core curriculum and the work load of running schools were also factors influencing non-participation in the Green-Schools programme. At the primary level, only 42 percent of primary schools in Ireland have achieved four of the eight green flag awards.

Case two explored the Civic Social Political Education programme (CSPE) which is the only education programme specifically related to sustainable development at the post primary level in the Republic of Ireland. Overall, the majority of teachers and students perceive CSPE as unimportant compared to the main curriculum. CSPE is also not considered relevant to the selection of college courses at the tertiary level. Politically, although CSPE is the only educational programme specifically related to sustainable development, under the new junior cycle reform it is proposed that the CSPE programme will lose its compulsory status and become a short course. When the CSPE programme is designated as a short course, some school management may exclude CSPE from the curriculum, further diminishing the role of education for sustainable development at the junior cycle level.

The role of education for sustainable development at the tertiary education level is also inadequate. Given the dominance of the present economic model, business and management education is particularly important in terms of achieving sustainability. To date no Higher Education Institution in the Republic of Ireland provides an undergraduate degree on sustainable development. Additionally, no Higher Education

Institution provides a mandatory module on sustainable development. Only one Higher Educational institution provides an elective module on sustainable development as part of a Bachelor of Business Studies degree programme. Case three showed that business students have poor awareness of sustainable development. Case three also demonstrated that a twelve week module on sustainable development positively influenced business students' awareness and knowledge of sustainable development. Education for sustainable barriers identified in this study across the three educational levels are summarised in Table 7.8.

Table 7.8 Summary of Barriers preventing the Implementation of Education for Sustainable Development in the Formal Educational System in Ireland

	Educational Programmes	**ESD Barriers**
Case One Primary Level	Green-Schools Programme	**Individual Level:** Green-School Programme Implementation is overly dependent on one teacher. **Principals:** lack of time due to the work load of running the school, commitment to the present curriculum, cuts in teaching resources. **Green School Coordinators:** some concerns regarding Information content suitability at the primary level and Time consuming nature of project and paper work. **Institutional Level:** The Green-Schools Programme is not part of the official Formal Curriculum
Case Two Post Primary level	Civic Social Educational Programme	**Individual Level:** Negative student and teacher perceptions of the CSPE programme- CSPE was not as important as the core curriculum or relevant to the selection of college courses at the tertiary level. **Institutional Level:** It is proposed that CSPE will lose its compulsory status under Junior Cycle Reform. In many cases School Management and Principals do not value CSPE
Case Three Tertiary level	Undergraduate Business Degree Programmes Teacher Training Programmes	**Individual Level:** Business Students' Awareness and Knowledge of Sustainable Development is Poor **Institutional Level**: **Business Degree programme content:** at undergraduate level, no HEI in the Republic of Ireland provides a mandatory module on Sustainable Development **Institutional Level:** No Higher Education Institution in the Republic of Ireland provides an Undergraduate Degree in Sustainable Development **Institutional Level:** Education for sustainable Development is not integrated into teacher training courses in Ireland
Post Primary and Tertiary levels		**Political and Institutional:** Pedagogic Norms of Disciplinarity

Source Compiled by the author (2017)

The views of the Irish expert panel regarding *'Education for Sustainability' the National Strategy on Education for Sustainable Development for Ireland 2014-2020*, showed, in terms of advancing education for sustainable development within the formal education system in Ireland, this new national strategy needs to be more specific and actionable.

The latter part of the chapter presented results pertaining to the second research question which asked, what are the challenges relevant to sustainable development and how can these challenges be more clearly understood? The power of big business globally was articulated, where the need to integrate sustainability issues into corporate strategy was outlined, where the embodiment of sustainability issues can be an opportunity for business actors. The expert panel highlighted the importance of integrating sustainability issues into business and management education at a global level. The importance of interdisciplinary research and the challenges associated with interdisciplinary were also highlighted. The expert panel also highlighted the critical importance of addressing climate change.

CHAPTER EIGHT
CONCLUSIONS AND RECOMMENDATIONS

8.0 Introduction

This chapter presents conclusions pertaining to the first and second research questions respectively. The chapter begins by presenting conclusions concerning the first research question which asked: what is the role of Education for Sustainable Development within contemporary education in Ireland and how can this role be developed? Conclusions relevant to the second research question: what are the challenges relevant to achieving sustainability and how can these challenges be more clearly understood, are then articulated. Irish government policy implications of this study are then outlined. Opportunities relevant to developing the role of education for sustainable development across the formal education sector in Ireland are then articulated. The remainder of this chapter focuses on this study's contribution to knowledge and suggestions for further research followed by a chapter conclusion.

8.1 Role of Education for Sustainable Development within the Contemporary Education in Ireland

The first research questions of this study asked: What is the role of Education for Sustainable Development within contemporary education in Ireland and how can this role be developed? In terms of answering this question from a micro perspective, this research aims to explore education for sustainable development barriers and opportunities relevant to the formal education system in Ireland.

Addressing this question was facilitated by the theoretical and conceptual frameworks presented in Section 4.7 p. 71. This section outlined that understanding sustainable development requires having regard for the historical context which has shaped the present economic development model, underpinned by the dominant social paradigm. In addition, Section 4.7 also emphasised the essential interdependency of the five components of sustainability, which needed to be considered in terms of holistically exploring the role of Education for Sustainable Development within contemporary education in Ireland and how this role can be developed?

Facilitated by the conceptual framework for sustainable development, key educational programmes explored included the Green-Schools programme at the primary level,

the civic, social and political programme at the post primary level and business and management education at the tertiary level (outlined in Sections 7.1-7.11). The three cases were explored from the environmental, social, economic, political and institutional perspectives outlined in the conceptual framework for sustainable development (Figure 4.1 p. 76), case exploration also captured the key issues and actions required in terms of developing the role of education for sustainable development within contemporary education in Ireland (presented in Figures 8.1-8.3).

Overall, the role of education for sustainable development within contemporary education in Ireland is inadequate, where education for sustainable development is marginalised within the formal curriculum. At the primary level between 1997 to 2016 only 42 percent of primary schools (1,367 of 3262 primary schools) and 17 percent of post primary schools (128 of 735 post primary schools) have been awarded four of eight green flags.

Barriers preventing further Green-Schools implementation and compliance exist at individual, institutional and political levels. At the individual level, Green-Schools Programme implementation is overly dependent on one teacher. Institutionally, at the school level concerns exist regarding the time consuming nature of project and the suitability of some programme content for primary school children. Additionally, at the school level, barriers preventing Green-Schools programme participation stem from a combination of factors including, lack of time due to the work load of running the school and commitment to the present curriculum. Politically, a key barrier preventing the integration of education for sustainable development at the primary educational level in Ireland concerns the voluntary decision to participate in this programme, since the Green-Schools Programme is not part of the official formal curriculum at the primary educational level in Ireland.

As part of the formal education system at the post primary level in Ireland, the Civic Social and Political Educational programme is the only compulsory educational programme specifically related to sustainable development. Barriers concerning the CSPE programme exist at individual, institutional and political levels. The main barrier to effective CSPE implementation is the dominance of the ‘main curriculum’ where CSPE is marginalised and viewed as unimportant by the majority of teachers and students.

Although teachers consider CSPE to be an important educational programme, when compared to the main curriculum, for the majority of teachers and students negative CSPE perception is underpinned by the view that CSPE is not relevant to the leaving certificate examinations or to the selection of college courses at the tertiary level. For most students, teacher disinterest in CSPE, the classification of CSPE as 'Common' and its allocation of one class per week on the time table further reinforces students' negative perception of the CSPE programme. From a political perspective, within the context of junior cycle reform, where the CSPE programme will lose its compulsory status and become a 'short course', without modification of the new junior cycle statements of learning, it is likely that some school management will not select the CSPE short course as part of the curriculum content.

At the tertiary educational level the provision of education for sustainable development is also inadequate. From an institutional perspective, although most Higher Education Institutions in Ireland provide courses relevant to sustainable development, these courses tend to be specialised courses in the environmental sciences. At the undergraduate level in Ireland no Higher Education Institution provides a Degree in Sustainable Development. As illustrated in the literature, there is an over emphasis on the economic component of sustainable development. This is reflected in the formal education system at the tertiary level where the provision of business and management education is evident in all Higher Education Institutions in Ireland.

At the individual level, business students' awareness and knowledge of sustainable development is poor. This is likely due to the fact that business education at the tertiary level in Ireland is for the most part void of sustainable development content. Only one Higher Education Institution in Ireland provides an elective module on sustainable development within an undergraduate business degree programme. This is influenced by the dominance of subject disciplinarity and the emphasis on the economic component of sustainable development within business and management education.

Case three at the tertiary level demonstrated that while business students had poor knowledge of sustainable development, the sustainable development module positively impacted business students' knowledge of sustainability. In line with the

findings of Drayson, *et al.,* (2013) the majority of the expert panel and all sustainable development module respondents believed business students should receive knowledge pertaining to sustainable development. In Ireland the integration of sustainability issues into business and management education is important, especially within the context of transitioning to a low carbon green economy.

Overall, a number of interrelated barriers are preventing the integration of education for sustainable development into the formal education system in Ireland. Where many of the education for sustainable development barriers highlighted in Chapter four, are contributing to the marginalisation of education for sustainable development. More specifically, education itself is a barrier, where the integration of education for sustainable development is made more difficult due to subject disciplinarity, curriculum overload and resistance to educational reform. Together these factors reinforce the dominance of the present curriculum, especially at the post primary and tertiary educational levels.

In reference to the external framework of the conceptual framework, at the paradigm level, the dominant social paradigm has influenced the development of formal education in Ireland. In line with government educational policy, historically the education system has been shaped around specific subjects, referred to in the literature as the pedagogic norms of disciplinarity, where functional specialisation still prevails. Teacher training at the tertiary level is also institutionally structured around subject disciplines, which feed into the delivery of the post primary curriculum, which in turn is connected to student course selection at the tertiary level. In terms of post primary teacher training, the Professional Masters in Education does not contain course content specifically relevant to sustainable development.

Overall, the Irish expert panel was disappointed with *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland, 2014-2020,* where it was uncritical of the present education system and lacked specific measures. In terms of the integration of education for sustainable development at the post primary education level, the implementation of recommendation 10, to implement 'Politics and Society' as a new Leaving Certificate subject, is particularly important. A prerequisite to the integration of education for sustainable development

within the formal educational system in Ireland is the integration of education for sustainable development into teacher training programmes.

8.2 Challenges Relevant to Achieving Sustainability

The second research question asked, what are the challenges relevant to achieving sustainability and how can these challenges be more clearly understood? This was achieved in this study through the development of a new conceptual framework for sustainability, detailed in Section 4.7. Primary research with the expert panel both conformed and reinforced the key issues and actions required highlighted in this framework (Section 7.14).

From a global perspective there are many interrelated challenges relevant to achieving sustainability, some of these challenges include anthropogenic climate change, resource overuse, wealth inequality and water stress. Inaction on climate change is a formidable challenge, the top global risk in 2016 was found to be a failure of climate change mitigation and adaptation. The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years (Table 2.6 p. 25).

Resource overuse is also a key concern. Humanity is now experiencing global ecological overshoot, since today Humankind uses the equivalent of 1.5 planets to provide the resources that are used (Figure 2.8 p. 20). The consequences of resource overuse include: diminishing forest cover, collapsing fisheries, species decline, the depletion of fresh water systems, and the build-up of carbon dioxide emissions which is driving anthropogenic climate change. As stated by John Ruggie, Professor in Human Rights and International Affairs in Harvard University*, "Climate change is the greatest challenge of our time"…"We are affecting the natural systems we depend on".*

Water stress is also a significant challenge, by 2030 it is predicted that almost half of the world's population will be living in areas of high water stress. In developing regions poverty still prevails, where one in eight people or 13.5 percent of the overall population, remain chronically undernourished. Although enough food is produced for everyone, a billion people still suffer from hunger. Hunger persists due to the

uneven distribution of resources and food wastage, whilst at the same time almost half of the world's wealth is now owned by one percent of the world population.

A formidable barrier to addressing these interrelated challenges is the predominantly unquestioned adherence to the present economic development model. Adherence to the present development path is pervasive and systemic and is affecting political action on climate change. For example commitment to the dominant economic model in the United States influenced the decision to withdraw from the Kyoto protocol. As outlined by John Ruggie, Professor in Human Rights and International Affairs at the Harvard Kennedy School, *"Politically for the United States the [Kyoto] protocol targets disadvantaged United States industry".*

As highlighted in the conceptual framework for sustainability (Sections 4.7 and 2.3.2) given the dominance of the economic component of sustainable development over social and environmental considerations, there is a need for big business to become more proactive in terms of addressing wealth inequality. This is a significant challenge, as stated by Mark Kramer, a research follow in Harvard University,

> *"The largest companies are larger than most countries by far"… "Businesses tend to drive the political agenda"…"The Global Compact Initiative and the World Business Council guidelines for Multinational Organisations are…voluntary".*

A shift towards wealth equality can be achieved through wealthy individuals and big business paying tax, as opposed to availing of tax havens. At the other end of the wealth creation process, business actors needs to implement fair value chains. Addressing this 'elephant in the room' requires action from the World Bank, the International Monitory Fund, the G20 and the Organisation for Economic Cooperation and Development. In partnership, these institutions need to implement legal changes which prevent the facilitation of tax avoidance by a small number of big banks, accounting and law firms.

Historically, adherence to the present development path has been influenced and shaped by the dominant asocial paradigm. A fundamental challenge to achieving sustainability is to address the assumptions underpinning the dominant social paradigm. Challenging the dominant social paradigm is elusive since as suggested by Perlmutter and Trist (1986) the dominant social paradigm is a social construction so widely held that individuals are only vaguely aware of the direction it gives to their

behaviour, where the dominant social paradigm provides legitimisation and justification for the institutions of society and as such acts as an ideology. Unearthing the assumptions underpinning the DSP requires perspective transformation, this is why education for sustainable development is a crucial enabler in the transition to a more equitable and sustainable World. Education for sustainable development is about perspective transformation, it is about re-constructing knowledge, which can create profound changes in the knowledge, skills and attitudes of those involved in this learning process.

A key barrier to the integration of education for sustainable development is education itself. Education leaders have a particular responsibility to support and proactively facilitate the inclusion of education for sustainable development especially within Higher Education Institutions.

8.3 Irish Policy Implications of this Study

The first research question asked, what is the role of education for sustainable development within contemporary education in Ireland and how can this role be advanced. In terms of addressing this question the first research objective examined sustainable development and education for sustainable development within the Irish context, with particular emphasis on the role of government policy on the provision of education for sustainable development within the formal education system.

Overall, in relation to the integration of education for sustainable development, future education policy needs to be more specific and measurable. In comparison to previous years, from 2012 to 2015 in Ireland, political progress has been made regarding the publication of government policy related to sustainable development and relevant to education for sustainable development. In terms of developing inter-departmental synergies, opportunities exist regarding linking these publications with education for sustainable development.

For Ireland, the green economy is fundamentally and strategically important both now and in the coming decades. The transition to a green economy will therefore require a different type of learning, which focuses on the development of the skills, competencies and strategic ability required to underpin a sustainable green economy.

This is why the integration of education for sustainable development into the formal education system in Ireland is both timely and strategically important.

For the purpose of enabling the Irish State to pursue, and achieve a transition to a low carbon, climate resilient and environmentally sustainable economy by the end of 2050, as outlined in Ireland's first climate change bill, *Climate Action and Low Carbon Development Bill 2015,* (Section 5.1.6) it is important that education for sustainable development is prioritised, resourced and integrated into the formal education system in Ireland. This integration of education for sustainable development is particularly important since, it is likely that Ireland will not meet its emissions targets by 2020.

In 2012, *Our Sustainable Future, a Framework for Sustainable Development for Ireland* was published. The integration of education for sustainable development into the formal education system would most likely contribute to the achievement of some of the 70 measures relevant to sustainable development outlined in this publication (Section 5.1.5).

The vision that Ireland will be a carbon-neutral society by 2050 is an important vision. This vision is detailed in *Ireland and the Climate Change Challenge*: *Connecting* '*How Much' with 'How To'* (Section 5.1.4). A more specific and measurable educational policy focused on the integration of education for sustainable development would most likely contribute to the realisation of this vision. Additionally, future education policy publications relevant to the integration of education should replicate this publication since, this publication is visionary, strategic and action orientated.

In 2014 Ireland's first strategy on education for sustainable development, *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland 2014-2020,* was published (Section 5.2.2). Overall, this publication was a welcome development and contains some important recommendations which are referred to later in this chapter. In terms of policy implications, decision makers within the Department of Education and Skills need to be cognisant of fact that, the Irish expert panel (Table 6.7) were generally disappointed with this inaugural strategy (Section 7.14.3). In compliance with and building on recommendations advanced in

the *'Education for Sustainability' The National Strategy on Education for Sustainable Development in Ireland, 2014-2020*, conclusions relevant to strengthening the provision of education for sustainable development within the formal education system in Ireland are advanced in the following section.

8.4 Conclusions relevant to Strengthening the Provision of Education for Sustainable Development within Contemporary Education in Ireland

The first research question asked, what is the role of education for sustainable development within contemporary education in Ireland and how can this role be advanced. This section presents a number of opportunities which may advance the integration of education for sustainable development across the formal education system in Ireland. The synthesis of key issues and recommendations (required action), are presented in the conceptual framework for sustainability, Figure 8.1, Primary educational level, Figure 8.2, Post Primary educational level and Figure 8.3, Tertiary educational level.

8.4.1 Advancing Education for Sustainable Development at the Primary Educational Level

While *An Taisce's* Green-Schools programme is viewed by most teachers as an important educational programme[77], where commitment to *An Taisce's* Green-School programme can result in positive ecological, social[78] and economic benefits[79], the choice to implement the Green-Schools programme is voluntary since this programme is not an official part of the curriculum[80]. With the aim of strengthening education for sustainable development at the primary educational level two recommendations are advanced[81].

[77] See Figure 8.1, column two, additional detail is presented in Section 7.4.1, p.141 and Tables 7 and 8, Appendix C, pp. 264-265.
[78] See Figure 8.1, column two, additional detail is presented in Sections 7.2.1 and 7.2.2, pp. 135-136 and Tables 1-5, Appendix C, pp. 261-263.
[79] See Figure 8.1, column two, additional detail is presented in Section 7.2.1, p. 135 and Table 6, Appendix C, p. 263.
[80] See Figure 8.1 Political and institutional barriers relevant to *An Taisce's* Green-Schools programme, column two.
[81] Recommendations relevant to advancing education for sustainable development at the primary level of formal education, Figure 8.1, column 3.

8.4.1.1 Recommendation One: Integrate *An Taisce's* Green-Schools Programme into the Primary School Curriculum and Teacher Education Programmes

It is recommended that *An Taisce's* Green-Schools Programme should be integrated into the formal curriculum at the primary educational level. As shown in case one, from a sample of 49 green school coordinators, 59 percent believed, the Green-Schools programme should be integrated into the formal primary school curriculum. The integration of the Green-Schools programme would also spread the responsibility of environmental education across the school, rather than being overly dependent on one teacher. The integration of this programme would also positively impact Green-Schools programme compliance. Furthermore, the integration of *An Taisce's* Green-Schools programme would lay the foundation for institutional synergistic linkages regarding education for sustainable development between the primary and post primary education levels in Ireland, especially given the political proposal to include 'Politics and Society' as a new leaving certificate subject at the post primary level.

From a political perspective, in line with recommendations 6 and 7 outlined in, *'Education for Sustainability' The National Strategy on Education for Sustainable Development for Ireland 2014-2020,* the integration of the Green-Schools programme is an important opportunity and would build on limited existing practice (recommendations 6) and is ideally suited for integration (recommendations 7) into the english, history, geography, and science curricula. A perquisite to the successful implementation of this recommendation (required action) is the integration of the Green-Schools programme content into all teacher training education programmes. This recommendation is in line with research conducted by Yavetz *et al.*, (2013), who have posited, there is a need to reorient teacher-education programs toward environmental education.

Politically, *An Taisce's* Green-Schools programme is supported by the Irish Department of Environment, Community and Local Government, Department of Transport, Tourism and Sport (National Transport Authority), and the Department of Arts, Heritage and the Gaeltacht via the National Parks and Wildlife Service (Green Schools Ireland, 2014). The integration of this programme would necessitate transferring responsibility for *An Taisce's* Green-Schools programme into the Department of Education and Skills. From the political, economic and environmental

perspectives, and building on the contribution of the Green-Schools programme[82] (see Section 7.2.1 and Table 6, Appendix C) in Ireland the integration of the Green-Schools programme would result in all primary schools participating in this programme, laying the foundation for even greater cost savings and ecological benefits into the future.

8.4.1.2 Recommendation Two: Reduce the Information Requirements of *An Taisce's* Green-Schools Programme

As shown in Section 7.4.2, 70 percent of green school coordinators indicated, the work load regarding projects and paper work was quite time consuming (48 percent) or very time consuming (28 percent), Additionally, a reduction of the information requirements of the Green-Schools programme should be considered, since 43 percent of survey respondents agreed (28 percent) or strongly agreed (15 percent) that some of the detail required regarding green school compliance was more suitable for older secondary school students. Consequently, the work load and information requirements may negatively impact Green-School compliance. A reduction of information requirements from *An Taisce* may positively influence the level of Green-Schools participation and compliance, at the primary educational level.

8.4.2 Applying the Conceptual Framework for Sustainability to Case One: Green-Schools Programme -Primary Educational Level

The conceptual framework for sustainability, developed as part of this study (see Section 4.7 and Figure 4.1) depicts the process required in terms of a transition towards a sustain-centric paradigm away from the dominant social paradigm. This framework was also utilised to explore *An Taisce's* Green-Schools programme and is outlined in Figure 8.1. When considering key institutional issues (Figure 8, column 2) the Green-Schools programme is viewed by teachers and green school coordinators as an important educational programme (Sections 7.1, 7.4.1, Tables 7 and 8, Appendix C). The Green-Schools programme did increase the environmental awareness of participants (Section 7.2.2 and Tables 1-5, Appendix C).

[82] In Ireland from 2013-2014, *An Taisce* Green-Schools programme diverted 5,200 tons of waste from landfill, saved 384 million tons of water, 17.7 million units of electricity, 1.27 million tons of petrol and diesel, saving an estimated €8 million (Green Schools Ireland, 2014)

In Ireland, the Green-Schools programme does provide ecological and economic benefits (Section 7.2.1 and Table 6, Appendix C). When considering political and institutional issues, concerns exist regarding Green Schools non-participation (Section 7.3.3), and the time and information requirements of the Green-Schools programme (Section 7.4.2), where there is room for greater programme implementation (Section 7.5).

With the aim of improving the integration of education for sustainable development at the primary education level (required action Figure 8, column 3), the Green-Schools programme could be integrated into the formal primary curriculum (Section 8.4.1.1). In addition, the information requirements of the Green-Schools programme could also be reduced (Section 8.4.1.2).

In conclusion, the implementation of these recommendations would require political and institutional commitment from the Department of Education and Skills, *An Taisce*, Institutes of Higher Education who deliver Teacher Training educational programmes and relevant Teacher unions (see Figure 8.1 Sustainable development: Primary Educational Level, key issues and required action).

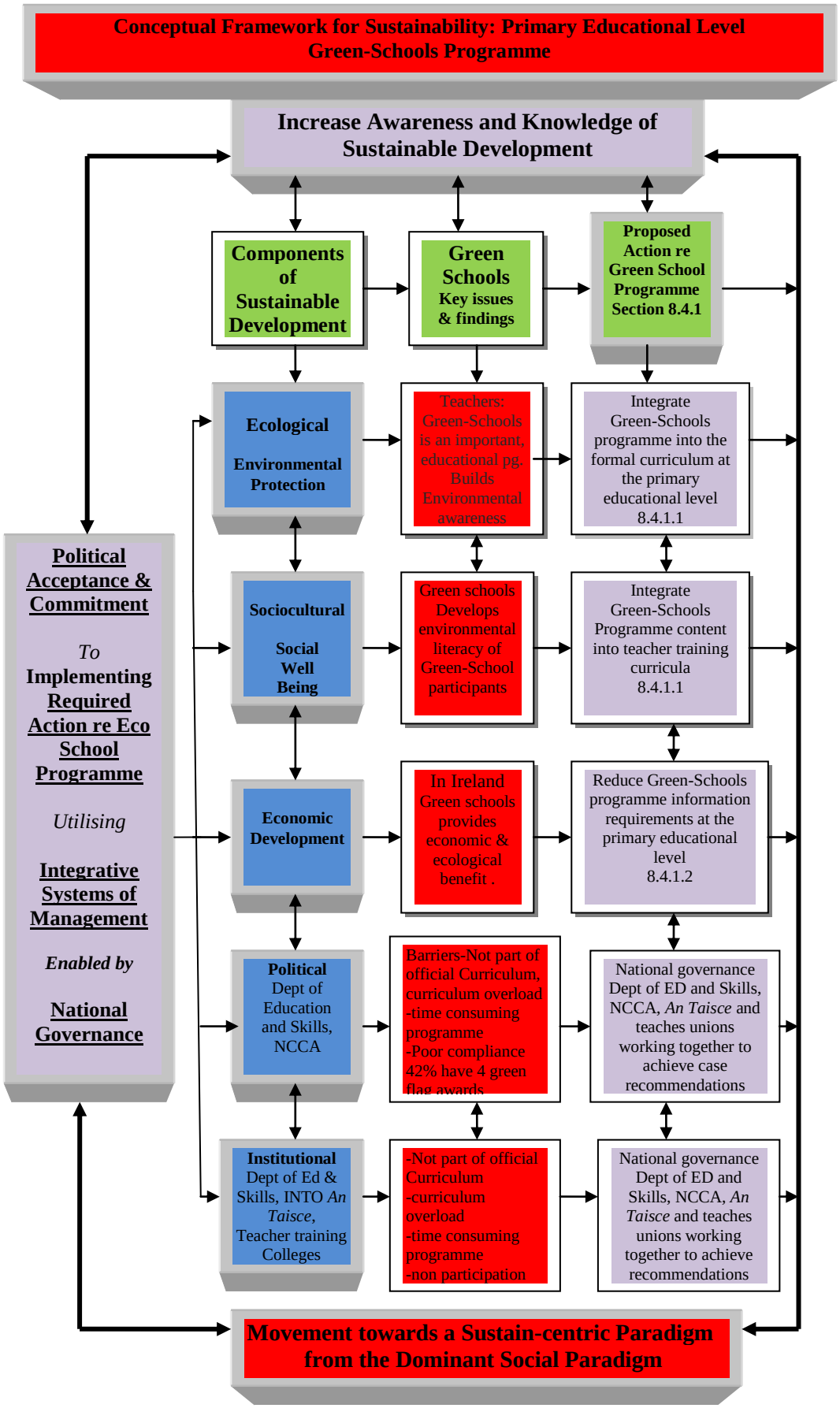
Conceptual Framework for Sustainability: Primary Educational Level
Green-Schools Programme
Increase Awareness and Knowledge of Sustainable Development
Components of Sustainable Development
Green Schools Key issues & findings
Proposed Action re Green School Programme Section 8.4.1
Ecological Environmental Protection
Teachers: Green-Schools is an important, educational pg. Builds Environmental awareness
Integrate Green-Schools programme into the formal curriculum at the primary educational level 8.4.1.1
Political Acceptance & Commitment
To Implementing Required Action re Eco School Programme
Utilising
Integrative Systems of Management
Enabled by
National Governance
Sociocultural Social Well Being
Green schools Develops environmental literacy of Green-School participants
Integrate Green-Schools Programme content into teacher training curricula 8.4.1.1
Economic Development
In Ireland Green schools provides economic & ecological benefit .
Reduce Green-Schools programme information requirements at the primary educational level 8.4.1.2
Political Dept of Education and Skills, NCCA
Barriers-Not part of official Curriculum, curriculum overload -time consuming programme -Poor compliance 42% have 4 green flag awards
National governance Dept of ED and Skills, NCCA, An Taisce and teaches unions working together to achieve case recommendations
Institutional Dept of Ed & Skills, INTO An Taisce, Teacher training Colleges
-Not part of official Curriculum -curriculum overload -time consuming programme -non participation
National governance Dept of ED and Skills, NCCA, An Taisce and teaches unions working together to achieve recommendations
Movement towards a Sustain-centric Paradigm from the Dominant Social Paradigm

Figure 8.1

8.4.3 Advancing Education for Sustainable Development at the Post Primary Educational Level

In this section two recommendations are outlined that would most likely advance the integration of education for sustainable development at the post primary educational level (see Conceptual framework for Sustainable development: Post primary Educational Level, key issues and required action, Figure 8.2).

8.4.3.1 Recommendation One: Political and Institutional: Implement 'Politics, Society and Sustainability' at the Post Primary Level

Within the *National Strategy on Education for Sustainable Development for Ireland 2014-2020*, it is recommended that 'Politics and Society' should be introduced as a new Leaving Certificate subject. Given the inadequate level of education for sustainable development at the post primary level, the proposed integration of 'Politics and Society' is an important recommendation which should be implemented. The implementation of this course provides an important opportunity for the Department of Education and Skills to advance education for sustainable development, at the post primary level in Ireland (see Figure 8.2 required action).

It is also proposed by the researcher that the new leaving certificate subject, 'Politics and Society' should be extended to include *sustainability*,[83] where the subject is renamed: *'Politics, Society and Sustainability'*. The implementation of this recommendation would ensure that education for sustainable development[84] would have a presence in the Irish formal senior cycle leaving certificate curriculum. The implementation of this proposal would also contribute to the development of interdisciplinary study at the post primary level, which is fundamental to the study of sustainable development. Given that educational reform can be difficult to achieve,[85] the addition of sustainability to this proposed new leaving certificate subject would be easier to achieve *prior to* the implementation of 'Politics and Society'. The renaming of the new leaving certificate subject, 'Politics and Society' to, 'Politics, Society and Sustainability' would also require modifying the course content to include additional information, particularly the environmental component of sustainable development.

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[83] Relevance of sustainability, sustainable development and education for sustainable development, Chapter Two, p. 10, Section 3.2, p. 48 and Chapter 4, p. 57.
[84] Education for Sustainable Development, Section 3.2, p. 48.
[85] Resistance to Change, Section 4.6 p. 71.

8.4.3.2 Recommendation Two: Political and Institutional - Modification of Statements of Learning regarding the New Junior Cycle Curriculum

Under the proposed Irish junior cycle reform measures, the Civic Social and Political Education programme (CSPE) will lose its compulsory status and become a short course. The decision to reduce the CSPE programme to a short course could negatively impact the implementation of recommendations 6 and 7 (Table 5.5 p. 91) of the National Strategy on Education for Sustainable Development. Under the new junior cycle, school management will make decisions regarding the inclusion or exclusion of short courses in the curriculum.

In phase one of the CSPE case (Section 7.8.4) a CSPE teacher stated *"The attitude of the board of management and the principal have a significant influence on whether the CSPE programme is prioritised or not*" (IP, 23) During phase two a CSPE survey respondent also outlined, *"Some members of staff do not value CSPE"* (SR3, P24) (Section 7.9.3), whilst 40 percent of survey respondents agreed, when the CSPE programme loses its compulsory status, their school will most likely exclude the CSPE programme form the curriculum (Section 7.9.7). Mr. Harlbert, responsible for the junior cycle curriculum in Ireland outlined, for school management the decision to include or exclude short courses will be guided by 24 statements of learning (Section 7.8.5.3).

From a review of the statements of learning only three of the twenty four learning statements are specifically relevant to sustainability (Table 5.4 p. 89). Since these statements of learning lack specificity, this may result in school management excluding the CSPE programme from the curriculum. Within this context, it is recommended that statements 7 and 9 should be more specific. Greater specificity of the statements of learning 7 and 9 would most likely encourage school management to include the CSPE programme as part of their curriculum selection.

Therefore, it is proposed by the researcher that: Statement of learning 7 should include – *Understands the meaning of sustainability,* where: Statement of learning 7 would read: **[the student] understands the meaning of sustainability and values what it means to be an active citizen, with rights and responsibilities in local and wider contexts.** It is also proposed that: Statement of learning 9 should include – *as it relates to sustainable development,* where: Statement of learning 9 would read: **[the**

student] understands the origins and impacts of social, economic, and environmental aspects of the world around him/her as it relates to sustainable development. Though these recommended changes are small, these modifications would enhance the specificity of the 7th and 9th statements of learning, thereby increasing the probability of post primary schools including the CSPE short course in their curriculum selection.

8.4.4 Applying the Conceptual Framework for Sustainability to Case two: Civic Social and Political Education Programme–Post Primary Educational Level

Similar to case one the conceptual framework for sustainability, developed as part of this study (Section 4.7 and Figure 4.1) was used to synthesise case two which explored the Civic Social and Political Education programme at the post primary education level. *Column two of Figure 8.2* summarises the key issues regarding the CSPE programme. Though positive CSPE perception exists (7.8.1- 7.8.4, and 7.9.1), overall, the CSPE programme is marginalised in the programme (Section 7.8.5), due to the dominance of the main curriculum and negative student and teacher CSPE perception (Section 7.8.5, 7.9.3 and 7.9.4). Institutionally and politically under the new junior cycle reform, the CSPE programme will lose its compulsory status (Section 7.9.7).

Column three of Figure 8.2 summarises the required action in terms of advancing education for sustainable development at the post primary level. The proposed new subject, 'Politics and Society' should be implemented and broadened to include sustainability content (Section 8.4.3.1). Improving the specificity of the statements of learning 7 and 9 relevant to the new junior cycle reform would most likely positively influence CSPE selection at the post primary education level (Section 8.4.3.2) (see Figure 8.2).

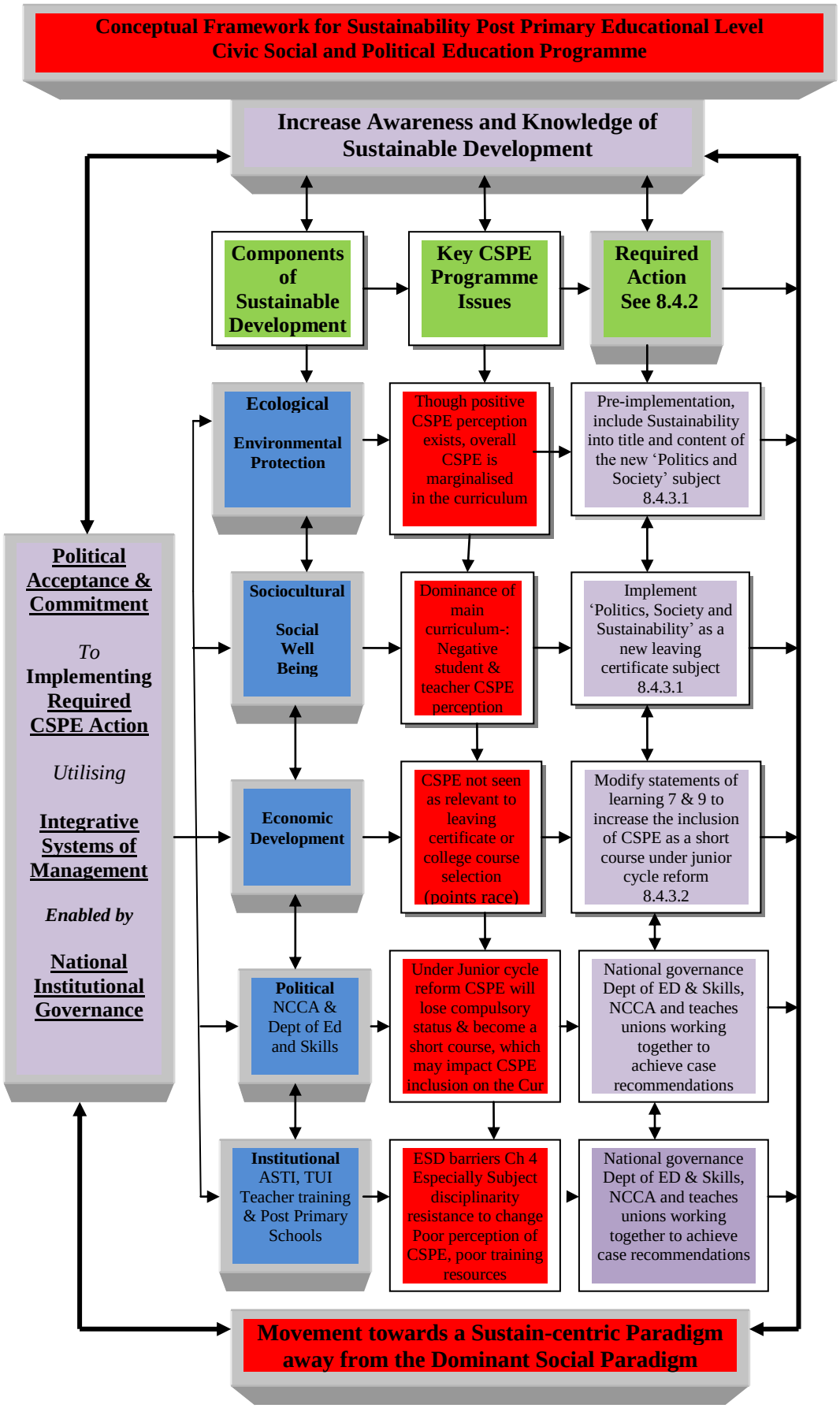
Conceptual Framework for Sustainability Post Primary Educational Level
Civic Social and Political Education Programme
Increase Awareness and Knowledge of Sustainable Development
Components of Sustainable Development
Key CSPE Programme Issues
Required Action See 8.4.2
Ecological
Environmental Protection
Though positive CSPE perception exists, overall CSPE is marginalised in the curriculum
Pre-implementation, include Sustainability into title and content of the new 'Politics and Society' subject 8.4.3.1
Political Acceptance & Commitment
To
Implementing Required CSPE Action
Utilising
Integrative Systems of Management
Enabled by
National Institutional Governance
Sociocultural
Social Well Being
Dominance of main curriculum-: Negative student & teacher CSPE perception
Implement 'Politics, Society and Sustainability' as a new leaving certificate subject 8.4.3.1
Economic Development
CSPE not seen as relevant to leaving certificate or college course selection (points race)
Modify statements of learning 7 & 9 to increase the inclusion of CSPE as a short course under junior cycle reform 8.4.3.2
Political
NCCA & Dept of Ed and Skills
Under Junior cycle reform CSPE will lose compulsory status & become a short course, which may impact CSPE inclusion on the Cur
National governance Dept of ED & Skills, NCCA and teaches unions working together to achieve case recommendations
Institutional
ASTI, TUI Teacher training & Post Primary Schools
ESD barriers Ch 4 Especially Subject disciplinarity resistance to change Poor perception of CSPE, poor training resources
National governance Dept of ED & Skills, NCCA and teaches unions working together to achieve case recommendations
Movement towards a Sustain-centric Paradigm away from the Dominant Social Paradigm

Figure 8.2

8.4.5 Advancing Education for Sustainable Development at the Tertiary Educational Level

As referred to in Section 8.3, in terms of laying the foundation in a transition to a sustainable green economy, whilst reducing emissions, the integration of education for sustainable development is particularly important at the tertiary educational level. Four recommendations are proposed in terms of advancing education for sustainable development at the tertiary education level in Ireland.

8.4.5.1 Recommendation One: Embed Education for Sustainable Development into Educational Programmes at the Tertiary Level

Selby (2006) has emphasised, disciplines form the organising framework in higher education, as reflected in the structures of faculties and schools. Recommendation 19 of the *National Strategy on Education for Sustainable Development in Ireland 2014-2020* outlines that, higher education institutions should seek to implement more undergraduate and post graduate programmes relevant to sustainable development. In ensuring the advancement of education for sustainable development at the tertiary level, recommendation 19 should be prioritised and implemented. In addition, recommendation 19 of the *National Strategy on Education for Sustainable Development in Ireland 2014-2020* needs to be more specific. The successful integration of education for sustainable development at the tertiary level in Ireland requires more actionable, measurable and specific goals which should also include retraining of educators (see, Figure 8.3).

8.4.5.2 Recommendation Two: Integrate the Social and Environmental Components of Sustainable Development into Business and Management at the Tertiary Level

In comparison to the economic component of sustainable development, as shown in phase one and two of case three (see Sections 7.12, 7.13.1, Table 7.6) business students' awareness and understanding of sustainable development was inadequate. Given the dominance of the economic component of sustainable development over social and environmental considerations, it is recommended that political and educational stakeholders should facilitate the inclusion of the social and environmental components of sustainable development into business and management

education at the tertiary level. Business and management education should embody the Principles for Responsible Management Education[86]. Given the importance and potential of the green economy in Ireland, this is an important recommendation (see Figure 8.3).

8.4.5.3 Recommendation Three: Prioritise and Support Research for Sustainable Development

The Irish Higher Education Authority, Irish Research Council, Department of Education and Skills and Higher Education Institutions working together, should proactively prioritise research in sustainable development at the tertiary level. This is in line with the Irish Research Council, who aimed to embed interdisciplinary thinking in the Irish research system at all levels in 2016. Aktas (2015) has argued, the prioritisation of research for sustainable development would likely encourage needed interdisciplinary research and teaching. The prioritisation of research for sustainable development is in line with the *National Strategy on Education for Sustainable Development in Ireland 2014-2020,* recommendations 21, 22 and 23 which should be proactively prioritised, supported and implemented.

8.4.5.4 Recommendation Four: Categorise Education for Sustainable Development as Sustainability Science

In terms of achieving recommendations 21, 22 and 23 of the *National Strategy on Education for Sustainable Development in Ireland 2014-2020,* it is recommended that education for sustainable development should be categorised as Sustainability Science. Given the challenge of achieving sustainability, the term sustainability science would serve to increase the profile of sustainable development and education for sustainable development among academics and practitioners. Given the dominance of subject disciplinarity and functional specialisation within education (Sections 4.1 and 4.3), the term sustainability science would provide additional legitimisation to the increasingly important area of education for sustainable development, which is interdisciplinary in nature. From an academic perspective the term, sustainability science would serve to unite the presently disconnected components of sustainable development. As highlighted in Section 3.2, sustainability science is not a new term and was introduced in Amsterdam at the *World Congress,*

[86] Principles for Responsible Management Education, Appendix K, p. 303.

Challenges of a Changing Earth in 2001. As stated by Nancy Dickson, Co-director of the Sustainability Science programme in Harvard University, *"The term Sustainability Science is more suitable"…"Sustainability Science is more process focused",* (IP, 42). In line with Kates (2010), essentially sustainability science is about furthering scientific understanding of human-environment systems; improving linkages between research and policy communities; and building capacity for linking knowledge with action to promote sustainability.

8.4.6 Applying the conceptual framework for sustainability to Case three: Awareness and Knowledge of Sustainable Development: Tertiary Education Level

From a global perspective the conceptual framework for sustainability, developed as part of this study (see Section 4.7 and Figure 4.1) depicts the process required in terms of a transition towards a sustain-centric paradigm away from the dominant social paradigm. This framework was utilised to synthesised case three which explored business students' awareness of sustainable development at the tertiary level. More specially, in terms of key political and institutional issues (Figure 8.3, column 2), education for sustainable development barriers exist, where subject disciplinarity is dominant (Section 4.3), and business and management education is not reflective of sustainability issues (Section 4.2.2). While international development students had excellent to very good awareness of sustainable development (Section 7.12), business students had inadequate knowledge of sustainable development (Section 7.12 and 7.13.1). The sustainable development module positively impacted business students' awareness of sustainable development (Section 7.13.2).

At the tertiary level education for sustainable development needs to be embedded into educational programmes especially teachers training (Section 8.4.5.1) and business and management education programmes (Section 8.4.5.2). More research on sustainability is required (Section 8.4.5.3). In terms of encouraging more interdisciplinary research in the area of sustainable development, the area could be categorised as sustainability science (Section 8.4.5.4).

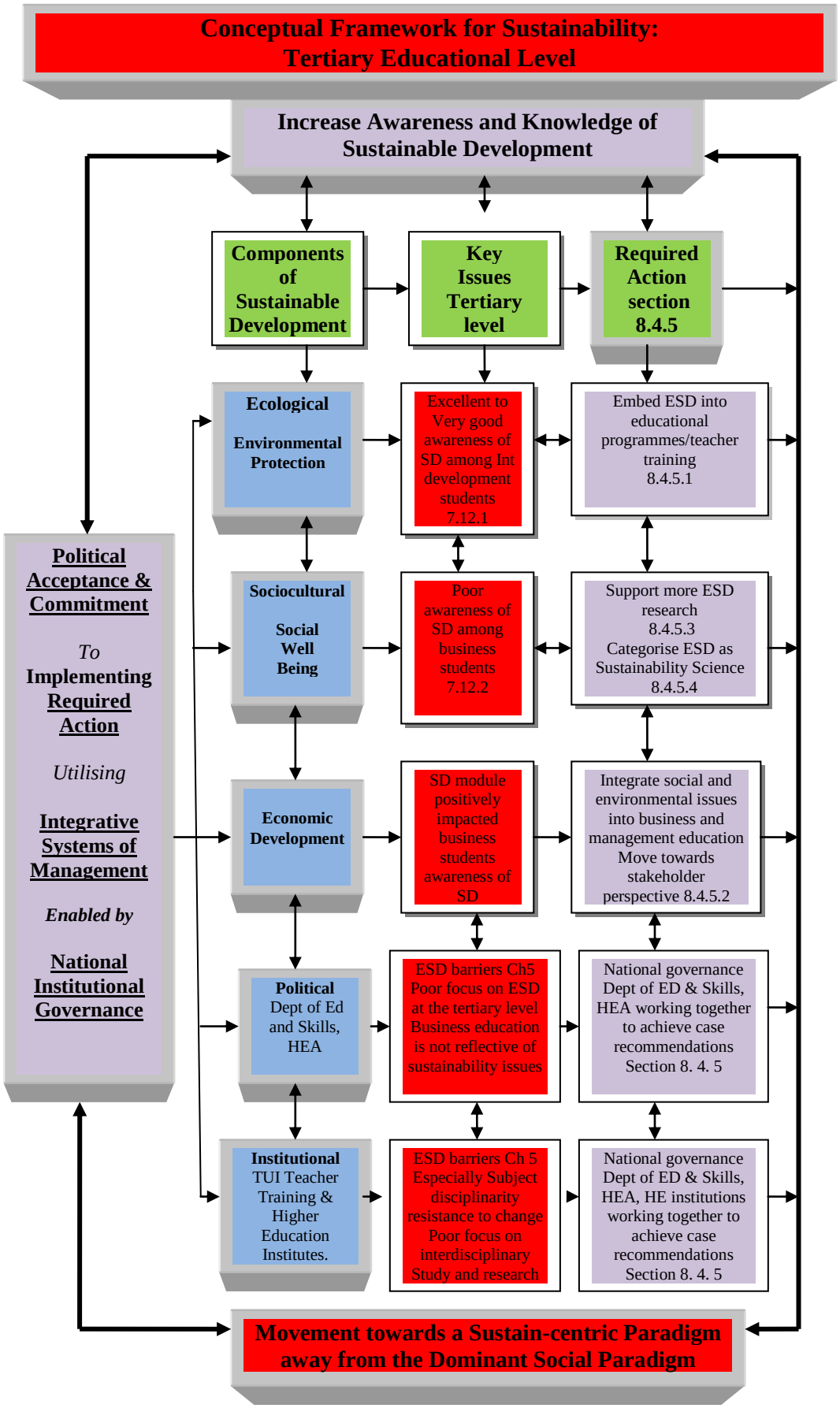
Conceptual Framework for Sustainability:
Tertiary Educational Level
Increase Awareness and Knowledge of Sustainable Development
Components of Sustainable Development
Key Issues Tertiary level
Required Action section 8.4.5
Political Acceptance & Commitment
To
Implementing Required Action
Utilising
Integrative Systems of Management
Enabled by
National Institutional Governance
Ecological
Environmental Protection
Excellent to Very good awareness of SD among Int development students 7.12.1
Embed ESD into educational programmes/teacher training 8.4.5.1
Sociocultural
Social Well Being
Poor awareness of SD among business students 7.12.2
Support more ESD research 8.4.5.3
Categorise ESD as Sustainability Science 8.4.5.4
Economic Development
SD module positively impacted business students awareness of SD
Integrate social and environmental issues into business and management education
Move towards stakeholder perspective 8.4.5.2
Political
Dept of Ed and Skills, HEA
ESD barriers Ch5
Poor focus on ESD at the tertiary level
Business education is not reflective of sustainability issues
National governance
Dept of ED & Skills, HEA working together to achieve case recommendations
Section 8. 4. 5
Institutional
TUI Teacher Training & Higher Education Institutes.
ESD barriers Ch 5
Especially Subject disciplinarity resistance to change
Poor focus on interdisciplinary Study and research
National governance
Dept of ED & Skills, HEA, HE institutions working together to achieve case recommendations
Section 8. 4. 5
Movement towards a Sustain-centric Paradigm away from the Dominant Social Paradigm

Figure 8.3

8.5 Contribution to Knowledge

As a consequence of this study, this research provides an original contribution to academic knowledge by advancing the conceptualisation of sustainability, within the context of education for sustainable development. This study has also provided new knowledge regarding the role of education for sustainable development within contemporary education in Ireland and how it can be developed within the formal education system in Ireland.

8.5.1 Advancing the Conceptualisation of Sustainability

The scholarship on sustainability and education for sustainability usually does not consider the multidisciplinary and complex nature of sustainability. Drawing on the literature presented in chapters 2-4, and underpinned theoretically by Bourdieu's social theory and complex adaptive systems theory, an important contribution of this research was the development of a new conceptual framework for sustainability (see Section 4.7 and Figure 4.1 p. 76). This framework advances present representations of sustainable development since most conceptualisations of sustainability refer to only three components of sustainable development: the social, environmental and economic components. The conceptual framework for sustainability advanced in this study, extends present frameworks for understanding the complexity of sustainability, through including political and institutional as additional components of sustainable development, in addition to the social, environmental and economic components.

This framework is unique since it also identifies key issues and actions required relevant to each of the five components of sustainable development. All key issues and required actions relevant to the five components of sustainable development are linked to the external part of the framework, which focuses on the creation of awareness and knowledge of sustainable development and emphasises the movement from the dominant social paradigm towards a sustain-centric paradigm. Essentially, this framework provides an important link between sustainable development and education for sustainable development and contributes to the ontology of sustainability science. This framework can be applied both globally and locally. In this study this framework facilitated the exploration of the research questions, aims and objectives.

8.5.2 Advancing Understanding of Education for Sustainable Development within the Formal Education System in Ireland

With the aim of contributing to government policy relevant to education for sustainable development, this study identified and provided understanding of key barriers preventing the integration of education for sustainable development in Ireland. This study also identified opportunities relevant to the development of the role of education for sustainable development, particularly with regard to *An Taisce's* Green-Schools programme at the primary level, the Civic Social and Political Education programme at the post primary level and business and management education at the tertiary level. Additionally, suggestions were identifies which may enhance the implementation of '*Education for Sustainability*' *National Strategy on Education for Sustainable Development in Ireland 2014-2020.*

Related to existing Government publications, especially the *Climate Change and Low Carbon Bill 2015*, this study identified how education for sustainable development could contribute to the vision that Ireland will be a carbon-neutral society by 2050.

8.6 Further Research

In terms of further research relevant to education for sustainable development, two suggestions are outlined in this section.

8.6.1 An Enquiry into the Impact of Education for Sustainable Development on the Decision Making and Behaviour of Business Students

As shown in case three, education for sustainable development can positively impact the awareness and knowledge of business students. A relevant question is therefore, does education for sustainable development impact the decision making and behaviour of business students? Consequently, an exploration of the impact of education for sustainable development on the decision making and behaviour of business students would be an interesting and important research study, which to date, has not been conducted in Ireland. This research could also be longitudinal and conducted at a broader scale, where it could be a collaborative opportunity, involving sustainability scholars from different Higher Education Institutions in a number of European countries.

8.6.2 Education Research and the Sustainable Development Goals

On the 25th of September 2015 at the United Nations General Assembly in New York, 193 countries ratified the new Sustainable Development Goals. These goals become applicable in January 2016 and are now a new, universal set of goals, targets and indicators that United Nations member states are expected to use to frame their agendas and political policies regarding sustainable development. It is important that the Sustainable Development Goals are integrated into the curricula especially within higher education institutions. Within this context, an important research question would be: What changes have higher education institutions made to their curricula, if any, regarding the integration of information commensurate with the Sustainable Development Goals.

8.7 Summary

This chapter present conclusions relevant to the two research questions. This chapter began by outlining the role of education for sustainable development within contemporary education in Ireland. Key challenges relevant to achieving sustainability form a global perspective were then presented. Focus was also given to the Irish policy implications of this study and conclusions relevant to strengthening the provision of education for sustainable development within contemporary education in Ireland. The chapter ended by highlighting the study's contribution to knowledge and suggestions for further research.

8.8 Conclusion

The importance of achieving sustainability through the pursuit of sustainable development has been the focus of past and more recent national and international agreements. In Ireland during 1997 the inaugural National Sustainable Development Strategy stated the formal education system, *"Has a crucial role in prompting environmental awareness"…"Environmental education can provide a sound basis for sustainable development and should be integrated into all educational systems" "Environmental education can also be effectively implemented through integrating environmental concepts, skills and strategies throughout the existing curriculum"* (Department of the Environment, 1997 p. 165-166).

In 2015 the 2030 Development Agenda in the form of the Sustainable Development Goals were ratified by 193 countries. In 2015 at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 21), representatives from 200 countries adopted an agreement on climate and committed to averting some of the worst effects of global warming and shift economies around the world to cleaner energy sources.

Also in 2015, 497 University Presidents and Chancellors from over fifty countries adopted the Talloires Declaration and committed to incorporating sustainability and environmental literacy in teaching programmes. While commitments have been given, little has been achieved in terms of action on climate change or embedding education for sustainable development holistically into the curriculum. While securing commitment is important, key to a transition towards sustainability is the realisation of that commitment through proactive implementation. As stated by Ban Ki-moon, ***"We do not need new promises"..."Current commitments are already sufficient for success"*** (Ki-moon, 2010, pp. 2-3).

The prioritisation and implementation of education for sustainable development is fundamental to realising action regarding the sustainable development goals and COP 21. Since education for sustainable development is an accelerator of inclusive development. It is through education for sustainable development that a narrative of change can be realised. It is only through proactive action, especially from developed nations that the interrelated global challenges of climate change, resource overuse and social inequality can be addressed. It is time to move from commitments to action. It is time to take the words of John F. Kennedy seriously for, ***"The Supreme Reality of our Time … is the Vulnerability of the Planet"*** (Kennedy, 1963).

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Appendix A
Information relevant to Understanding Sustainable Development

Table 1 Principle Components of Sustainable Development

Inclusiveness Sustainability embraces both environmental and human systems, both near and far, in the present and the future (Gladwin, *et al.,* 1995). To accurately understand the human dimension of sustainability, on must include the driving forces of anthropogenic global environmental change: population change, economic growth, political and economic institutions, technological growth and attitudes and beliefs (Stern, *et al.,* 1992).
Connectivity Understanding sustainability requires an understanding of the world's problems as systemically interconnected and interdependent. The concept of sustainable development is based on the recognition that a nation cannot reach its economic goals without also achieving social and environmental goals. This requires a focus on universal education and employment opportunities, universal health and reproductive care, equitable access to and distribution of resources, stable populations and a sustained natural resource base (World Resource Institute 1994, p.43).
Equity Fair distribution of resources and propriety rights, both within and between generations, is a central theme of most conceptions of sustainable development. While some people place special emphasis on providing for the needs of the least advantaged in society, few people address human obligation to the nonhuman world. The absence of objective criteria pushes the study of sustainability towards that of normative science where the rules will be worked out over time via a competition of beliefs and moral debate (Gladwin, *et al.,* 1995).
Prudence Most definitions of sustainable development call for keeping life support ecosystems and interrelated socio-economic systems resilient, for avoiding irreversibility's and for keeping the scale and impact of human activities within regenerative and carrying capacities. Most analysts call for prudence and humility in the pursuit of sustainable development, given the massive uncertainties and unpredictability, non-linear interaction between system components, unknown thresholds and complex dynamics in ecology and social systems (Costanza, *et al.,* 1993). This constraint demands precaution, pre-emptive safeguards, reversible action, safety margins and preparation for perpetual surprise (Ludwig, *et al.,* 1993).
Security Sustainable development is generally a human-centred construct, aimed at ensuring a safe, healthy, high quality of life for current and future generations. A number of overlapping boundary conditions must be fulfilled to support this goal. At a minimum sustainability mandates no net loss to: (a) Ecosystem and Social system health (Costanza, *et al.,* 1992); (b) Critical Natural Capital - stocks of irreplaceable natural assets- the ozone layer, biological diversity and biogeochemical cycles (Daly, 1994); (c) Self-organisation and self-transformation, this is the capacity of living systems to carry out self-renewal, self-maintenance and self-transformation, which provides the context for all human activity. (Norton, 1991); (d) Carrying Capacity- long run capacities of biophysical and social systems to support physical scales of human enterprise (Daily and Ehrlich, 1992) ; (e) Human freedom, this refers to civil society, with democracy and full recognition of human rights in day to day living dependent on participation, accountability , reciprocity and transparency.

Source Gladwin *et al.,* (1995 pp. 877-880)

Table 2 The World's Biggest Public Companies: sales, profit, assets and market value

Rank	Company	Country	Sales	Profit	Assets	Market value
1	ICBC	China	$166.8 B	$44.8 B	$3,322 B	$278.3 B
2	China Construction Bank	China	$130.5 B	$37 B	$2,698.9 B	$212.9 B
3	Agricultural Bank of China	China	$129.2 B	$29.1 B	$2,574.8 B	$189.9 B
4	Bank of China	China	$120.3 B	$27.5 B	$2,458.3 B	$199.1 B
5	Berkshire Hathaway	United States	$194.7 B	$19.9 B	$534.6 B	$354.8 B
6	JPMorgan Chase	United States	$97.8 B	$21.2 B	$2,593.6 B	$225.5 B
7	Exxon Mobil	United States	$376.2 B	$32.5 B	$349.5 B	$357.1 B
8	PetroChina	China	$333.4 B	$17.4 B	$387.7 B	$334.6 B
9	General Electric	United States	$148.5 B	$15.2 B	$648.3 B	$253.5 B
10	Wells Fargo	United States	$90.4 B	$23.1 B	$1,701.4 B	$278.3 B
11	Toyota Motor	Japan	$252.2 B	$19.1 B	$389.7 B	$239 B
12	Apple	United States	$199.4 B	$44.5 B	$261.9 B	$741.8 B
13	Royal Dutch Shell	Netherlands	$420.4 B	$14.9 B	$353.1 B	$195.4 B
14	Volkswagen Group	Germany	$268.5 B	$14.4 B	$425 B	$126 B
15	HSBC Holdings	United Kingdom	$81.1 B	$13.5 B	$2,634.1 B	$167.7 B
16	Chevron	United States	$191.8 B	$19.2 B	$266 B	$201 B
16 Equal to Chevron	Wal-Mart Stores	United States	$485.7 B	$16.4 B	$203.7 B	$261.3 B
18	Samsung Electronics	South Korea	$195.9 B	$21.9 B	$209.6 B	$199.4 B
19	Citigroup	United States	$93.9 B	$7.2 B	$1,846 B	$156.7 B
20	China Mobile	China	$104.1 B	$17.7 B	$209 B	$271.5 B
21	Allianz	Germany	$128.4 B	$8.3 B	$979 B	$82 B
22	Verizon Communications	United States	$127.1 B	$9.6 B	$232.7 B	$202.5 B
23	Bank of America	United States	$97 B	$4.8 B	$2,114.1 B	$163.2 B
24	Sinopec	China	$427.6 B	$7.7 B	$233.9 B	$121 B
25	Microsoft	United States	$93.3 B	$20.7 B	$174.8 B	$340.8 B
280	Facebook	United States	$12.5 B	$2.9 B	$40.2 B	$231.6 B

Source Forbes (2015a)

……Note To ensure accuracy, profit figures were cross referenced with data from the Statistics Portal (Statista, 2016)

Note: A small number of companies that are privately owned are not included on this list since, the financial information is not publically available.

Appendix B

Primary level: Green-School participant survey: 1st green flag

Descriptive Surveys used to explore participants' experiences of *An Taisce's* Green-Schools Programme in a model green school in Waterford City
Research group: 23, 11 year old female students (Code: SR 1, P 1-23, Table 6.1 p 109)
Five surveys were used, one for each green flag, except for question one, which specified the green flag being explored, the five survey question were the same, therefore only one survey is included in this appendix.

Survey One: 1st Green Flag
Focus: Litter and Waste Management

Q1 Were you involved in the green flag that focused on litter and waste management?
Yes _ No _

Q2 Please explain what class activities you were involved in when working on litter and waste.

_____
_____
_____
_____
_____

Q3 What did you learn from these class activities?

_____
_____
_____
_____
_____

Q4 Did you change your behaviour due to completing this green flag?
Yes _ No _

Q5 If you answered yes to Q4, please give examples of how your behaviour changed due to completing this green flag.

_____
_____
_____
_____
_____

Thank you for participating in this research

Primary Level - Green School Coordinator Survey (Code: SR 2, P 49, Table 6.1)

Green School Coordinator Survey

To be completed by the School principal / green schools coordinator

Section One: to be answered by all respondents

As outlined in the email letter sent to your school, this short survey aims to explore the reasons for school participation and non-participation regarding the Eco School - Green Schools Programme. This is an important survey and will require about 20 minutes of your time, 80% of the questions require you to click on the most accurate option provided.

This survey is completely confidential.

Thank you in advance for your participation.

1. Please indicate the position you have in your school __

Principal __

Teacher __

Principal and Green Schools Coordinator __

Teacher and Green Schools Coordinator __

Green schools Coordinator __

2. Is your school

A Girls School __ A Boys School __ A Mixed School__

3. How many students attend your school?

1 to 25 __ 26 to 50__ 51 to 100 __ 101 to 200 __

201 to 300 __ 301 to 400 __ 401 to 500 __ more than 500 __

4. Where is your school located?

Munster __ Leinster __ Connaught __ Ulster __

5. Where is your school located?

In a Rural Area __

In an Urban Area __

6. Overall, which of the following categories most describes the occupation of students' parents?

Managerial, Professional, Supervisory and Clerical __

Skilled Manual, Unskilled Manual and Unemployed __

Section Two: Questions for Non Green School participants only

This section is for schools who are NOT involved in the Green Schools Programme. Please answer questions 7 to 12.

7. Your school is not involved in the Green Schools programme, is this correct?

Yes __ No __

8. Please give at least two reasons why your school has not made the decision to participate in the Green Schools programme

9. What are the main barriers preventing green school participation in your school?

10. Do you believe the Green Schools programme is an important educational programme?

Yes __ No __ I do not know __

11. Do you believe the green schools programme should be integrated into the school curriculum?

Yes __ No __ I do not know __

12. Please give a reason for your answer to the last question

Section Three: Questions for Green School participants only

Please answer questions 13 to 26. Thank you for your participation in this research.

13. Is your school registered on the *An Taisce* Green Schools programme?

Yes __ No __

14. How long has your school been involved in the Green Schools Programme?

less than one year __ 1 to 2 years __ 2 to 3 years __ 3 to 4 years __

4 to 5 years __ 5 to 6 years __ 6 to 7 years __ more than 7 years __

15. How many green school flag awards has your school received?

(0) _ (1) _ (2) _ (3) _ (4)_ (5)_ (6)_ (7) _

16. Please give at least two reasons why your school made the decision to participate in the Green Schools programme

17. Do you believe the Green Schools Programme is an important educational programme?

Yes __ No __

18. If you answered yes to the last question, please explain why you believe the Green Schools is an important educational programme?

19. Please select one of the options below that most describes your experience in terms of complying with the *An Taisce* Green Flag requirements.

The work load regarding projects and paper work is:-

a) Time consuming __

b) Quite time consuming __

c) Very time consuming __

20. Regarding the following statement, please click on the most accurate answer.

Green School compliance is very time consuming and prevents schools committing to the programme after the 1st and/or 2nd green flags have be awarded

Agree __ Strongly agree __ Disagree __ Strongly disagee__

21. Regarding the following statement, please select the most accurate option.

Some of the detail required regarding green school compliance is more suitable for older secondary school students.

Agree __ Strongly agree __ Disagree __ Strongly disagee__

22. Do you believe the green schools programme should be integrated into the school curriculum?

Yes __ No __ I do not know __

23. Please give a reason for your answer to the last question.

24. If you would like to receive survey results, please enter the name and email of your school

25. Are you Male __ Female__

26. Please indicate your age range

20-25_ 26-30_ 31-35_ 36-40_ 41-54_ 55-60_

61-65_

Thank you very much for completing this survey.

Any additional comments regarding the green schools programme are welcome.

Post Primary Level: Civic Social and Political Education Teachers Survey

(Code : SR 3, P 45, Table 6.2)

Civic Social and Political Education Teachers Survey

This CSPE Survey should be completed by teachers who teach the CSPE programme. This survey is completely confidential.

Section One: General School Information

This survey aims to explore key issues relevant to the implementation of the CSPE programme. Exploratory research has identified some themes concerning the CSPE, these themes are reflected in the survey questions below. This research may contribute to identifying issues relevant to CSPE implementation.

This survey and will require about 20 minutes of your time, the majority of the questions require you to click on the most accurate option provided.

Please read questions carefully before answering. Thank you in advance for your participation.

1. Is your school

A Girls School __ A Boys School __ A Mixed School__

2. How many students attend your school?

1 to 50__ 51 to 100 __ 101 to 200 __

201 to 300 __ 301 to 400 __ 401 to 500 __ more than 500 __

3. Where is your school located?

Munster __ Leinster __ Connaught __ Ulster __

4. Where is your school located?

In a Rural Area __

In an Urban Area __

5. Overall, which of the following categories most describes the occupation of students' parents?

Managerial, Professional, Supervisory and Clerical __

Skilled Manual, Unskilled Manual and Unemployed __

Section Two: CSPE

This section should be completed by teachers who are teaching on the CSPE programme.

THANK YOU FOR YOUR PARTICIPATION IN THIS RESEARCH.

6. Do you teach CSPE?

Yes __ No __

7. Please indicate how many years you have been teaching on the CSPE programme?

1 __ 2__ 3__ 4 __ 5 __ 6 __ 7 __ 8 __ > 8 __

8. Please select the most accurate option below.

In your school:

a) Students have the same teacher for CSPE throughout the three year programme __

b) Students usually have different teachers for CSPE throughout the three year programme__

9. Please select the most accurate option below.

In your school:

a) CSPE is taught because we have to teach it, the time table is already overcrowded and given the present work load, CSPE is not as important as other junior cycle subjects__

b) Although the time table is crowded, CSPE is as important as other junior cycle subjects__

10. **CSPE is an important educational programme because the CSPE themes are very relevant to the education of junior cycle students.**

According to this statement please select the most appropriate option below.

Agree __ Strongly agree __ Disagree __ Strongly disagee__

11. Please give an explanation for your answer to the previous question.

12. Please select the most accurate option below.

Overall, in our school CSPE is perceived negatively __ perceived positively __

13. Please give an explanation for your answer to the previous question.

14. Time allocation of one hour per week is not enough for adequate CSPE implementation.

According to this statement, please select one of the following options.

Agree __ Strongly agree __ Disagree __ Strongly disagee__

15. **CSPE should be given the same amount of teaching hours as other junior cycle subjects.**

Regarding this statement, please select one of the following options.

Agree __ Strongly agree __ Disagree __ Strongly disagee__

16. Please give a reason for your answer to the last question.

17. Students do not believe CSPE is relevant to the leaving certificate or to the selection of college courses.

Regarding this statement, please select one of the following options.

Agree __ Strongly agree __ Disagree __ Strongly disagee__

18. **Students perceive CSPE as less important that other junior cycle subjects because it is classified as common rather than pass or honours.**

Regarding this statement please select one of the following options.

Agree __ Strongly agree __ Disagree __ Strongly disagee__

19. Teachers perceive CSPE as less important than other junior cycle subjects because it is classified as common rather than pass or honours.

Regarding this statement please select one of the following options.

Agree __ Strongly agree __ Disagree __ Strongly disagee__

20. There was little consultation with teachers prior to the implementation of the CSPE programme. This contributed to teachers' negative perception of the CSPE programme.

Regarding this statement please select one of the following options.

Agree __ Strongly agree __ Disagree __ Strongly disagee__

21. The CSPE in-service training was inadequate; in some cases teachers could not attend the in-service because funds were not available to pay substitute teachers, this resulted in some teachers receiving a CSPE handout instead of attending CSPE in service training.

Regarding this statement, please select one of the following options.

Agree __ Strongly agree __ Disagree __ Strongly disagee__

22. Under the proposed changes to the junior cycle, it is proposed that the CSPE programme will become a short course and lose its compulsory status.

When CSPE loses its compulsory status, our school will most likely choose not teach CSPE.
Regarding this statement, please select one of the following options.

Agree __ Strongly agree __ Disagree __ Strongly disagee__

23. Please give a reason for your answer to the previous question.

24. Are you Male __ Female__

25. Please indicate your age range

20-25_ 26-30_ 31-35_ 36-40_ 41-54_ 55-60_

61-65_

If you would like the results of this survey, please enter the name and email of your school

Thank you for contributing to this research.

Tertiary Level: Sustainable Development Module Survey

(Code : SR 4, P 11, Table 6.3)

Q1. Having completed the SD module, please explain your understanding of sustainable development.

Q2. Are you glad you completed the sustainable development module, please give a reason/s for your answer.

Q3. Has this module change your understanding of business and how it operates, if yes, please give a reason/s for your answer.

Q4. Do you believe business students should be informed about sustainable development, if so please explain why this is the case.

Q5. What aspects of the Sustainable development module were most influential in terms of increasing your awareness and knowledge of sustainable development?

Appendix C

Thematic Analysis of Green School participants and additional information relevant to Case one

Table 1 Thematic Analysis of Green School participants - 1st Green Flag
Focus: Litter and Waste Management

Class activities	**Yes Response in %'s (N23)**
Cleaned Up/ tidy up school and school grounds	N18 86%
Created and tidied Compost Bins	N18 78%
What students learned from the class activities	
That it is good to keep things clean and tidy	N14 60%
How to recycle and care about the environment	N10 43%
That one person can help a lot, and this can make a big difference	
Behavioural change of student and students' family	Yes 22 95%
Examples of Behavioural Change – Litter and Waste	
Students stated they - Recycle more	N15 65%
-Kept environment clean/tidied up more at home/community	N9 39%
-Used green and brown bins more	N9 39%
-Developed compost bin at home	N8 35%

Source Compiled by the Author

Note: According to the green schools coordinator this school achieved a '*95 percent reduction in the use of plastic bags'.*

Table 2 Thematic Analysis of Green School participants - 2nd Green Flag
Focus: Energy (Energetic Eddie)

Class activities	**Yes Response in %'s (N23)**
Left radiator off unless the weather was cold	N10 43%
We turn off the lights if it is bright	N20 86%
Turned off computer when finished	N12 52%
What students learned from the class activities	
It saves money to turn off electricity	N11 47%
It's important to save energy	N10 43%
Stop creating waste, use energy only when you need to (eg turn off the lights and all other things when not in use)	N9 39%
Behavioural change of student and students' family	Yes 22 95%
Examples of Behavioural Change - Energy	
We turned off the lights more often (14)	N14 61
Told others to turn things off (10) lights, charger (5), TV& computer (4)	N19 82%
I plugged out the TV and computer (13), Radio (1)	N14 61%
Using less electricity (1) use fire not central heating (2) candles not lights (1) got rid of TV (1)	N5 22%

Source Compiled by the Author

Table 3 Thematic Analysis of Green School participants - 3rd Green Flag
Focus: Play Ground/Garden (pixie)

Class activities	**Yes Responses in % (N23)**
Created a little vegetable and flower Garden	N19 82%
Painted the walls and ground (hop scotch) on the playground	N18 78%
Created and put up flower hanging baskets	N11 47%
We played more due to games painted on the playground	N8 35%
What students learned from the class activities	
We learned, not to litter and how important it was to keep the school grounds looking tidy (6). It made the school so much nicer with *a little bit of effort* (5)	N11 47%
That you can change the playground, so playing is a lot more fun/more enjoyable.	N11 47%
We learned how to grow fruit and vegetables	N9 39%
Behavioural change of student and students' family (q6).	Yes 22 95%
Examples of Behavioural Change - Play Ground/Garden	
I planted flowers with my granddad/Nan/Mum/Dad	N9 39%
We planted vegetables (Granddad/Dad/Mum)	N8 35%
We planted an apple tree at home (1) made hanging baskets(2) Started reading about plants and gardening (2) started my own Garden (2)	N7 30%
I now play more / became more active	N6 26%

Source Compiled by the Author

Table 4 Thematic Analysis of Green School participants - 4th Green Flag
Focus: Water (Water Lilly)

Class activities	**Yes Responses in % (N23)**
We created the *Ten Tap Tips* to reduce water use	N19 82%
We now use Economy / Short Flush in out toilets	N18 78%
We turned off the taps when not in use	N9 39%
What students learned from class activities	
Importance of Water-.	
Water is scarce and not to waste it	N11 47%
Water is more important than I thought (5) Not everyone has water (2)	N7 30%
Water use-	
-Shower not bath (5) take 5 min shower (1) When washing car, use a sponge and bucket, not a hose (5) Collect water when its raining (2) Turn off water when brushing Teeth (1) Not to leave taps running when washing hands (1)	N 15
Behavioural change of student and students' family	Yes 22 95%
Examples of Behavioural Change at Home - Water	
Turned off the taps more often at home (10). Turned off the taps when washing my teeth (2)	N12 52%
We used the shower instead of the bath (6) Shorter showers(4) We got rid of our bath (1)	N11 47%
We now save more water	N5 22%
We collect rainwater (2) I told my dad to wash the car when its Raining (1) We use a basin for washing dishes (1)	N4 17%
My mum now uses a full load in the washing machine	N4 17%

Source Compiled by the Author

Note: According to the green schools coordinator '*a significant reduction in water usage was recorded*'.

Table 5 Thematic Analysis of Green School participants - 5th Green Flag Focus: Transport and Travel (Foot Print Fiona)

Q2 Class activities	**Yes Responses in % (N23)**
We took part in *WOW day*, Walk on Wednesday's	N22 96%
It was too far to walk so we took part in *Park and stride*	N10 43%
We used the bus more	N3 13%
Q3 What students learned from class activities	
You should *walk not drive* to help our environment (7) take away the pollution (1) and prevent global warming (1) It is better to walk more not drive (8)	N17 74%
I learned to car pool	N8 35%
Getting more exercise is good for you (5)	N5 22%
Animals are dying from global warming (2). It's important to save the ozone layer (1)	N3 13%
Behavioural change of student and students' family (q6)	Yes 22 95%
Examples of Behavioural Change at Home - Transport and Travel	
We walk more than we used to (13) My Mum started to walk to Tesco (1) I parked and stride and walked to the shop (3)	N17 74%
We use the car less and my family is more active (1) I am more active at home (2) Use my bike more (1) I use the bus more (1)	N5 22%
We Car pool more than we used too	N3 13%
We live near a shop and my mum drives, so I told my mum to walk	N1 4%

Source Compiled by the Author

Table 6 Saving generated by Green-Schools in the Academic Year 2013-2014

Area	**Savings across six areas**
1. Litter and Waste	**Waste - 5,200 tones diverted from landfill: the same weight as 5,200 cars, or 2,260 Hippos and 6 Hamsters!**
2. Energy: Electricity	**- 17.7 million units (kWh) saved - the same amount of electricity that 3,340 Irish houses use each year!**
3. Oil	**- 2.08 million litres of oil saved - This is enough oil to heat 230,000 homes for a day!**
4. Water:	**384 million litres of water saved - Enough water to have 4.8 million showers, or 1.5 million baths! The same amount of water needed to make 3 Billion cups of tea!**
5. Travel:	**Transport fuel saved - 1.27 million litres of petrol and diesel - This amount of fuel will take you to the moon and back 32 times and then there is still enough fuel left to travel around the world 9.5 times**
6. Biodiversity:	**Increase in knowledge of biodiversity from 22% to 84%. 2,500 trees were planted by schools working on biodiversity this year, once these trees have matured they will absorb 11,250 kg of air pollutants!**
Overall:	**This year schools participating in Green-Schools saved an estimated combined €8 million from implementing the programme!**

Source Green Schools Ireland (2014)

Table 7 The importance of the Green-School Programme: primary level phase two: teachers perspective

Teachers perspective: The Importance of the Green-Schools Programme
Dominant theme: Development of awareness, responsibility and life skills
(1) Green-schools is a very practical way of educating children on a greener way of life. It encourages children to get involved in environmental issues. It is suitable for all ages and children can build on their knowledge and understanding every year. (2) Green-Schools gives the children the opportunity to learn about the environment and to ensure it is there for generations to come (3) Pupils should respect their environment and do all they can to protect it (4) Long term awareness of the need to protect environment. (5) A wide variety of topics are covered within the Green school programme and they have a huge global impact. Children are wonderful to embrace these issues and put them into practice. (6) It is important to make children aware of issues involved and give them something to work towards (7) Important aspect of their education (8) Children need to be educated to care for the world we live in (9) Children learn lifelong skills on how to care for the environment. (10) It ties together life skills and essential awareness about environmental attitudes. (11) Awareness (12) The green schools programme is hugely important, on this programme the children learn the greatest life shills of all (re biodiversity one student took photographs of changes in the school garden and grounds every week, the photos were uploaded onto the school blog, even I learned a lot about biodiversity from this exercise. The programme is also great reinforcement for the children at home. This is a special school, there's room for everyone at all levels. The green schools programme brings the whole school together (this overcomes the isolation of the class). It's a ready-made programme, connected to life where awareness also reaches the parents (through school blog). (13) Helps children to become Eco Aware. (14) It is important that children grow up learning about how to care for the environment. Often, they do not learn about this at home. (15) It is a useful tool for introducing and exploring green issues with the children. (16) Teaches the children about important environmental issues. Student participation means concrete experience of green activity. (17) It highlights environmental issues and creates awareness about the importance of protecting our environment. (18) Children need to be encouraged. The receipt of a green flag provides that gratification and serves as a constant reminder of the work they have done to achieve it and an encouragement to continue making the effort. (19) Creates green awareness. (20) Through participation in Green schools important life skills are been instilled in children that they can carry with them all through their life. As there is a whole school approach to the programme the children are more inspired to take on the responsibility of recycling and conserving energy.
Theme: Bring Environmental awareness into the home and community
(1) Children are good at talking to adults and so the impact of green schools can be transferred to home. (2) It helps children and adults alike to be aware of their surroundings and the need of care of same. (3) Gives structured incremental form to the education of pupils and their families in living more sustainable lives People taking responsibility for their own use/misuse of their environment. (4) Children are encouraged to bring the message home and to live a greener lifestyle at home as well as in school. (5) It is important that children learn about this and work on it as a whole school activity and bring it home with them as well. (6) Awareness, bringing it home. Every little habit counts and can multiply. (7) Children learn responsibility towards environment. Involves children participating and feeling they have a voice. Good for school atmosphere/community. Children responsible for looking after school - not just the adults' job. (8) It is a well-structured programme allowing for cooperation between staff, pupils, parents & local community
Minor theme: Linking Green-Schools Programme to the curriculum
(1) Covers many curriculum objectives in a holistic way. (2) There are many areas within the teaching curriculum that can be integrated with Green Schools. (3) Green schools is linked into all curricular areas. (4)Ties into the curriculum in Science and Geography in a very practical and hands on way (5) Encourages independent thinking and team work".

Source Compiled by the Author

Table 8 Thematic analysis of Green-Schools coordinators survey responses: reasons for Green-School Participation: Primary level: Phase two

Dominant theme: Environmental awareness
(1) Good for environment. (2) To education the pupils. (3) Pupil awareness. (4) We are interested in looking after the environment and making children aware of same. (5) Raise awareness in children. (6) give children pride in their area. (7) raise awareness on environmental issues improve our school environs help the environment. (8) To educate the future generation about environmental issues. (9) To foster green awareness. (10) Heighten children's awareness of different green issues. (11) Because we feel an environmental awareness is a vital part of our pupils education. The structure of the green school programme brings that education to life and into the pupils' lives. (12) It's good to give the children a sense of the positive/negative impact on the environment and it reduces the amount of rubbish to be disposed of at serious cost to the school. (13) Builds awareness and helps the environment. (14) To increase environmental awareness among pupils. (15) To actively involve pupils in Green Flag awards. (16) Increase pupil awareness of environmental issues. (17) To develop awareness of green issues among school children. To teach children how to work as a committee to achieve a common goal. (18) To give pupils good example on green living.
Dominant theme: Behavioural change
(1) It helps children establish good habits at a young age, it makes them more responsible for their actions. (2) To encourage recycling. (3) Promotes a positive behaviour towards our environment - To keep the school efficient and bring the cost of running the school down. (4) Learn more on recycling. (5) Educational active involvement. (6) Cut costs re energy bills (7) Reduce rubbish. (8) To reduce school waste. (9) Improve carbon footprint of the school. (10) Reduce litter, waste, energy and water consumption. (11) Overall the green schools is a good project, good education for children makes them aware of waste, litter and best practise in the use of water and electricity in a very practical and hands on way.
Minor theme: Formalise Existing Behaviour
(1) Opportunity to formalise work already being done Helps to motivate children. (2) We were always involved in recycling since the recycling of cans days, so decided to formalise the programme through *An Taisce*. (3) The ideology of the green schools was there before we joined the programme. We becoming involved in the green schools programme formalised what we were already doing (e.g. we always had a kitchen garden where we grew our own vegetables.
Minor theme: The Development of Values
(1) We believe it is important to teach the boys about the value to the environment to recycle and conserve natural resources. Children need to know of their responsibility to the environment. (2) Desire on part of staff to inculcate values in children.
Minor theme: Skill Development
(1) Teaches kids lifelong skills and habits. (2) To give pupils the skills and interest in protecting the environment.
Others
(1) Pressure from parents Improve school profile. (2) Incentive at the time was worthwhile - free bin collection. (3) An inspector recommended it to local schools. Other schools were doing it.

Source Compiled by the Author

Table 9 Number of Green-School Flags Awarded at the primary and post primary educational levels

Number of Green Flag/s awarded	**Primary schools**: total number 3262 Overall number of schools and overall percentage	Post Primary schools Total number 735
1	2,730 (83.7%)	429 (58%)
2	2,295 (70%)	290 (39%)
3	1,806 (55%)	194 (26%)
4	1,367 (42%)	128 (17%)
5	748 (23%)	61 (8.2%)
6	324 (9.9%)	25 (3.4%)
7	103 (3.1%)	9 (1.2%)
8	31 (0.95)	0

Source calculated by the Author based on figures provided by *An Taisce* and the Department of Education and Skills 2016.

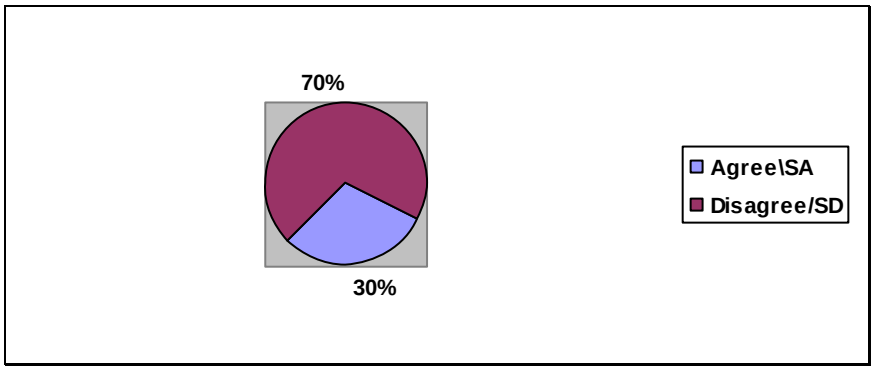

Figure 1 Green School compliance is very time consuming and prevents schools committing to the programme after the 1st and/or 2nd green flags have be awarded Source Author

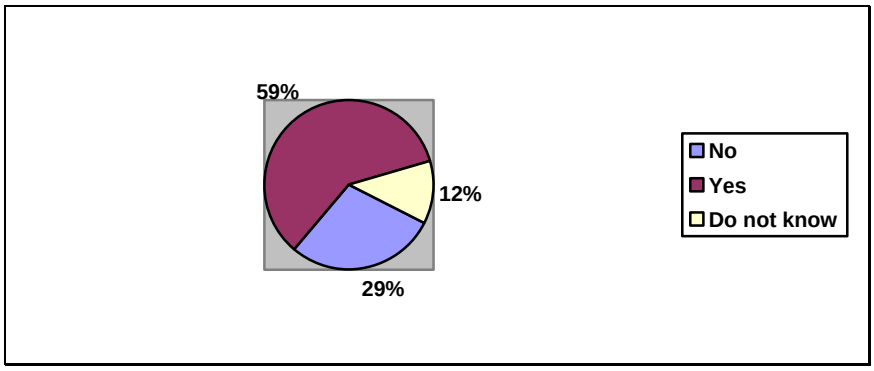

Figure 2 Do you believe the *An Taisce* Green-Schools programme should be integrated into the school curriculum?
Source Author

Appendix D
Civic Social Political Education Programme thematic analysis and additional information

Table 1 Thematic Analysis of Teachers negative perception of the CSPE programme (IP23-26)

Key factors influencing perception of the CSPE programme	**Thematic Analysis - CSPE Teachers (3) Semi-structured interviews**
Hours allocated to the CSPE programme	All teachers interviewed agreed the time allocated to the CSPE programme is inadequate, Teachers stated "*Students perceive the CSPE programme, as less important than other subjects because it is only allocated one class per week*"… "*other subjects receive from 3 to 5 classes per week".*
Overcrowded timetable	The timetable is "*already Overcrowded*"
Poor CSPE Consultation with Department of Education	"*Inadequate consultation regarding the implementation of the CSPE from the department of education with teachers and schools*", was also a source of annoyance for CSPE teachers.
Continuing Professional Development -Inadequate in-service	CSPE teachers also complained that "*the CSPE in-service training was inadequate",* where some CSPE teachers "*received no CSPE in-service training at all*".
Continuing Professional Development -Inadequate resources	In exploring the issue of inadequate in-service, teachers stated "*The Department of Education did not allocate sufficient resources to pay substitute teachers, therefore some CSPE teachers were not able to attend the in-service CSPE training. They received handouts from those that did attend the in-service*".
Poor teacher consistency in the delivery of the CSPE programme	To maximise the effectiveness of CSPE "*Teacher consistence through the three years is important because it will facilitate the development of closer teacher pupil relationships*"… "*This will then have a positive impact on the delivery of the CSPE programme*".

Source Compiled by the Author

Table 2 Thematic analysis of Teachers positive perceptions of the CSPE programme (SR3, P45)

Awareness and knowledge	*"Students need to become aware of the world out there". "The 7 concepts need to be understood in order to allow the student to look beyond their own narrow experience, to see the bigger picture".*
	"CSPE is a preparation for life subject dealing with all areas of student education incorporating real life experiences".
Including political awareness	*"I feel that the political and legal concepts are most informative for pupils who don't read newspapers or watch the news they need to recognise their politicians and know how the political system works".*
	"It is important to teach politics to guard against negative image of government".
Life skills development	*"Each of the themes is present in everyday life so if we can teach the child the underlying principle of each of these themes, educate them on the importance of each and encourage them to promote and develop each theme throughout their lives as teenagers then we are shaping them into better citizen's as adults".*
	"Education for life".
	"The course content is relevant to the daily lives of the students".
	"Topics covered are very relevant to life outside school".
Citizenship	*"Areas such as citizenship and environmental sections very important"*
	"I feel we are less and less civic minded. Our young people also need to learn how better to relate to each other, themselves and their society".
	"CSPE is important as it gives the students a broad knowledge on a range of issues, good citizenship is a learned skill".
	"CSPE has cross curricular links to other subjects as well as important citizenship topics, life skills, active learning methodologies etc".
	"CSPE allows for open discussion around relevant parts of their lives, e.g. stewardship, citizenship, rights etc. it also opens their eyes and mind to the wider world, something that J.C students often do not engage in as they're only concerned about their own world".
Personal development	*"CSPE teaches students the importance of working in a team and their responsibility to contribute. They learn to value each other. It empowers them to create their own opinions and helps them see beyond their small worlds. It helps you understand what people are going through in the world".*
	"I agree that the many of the concepts of CSPE are not taught elsewhere in the curriculum and do need to be taught to students, the concepts are important in terms of students personal development".
	"CSPE reinforces a sense of community including a school community. It also helps introduce some topics that are covered in transition year (which two thirds of our third years do) such as legal studies, political studies and developmental education".
School Ethos	*"CSPE is well established in the school and as a subject has been treated with respect from the start. It took a few years to become established and some teachers were not committed to it. However by and large the teachers who are teaching CSPE are committed to it and do it very well. This is the key to giving it the importance it deserves".*

Source Compiled by the Author

Table 3 Numbers of years teaching on the CSPE programme

Years teaching on CSPE	1	2	3	4	5	6	7	>8
% of total	3.03	3.03	12.12	3.03	12.12	6.06	0.00	60.61
No of teachers	1	1	4	1	4	2	0	20

Source Compiled by the Author

Table 4 Reasons why CSPE should receive equal time table allocation as other junior cycle subjects (SR3, P45)

1 hour is inadequate to cover course content: "*CSPE should definitely be given more than one hour, due to project work" ... "There is a lot to cover, a project to do and many methodologies that can be used which require time" … "I feel more classes should be allocated for this subject and it should be carried into senior cycle"... "CSPE should not be allocated as many hours as Maths, English and Irish but certainly as many as subjects like history, art and business". "In order to do the various strands of the course justice, more time is needed" ... "A 35 minute class once a week over 3 years is not enough"... "Topics often have to be rushed in order to complete the course and action projects" ... "It is very difficult to cover the curriculum in the time allocated"... "The CSPE Subject focuses on life skills and current affairs, very important to be aware and learn about national and international events as they happen".*
Importance of the CSPE programme: *"This subject is an excellent tool for educating children in a way they can relate and comprehend everyday experiences and should definitely be as important as other subjects" ... "Possibly 2 class periods would suffice. I use some RE class time to cover some topics" ... "Not necessarily as much as other subjects with much heavier work load, but two periods per week would be preferable to one class".*
Implementation difficulties*: "If a class or teacher is missing on the day the CSPE class is timetabled a whole week's work can be missed"... "It's often rushed. Hard to chase up work. CSPE is not seen as an equal subject to others. Hard to get the project done in one class a week"... "Unless the DES GUIDELINES CHANGE THEN SCHOOLS ARENT' GOING TO GIVE IT MORE TIME".*

Source Compiled by the Author

Table 5 Reasons why CSPE should not receive equal time table allocation as other junior cycle subjects (SR3, P45)

One class per week is adequate: *"Time allowed is adequate" ... "The course does not need to be as dense as others"... "Giving more time to CSPE would only highlight the fact that it is light on course content"... "Just don't feel that CSPE deserves more time!"... "Course content doesn't demand more". "The current syllabus would not fill the same time allocation as the other JC subjects"... "Other subjects require a lot more time due to the nature and length of the courses".*
Overcrowded timetable: *"The curriculum is already overloaded and I can't see how this could be done except at the expense of other subjects"... "It is a 70 hour course"… "it is very difficult to include all subjects" … "I don't think the subject needs extra time, I think it is suited to the short course which will be implemented in the new JC"*
Not valued by school management: *"Some members of management do not value CSPE in my opinion"... "NOT FEASIBLE"*

Source Compiled by the Author

Appendix E
Information relevant to research conducted at the Tertiary level

Table 1 Summary of themes and key findings identified during group discussions at the tertiary level - phase one

Theme 1	**Participants' *understanding* of sustainable development:** *International Development group***:** had a very good understanding of sustainable development. Business accounting group: had a poor to inadequate understanding of sustainable development.
Theme 2	**The impact of participants' course of study on their awareness of Sustainable Development.** *International Development group***:** over 80 percent of this group indicated that the BSc in International Development and Food Policy had influenced their awareness and understanding of sustainable development. *Business Accounting group:* 75 percent of the outlined that their course had not developed their awareness of sustainable development.
Theme 3	**Awareness regarding the content of the business and management education curricula:** *International Development group* were unsure of the content of business and management education, many of this group agreed that business and management education should equally reflect both shareholder and stakeholder theory. *Business accounting students*, over 50 percent of this group believed, business and management education was reflective of both shareholder and stakeholder theory.
Theme 4	**The link between education for sustainable development and sustainability:** The majority of the International Development group and a small number of the Business Accounting group agreed that education was important in terms of achieving sustainable development.

Source Compiled by the Author

Table 2 Sustainable Development module outline (Phase two)

Description of Module / Aims The purpose of this module is to introduce students to the concept and perspectives relevant to sustainable development. This module will also provide students with an understanding of how the consideration of environmental, social and economic considerations are relevant to the strategic goals of organisations.
Programmes - DEVP-0032 - Bachelor of Business (Honours) (WD_BBUSI_B)
Indicative Content 1. Defining sustainable development 2. Exploring the components of sustainable development. 3. Climate change and sustainable development. 4. Corporate strategy and sustainable development. 5. The benefits of sustainable development for organisations. 6. Analysing and exploring the integrative role of sustainable development, and the relevance of sustainable development to strategy formulation and implementation.
Learning Outcomes On successful completion of this module, a student will be able to: 1. Explain the definitions and principles of sustainable development. 2. Critically evaluate the social environmental and economic components of sustainable development. 3. Critical evaluate a range of current issues and debates relating to sustainable development. 4. Evaluate some key strategies for promoting sustainable development and their relevance to organisations.
Assessment Methods *100% Continuous Assessment: Reflective learning Journal 60% Academic Essay and Presentation 40%.
Learning Modes Learning Type Fulltime Mode Lecture 24 Seminar/Tutorial 12
Essential Material(s) Roosa. S.. *Sustainable Development Handbook* . Britain, Fairmont Press, 2007.

Adams. , W.M. *Green Development,*. .3 Edition. : London and New York. Routledge, 2009. Strong. W. A. and Hemphill. L. *Sustainable Development Policy* . UK: Blackwell Publishing, 2007.
Supplementary Material(s) Soubbotina, T. P. *Beyond Economic Growth: An Introduction to Sustainable Development* 2nd Ed. The World Bank Washington, D.C. Dalal-Clayton, B. and Bass, S. (2002) *Sustainable Development Strategies: A Resource Book*, Compiled by The International Institute for Environment and Development, Earthscan Publications Ltd London • Sterling, VA

Table 3 Pre-module analysis: rating of business students' understand of sustainable development (Case three: phase two)

Dominant theme: Inadequate knowledge of sustainable development: **Using the rating scale (see Table 7.6). Rating 6 - Category: very poor.**
"No I can't give an explanation of what sustainable development is about". Rating 6.
"Co2 emissions are increasing and this is having a negative effect on the health of the environment" . Rating 6.
"I remember from the presentation on our elective options before Christmas, reference was made to business and the environment and the importance of sustainability". Rating 6.
"Sustainable development was not covered up to now on the degree so, no I can't explain it". Rating 6.
"Though you hear about climate change and the green economy more, I don't know about either of them". Rating 6.
"Sorry I can't explain sustainable development, I'd just be guessing". Rating 6.
All shareholders want their business to be sustainable, so the business lasts a long time. Rating 6.
"At the elective presentation, it was outlined that sustainable development was about social economic and the environment, aside from that I could not explain it really". Rating 6.
"Business is about sustaining profits into the future". Rating 6.
"At the presentation at the end of the last semester, the importance of society and the environment and its link with the economy was mentioned". Rating 6.
"No I can't explain what sustainable development is about". Rating 6.
Subordinate theme: Adequate knowledge of sustainable development: **These students had completed an elective on business ethics in the previous semester. Using the rating scale (see Table 7.6). Rating 4 - Category adequate.**
"I completed the business ethics course and this is one of the reasons I choose the sustainable development module for this semester. Business need to behave more ethically, but this is difficult to achieve, especially regarding the treatment of employees in very big companies". Rating 4.
"Yes in the ethics module in the last semester and we covered topics that were relevant to sustainable development. We focused on unethical business behaviour and corporate scandals and the need for business to be more ethical in terms of how they function. The ethics module made us think about business from a broader perspective". Rating 4.
"I did the ethics elective as well last semester, so I believe human behaviour is impacting the environment in a negative way. We need to be aware of the link between business and the environment". Rating 4.

Tables 4 to Table 8 are relevant to the exploration of the sustainable development module with business students, phase two post analysis at the tertiary level

Table 4 Having completed the SD module, please explain your understanding of sustainable Development (SR4, P11)

My understanding of SD is that it is the balance of three main components economic, political and social which are equally important and interdependent. It is about finding the middle ground where each of the components benefits and there is no opportunity cost to one of the other components. It is about recognising that our decisions have an effect on each component and taking responsibility for that decision.
My understanding of sustainable development is that it is the conservation of the earth's resources for future generations.
Sustainable Development involves meeting the needs of the current population without adversely affecting future generation's ability to meet their needs. It also involves a balanced view of the various social, economic and environmental aspects involved with Sustainable Development.
My understanding of sustainable development is that it is more than just simply being more environmentally minded and friendly, it is more about looking how to balance the environmental imperatives with the social imperatives and the economic imperatives. However I also believe in the concentric circles model by OTT which stated that we cannot balance these out equally and instead we must put our environmental needs to the foremost of our minds as these are the most important followed by social issues and then economic which are the least important (although currently it seems the other way around). In conclusion I believe that sustainable development is massively important in today's society and should be looked upon as the only way to develop.
In my opinion sustainable development is concerned with acting ethically and responsibly now in order to create a world in which future generations can survive. The worlds resources are being used up far too quickly and we must monitor our consumption of natural resources. Sustainable development is also dependent upon society and the economy. In today's increasingly competitive environment businesses tend to focus on the performance of the economy. However, businesses will not remain successful into the future unless the two other factors are considered. Overall, sustainable development is concerned with acting ethically and morally now in order to protect our world's resources so that future generations can survive and thrive.
Before completing this module I believed that sustainability was solely to do with the environment. I now understand that it is to do with many other things as well such as social and economic factors. I understand the importance of acting sustainably responsible in all of these areas in order to safeguard resources for future generations. Each lecture helped me to gain a broader understanding of what sustainable development really is. I now realise the importance of sustainable development and understand the necessity for every single person to try and act sustainably responsible.
My understanding of SD now is how we balance the three pillars, environmental, social and economic. Combining these and balancing these 3 pillars is key in order to meet our needs but also the needs of future generations.

Source Compiled by the Author

Table 5 Are you glad you completed the sustainable development module? (SR4, P11)

I enjoyed this module as it gave me a better insight into SD. When I first started the module I assumed it would be about the environment but now I understand it is about ethics, human rights, ecosystems, poverty and so much more.
I am glad I choose Sustainable Development as I found that the module opened my eyes to the resistance to sustainable development worldwide.
Yes, Sustainable Development was an incredibly informative and beneficial module to complete. The module also involved two presentations and some group work. It was a well-rounded module and very beneficial.
I personally am immensely glad that I completed the sustainable development module. I believe the sustainable development module has opened my eyes massively about the needs to not only to develop, but to develop in an ethical and sustainable way. I believe that after partaking in the sustainable development module that I will now go into the working world with my eyes more open to how to try and develop more ethically and sustainably.
Yes I am extremely happy I completed the sustainable development module. I can honestly say it is the module I enjoyed most throughout my time in W.I.T. There are many reasons for this. Firstly, this module moves away from traditional learning and focuses more on discussion and debate. I found that I absorbed vast amounts of information thanks to the open, comfortable environment during class. Opinions were always encouraged which helped tremendously with the openness of class discussion. The variety of teaching techniques also contributed to my enjoyment of this module. Classes varied between videos, films, debates, discussions and traditional learning (slideshow notes). Every class was exciting and I learned something new every day. It also helped to dramatically increase my understanding of sustainable development. I am extremely glad I completed this module.
Yes I am delighted that I completed this module. It was by far my favourite module during my whole time in WIT. I learned so much more about sustainable development and it helped me to understand current affairs in more depth. I was ignorant to a lot of things that were going on in the world before doing this module. Every class was very interesting and discussions held by the lecturer really helped us to express our views and hear the views of other people in our group. It was one class that I felt I could express my opinion while also gaining from the opinions of everyone else.
Yes, I am very happy I picked this module. It was my favourite module out of the four years in college. I enjoyed SD so much as it opened my eyes to how we are damaging our planet and thought me many things.

Source Compiled by the Author

Table 6 Has this module change your understanding of business and how it operates? Please give a reason/s for your answer (SR4, P11)

It has definitely made me see businesses in a different light. Before this module I assumed there was some ethics involved in most businesses and that it was just a handful of unethical businesses that gave industries a bad name. However after completing this module I realise there are only a tiny percentage of businesses with any ethical system and that most businesses are 100% about financial benefit.
I found it remarkable to learn of organisations which were looking past their profits to find ways in which they can contribute to sustainable development.
I had a good idea about the issues in the corporate world but this module thought me a lot about how businesses can change and should change. Through the research involved I discovered a tangible difference between the companies who genuinely implement sustainable practises and those who attempt to greenwash their firm.
Yes the module has definitely given me a far greater insight into how a business operates and how they can develop more sustainably. Especially our personal project on child labour which showed me how much child labour is still being used throughout the world and how although there are laws to prevent it these are still loopholes. This module has shifted my understanding of how businesses work and how they should operate and develop hugely. Businesses must be constantly aware of how they can develop more sustainably and how where they can improve.
Yes, most definitely. Before completing this module I believed that sustainable development was defined by global warming, rising sea levels and CO2 emissions. Although these are fundamental issues which were discussed in class, I never imagined that it is also based on things like paying fair wages across the globe, providing education and monitoring economic activity. Businesses have a huge role to play in sustainable development which I never realised before. At the moment, large multinationals across the globe are engaging in exploitative activity, such as paying unfair wages and providing unsafe working conditions. This is because the main goal of many businesses is profit maximisation. However, all businesses need to make a change in order for our planet to survive. I now understand that business operations have a fundamental impact on the overall goal of the planet to survive.
I have a much clearer understanding of how businesses can impact the world in many ways. If large organisations took the leap in acting as role models for the rest of us, much more could be done. If they made more of an effort, major changes could be made to help change sustainability attitudes and increase awareness.
Yes because business is being thought and looked at it the wrong way. Going forward if business is thought and business continue to act in the way they are we are heading towards an unstainable planet.

Source Compiled by the Author

Table 7 Do you believe business students should be informed about sustainable development? If so, please explain why this is the case (SR4, P11)

I think most business courses are 90% focused on how to maximise wealth. Even HR modules are focused on making employees work the best for your company. I think to stop the cycle of unethical business practice you need to educate people from day one about how things are done now, why it's unethical and that it doesn't have to be an unethical business to be a successful business.
Yes I believe students in all courses should receive an education involving sustainable development.
Throughout the four years of the level 8 business course, students are informed about a wide range of business issues such as IT, Accounting, Marketing etc. but no modules exist about issues corporate responsibility and sustainable development. The module that is available is an elective which means that many students complete their course with no education about sustainability.
Yes it is my firm belief that every business student should be obligated to complete this sustainable development model. I Believe this as it has given me great insight into how to carry on business more ethically and responsibly and I believe we need to show everyone this in order for us to develop. I also believe this as I had gone through 4 years of college and this semester was the first time I had heard the term sustainable development. A lot more emphasis must be put on this topic worldwide.
Absolutely. I believe it is essential for business students to be informed about this. Many of us will go on to work in businesses, big or small, and this module helps to inform people of the vast impact operations can have on sustaining our planet as a whole. I believe this module would help to give students from WIT a competitive advantage when applying for future employment. It has become a topic that people can no longer ignore and I believe that businesses are making a shift towards becoming sustainable. In my opinion, I will perform better in my future place of work thanks to being more informed about sustainable development.
Yes definitely. This I was unaware of so many things before completing this module. I feel like it is such an important topic. Before studying this topic I was completely unaware of the importance of sustainability and also more importantly the relevance of sustainable development in today's world. Unlike some modules that focus on certain areas that may not be relevant for us in the workplace, sustainable development will always be relevant for all students in the workplace. As well as learning about sustainable development, my understanding of current affairs around the world was heightened. I also feel very strongly about the responsibility we all have to ensure that we safeguard resources for future generations and this module really would help people to understand this. Students could learn so much from this module while also enjoying going to the lectures.
Yes, I think SD module should be compulsory for business students in 1st or 2nd year. If I learned what I learned in this module in 1st or 2nd year and not my final year of college my outlook on business and in life in general would be completely different.

Source Compiled by the Author

Table 8 What aspects of the Sustainable development module were most influential in term of increasing your awareness and knowledge of sustainable development?(SR4, P11)

I was most influenced by the social component of SD. I think before we can consider ourselves as civilised, evolved human beings we have to give every single person basic human rights. I am more informed now about how rights people in developing countries have and how there seems no one doing anything about it. It influenced me to open my mind to these things that in the developed world we ignore.
Education as to the making of goods worldwide involving child labour was very Important to my learnings in sustainable development.
The videos that were shown throughout the module were very eye opening. The initial videos about the mistreatment of humans around the world set the tone of the module. Further videos, in particular about the changes made by IKEA were very influential in understanding the issues with sustainability in the business world and also how positive changes can be implemented to make real changes to business practise.
What for me the most influential part of sustainable development was the video we watched called stolen childhoods. I found his shocking as not only was child labour a problem in third world countries but it was also a problem in countries such as America. This video shocked and saddened me and led me to do my personal project on this topic as I wanted to learn more about it. It truly is shocking the scale of this problem and it must be tackled more head on in order to amend the issue.
Many aspects of this module were influential. Firstly, the models of SD presented to us in class helped to increase my understanding. As well as this, completing a presentation on the benefits of SD in an organisation was hugely beneficial. The aspect that was most influential in terms of increasing my awareness of SD was the project I completed on exploitative value chains. This helped me to gain in depth knowledge about businesses, how they are acting unethically and how they must change in order to contribute to the world becoming more sustainable overall. Honestly, all aspects of this module were extremely beneficial and I am very happy I chose to study sustainable development.
Class discussions every day were eye opening for me. We would discuss different topics such as child labour, climate change and social inequality. These discussions really helped me to look at things from other peoples' perspectives. We were always entitled to voice our opinions which enabled conversations between all students and Helen. I learned something new in every single lecture and as work was done every day, the pressure to meet deadlines at the end of the semester during exams was not massive.
The 3 aspects for me that really changed my outlook on SD were the YouTube clip of Steve Howard's talk at the ted conference, the dvd we watched of the child labour, which showed what's going on in the world and the general debates we had in class.
Our reflective log books were great as we could look back week on week and see how much we were learning. By completing our own research throughout the module we were able to broaden our knowledge on the subject even further. Unlike other modules, the SD module was completed bit by bit and our opinions and research were so important.
Completing my literature review was a difficult task but had I not completed this module I would be completely unaware of what as lit review was, because I did the accounting stream. We were able to complete the lit review on a topic of SD that we were interested in and I learned so much in doing this
A lot of the learning came from my own research which helped put what we learned in class into use.
I also liked how we were shown videos such as a talk from Steve Howard of ikea who showed us an example of the best practice of sustainable development in action.

Source Compiled by the Author

Table 9 Review of sustainable development content or related content on Business/Management undergraduate degree programmes in Higher Education Institutions in the Republic of Ireland

Name of Institution	Business Course	
University College Dublin	Commerce	Year one (core) Business in Society
University College Cork	Commerce	Years 3 & 4 (elective) Food Business and Development
University of Limerick	BBS (Hons)	-
Trinity College Dublin	Bachelor in Business Studies	Year one: (core) Fundamentals of Social Science, Ethics and Philosophy Year three: (Elective) Business in Society Year four: (Elective) Social Entrepreneurship and Social Impact
National University of Ireland Galway	Business/Commerce Degree (B.Comm)	-
National University of Ireland, Maynooth,	B.B.S. Business and Management	Year one: (core) Introduction to Business Ethics Year two: (elective): Engaging with Civil Society: Justice, welfare and the environment – theory and practice 1 and 2 (Department Applied Social Studies) (elective): Perspectives on poverty and development participatory principles and approaches (Department : International Development) 1 and 2 (elective): Global Environmental Change 1and 2 (Department of Geography) Year 3 (core) Business Ethics and Society
Dublin City University	BBS (Hons)	-01 7005265
Blanchardstown Institute of Technology	Higher Cert in Business leading to a Business Degree	Year two (elective) Environmental Resource Management
Cork Institute of Technology	Management (BBus degree)	Year one: (core) Business Ethics
Carlow Institute of Technology	BBS (Hons)	-
Waterford Institute of Technology	BBS (Hons)	Year four: (elective) Business Ethics Year four: (elective) Sustainable Development
Sligo Mayo Institute of Technology Management	Bachelor of Business	-
Dundalk Institute of Technology	Bachelor of Business (Honours)	Year three: (core) Business Ethics
Tralee Institute of Technology	BBS	-
Athlone Institute of Technology	Bachelor of Business Studies	-
Dublin Institute of Technology	Bachelor of Science (Hons) Business and Management	Year four: (elective) Corporate Governance and Business Ethics
Dún Laoghaire Institute of Technology	Bachelor of Business (Honours) in Entrepreneurship and Management	-
Letterkenny Institute of Technology	Bachelor of Business Studies (Honours)	-
Institute of Technology Tallaght	Bachelor of Business (Honours) in Management	-

Note BBS - Bachelor of Business Studies

Table 10 Criticisms of Business and Management Education

Management curriculum places an emphasis on functional boundaries over holistic management practices. Management Education emphasizes analysis over integration and technique over leadership and interpersonal skills (Pfeffer and Fong, 2002; Mintzbery and Gosling, 2002; Porter and McKibbin, 1988).
They are technical units (Cornuel, 2005).
The narrow approach to business education may have been a factor in the Tyco, Arthur Anderson, WorldCom and Enron scandals. Two theories dominate, Transactional Cost Analysis and Agency Theory (Mitroff, 2004).
Business schools have failed to provide the education for citizenship -An inappropriate and ultimately self-defeating model of academic excellence. Business Schools's measure themselves almost solely by the rigor of their scientific research. Graduate business education has become increasingly circumscribed and less and less relevant to practitioners. Most issues facing business leaders are questions of judgment. In business research, the things routinely ignored by academics on the grounds that they cannot be measured are most human factors and all matters relating to judgment, ethics, and morality. PhDs are organised around functional chimneys and this prevents crucial challenges to be addressed (Bennis and O'Toole 2005; Newman 1985, p. 31).
Business Ethics/CSR is marginalized within the M.B.A. curriculum and viewed as peripheral. MBA students are saying they are not being prepared to manage the conflicting demands of multiple stakeholders (Mitroff, 2004; Adler, 2002; Gioia, 2002).
Students at top schools can still complete their degree without ever contemplating the notion of Corporate Social Responsibility (Russell, 2006).
Compared to the traditional focus on economic development and financial management, social and environmental accounting research is still marginalised by the majority of accounting researchers (Parker, 2011). An important reason for the slow change in accounting education for sustainable development is the lack of professional accreditation requirements for knowledge in sustainability (Sundin and Wainwright, 2010).

Source Adapted from different sources by the Author (2013)

Appendix F
Expert Panel Thematic Analysis

Please note: Additional contributions were also obtained from Mr. Aidan Clifford, Director of the Curriculum Development Unit and Ms. Deirdre Hogan, Coordinator of the Ubunto Network, University of Limerick (see Table 3).

Table 1 Theme: The Concept of Sustainable Development and sustainability research Contributors: Nancy Dickson and Daniel Schrag

The Concept of Sustainable Development	Professor Schrag: *"Sustainable development is a complicated thing, it means different things to different people and frankly Sustainable Development is a contradiction in terms"…"Fundamentally to the economic community, SD means being able to sustain development and economic progress'. From a climate perspective this development puts a strain on the earth". "Sustainable development is a term that is used to marry economists with environmentalists and in some cases these are fundamental conflicts which you can't resolve".*
	Ms. Dickson: "*Ultimately Sustainable development is about 'Reducing Poverty, while Protecting the Environment*".
Sustainability Science (Not SD)	Ms. Dickson: "*SD has lost a lot of its meaning, the term Sustainability Science is more suitable. Sustainability Science is an evolving and important science"…"Sustainability Science is more process focused*".
Use of Sustainability Research is often ignored	Ms Dickson: "*Often the use of the research is not considered at all" … "Researchers in many cases do not ask the question, how is this research going to be used or of value on the ground*".
Problem Orientated Research	Ms. Dickson: "*Research needs to be problem orientated. The solutions generated need to address a practical problem on the ground, this can then be up scaled*".
Environmental and Development communities	Ms. Dickson: "*These communities are organised very differently, to the point where they almost don't interact**,** you are either Pro Environmental Conservation or Pro Development and Poverty Reduction*".
	Ms. Dickson: "*Sustainability issues (the worlds big problems) will not be resolved unless these communities interact with each other*".
	Regarding sustainability science education Dickson stated "*it is not environmental or development, problem solving in **Education must focus on both**".* (Connectivity and Integration)
Environmental Education and Development Education	Ms. Dickson: "*Environmental education must also focus on Development issues*"…"*Development education must also focus on Environmental issues*".
ESD Boundary Spanners	Ms. Dickson: "*Student of Sustainability Science need to become Boundary Spanners**,** students must have knowledge of the three components of sustainability*"). (Connectivity and Integration)
Policy level	Ms. Dickson: "*Policy makers need to listen more to existing knowledge that is out there, Academics need to listen to the needs of the policy makers more*".
Policy level	Ms. Dickson: "*People who are knowledgeable about sustainability science (sustainable development) are boundary spanners*"…"*The boundary spanners are very important, they are the disseminators of this information, when budgets get cut, it is the disseminators who often lose out, severing the link between policy makers and academics*".

Source Compiled by the Author (2010)

Table 2: Business and Management Education and Education for Sustainable Development. Contributors: Ms. Nancy Dickson, Mr. Mark Kramer, Professor John Ruggie, Professor John Sweeney, Dr. Ken Boyle, Dr. Shane Darcy and Dr. Susan Murphy

Management Education	Ms. Dickson, Mark Kramer, Professor John Ruggie, Professor John Sweeney, Dr. Ken Boyle and Dr. Susan Murphy: all agreed:, Management Education should be reflective of social and environmental issues. Professor Ruggie: "*Business and Management Education should become more reflective of Social and Environmental Issues".* Professor Ruggie: *"Management Education will change as the regulatory environment changes*." Mr. Kramer: "*The norm is that CSR is not embedded in Management Education and Business Strategy*".
Practitioners are ahead of academics	Mr. Kramer: "*Management education should be reflective of social and environmental issues. Education should be about creating informed citizens and we have lost that within business education*"…"*The calls for management education to be more reflective of sustainability issues are coming from practitioners, not academia*".
Harvard Business School	Mr. Kramer: *"You are not going to do particularly well at Harvard Business School if your area is Sustainability. You are not going to be taken that seriously frankly".*
No Commitment to sustainability in the HBS	Mr. Kramer: *"Those in the Harvard Business School have had real trouble building up any kind of faculty department"…"There is really no serious faculty commitment to sustainability at the Harvard Business School".*
Low Status	Mr. Kramer : *"You are going to have low stature at the Harvard Business School if you are the sustainability person".*
Change needed at Harvard University	Mr. Kramer: *"Harvard University and other educational institutions really do need to change quickly; Practitioners are changing much more quickly".*
Harvard Oath	Mr. Kramer: *"The Harvard oath was basically about the students agreeing to be responsibility to society and ethics, about one third of students were willing to take the oath'. On TV business students said they would not take the oath because it is about my career and maximising profit".*
Socialisation is hard to change	Mr. Kramer: *"It is hard to change deep socialisation. Management Education does need to change, but so too do other areas of study"... "If you study social science courses these courses should also look at the impact of business, on society and the environment, so it really goes both ways".*
Strategy Professors: poor knowledge of the benefits of CSR	Mr. Kramer: "*At the National conference for the association of Strategy Professors, the key question was; is CSR related to strategy?, it was a sceptical response in this audience, I speak all over the world and it was the strategy professors who were the furthest behind".*
Role of Lecturers	Mr. Kramer: *"The role of lectures is a barrier"…"Lecturers only teach what they know and what they know they learned twenty years ago. There is a large gap here and there is also a credibility issue". (disciplinarity) "It is an opportunity for management education to be reflective of the social, environmental and economic, to emphasise the win-win".*
A Paradigm Shift is required	Mr. Kramer: *"A paradigm shift within management and business education is much needed"…*"*How Education works in business schools is very important, and this education requires a shift in thinking"…"CSR is material to business"…"for this to happen in business, a shift has to happen within the educational system before there is any long term impact in the world of business".*

Source Compiled by the Author (2016)

Table 3: Key issues and barriers regarding the '**Education for Sustainability' The National Strategy on education for sustainable development for Ireland 2014-2020**
Contributors: Dr. Ken Boyle, Dr. Susan Murphy, Mr. Aidan Clifford and Ms. Deirdre Hogan

Ambitious but short on accountability	*"Although it's an ambitious strategy"…"This strategy is very much in the realm of aspiration"…"It is short on accountability".*	Dr. Susan Murphy, Trinity College Dublin
Poor on aspiration and specific goals	*"The National strategy has limited itself in terms of aspiration and specific goals"…"The government are very conscious of lack of money"…"The recommendations made by the curriculum development unit were not reflected in the strategy".*	Aidan Clifford Director of the Curriculum Development Unit
Externally driven strategy	*"The strategy was eternally driven by the UN, the Department are engaged now because they have to be engaged".*	Mr. Aidan Clifford Director of the Curriculum Development Unit
Resource allocation	*"There is little reference about resources to support this strategy"…"Its vague on specifics" … "But at least it gets the Department of Education talking about ESD".*	Deirdre Hogan, Coordinator of the Ubunto network, University of Limerick
Uncritical of the present educational system	*"This strategy is not critical of what is going on in the educational system now"…"The strategy is overly focused on the green flag rather than rooting ESD in the curriculum, overall the strategy does not make any attempt to criticise the curriculum"…"It's just paying lip service".*	Dr. Ken Boyle programme chair of the MSc Sustainable Development, Dublin Institute of Technology (DIT).
Not a political priority	*"This strategy is overly general"… "The strategy is rooted within the Department of Education and skills and does not go into how other departments can feed intoit"…"Politically education for sustainable development is not identified as an area that's important".*	Dr. Ken Boyle programme chair of the MSc Sustainable Development, Dublin Institute of Technology (DIT)

Source Compiled by the Author (2016)

Table 4 Required action regarding Education for Sustainability' The National Strategy on education for sustainable development for Ireland 2014-2020
Contributors: Dr. Ken Boyle and Dr. Susan Murphy

Embed ESD into the core curriculum	"*Education for sustainable development should be rooted in the core curriculum, where it should inform all of the educational process*"*…"There is a need to start at the beginning of the educational process".*	Dr. Ken Boyle chair of the MSc Sustainable Development, Dublin Institute of Technology (DIT)
Allocate advisory group under the Taoiseach's office: creating policy coherence and synergies	"*The proposed advisory group would sit better under the Taoiseach's office rather than in the Department of Education and Skills"…"This will facilitate policy consideration that is mainstreamed across the different departments, so you can achieve policy coherence*"…"*In addition, this will provide opportunities to create new synergies*" … "*This type of innovation and creativity is essential going forward*".	Dr. Susan Murphy, Trinity College Dublin (TCD).
ESD education and research	*"A multi-disciplinary approach should be used" ... "Interdisciplinary research is fundamental to education for sustainable development"..."Seeing the connection across the components of sustainability is fundamental".*	Dr. Boyle DIT and Dr. Susan Murphy TCD
Integrate ESD rather than bolt on measures	"*Aspects of ESD can be identified within any discipline*"*…"We need to go beyond 'bolt on' measures".*	Dr. Ken Boyle DIT
Teacher training	*"Teachers and lecturers need to be retrained and educated themselves" ... "It's not just about saving water and energy in schools*".	Dr. Ken Boyle DIT
Business and management education	*"Business and management education should place more emphasis on social and environmental issues, it is dominated by shareholder theory*".	Dr. Boyle DIT and Dr. Susan Murphy TCD

Source Compiled by the Author (2016)

Table 5: Theme: The power of the economic component of sustainable development - Contributor: Mark Kramer, Professor John Ruggie and Dr. Shane Darcy

Global Business	Mr. Kramer: "*Certainly the largest companies are larger than most countries in the world by far*".
	"*The more seriously responsible businesses are imposing upon themselves a set of ethical standards that the country does not impose*".
States and Governments	Mr. Kramer: "*In a global economy, states and governments really do not have the power to regulate global corporations very effectively".*
Business influencing government policy	Mr. Kramer: "*American legislation is dominated by the lobbyists"…*"*Businesses tend to drive the political agenda. There is no question, the power of corporations is a factor*".
The automobile industry	Professor Ruggie: *"The automobile industry, have spent a tremendous amount of money lobbying congress"…"so they missed the market".*
	Professor Ruggie: *"The Automobile industry …poured their money into lobbying so they did not have to change (become more efficient)"…"and this industry is struggling now because they didn't innovate and become more efficient".*
Being Proactive	Professor Ruggie: "*By being more proactive, businesses can get involved with forming the legislation, being more proactive is a form of competitive advantage".*
Voluntary nature of global compact and Global business council guidelines	Mr. Kramer: "*The Global compact initiative and the World Business Council guidelines for multinational businesses are positive but these initiatives and guidelines are voluntary, who is going to change that?"…"Corporations need a common standard".* Professor Ruggie: "*Business need to embody CSR simultaneously, but there is no international government in place to implement this".*
Stock Market	Mr. Kramer: "*The Stock Exchange is a major driver of how business function".*
The stock market encourages Short-termism	Mr. Kramer: *"The Stock exchange does not encourage business leaders to consider decision relevant to the long term success of their businesses"…*"*The stock exchange makes management focus on the short term*".
Creates Wrong Incentives	Mr. Kramer: "*The stock exchange creates the wrong set of incentives for managers, not just every three months but every three minutes".*
	Mr. Kramer: "*Share options, incentives managers to work in a certain way that ultimately focused on the share price*"*…*"*Need to encourages business leaders to invest with a long term business perspective in mind*"
Link between Poverty and the economy	Professor Ruggie: *"The Divide between rich and poor is increasing 90 m more will live in extreme poverty due to the financial crisis"…"In action could result in destabilisation*".
Lack of political well re poverty **Millennium Development Goals**	Professor Schrag: "*Millennium Development Goals will not be achieved, also due to lack of political will*". Professor Ruggie: key problems associated with achieving the MDG's include, "*Lack of commitment from Political Leaders - Re-cycling the same fund commitment, promising but not giving the funding*"… "*The financial crisis is affecting fund commitment (.7% of GDP)*"…"*Income transfer takes attention away from need to do things differently*".
Human Rights	Dr. Darcy: "*Business should take more responsibility for human rights. Especially business who work in collaboration with corrupt governments, paying for licences to extract precious stones*".
Clothing Industry	Dr. Darcy: "*there are very few workers unions in the clothing industry in the developing works*".
Political: Governments need to be more proactive	Dr. Darcy: "*Governments need to take more action re, human rights at home and abroad"…"Governments should implement legislation preventing big corporations form doing business with corrupt governments and employing sweatshops in their value chains*".
Consumer decision	Dr. Darcy: "*Although governments and corporations are happy to let consumers decide re cheep cloths, consumers do not make the connection*

	between cheap cloths and sweatshops".
Institutional: World Bank, IMF and WTO	Dr. Darcy: *"Key global organisations like the World Bank, IMF and World trade organisation do not take into account the impact of their policies on human rights, and this needs to change*".

Source Compiled by the Author (2016)

Table 6: Environmental component of SD Theme: Political factors influencing climate change policy. Main Contributions from Professor Robert Stavins and Professor John Ruggie.

The Importance of Climate Change	Professor Ruggie: "*Climate change is the greatest challenge of our time, we are affecting the natural systems we depend on*". In addition Ruggie is: *"supportive of the IPCC findings".* Mr. Kramer**:** "*The overwhelming majority of sciences do agree with the findings of the IPCC"…"It's a bit like what Thomas Aquinas said about the proof of God, the consequences of not believing are much worse than the consequences of believing*". Professor Stavins: *"There are many challenges; I can't compare the challenge of climate change to the challenge of urban poverty, the challenge of nuclear proliferation, the challenge of the rise of fundamentalist Islamic terrorism.*
Climate Change Policy	Professor Stavins: "*The US needs to move in parallel, with commitments from China, in the US change regarding climate change is not going to be sudden".*
Kyoto meaningful Agreement	Professor Stavins: "*It would be easy to get an agreement that has un-ambitious targets that does not include China and the United States. This type of agreement would not do much about the problem*".
Positive attributes of Kyoto	Professor Stavins: "*The protocol passed the political feasibility test, 160 countries signed it, and enough annex one countries ratified it, so it came into force. The Kyoto protocol also has the three flexibility mechanisms built into it, it was a first step, it laid a framework*".
Protocol disadvantaged US Industry	Professor Stavins: "*Bush didn't withdraw from the Kyoto protocol, he affirmed the same position as President Clinton, vice president Gore and John Kerry"*. Professor Ruggie: *"Politically for US – the Protocol targets disadvantaged US industry".*
	Professor Stavins: "*The Kyoto protocol was a flawed approach and would not be submitted to the senate for ratification"…"Clinton did not submit the Kyoto protocol to the senate for ratification"…"Bush made a lot of people very angry, but in terms of the subsistence of Kyoto it was not a change, which I often find Europeans do not recognise".*
Non-compliance with the Kyoto Protocol was partisan.	Professor Stavins: "*The decision not to participate in the Kyoto protocol was by partisan*"…"*The Vote was 95 to nothing, it was not democrat versus republicans, it was unanimous".*
For action to occur on CC China and India must be involved	Professor Stavins: "*The US said we will not ratify an agreement that does not include major developing countries, China, India, Brazil, Mexico, South Korea and South Africa*". Professor Ruggie: "*The US did not commit to the Kyoto Protocol, because no political commitment came from India and China".*
Include developing countries	Professor Stavins: "*If you are putting in place a policy – it is to address what's happening now, for the world to take action without the developing countries taking action, means you are not addressing the problem*"… "*There have been positive bilateral discussions between China and the United States, a bigger concern is to get India on board*".
Emissions	Professor Stavins: "*The question is not the population, it is the emissions*".
Climate change is not a big issue in the US	Professor Stavins: "*The US is a democracy, climate change is not a big issue in the US like it is in Europe. People in the US are concerned about, health care, the recession, and the economy is a huge issue*".
Domestic Coal Resources	Professor Stavins: "*China, the US, Australia and Poland huge domestic coal resources, and that's not true for Europe. UK shifted from coal to natural gas, for reasons that have nothing to do with the climate*".

Source Compiled by the Author (2010)

Table 7 Theme: Climate Change Denial - Role of the media and climate change deniers Contributors: Professor John Sweeney, Professor Daniel Schrag, Dr. O'Mahony, Ms. Nancy Dickson

Media contribute to confusion	Professor Sweeney: "*In terms of increasing awareness of climate change, the role of the media is very important, but unfortunately the media contributes to the confusion of the public themselves*".
Media is not reflective of the scientific consensus	Professor Sweeney: *"97 percent of the evidence supports the reality of anthropogenic climate change and 3 percent does not"* Dr. O'Mahoney: "*There is a high level of acceptance of the IPCC's findings"…"895 papers and 2500 scientists support the IPCC findings*". Professor Schrag: "*The findings of the IPCC are conservative*".
Media focus:- Debate not discussion or conclusions	Professor Sweeney: "*The media don't want to discuss climate change they just want a debate, and then the public are as confused as they were before the debate*". Dr. O'Mahoney: "*The media do not want conclusions, regarding the science of climate change, they want debate and argument*". Professor Schrag: "*Many journalists, treat climate change like it's a political party"…"Giving equal representation to a small fringe group, 'that's just bad irresponsible journalism*". Ms. Dickson: "*The media want a story, they don't seem interested in the truth*".
Action on CC requires public awareness acceptance of CC	Dr. O'Mahoney: "*For real change to occur regarding sustainability it is the public acceptance of the science which is the key, this is known as social inertia"…"social inertia is being prevented by the media and through funded research negating the IPCC's findings*". Professor Schrag: "*The public will only begin to deal with climate change when people get scared of the consequences, only then, they will demand action'(social inertia). The issue is when will this happen*".
Denying Anthropogenic Climate Change	Professor Schrag: "*I have been dealing with climate change deniers for many years*"…"*There are three types of climate sceptics, these are sceptics who are ignorant about the reality of Climate Change*".
Climate Change Deniers	Professor Schrag: "*Some experts in theoretical physics regard the Earth Sciences as a lower level field, - it's a form of academic snobbery. They say CC models are wrong, but CC is based on observations not models. They focus on one thing"… "if their focus does not quite fit into the whole theory… the whole theory is wrong".*
CC Deniers contrarians	Professor Schrag: "*These CC sceptics are the contrarians; they will oppose the major consensus, just to be controversial".*
CC Deniers Paid Liars	Professor Schrag: "*These sceptics/ deniers are basically paid liars - paid by oil companies and other organisations to just Confuse the climate change debate, these deniers are Paid to confuse. Payment amplifies them, they become more vocal and write more papers*"…"*This is ethically horrible*".
Climate deniers also support tobacco industry	Professor Sweeney: "*You have the sceptics and paid scientists working for a particular agenda which complicate things no end"… "Many of those sceptics were themselves paid scientists defending the tobacco industry before they became to become sceptics in climate science*"
Climate Science and ESD	Nancy Dickson: "*Students must be presented with the realities and facts of the IPCC consensus. In addition, know your enemy"…"students need to explore who the most articulate objectors are and where the funding comes from*".
Lack of Political Will	Professor Schrag: "*We know what we have to do but we don't have the political will to do it. Political will is lacking, because managing and dealing with CC is expensive and inconvenient, there is a lot of money at stake*".

Source Compiled by the Author (2010)

Table 8: Economic and Social Components of SD - Theme: Corporate Social Responsibility as a business opportunity. Contributor: Mark Kramer

Viewing CSR as a Win -Win	Mr. Kramer; *"CSR is a business opportunity; there is money to be made in social issues being solved".*
Shift in Strategic Thinking is required	Mr. Kramer; "*It is through seeing the interrelationship between the components of SD that strategists can identify opportunities"…* "*This requires a shift in thinking… that's the real barrier'. Strategists could not see the connection between SD components so they couldn't see this opportunity*".
	"*Increasingly with companies, strategists need to jump to the chasm and get to the companies' core business strategy … this is a new growth area for business*".
Linking Core Strategy and Social Issues	Mr. Kramer believes "*With regard to strategy now you have got to think of the social context and the sustainability issues as part of your strategy and that's the shift that has to happen. You need to think of the social context and opportunities as part of you strategy*".
CSR and Strategic Thinking	Mr. Kramer stated "*the pursuit of sustainability/CSR is fundamentally influenced by the strategic thinking of key decision makers in the firm*".
Key Questions: Re Executives Perspective	Mr. Kramer: "*Do the key executives' 'take a short term perspective and see CSR as public relations exercise? or Do key executives think about CSR/Sustainability as contributing to the long term success of their business*".
	Mr. Kramer: "*For most companies, CSR is still cut off and separate from the strategy of the company".*
Change of Mind Set at the strategic level	In terms of linking CSR with Strategy Kramer believes - "*the Mind set at strategic level - needed is a change".*
CSR and Long Term Success	"*Senior management need to see CSR as something that will contribute to the long term success of the organisation*".
	With the companies they work with Kramer states "*there is a shift in mindset towards the long term*", *due to Activism, Self Regulation and the regulatory environment".*
Linking CSR to Management Incentive Programmes	There is a tendency "*to isolate CSR to public relations*" Re conversations with CEO - "*it is difficult to get (win-win) type of thinking down through the management structure*"
Few companies build CSR incentives into strategy	Mr. Kramer explained "*While companies talk a good game regarding CSR, there are* ***very few that have created financial incentives within the company for manager to pay attention to CSR".***
	"*CSR is not linked to management incentives programmes' and this is why managers do not pay attention to Corporate Social Responsibility*".
	"*Nearly all the companies that produce CSR reports do not tie performance reviews to the CSR report*"
Stakeholder v Shareholder Theory	"*There is a movement towards stakeholder, although the shareholder is dominant. The Primary interest is the shareholder*".
CSR is not about public relations	Kramer: "*CSR is the responsibility of the head of manufacturing, its not about public relations or community relations, it is very much imbedded in their operations of the company*".
Building Incentives	Mr. Kramer: "*If you are not building it into the annual incentive for managers or building incentives into their annual performance review, then managers are right not to take it seriously*"… "*What gets measured gets done and what gets paid for gets done"… "Senior managers need to unearth their assumptions and identify what is influencing their socialisation process".*

Source Compiled by the Author (2010)

Appendix G

Definitions of sustainable development and support information

Table 1 Definitions of Sustainable Development

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs	World Commission on Environment and Development's - Brundtland Commission (1987, p.43)
Three main dimensions of sustainable development, namely the environmental, economic and social dimensions	UNIDO (2007)
Sustainable development is the triple bottom line (pursuit of social, environmental and economic goals)	Elkington (1997)
Sustainable development is Environmental suitability, economic viability and social acceptability	Bell and Morse (2000)
Sustainability is a condition; sustainable development is the means by which we achieve Sustainability	Buchan, Spellerberg, and Blum (2007)
Sustainable development is the consideration of Environmental performance, societal responsibility and economic contribution	Krajnc and Glavic (2005)
When defining sustainable development, one must take a global perspective	Moldan (2002)
Sustainable development is the interdependence between social, economic, political and environmental objective	UNESCO (2002?)
Corporate Social Responsibility (CSR) is the business contribution to sustainable development.	World Business Council for Sustainable Development (WBCSD)
Sustainable development is a process of reconciliation of three imperatives. These are the ***ecological imperative*** to live within global biophysical carrying capacity and to maintain biodiversity, ***the social imperative*** to ensure the development of democratic systems of governance that can effectively propagate and sustain the values that people wish to live by, and the ***economic imperative*** to ensure that basic needs are met worldwide.	Dale (2001) Robinson and Tinker (1997) Norgaard (1994)
Improving the quality of life while living within the carrying capacity of supporting ecosystems.	World Conservation Union, UNEP(1992), Worldwide fund for nature (1991p. 10)
Sustainability is a relationship between dynamic human economic systems and the larger dynamic, but slower-changing ecological systems, in which (a) human life can continue indefinitely, (b) human individuals can flourish, (c) cultures can develop ; but in which effects of human activities remain within bounds, so as not to destroy the diversity, complexity, and function of the ecological life support system.	Costanza, Daly and Bartholomew (1991p.8)
A sustainable society is one that can persist over generations, one that is far-seeing enough, flexible enough and wise enough not to undermine either its physical or its social systems of support.	Meadows, Meadows and Randers (1992 p. 209)
Our vision is of a life-sustaining earth. We are committed to the achievement of a dignified, peaceful and equitable existence. We believe a sustainable United States will have an economy that equitably provides opportunities for satisfying livelihoods and a safe, healthy, high quality of life for current and future generations. Out nation will protect its environment, its natural resource base, and the functions and viability of natural systems on which all life depends.	United States President's council on Sustainable Development (1994 p.1)
Defines sustainability as having four dimensions, Social, Natural, Economic and Institutional	United Nations Commission on

	Sustainable Development (Spangenberg , 2002)
The WEHAB Agenda :- WEHAB stands for water, energy, health, agriculture, and biodiversity (Adopted at the World Summit on sustainable development)	(WSSD,2002)
Sustainable Development is a process of achieving human development in an inclusive, connected, equitable, prudent and secure manner **(see table 2.9)**	Gladwin *et al.* (1995)
Sustainable development is a continuous guiding process of economic, environmental and social change aimed at promoting wellbeing of citizens now and in the future. To realise this involves creating a sustainable and resource efficient –economy founded on a fair and just society, which respects the ecological limits and carrying capacity of the natural environment	(Department of Environment, Community and Local Government in Ireland, June of 2012, p10).
The fundamental debate regarding sustainable development is whether we choose to adopt a strong or a weak conception of sustainability	(Pelenc, and Dedeurwaerdere, 2015)

Source Adapted from different sources by the Author (2010)

Appendix H

Data collection support information

Table 1 Interview Protocol

Aim: The protocol was used to ensure consistently and ethical standards were adhered to thought all individual and group interviews.
Scheduling of interviews: All individual and group interviews were scheduled at times suitable to the interviewees. In addition, all interviews were conducted in the schools colleges or university, where staff or students either worked or studied. All group interviews were conducted in a quiet private space, all group interviews with students were conducted in their class room. Excluding telephone interviews, all semi structured interviews with Professors, Lecturers, School Principal, Deputy Principal, CSPE Teachers, Green School Coordinator and Environmental Awareness officer, were conducted in their class room or in their private offices at their place of work.
Interviewee Consent: Although verbal consent was given when teachers were initially contacted and invited to participate in this study, at this time prospective interviewees were given an information sheet- consent form, detailing the research objective and outlining information relevant to the study. Prospective interviewees were requested to read and sign the consent form. It was explained that the consent form would be collected prior to the commencement of the scheduled interview.
Focused attention: With the aim of achieving the maximum from interviews, focused attention is critical; respondents can sense good attention and will often give more information when the interviewer is attentive. Consequently, the researcher was mindful of the importance of good eye contact and focused attention throughout all individual and group interviews.
Opening Statements: (1) Individual interview: individuals were greeted and thanked for agreeing to participate in the research. (2) Group interviews: After introducing myself, all groups were thanked for their willingness to participate. The aim of the group interview was outlined. E.g. Primary level Eco School - Green Schools programme (11 year old female students) "Today with your involvement we are going to discuss your experience of the green flag programmes you have been involved with since you entered primary school. I have five short surveys that focus on each of the green flags, each survey contains the same five questions. The questions are about the green flag activities you were involved in and what you learned from these activities. The last two question will ask you about the green flag and whether completing the green flag changed your behaviour or not".
Expert panel interviews: Preparation: Careful research was conducted on the background of each expert panel member to gain insight into the specific area of expertise of each panel member. This preparation also allowed for the identification of more specific questions linking their area of expertise relevant to sustainable development. E.G Daniel Schrag and John Sweeney were asked to discuss climate change deniers, since both have expertise in the area of climate change. To maximise the qualitative interview, open ended questions were utilised in addition to probing questions. In line with the emergent design (Creswell, 2007) Although each interview was carefully planned the researcher was also mindful of being willing to make adjustments to the interview protocol, to facilitate emergent information in the interview.
Recording interviews: All interviews conducted in Harvard university were tape recorded, the interview conducted with Professor John Sweeney was also recorded. The remaining expert panel interviews were telephone interviews, where note taking was utilised to record interviewee information. Where interviews were recorded, a second recording device and extra batteries was brought to each interview, the recording device was tested prior to each interview.
Additional contact: At the end of all interviews, the interviewee was informed that there would be a subsequent contact to clarify information received from the interviewee, and perhaps to ask additional questions, or perform member checking.

Source Compiled by the Author

Table 2 Sample of Interview guides

Sample of guides used by the researcher when conducting interviews are outlined here. In some cases, the guides served as a template for interviews with similar individuals and groups: e g. interviews with CSPE teachers were asked the same specific and open-ended questions relevant to the CSPE programme. All Green-Schools programme participants were asked the same questions relevant to the five different green flag awards (see Tables 1-5, Appendix D).
E.G. Civic Social Political Education Programme (CSPE) semi structured interview guide How long have you been involved in teaching the CSPE programme? What is your opinion regarding the CSPE programme? Overall could you talk to me about how school management view the CSPE programme? Does the same teacher/s usually teach on the CSPE programme? Do you think one class per week is adequate for CSPE implementation? Interviewees will be asked to give an explanation for their answer to the previous question Did you participate in the CSPE in-service? If yes, interviewees will be asked to give their opinion regarding their experience of the CSPE in-service training If no, interviewees will be asked to discuss why they did not participate in the CSPE in-service training. Could you discuss how you think students' perceive CSPE? In comparison to other junior certificate subjects, how do you think students' perceive CSPE? Interviewees will be asked to give an explanation regarding the previous question. If CSPE is made a short course under the proposed junior cycle reform, do you think your school will include the CSPE short course in the curriculum? Interviewees will be asked to give an explanation regarding the previous question.
E.G.– Green-Schools programme semi structured interview How long have you been involved in the Green-Schools programme? Overall what is your opinion regarding the Green-School programme? Overall could you talk to me about how school management view the Green School programme? Could you talk about what influenced the decision in your school to participate in the Green School programme? How has your school benefited from Green-School programme participation? Could you talk about the time required for successful green school implementation? In terms of Green-Schools support, do you get much support from the local environmental awareness officer? Could you talk to me regarding the *An Taisce* information requirements? The Green-Schools green schools programme is not part of the official curriculum, what are your thoughts on this?

Source Compiled by the Author

Table 3 Information and consent form

INFORMATION and CONSENT FORM

Introduction

Overall this research focuses on the area of education for sustainable development. At the primary and post primary levels of education I am conducting a study to identify factors influencing the implementation of the (Civic Social Political Education programme or the *An Taisce* Eco School-Green schools programme or education for sustainable development at the tertiary level). As a teacher who is involved in one of these educational programmes, your opinion is most important and may help in the identification of issues influencing programme implementation. The key themes identified in these individual interviews will be used to develop a survey on the (Civic Social Political Education programme and the *An Taisce* Eco School - Green schools programme and education for sustainable development at the tertiary level). This survey will be distributed a greater number to gain more detailed understanding of the issues and barriers influencing programme implementation.

Procedure

You will participate in one semi structured interview, you may be contacted at a later date to confirm information given or to answer additional questions. All information gathered will be treated as confidential by the researcher. How long will the interview last? The interview will last about 60 minutes.

What risks can I expect from being in the study?

Information you provide about your experiences and opinions will be recorded, transcribed and deleted after the research has been completed. The information obtained from your interview/s will be used by the researcher in the case report and may contribute to a larger report relevant to exploring the implementation of education for sustainable development within the formal education system in Ireland.

Are there benefits to taking part in the study?

There will be no direct benefit to you from participating in this study. However, the information that you provide may aid policy-makers to better understand teachers/ lecturers views regarding the (CSPE or Eco School- Green schools and education for sustainable development programme/s or education for sustainable development at the tertiary level) and may influence changes if any that are required in terms of improving the implementation of this programme/s and education for sustainable development within the formal education system in Ireland.

What are the costs of taking part in this study?

There are no costs to you for taking part in this study.

What are my rights if I take part in this interview?

Taking part in this study is your choice. You may choose either to take part or not to take part in the interview. If you decide to take part in this study, you may change your mind at any time.

Giving consent to participate in the study

Participation in this interview is voluntary. You have the right to decline to participate in the study, or to withdraw from it at any time during the interview. Please indicate your willingness to participate in this research by reading and signing this information consent form. This information and consent form will be collected on the day of your interview.

I have read this information and consent form and I give my consent to participating in this research. I am aware that I can change my mind at any time, up to and including during the interview. If I change my mind before the scheduled interview, I will contact the researcher by email at hfoley@wit.ie.

_____

Signature of participant Date _____

Source Compiled by the Author

Appendix I

Global Temperature

The temperature of the air near the surface has been measured by land, sea and satellite instruments, very accurately since the 1970s and fairly accurately since the late 19th century (see black curve in Figure 1 A.

Four main influences are known to affect global temperature, (1) El Niño (2) Volcanic smog particles (3) Sun radiation and (4) Human anthropogenic changes. The combined influences of the latter four influences are depicted as the orange curve in Figure 1A below.

It is relevant to briefly explain these four influences on global temperature

(1) **El Niño** - irregular "El Niño" are fluctuations in the up welling of *deep cold waters in the tropical Pacific Ocean*, which cool or warm the air for a few years (purple curve, Figure 1B);

(2) **Volcanic smog particles** - sulphate smog particles emitted in volcanic eruptions, such as El Chichón in 1982 and Pinatubo in 1991, which bring temporary cooling (blue curve, Figure 1B);

(3) **Sun radiation** - a quasi-regular cycle in the Sun's activity that changes the radiation received at Earth (green curve, Figure 1 B); and

(4) **Human anthropogenic changes** - primarily emission of carbon dioxide from fossil fuels, but also other greenhouse gases and pollution such as smoke, and land-use changes such as deforestation (red curve, Figure 1 B). In conclusion as Figure 1B indicates, the global heating since the 1970s can be explained only by humanity's greenhouse gas emissions (Weart, 2010).

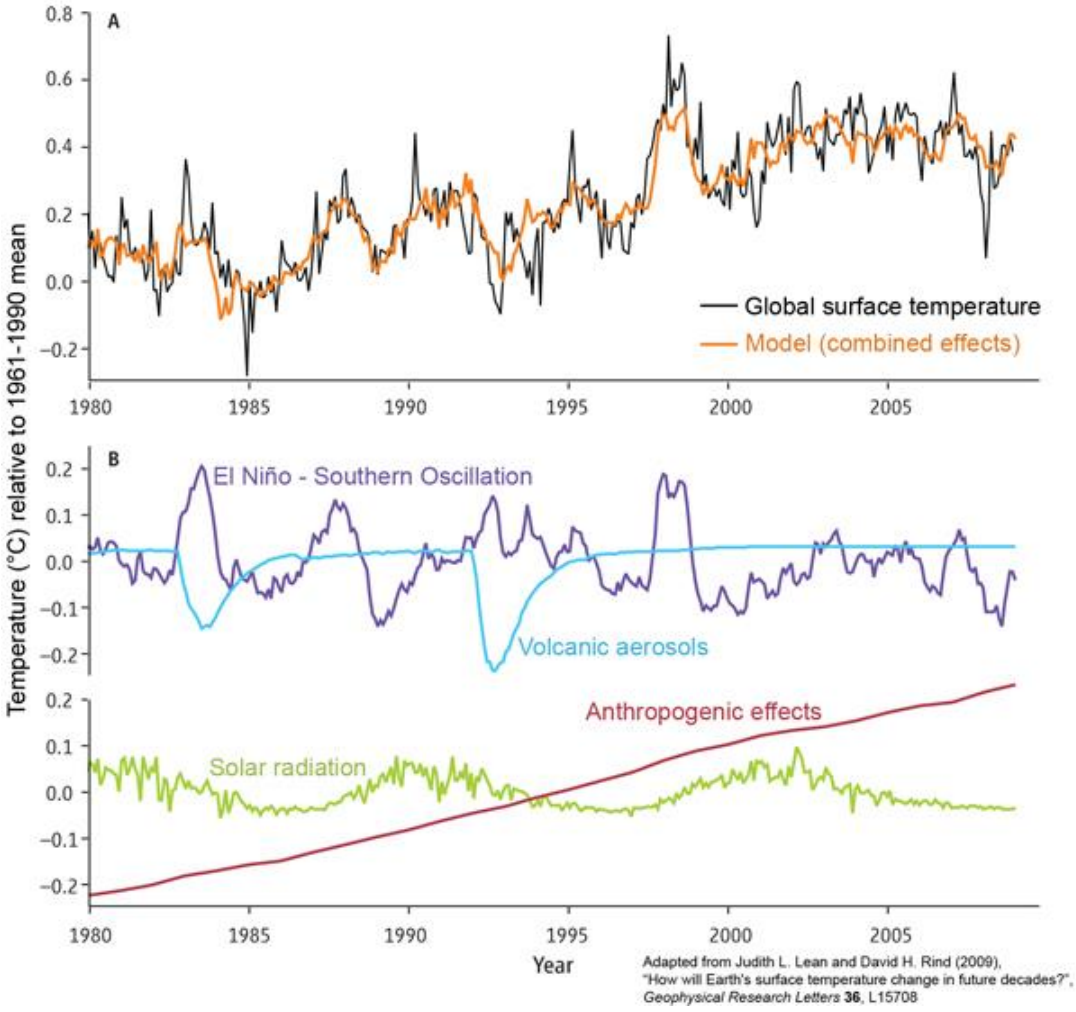

Figure 1 A and B Key Factors Influencing Global Temperature
Source Lean and Rind (2009) '

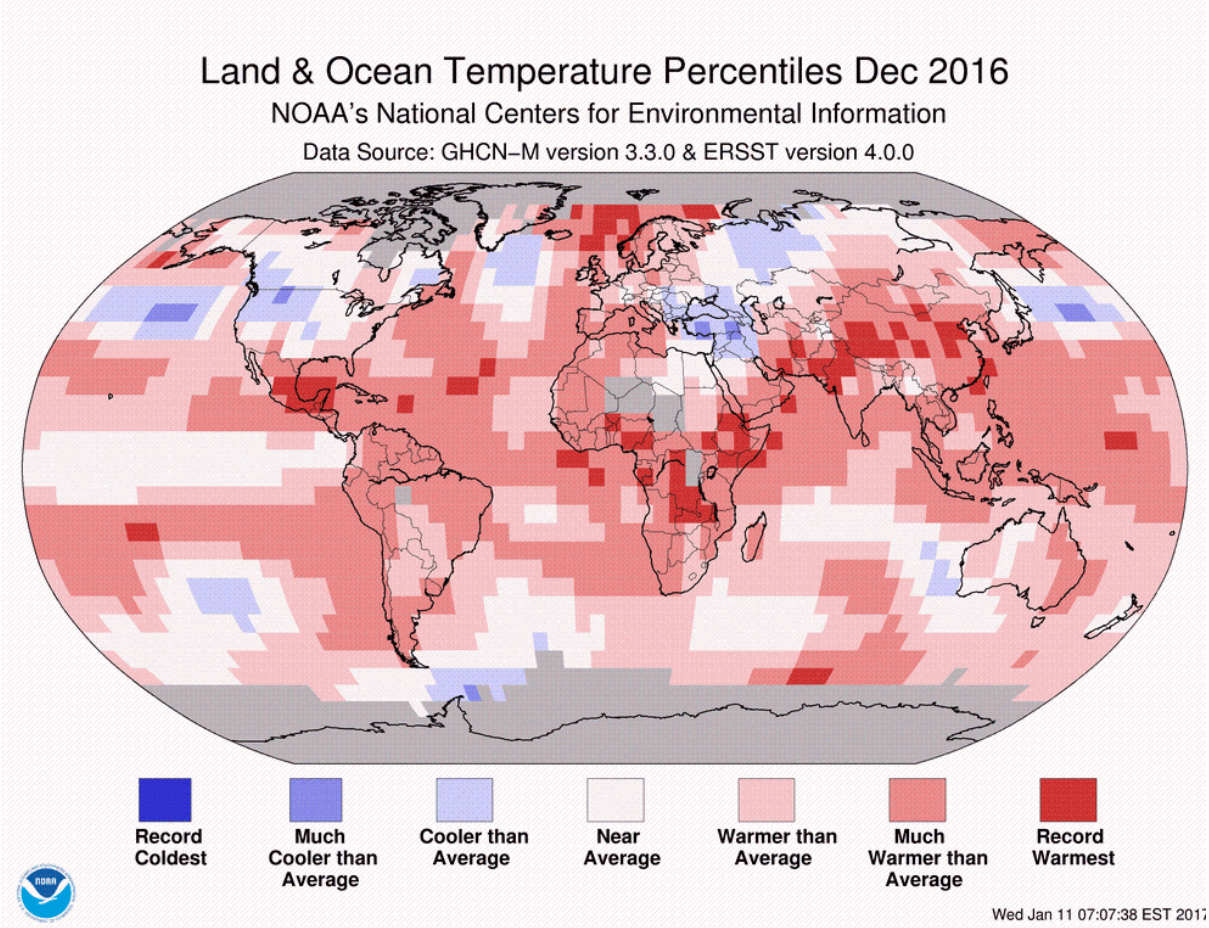

Figure 2 Land and Ocean Temperature Percentiles December 2016
Source NOAA (2017) (National Oceanic and Atmospheric Administration)

The combined average temperature over global land and ocean surfaces for September 2016 was the second highest for September in the 137-year record, 0.04°C (0.07°F) cooler than the record warmth of 2015. A few months after the end of one of the strongest El Niños in at least the past half century, this month effectively snapped the 16-month streak of record warm monthly global temperatures.

The average global temperature across land surfaces was 1.29°C (2.32°F) higher than the 20th century average of 12.0°C (53.6°F)—the highest September global land temperature on record, besting the previous record set in 2015 by 0.11°C (0.20°F).

Warmer- to much-warmer-than-average conditions were present across most of the world's land surfaces, with record warmth evident around the Great Lakes region in North America, parts of central and northern Europe, part of north central Russia, a region extending from central Asia southwest to northern Yemen and southern Oman, along with a couple of areas in equatorial Africa, as seen in the Land & Ocean Temperature Percentiles map above.

Overall, with continental records dating to 1910, Europe and Asia were both record warm for September, while Africa was second warmest and North America third, according to NCEI's Global Regional analysis. Only western Australia observed below to well-below average temperatures for the month. No land areas experienced record cold temperatures during September 2016 (NOAA, 2017).

Appendix J

Education relevant to sustainable development in Ireland

Tertiary Level Courses specifically related to sustainable development

Table 1 Dublin Institute of Technology: MSc in Sustainable Development

Dublin Institute of Technology
The MSc in Sustainable Development
The MSc in Sustainable Development aims to produce the environmental professionals who can pursue actions and policies derived from evidence, experience and rigorous evaluation. The programme aims and objectives are to provide graduates with the skills and ability to interpret principles of sustainable development and translate these into policy responses. There is an option to take a part-time MSc in Sustainable Development over two years. A postgraduate diploma (one year or two years) or a postgraduate certificate in Sustainable Development are also offered.
MSc Sustainable Development Programme Objectives: The objective of the programme is to provide graduates from diverse disciplinary backgrounds with a detailed understanding of the most current, and emerging, concepts of sustainability and a high level of applied environmental knowledge and skills. Furthermore it is an objective to facilitate the development of high levels self-learning and self-evaluation. These competencies are intended prepare candidates to take up positions of leadership where they would have specific responsibility for environmental performance. The programme is not intended to produce environmental specialists but rather to equip professionals with the most current information, awareness, knowledge and understanding of how to optimally manage environmental factors while sustaining and enhancing society. Part-time MSc, postgraduate Diploma or Certificates in Sustainable Development are offered to facilitate those currently employed or through other constraints unable to take on a full-time programme of study.
General Structure: The MSc Sustainable Development is a full time course that runs over 15 months at the DIT. Lectures take place on Wednesday, Thursday and Fridays in semesters 1 and 2. Mondays and Tuesdays are allocated to work placement. The Programme is structured to provide a first semester of modules which ensure that all candidates are exposed to the most current thinking about the core topics of sustainable development – such as ecology, the socio-economic environment, environmental law and institutions etc – while 'Techniques' ensures that candidates are aware of the research and writing standards necessary for participation in an MSc programme. The first Semester is also used to prepare the candidate to select a Dissertation topic – largely though the 'Research Conference' (See below). Two modules – Case Studies and Sustainability in Practice – link the two semesters by providing opportunities to meet and visit examples of best practice – both in Ireland and abroad1 . The second semester consists almost entirely of optional modules that provide the candidate with exposure to modules they feel will develop an expertise in a particular aspect of sustainable development.
Research Conference: A formative element of the programme is a conference (in the latter half of Semester 1 at the DIT) at which the students address the key sectors of the economy relating work based on the environmental, social or economic elements of sustainable development. A speaker from an appropriate sector/industry is invited to provide a keynote address and the students then report on their research as it address current issues in sustainable development. The conference is organised by staff with the assistance of the students and the audience is industry, the public/state sector and or the general public. A final report amalgamates all the presentations for dissemination.
Year 1 Semester 1 and 2 Module title SSPL Code ECT Credits Core modules Society and Sustainable Development †† SSPL9062 5 credits Ecology †† SSPL9028 5 credits Economy and Sustainable Development †† SSPL9035 5 credits Prior learning/work experience 10 credits (compulsory on MSc & Diploma) 2/3 Option modules in semester 2 Code varies* 10/15 credits * See option modules list for codes ††PG Cert core modules

Year 2 Semester 1 and 2 Core modules Research Techniques SSPL9006 5 credits Transport and Urban Development SSPL9014 5 credits Work Experience # SSPL9057 5 credits 2/3 Option modules in semester 2 Code varies* 10/15 credits Dissertation # SSPL9056 25 credits # Modules for part time MSc only

Source Dublin Institute of Technology (2016)

Table 2 Dublin City University: MSc. Sustainable Development

Dublin City University
M.Sc. in Management for Sustainable Development Degree
The overarching aim: The overarching aim of the programme is to provide a Masters programme for graduates who wish to develop their professional skills from a sustainable management perspective through part time study and at a distance. This programme is a Level 9 programme on the NFQ framework. The programme's main philosophy is that for business to be sustainable in the long-term, a successful manager must effectively manage the whole of the business' resources, including environmental, economic and social resources, from a sustainable, global perspective. Aims and Objectives: To provide students with an understanding of the theoretical, practical and legal aspects of modern environmental practices. To develop in students an understanding of the key management functions required in business, including strategic management, project management and risk assessment. To enable students carry out research on a range of focused topics, involving data collection, critical analysis, interpretation and to present them in a report format.
How the course is delivered: Open Education's post graduate programmes are provided through distance learning, which means that a working professional can achieve a deeper understanding in a specialist area and provide a sound basis for their long-term career, without disruption to their career or other commitments. For each module you undertake, you are given access to a specially written module text. While some modules have none, most modules require that you acquire one (and sometimes two) textbooks. You also get access to the vast range of academic journals and other resources provided by DCU Library and increasing use is being made of these resources on the course.
How the course is assessed: All modules are assessed via continuous assessment. There are no end of year examinations. For the taught modules, the continuous assessment normally takes the form of three assignments per module which have to be submitted at pre-defined points during the academic year. For the dissertation element, you are required to submit a 20,000 word document which is largely self-directed, but with the guidance of a research supervisor.
Programme Structure: YEAR 1: The building block of each programme is the module. Two modules (30 credits) are studied in year 1. You will register for your programme of choice at the start of year 1. However, as the first year modules are common to all programmes, you may switch to another programme at the start of year 2 if you wish. If you wish to terminate your studies on completion of year 1, you will receive a Graduate Certificate. YEAR 2: In year 2, the first 15 credits are essential to the MSc in Management for Sustainable Development programme. This module should be completed by the end of December of year 2. You will also complete a research proposal on a topic of relevance to the Management for Sustainable Development for submission by the end of October of year 2. Once the research proposal is approved, a dissertation supervisor will be appointed to you. It is envisaged that you will complete the Research Methods and Case Study module by end of April of year 2. This module is a combination of common research methods sub module, a Management for Sustainable Development specific case study and one elective from a range of modules currently on offer within the specific programmes. It is anticipated that while you can choose any of the electives, it is recommended that you choose the elective that best fits with the Management for Sustainable Development programme. You will receive advice in relation to this at the appropriate time. To conclude your studies for the MSc award, you must complete a dissertation of about 20,000 words in a topic compatible with the aims of the Management for Sustainable Development programme. The

purpose of the dissertation is to enable you to develop your investigative and analytical skills and to plan, organise and carry out independent research under supervision. The dissertation is also an opportunity for you to investigate a problem or issue of importance to your organisation or of professional relevance to yourself. You will be required to demonstrate competence in the critical study of your chosen topic and lucidity in the presentation and communication of the results. You will already have completed two research methods modules as part of your Post Graduate diploma studies, which will provide you with the tools required to undertake this major piece of research. The final dissertation must be submitted for examination by the end of July of year 2. You may also postpone registration for the dissertation module until year 3 if you wish and only take the two taught modules in year 2.
If you decide not to complete the dissertation, and have already completed the taught modules (60 credits), you may elect to graduate with the award of Graduate Diploma.

Module Syllabi - Subject Outlines:
Project and Change Management (15 credits) OSC1
Project Management; Managing Change
Electives
Business Support Systems (15 credits) OSC2
Research Methods 1;Business and the Environment; Legal Frameworks

MSD (15 credits) OSC14
Sustainable Procurement; Sustainable Waste and Enviroment Management; Sustainable Energy and Water Management
Research Methods and Case Study (15 credits) OSC3
Research Methods II; Case Study; Strategic Management

DISSERTATION (30 credits) OSC20
Figure 1: M.Sc. in Management of Sustainable Development Programme Structure
Project and Change Management - OSC1
This module consists of three elements with one assignment per element. In Project Management and Risk Assessment students are introduced to how key project management principles are applied to project planning, project scheduling, project generation, project feasibility selection and initiation and project scheduling techniques. In the Second element, Managing Change the different models of change are describes and how these assist in understanding and managing resistance to change, building readiness for change and sustaining change is outlined. Finally an elective where students can choose one element from four options, which currently include Enterprise Systems, Value Chain Management, Business Analysis and Social Context of Information and Internet Systems is completed.
Business Support Systems - OSC2
This module consists of three elements with one assignment per element. In Legal Frameworks, students are introduced to Irish Law, court procedure and litigation, remedies and enforcement and will be equipped to understand European Environmental legislation and how this relates to Irish law. In Research Methods 1 you are introduced to Qualitative and Quantitative research methods, while in Business and the Environment you are provided with an understanding of the essential elements of environmental management, including environmental management systems within an organisation and its link to business management.
Research Methods and Case Study - OSC3
This module consists of three elements with one assignment per element. Research Methods II develops the concepts covered in Research Methods 1, by describing the specific research methods in more detail. This element is followed with a programme specific case study which requires assessment of all aspects of a particular situation relevant to the core programme. The Final element of this module Strategic Management, provides an overview of the development of strategy and strategy making processes and sets it in context.
Management for Sustainable Development - OSC14
This is the core module of the MSc in Management for Sustainable Development programme. The overall aim of this module is to provide you with an understanding of the challenges involved in current best practices for the delivery of sustainable management practices across a range of operational issues specifically, waste and environmental management, energy and water management and procurement management.
Dissertation - OSC20
The Dissertation is a major piece of independent work of 20,000 words in length and gives you the

opportunity to bring to bear the techniques and perspectives covered in the taught modules upon a specific issue of interest. An independent and critical appraisal of an issue is essential in order to successfully complete the dissertation.

Source Dublin City University (2016)

Table 3 Trinity College Dublin - University College Dublin: Masters in Development Practice

TCD-UCD Masters in Development Practice "An interdisciplinary and constructivist program to better identify and address the challenges of sustainable development"
Established in 2009 following recommendations from the International Commission on Education for Sustainable Development Practice, the Global Masters in Development Practice (MDP) is a world-leading and uniquely innovative interdisciplinary graduate degree programme that blends health, natural, social, and management sciences--combined with cross-sectoral field training and professional local and international work-based placements to better understand international development problems and best practices. The Dublin MDP is a member of this global network of Master's in Development Practice, headquartered at Columbia University, New York, linking with over 30 universities and hundreds of partner organisations worldwide.
The two-year Masters in Development Practice encompasses an integrated theoretical and practical approach with multidisciplinary training in four "pillars"- health, natural, social, and management sciences. Eighteen core academic modules (link) provide rigorous training across the core pillars, complemented by masters level training in research design, methodology, and methods including training in leading edge quantitative, qualitative, and digital tools and techniques. The programme includes four work-based placements (link) which provide hands-on practical experience for students, both in International Development NGOs and International Intergovernmental Organisations. This programme aims to create a new generation of development practitioners with the skills to implement and manage comprehensive approaches to sustainable and efficient development. The Dublin MDP is a joint degree led by the Trinity College Dublin (TCD) School of Natural Science and University College Dublin (UCD) School of Politics and International Relations, and delivered by staff from all faculties across the universities, in collaboration with leading scientific researchers, and national and international organisations with specialist skills.
Course Modules The Dublin MDP it combines a range of teaching and learning approaches both in the seminar room and in the field. Students engage in a minimum of eighteen class-room based modules and four work-based placements to gain hands-on practical experience during the programme. Specialist skills are formed across a range of areas including research design and methods, development economics, global health, gender, climate change and climate justice, governance and politics and language training. Students engage with leading experts, practitioners, and academics both in the classroom and in the field. Students also produce a dissertation drawing upon research conducted during fieldwork modules. These have attracted attention from policy-makers, such as the Minister of Education in Rwanda.
Year 1 Modules: Tropical Agriculture (Natural Sciences Pillar) Climate Justice, Human rights, & Development (Social Sciences) Economic Policy & Analysis I (Social Sciences) Economic Policy & Analysis II (Social Sciences) Irish NGO Placement (Management) Fieldwork 1 (Management) Global Health (Health Sciences) Global Classroom (Cross-Disciplinary) NGOs: Law, Governance & Social Change (Cross-Disciplinary) Introduction to Statistics (Cross-Disciplinary) Globalization & African Development (Social Sciences) Year 2 Modules: Climate Change & Development (Natural Sciences Pillar) Science, Technology & Development (Natural Sciences Pillar) Economics of Sustainable Development (Social Sciences) Governance, Politics & Development (Social Sciences) Post-Conflict Situations (Social Sciences) Gender & Development (Social Sciences) Impact Measurement in Development Aid (Cross-Disciplinary) Fieldwork 2 (Management) MDP Dissertation

Source Trinity College Dublin, University of Dublin (2016)

Table 4 PhD Level: University College Dublin: PhD in Sustainable Development and Earth Systems Institute PhD Programme in Earth and Natural Sciences

University College Dublin: PhD in Sustainable Development
PhD in Sustainable development
This programme is a UCD Urban Institute Ireland (UII) initiative with support from three UCD Schools: the UCD School of Architecture, Landscape and Civil Engineering, the UCD School of Geography, Planning and Environmental Policy and the UCD School of Biology and Environmental Science Programme Structure: This is a four year programme which follows the UCD Structured PhD Framework, incorporating taught modules and a research internship, followed by a program of original research leading to the award of Doctoral (or Masters) degrees by research.
STAGE I - Taught Modules Taught courses will be concentrated in the first two semesters. In the first semester, students will learn transferable skills and be introduced to the overarching themes of sustainable development. In the second semester students may choose relevant specialist modules. These modules, which are designed to aid the student in developing his/her area of expertise can be taken from within UCD or from our collaborating partner institutions (see list below), subject to availability and to the agreement of supervisor(s). The Taught component specialisations will reflect the six research themes of the programme: (1)Biodiversity & Climate Change (2)Energy Efficient Build and District (3)Environmental Policy Analysis(4)Planning and Land Use (5)Sustainable Water Management (6)Transportation & Infrastructure. A number of these specialist modules will be available through several contributing partner institutions, who will be making specialist content available to UCD programme students: Contributing partner institutions: Trinity College Dublin (School of Natural Sciences); Queens University Belfast , UK (Gibson Institute for Land and Food); Göteborg University, Sweden (Environmental Economics Unit); University of Nottingham, UK (Nottingham Transportation Engineering Centre); International Institute for Geo-Information Science and Earth Observation (ITC), Enschede , Netherlands
STAGE I/II Research Seminars Every semester for the first three years, all students will present their ongoing research to their classmates. The presentations should combine a mixture of formal presentation (accompanied by slides) and interactive questions and answers. Presentations should be individual efforts. The research seminars are an opportunity for students to present and define the research that forms their PhD. The seminars alternate between UCD Urban Institute Ireland and TrinityHaus. Professional placement/internship Students can spend between three and six months in a professional placement. The internship will normally take place in a research-focused national organisation (e.g. Teagasc, Forfas, Comhar) or in a research institute abroad. The internship should be focused on research and should complement the academic programme. The internship should help define and illuminate the subject of the student's academic research and provide students with practical experience of the application of the academic tools and methods contained in the programme. The internship programme is also helpful in preparing students for their subsequent professional careers. STAGE II - Research and final examination Students will be required to complete a thesis based on original research, which will form the basis of the final examination. The thesis concludes a programme of research under which students will be required to produce Working Papers, co-author papers with their supervisors, attend conferences, etc. The research component of the degree programme will be based on the new protocols implemented for the UCD Structured PhD. This includes regular meetings with formal supervisory panels, a two-stage assessment of research progress and a student Research and Professional Development Plan which is regularly reviewed.
Stage one: Year one Taught 1. Introduction to Sustainable Development 2. Research methods I* 3. Research methods II - Professional tools for SD 4. Interdisciplinary project 5. Research methods III (Seminar series) 6.-7. Specialisation I+II*Two chosen modules from the following general areas: Environmental policy; Biodiversity & Climate Change; Planning & Land use; Transport & Infrastructure Stage II (12-48 months) Taught Research methods 11 (One series per semester over two years) Research

Earth Systems Institute PhD Programme in Earth and Natural Sciences
The ESI PhD programme forges a collaboration between Irish and international scientists, policy makers and industry to create the graduates who will play a major role in developing a knowledge-based economy that is competitive and yet protects its fragile environment. The graduate programme is based upon national guidelines and the recommendations and findings of the OECD, and is aligned to national and international strategies towards developing a green technology sector.
Collaborating Institutions: The Structured PhD Programme in Earth and Natural Sciences is a new multi-institutional collaborative Ph.D. programme involving University College Dublin, Trinity College Dublin, Queen's University Belfast, the National University of Ireland, Galway and the University of Limerick.
Structure of the Programme: Students will be embedded within the PhD programme at three levels: 1. Structured Component: There will be a focus on innovation, transferable and horizontal skills training including those provided by the TCD-UCD Innovation Academy and the NUI GALWAY Ignite Graduate Education Programme; 2. Disciplinary Component: Students will be embedded in a coherent discipline specific programme; 3. Research Component: Students will focus the majority of their time on original research organised into 6 interdisciplinary themes that address key global challenges. Training will prepare the student for industry, academia and government agencies where they will contribute to the emergence of a global reputation, the national deployment of green technology and sustaining the competitiveness of Irish industry. Graduate training will draw on and embed students in strong disciplines and multidisciplinary teams of specialists working on thematic research areas.
Research Areas: Students will be embedded within 1 of 6 disciplinary education strands. Their research projects will be aligned with one of the six major multidisciplinary research themes. In this way students will gain: • A deep understanding of their discipline. • Experience of original research that addresses issues of national and global import. • A high level of technological expertise and understanding of a broader range of technologies. • First-hand experience on how diverse knowledge can be integrated to overcome major challenges and/or to sustainably exploit Earths' resources.

Source University College Dublin (2016)

Table 5 Local Agenda 21 Environmental Partnership Fund - 2015/2016: Category Training, Education and similar Awareness-Raising Initiative

Carlow City Council	Creating the Climate for Change: Transition Year workshops
Carlow City Council	Workshop to primary/post primary schools on topics such as Biodiversity, Water, Energy, Waste Minimisation
Carlow City Council	Bio Diversity & sustainability in school: Overall plan is to create a sensory garden and a horticultural /biodiversity area- this phase develop perennial planting and hen coop
Cavan City Council	Environmental Awareness programme between five Co. Cavan primary schools and primary schools in South Africa
Cavan City Council	Biodiversity & Leave no trace Workshops for two primary schools and third level college: Environmental awareness workshops with a specific focus on leave no trace, ecology and biodiversity education using Dromore
Cork City Council	Composting Workshops: Workshops on home composting of food and garden waste
Cork City Council	Ballycotton School Gardens & Allotments: Teach primary school children how to grow, maintain & harvest their own vegetables & fruit
Cork City Council	Green Schools Energy Day of Action: "Day of Action" is essential component in Green-Schools 7 step environmental management programme. Energy Day being planned
Donegal City Council	Biodiversity workshops for primary schools. One day workshop per school for 12 schools
Donegal City Council	Our Environment – Future scenarios and Action Plan: Workshop for secondary schools future scenarios action planning and strategy
Donegal City Council	Mevagh Ecological Awareness Project: Workshop for community and schools on Food waste reduction awareness, planting, bees, recycled materials
Donegal City Council	Inch Wildfowl Reserve: To engage communities and schools in the conservation of flora and fauna
Dublin City Council	Living Science: Environmental education and training for school students
Dublin - Green Sod Ireland	Bee Aware: An awareness raising project on the importance of bees in Ireland, delivered through workshops in schools
Dublin City Council Vincent English	The uses and applications of hydrogen fuel cell technologies and the problems with the wholesale integration of this renewable technology into everyday use: School workshops, demonstrating the importance of renewable energy and the need to find alternatives to fossil fuels
Dublin City Council Trinity College Dublin	Impacts of Light Pollution – A practical awareness raising school project addressing environment, health and economic issues: Delivery of a school workshop and support on-going research of light pollution and its consequences
Songschool Ltd T/A CREATE SCHOOL Dublin	Write, Record and Share an Environmental Podcast: Training for schools to enable participants to write, record and share an environmental podcast
Dun Laoghaire Rathdown County Council	Ecology and Biodiversity Workshop: Practical Ecology workshops for secondary school students that complement the junior and senior leaving certificate syllabi.
Dun Laoghaire Rathdown Presentation Ireland	Climate Connections: Educational workshops to secondary school pupils interested in increasing their awareness and action on climate change
Dun Laoghaire Rathdown Owls - The Childrens Nature Charity	'Learning Through Nature' Raising biodiversity awareness within primary schools: Education programme for school children about biodiversity in a fun and interesting way.
Fingal County Council Global Action Plan	Creating the Climate for Change - TY Workshops: Deliver a series of 10 workshops in 5 schools about Climate Change
Fingal County Council The Ecological Gardener	Biodiversity, birds & Native Trees workshops: A series of 3 different workshops for 15 schools on environmental themes
Galway City Council	Educational Workshop for Energy Flag and Green Schools
Galway County Council *An Taisce* Environmental Education Unit	Coastcare Kids: To enhance appreciation & awareness of coastal habitats with primary school children with their local coastal environment
Galway County Council Living Gardens	Biodiversity and Sustainable Living at School: To deliver practical, hands on workshops to primary & secondary schools on biodiversity, habitat creation, composting, native trees, organic vegetable
Galway County Council Burren Nature Sanctuary	Cycles of Nature reconnecting to the biodiversity of this unique karst landscape: To allow TY students to experience the changes in biodiversity of the dynamic Burren landscape
Kerry County Council	Presentation Secondary School Green Schools Energy day of action.

Kerry County Council Ballybunion tidy towns	Build a bird hide in the Cashen carpark overlooking the Cashen river and mud flats, thus raising awareness in schools.
Kildare County Council Crann	Bring a Tree to School Education Programme: School biodiversity project
Kildare County Council Green Point	Outdoor Classroom: Provision of environmental education area
Leitrim County Council Eco Envolve	Creating Natural Outdoor Spaces for Children: To raise awareness of the natural environment & wildlife and to explore its value as a learning resource for children in County Leitrim. Outcome from project is to produce a guide which childcare practitioners and parents can use to develop and enhance their outdoor spaces
Leitrim County Council Niamh Eustace	Sustainable Solutions: Workshops for Primary Schools to promote and raise awareness of sustainable energy solutions
Limerick City & County St Brigid's	Nature wildlife Info boards: Education in schools
Longford County Council Caitriona Mc Cabe	Biodiversity Primary Schools Workshops: Educational programme for four primary schools with strong focus on Irish biodiversity
Longford County Council Carrick On Shannon Education Centre	St Joseph's N. S. green schools TV show: Training students in video journalism to document their green schools activities and raise awareness through on line videos.
Longford County Council Party Entertainers	Magical 3R's show: A magic show for primary schools highlighting waste minimisation, recycling and the importance of reusing materials.
Meath County Council Enrich	Waste and Biodiversity - A valuable resource: To include a workshop in schools and a site visit to Enrich and Adjacent Ash woodland in Kilcock
Meath County Council Gealscoil na Boinne	Outdoor Classroom: To create an outdoor classroom for the school i.e. Wooden seating, blackboard/notice board with associated ground works
Roscommon County Council St. Nathy's College	Native Hedgerow: Planting of Native Hedgerow in schools
Sligo County Council	Exploring Diversity through Art: Workshops in Primary Schools to increase awareness of biodiversity
Tipperary County Council St. Mary's N. S. Killenaule	Biodiversity in our School: Promote biodiversity in our school environment to enhance our school garden habitat to incorporate and promote biodiversity
Waterford City and County Council Waterford One World Centre	Winterval Festival Primary School Workshops: Deliver environmental education workshops to 800 primary pupils re importance of living sustainably.

Source Department of Housing, Planning, Community and Local Government (2016)

Table 6 Education Environmental Education Workshops GrassRoots

2016	Delivered in 35 primary schools - projects: An exploration of Waste, Energy and Climate Change and Water Conservation Workshops. Workshops were funded by the Local Agenda 21 Environment Partnership Fund 2015 and local authorities located in: Offaly, Tipperary, South Dublin, Dublin City council, Meath, Wicklow, Clare and Westmeath.
2015	Delivered in 42 primary schools - projects: An exploration of Waste, Energy and Climate Change and Water Conservation Workshops. Workshops were funded by the Local Agenda 21 Environment Partnership Fund 2014, and local authorities located in: Limerick, Clare, Offaly, Kilkenny, Carlow, South Dublin and Dublin City.
2014	Delivered in 40 primary schools - project: An exploration of Waste, Energy and Climate Change. Workshops were funded by the Local Agenda 21 Environment Partnership Fund 2013, and local authorities located in: Monaghan, Limerick city and county, Fingal, North Tipperary, South Dublin and Dublin City.
2013	Delivered in 30 primary schools - project: An exploration of Waste, Energy and Climate Change. Workshops were funded by the Local Agenda 21 Environment Partnership Fund 2012, and local authorities located in: Offaly Limerick city and county, Limerick, Meath, North Tipperary and Dublin City.
2012	Delivered in 44 primary schools - project: An exploration of Waste, Energy and Climate Change. Workshops were funded by the Local Agenda 21 Environment Partnership Fund 2011, and local authorities located in: Offaly, Limerick city and county, Fingal, South Tipperary, DunLaoighre-Rathdown and Dublin City.
2011	Delivered in to 45 schools - project: An exploration of Climate Change and Biodiversity. Funded from the Department of the Environment and the Local Agenda 21 Environment Partnership Fund 2010 and local authorities located in: North Tipperary, Offaly, Laois, Fingal, South County Dublin, DunLaoighre-Rathdown and Dublin City.
	Schools throughout Connaught, Leinster and Munster have been worked with from 2000 to 2010

Source GrassRoots Education (2016)

Table 7 ECO-UNESCO: all-Ireland environmental awards programme, Young Social Innovators and The President's Award

ECO-UNESCO's Young Environmentalist Awards
ECO-UNESCO's Young Environmentalist Awards (YEA) is an all-Ireland environmental awards programme that recognises and rewards young people who raise environmental awareness and improve the environment. Since 1999, ECO-UNESCO has run the YEA programme to honour the work of young people to protect, conserve and enhance the environment through local environmental projects, making a difference to their lives and the lives of others both locally and globally. To date the YEA programme has attracted over 39,000 young people and reached countless others with awareness-raising campaigns in schools and communities throughout Ireland. The YEA programme is a fun and exciting way to empower young people to become better citizens, to build awareness of environmental issues in the community and promote local actions and lifestyle changes to improve the environment. Category Awards: Biodiversity, energy, waste, climate change, water, transport, Eco-tourism, Eco-Health and Wellbeing, Eco-Art and Design, Eco-Community Development. ECO-UNESCO's Young Environmentalist Awards programme is open to any group of young people in the Republic of Ireland and Northern Ireland from 10-18 years of age. Super Junior Group: 10-12 years (new), Junior Group: 13-15 years and Senior Group: 16-18 years. A group can range 2-25 individuals. Sponsored by the Environmental Protection Agency, the ECO-UNESCO's Young Environmentalist Awards programme supports, compliments and rewards projects undertaken as part of other programmes including: Green-Schools, Gaisce Awards, Duke of Edinburgh Awards, Young Social Innovators and the BT Young Scientist.
Young Social Innovators
The Social Innovation School Awards scheme was developed in association with the Departments of the Environment, Community and Local Government; Children and Youth Affairs; Education and Skills as well as WorldWise Global Schools and the Health Service Executive. It was launched by an Taoiseach Enda Kenny in March 2014. YSI provides prestigious Awards to secondary schools taking part in its social innovation programmes. These awards recognise the resilience and commitment of young people, staff and management to social innovation education and to building a fairer, inclusive and more equal world. Eligible: all second level schools registered and taking part in YSI Action programmes. School Awards scheme identifies two levels of achievement: (1) School Certification: Awarded to schools that complete a Young Social Innovators Action Programme (Senior) on an annual basis. (2) YSI Schools of Excellence Award: Awarded to schools who fully complete the Young Social Innovators Action Programme (Senior), Young Social Innovators Action Programme (Junior) and participate in Social Innovation Week. To date 100,000 secondary school students have participated in this programme.
The President's Award
Gaisce: The President's Award programme is relevant to sustainable development since an outcome of this award is to contribute to society and the community. The President's Award is a three-tiered personal development programme for young people aged 15 to 25. Combining self-directed challenges and structured supervision by an adult volunteer, young people set and achieve a series of personal, physical, and community challenges at Bronze, Silver, or Gold level. It is estimated that more than 300,000 young people have taken up the challenge since it was established in 1985. Strategic Plan 2015 – 2018- *Vision 2030*: Ireland - where young people dream big and fulfil their potential. *Mission*: Provide opportunities for young people to realise their potential through personal challenges, facilitating the transition from young person to young adult and enhancing their potential and contribution as active participants in society. *Values:* Everything we do is driven by our core values: (1) Respect: - for all those we work with and aim to serve: we respect people and believe that we should all be treated with dignity. (2) Striving for excellence: in the standards we set ourselves and expect from others: we go about our business with integrity, in an ethical and transparent manner in the pursuit of excellence in all that we do. (3) A commitment to inclusion and equity: in engaging with all young people: we believe that all young people have immense potential that can be developed through Gaisce, and that every young person is entitled to equal opportunity to participate and discover their potential. (4) Participation by young people: in directly shaping Gaisce, achieving their awards and contributing as active participants in society: we believe in the unique and inspirational creativity of young people and their vital role and contribution as active participants in society.

Source ECO-UNESCO (2016), Gaisce (2016) and Young Social Innovators (2016)

Appendix K

Principles for Responsible Management Education

The UN PRME initiative of the United Nations is a reaction to a set of challenges that business schools are facing today. The initiative formulates six principles which reflect the implications of the societal transformation process for business schools and provide guidance to business schools in integrating sustainability into teaching, research and operations (UN PRME, 2008).

To embrace the increased demands upon and societal expectations of managers the first three principles focus on a shift in business education:
Purpose: "We will develop the capabilities of students to be future generators of sustainable value for business and society at large and to work for an inclusive and sustainable global economy (Principle 1).
Values: "We will incorporate into our academic activities and curricula the values of global social responsibility as portrayed in international initiatives such as the United Nations Global Compact"(Principle 2).
Method: "We will create educational frameworks, materials, processes and environments that enable effective learning experiences for responsible leadership" (Principle 3).

The fourth principle addresses the relationship of knowledge generation and the businesses role in and interaction with society and the natural environment:
Research: "We will engage in conceptual and empirical research that advances our understanding about the role, dynamics, and impact of corporations in the creation of sustainable social, environmental and economic value" (Principle 4).

In relation to the mission of educating responsible managers and enabling them to deal with complex global problems, two further principles are formulated: Partnership and Dialogue. These two principles stress that business education has an important role in fostering a stakeholder-oriented ethic to managers. "Otherwise, students will continue to get the message that practicing managers have little or no legal and ethical responsibilities to society". More broadly, it highlights the role of business schools in developing a debate about sustainability and the importance of engaging with stakeholders to better understand and meet the challenges of sustainable development.

Partnership: "We will interact with managers of business corporations to extend our knowledge of their challenges in meeting social and environmental responsibilities and to explore jointly effective approaches to meeting these challenges" (Principle 5).

Dialogue: "We will facilitate and support dialog and debate among educators, business, government, consumers, media, civil society organizations and other interested groups and stakeholders on critical issues related to global social responsibility and sustainability." (Principle 6) Finally, the initiative also stresses the necessity to transform organisational practices to reflect the business schools overall commitment to responsibility and sustainability. In following this requirement, it has become current practice in business schools SIP reporting to disclose information about the integration of sustainability into their operations.

Operations: "We understand that our own organizational practices should serve as example of the values and attitudes we convey to our students." (Additional Principle 7) (UN PRME, 2008).

Appendix L

The Talloires Declaration (TD)

Composed in 1990 at an international conference in Talloires, France, this was the first official statement made by university presidents, chancellors, and rectors of a commitment to environmental sustainability in higher education. The Talloires Declaration (TD) is a ten-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations and outreach at colleges and universities. According to the University Leaders for a Sustainable Future (2015) as of March 2015, 497 institutions from 56 countries have signed the Tallories Decleration (University Leaders for a Sustainable Future, 2015)

The following is a list, by country, of the number of Universities, Colleges or Higher Education Institutes that have signed the Talloires Declaration (TD)

Argentina:1, Australia: 14, Bangladesh: 1, Belgium: 1, Belize: 1, Brazil: 44, Bulgaria: 1, Canada: 39,Chile: 3, China: 1, Colombia: 25, Costa Rica: 5, Croatia: 1, Cyprus: 1, Czech Republic: 1, Ecuador: 1, Finland: 2, France: 2, Germany: 2, Ghana: 2, Greece: 1, Haiti: 1, Hong Kong: 3, Hungary: 1, India: 28, Italy: 1, Japan: 3, Kenya: 2, Lebanon: 2, Malawi: 4, Malaysia: 1, Mexico: 8, New Zealand: 1, Nigeria: 2, Paraguay: 1, Peru: 4, Philippines: 2, Poland: 2, Portugal: 1, Puerto Rico: 5, Romania: 1,Russia: 1, South Africa: 1, South Korea: 1, Spain: 3, Switzerland:1, Taiwan: 43, Thailand: 1, Tunisia: 1, Turkey: 1, Ukraine: 1, United Kingdom: 12, United States of America: 113, Venezuela: 1, Vietnam: 1 and Zimbabwe: 1.

Source Adapted by the Author, using information provided by the University Leaders for a Sustainable Future (2015)

Appendix M

COP 21 The Paris Agreement

The agreement sets out a global action plan to put the world on track to avoid dangerous climate change by limiting global warming to well below 2°C.
The agreement is due to enter into force in 2020. Cop 21 The Paris Agreement is a bridge between today's policies and climate-neutrality before the end of the century. The agreement opened for signature for one year on 22nd of April 2016. The agreement will enter into force after 55 countries that account for at least 55% of global emissions have deposited their instruments of ratification.

Mitigation: reducing emissions

Governments agreed:
•to a long-term goal of keeping the increase in global average temperature to well below 2°C above pre-industrial levels;
•to aim to limit the increase to 1.5°C, since this would significantly reduce risks and the impacts of climate change;
•on the need for global emissions to peak as soon as possible, recognising that this will take longer for developing countries;
•to undertake rapid reductions thereafter in accordance with the best available science.
Before and during the Paris conference, countries submitted comprehensive national climate action plans (INDCs). These are not yet enough to keep global warming below 2°C, but the agreement traces the way to achieving this target.

Transparency

Governments agreed to
•come together every 5 years to set more ambitious targets as required by science;
• report to each other and the public on how well they are doing to implement their targets;
•track progress towards the long-term goal through a robust transparency and accountability system.

Adaptation

Governments agreed to
•strengthen societies' ability to deal with the impacts of climate change;
•provide continued and enhanced international support for adaptation to developing countries.

Loss and damage

The agreement also
•recognises the importance of averting, minimising and addressing loss and damage associated with the adverse effects of climate change;
•acknowledges the need to cooperate and enhance the understanding, action and support in different areas such as early warning systems, emergency preparedness and risk insurance.

Role of cities, regions and local authorities

The agreement recognises the role of non-Party stakeholders in addressing climate change, including cities, other subnational authorities, civil society, the private sector and others.
They are invited to
•scale up their efforts and support actions to reduce emissions;
• build resilience and decrease vulnerability to the adverse effects of climate change;
•uphold and promote regional and international cooperation.

Support

•The EU and other developed countries will continue to support climate action to reduce emissions and build resilience to climate change impacts in developing countries.
•Other countries are encouraged to provide or continue to provide such support voluntarily.
•Developed countries intend to continue their existing collective goal to mobilise USD 100 billion per year by 2020 and extend this until 2025. A new and higher goal will be set for after this period.
Lima-Paris Action Agenda: This initiative of the Peruvian and French COP Presidencies brought countries, cities, businesses and civil society members together to accelerate cooperative climate action in support of the new agreement.
EU's role:The EU has been at the forefront of international efforts towards a global climate deal.
Following limited participation in the Kyoto Protocol and the lack of agreement in Copenhagen in 2009, the EU has been building a broad coalition of developed and developing countries in favour of high ambition that shaped the successful outcome of the Paris conference.
The EU was the first major economy to submit its intended contribution to the new agreement in March 2015. It is already taking steps to implement its target to reduce emissions by at least 40% by 2030.
Source European Commission (2016)

Appendix N
Targets relevant to the Sustainable Development Goals

Table 1 Guard rails as targets for the Sustainable Development Goals

Sustainable development must be oriented in such a way that it is neutral in relation to the guard rails and does not jeopardize Earth system services. To achieve this, the anthropogenic drivers of global environmental change must be stopped. The WBGU recommends adding an SDG concerning the planetary guard rails entitled 'safeguarding Earth system services'. Global, long-term targets should be allocated to this SDG for the following six global environmental problems. They involve stopping the anthropogenic drivers in order to keep the Earth system changes within tolerable limits. The WBGU recommends the following global long-term SDG targets for the 'guard-rail SDG':	
Climate change:	The warming of the climate system should be limited to 2 ° C. Global CO2 emissions from fossil energy sources should thereforebe stopped completely by about 2070.
Ocean acidification:	In order to protect the oceans, the pH level of the uppermost ocean layer should not fall by more than 0.2 units compared to preindustrial figures in any major ocean region. CO2 emissions from fossil energy sources should therefore be stopped completely by about 2070 (congruent with Target 1).
Loss of biological diversity and ecosystem services:	The human-induced loss of biodiversity and ecosystem services must be halted. Its direct anthropogenic drivers, e. g . the conversion of natural ecosystems, should be stopped by 2050 at the latest.
Land and soil degradation:	Anthropogenic land and soil degradation must be halted. Net land degradation should be stopped by 2030 – worldwide and in all countries.
Risks posed by long-lived and harmful anthropogenic substances:	The substitutable use of mercury and anthropogenic mercury emissions should be stopped by 2050. The release of plastic waste into the environment should be stopped worldwide by 2050. The production of nuclear fuels for nuclear weapons and nuclear reactors should be stopped by 2070.
Loss of phosphorus:	Phosphorus is an essential resource for agriculture and therefore also for food security. The release of non-recoverable phosphorus into the environment should be stopped worldwide by 2050, so that its global recycling can be achieved.
National implementation: The aim of halting a global environmental problem by a specific date means that all countries, regions and sectors in society must stop their contributions to the respective anthropogenic driver. The WBGU proposes entrusting the specific UN environmental conventions with the detailed negotiations on implementing the guard-rail SDG to avoid duplication of structures and parallel negotiations. Under the conventions, all parties should develop transformation plans for implementing the SDG targets showing how the corresponding national target can be reached, what intermediate objectives would be involved, and what international transfer payments would be required. Taken together, the countries' contributions must suffice to comply with the corresponding planetary guard rail. The monitoring and review of the national formulation and implementation of these targets are therefore indispensable components of the SDG process.	

Source WBGU (2014b)

Table 2 Ireland: Social, Economic and Environmental Indicators

The Survey on Income and Living Conditions (SILC) in Ireland (CEO, 2015a)
In 2015, the nominal median annual equivalised disposable income was €20,000
In 2015, the 'at risk of poverty' rate was 16.9% compared with 17.2% in 2014.
Enforced deprivation was experienced by 25.5% of the population, down from 29.0% in 2014. This change is statistically significant. The deprivation rate for those at risk of poverty was 51.5% in 2015, up slightly from 51.2% in 2014.
The consistent poverty rate was 8.7%,
Individuals who were unemployed had the lowest real median equivalised disposable income of the categories analysed in 2015, at €12,747. The real median equivalised disposable income for this group in 2014 was €12,593.
The types of deprivation most commonly experienced by those living in consistent poverty were an inability to replace worn out furniture (74.2%), afford a morning/afternoon/evening out (67.8%) and have family/friends over for a meal/drink (61.8%). Over half of those living in consistent poverty (53.3%) reported going without heating at some stage in the last 12 months.
Sustainable Development Indicators 2015 (CEO, 2015b)
The amount of municipal waste sent to landfill decreased from 2 million tonnes in 2001 to just over 1 million tonnes in 2012. The recovery rate of packaging waste increased from 25% in 2001 to 87% in 2012.
Ireland's imported energy dependency increased from 69% in 1990 to 89% in 2013. Our import dependency on oil decreased from 66% of total fuel imports in 2005 to 55% in 2013. Our import dependency on gas increased from 20% to 30% over the same period.
In 2012, persons earning under €20,000 accounted for 9% of total taxable income and paid 0.6% of total income tax. Those earning over €100,000 accounted for 23% of total taxable income and paid 44% of total income tax.
Income tax as a proportion of total exchequer tax revenue decreased from 34% in 2000 to 27% in 2006 but then increased to 42% in 2014. In contrast corporation tax increased from 10% in 1995 to 15% in 2006 but fell to 11% in 2014.
General government debt in Ireland fell from 79% of GDP in 1995 to 24% in 2006 before increasing to 123% of GDP in 2013.
The 'at risk of poverty' rate in Ireland in 2013 was 15.2%, which was the twelfth lowest in the EU, and below the EU average of 17%.
Social Justice Ireland (Social Justice Ireland, 2017)
Information is based on the CSO Survey on Income and Living Conditions. Despite an increase in median incomes 789,855 people are living in poverty in Ireland today. 1.2 million people in Ireland are experiencing deprivation. 460,612 people in Ireland are living in consistent poverty. 105,051 people living in poverty are in employment (the working poor). 394,484 children are living in households experiencing deprivation. Almost 790,000 people in Ireland are surviving on incomes of less than €11,863 per annum.
Focus Ireland (Focus Ireland, 2017)
There were 7148 people homeless nationwide in the week of December 18th to 25th 2016 in Ireland.
Environmental Protection Agency (Environmental Protection Agency, 2017)
Water: 53% of rivers, 43% of lakes, 45% of transitional waters, 93% of coastal waters and 99% of groundwater were satisfactory at good or high status. While there was a decrease in detections of faecal coliforms in groundwater from 61% in 2008 to 51% in 2012, these levels highlight a risk for drinking water in areas where there is inadequate treatment. The south and south-east of the country continue to have the greatest proportion of groundwater and rivers with nitrogen concentrations over 10 mg/l NO3.

Compiled by the Author from different sources (2017)

Appendix O
Research dissemination

Foley, H., Bogue, J. and Onakuse, S. (2016) 'New Conceptual Framework for Sustainability', *Irish Studies in International Affairs*, Vol. 27, pp.1-19.

New Conceptual Framework for Sustainability

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ABSTRACT

In 2015 the sustainable development goals (SDGs) and the Paris climate change agreement (COP 21) again drew international attention to the critical global challenges of sustainable development and climate change. For addressing these challenges, an accurate understanding of the complexity and interdependent nature of sustainability is imperative. Within the context of the present development path, this conceptual paper brings clarity to the key issues and actions needed, relevant to the five components of sustainable development. Connected to the key issues and actions required, from a broader and deeper paradigmatic perspective, the framework emphasises the need to shift towards a sustain-centric paradigm, away from the dominant social paradigm.

INTRODUCTION

Sustainability is now a crucial issue in modern business and society.[1] Sustainable development (SD) is about 'Improving the quality of life while living within the carrying capacity of supporting ecosystems'.[2] As detailed in this paper, concerns are increasing regarding the interrelatedness of environmental degradation, the present development path and wealth inequality. Importantly, inaction regarding climate change 'could result in destabilisation and violence, jeopardising national and international security to a new degree'.[3] Within this context the

[1]Rüdiger Hahn and Daniel Reimsbach, 'Are we on track with sustainability literacy? A viewpoint on the influence of sustainability and accounting education on future managers' processing of sustainability information', *Journal of Global Responsibility* 5 (1) (2014), 55–67.

[2]IUCN/UNEP/WWF, *Caring for the Earth: a strategy for sustainable living* (Gland, Switzerland, 1991), 10.

[3]Renate Schubert, Joachim Schellnhuber, Nina Buchmann, Astrid Epiney, Rainer GrieBhammer, Margareta Kulessa, Dirk Messner, Stefan Rahmstorf and Jürgen Schmid, *World in transition: climate change as a security risk*, German Advisory Council on Climate Change (London, 2008), 1.

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need to achieve sustainability is gaining greater traction, as reflected in the call of member states of the United Nations to implement the recently agreed upon sustainable development goals (SDGs).[4] According to Irish Aid the significance of the SDGs is immense.[5] The final SDGs intergovernmental negotiations, facilitated by Irish and Kenyan leadership,[6] represent the world's most comprehensive agenda in terms of addressing environmental degradation and climate change, and building a more peaceful, fair and sustainable world. The SDGs have been compared to that critical moment, 70 years ago, when the United Nations was created from the ashes of war and division.[7]

Understanding sustainability requires bringing clarity to the ambiguity associated with sustainable development and moving beyond simplistic representation of sustainable development. Sustainability will not be achieved without addressing key issues underpinning unsustainable development. According to the United Nations High-Level Panel on Global Sustainability, sustainable development has not become a reality since policies, politics and institutions disproportionately reward the short term. In addition, this panel has posited, the concept of sustainable development has not yet been incorporated into mainstream national and international economic policy debate.[8] At a deeper and more powerful level, un-sustainability, in all its manifestations, arises from the social, economic and political systems of the dominant social paradigm.[9]

The conceptual framework for sustainability proposed in this paper is reflective of the key issues and required actions associated with the five components of sustainable development. Additionally, this proposed framework both emphasises and captures the interdependency and complexity of sustainable development and the historical influence of the dominant social paradigm that has fundamentally influenced the present development path. Essentially, the transition to realising sustainability is a formidable challenge, which requires a paradigm shift away from the dominant social paradigm towards the embodiment of the sustaincentric paradigm. This transition will require global partnership and the implementation of required action from economic, political, institutional and educational actors.

UNDERSTANDING SUSTAINABILITY

Sustainability is a condition, and sustainable development is the means by which we achieve sustainability.[10] The term sustainable development was brought into prominence by the Brundtland commission which stated, 'Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.[11] Overall, there is consensus that economic, environmental and social issues,

[4]United Nation Development Programme, 'UNDP Policy and programme brief: UNDP support to the implementation of the 2030 agenda for sustainable development', January 2016.

[5]Irish Aid, Department of Foreign Affairs and Trade, 'Sustainable development goals', 2015, available at: https://www.irishaid.ie/news-publications/news/newsarchive/2015/september/sustainable-development-goals/ (accessed 29 July 2016) (hereafter cited as IA DFAT SDGs).

[6]Irish Aid, Department of Foreign Affairs and Trade, 'Ireland's special role', 2015, available at: https://www.irishaid.ie/what-we-do/post-2015-negotiations/ireland's-special-role/ (18 August 2016).

[7]IA DFATT SDGs, 9/15.

[8]United Nations, *Resilient people, resilient planet: a future worth choosing*, Report of the High-level Panel on Global Sustainability (New York, 2012).

[9]Leister Milbrath, *Envisioning a sustainable society: learning our way out* (Albany, NY, 1989).

[10]Graeme Buchan, Ian Spellerberg and Winfried Blum, 'Education for sustainability: developing a postgraduate-level subject with an international perspective', *International Journal of Sustainability in Higher Education* 8 (1) (2007), 4–15.

[11]World Commission on Environment and Development, *Our common future* (New York, 1987), 43.

together with intergenerational and intragenerational equity, ought to be considered within the framework of sustainable development.[12]

Since the publication of the Brundtland report in 1987, the term sustainability has accumulated hundreds of definitions, which has led to confusion about the meaning of sustainability,[13] where the concept has escaped definition.[14] A review of the literature relevant to sustainable development indicates the absence of a comprehensive framework for understanding sustainable development and its complexities.[15] According to sustainability scholars, sustainability still requires definition and elaboration,[16] since existing definitions of sustainable development are vague,[17] and fraught with contradictions.[18,19] Additionally, the lack of clarity regarding sustainability can result in sustainability becoming everything and in essence becoming nothing.[20]

Sustainable development is illustrated in different ways here. The World Conservation Union[21] used the interlocking circles model (Fig. 1). This representation of sustainable development emphasises the essential interdependence between the three core components of sustainable development.[22]

In addition, Fig. 1 is an important diagram, since it illustrates the theory relevant to sustainable development (where each component should be addressed equally), the present situation (where there is an overemphasis on the economic component) and shows that changes are required regarding the social and especially the environmental components of sustainable development, to re-establish balance between the three components of sustainable development.[23] The concentric circles model (Fig. 2) shows the critically important hierarchical relationship between the three core elements of sustainable development more clearly, reflecting the fundamental importance of the environment (there is no life without planet Earth), where society is totally dependent upon the environment, and the economy is a sub-system of the social sphere.[24]

[12]International Union for Conservation of Nature, *The future of sustainability: re-thinking environment and development in the twenty-first century*, Report of the World Conservation Union (IUCN) Renowned Thinkers Meeting, 29–31 January 2006; Konrad Ott, 'The case for strong sustainability', in Konrad Ott and Philipp Thapa (eds), *Greifswald's environmental ethics* (Greifswald, 2003); John Elkington, *Cannibals with forks: the triple bottom line of 21st century business* (Oxford, 1997); Keith Pezzoli, 'Sustainable development: a trans-disciplinary overview of the literature', *Journal of Environmental Planning and Management* 40 (5) (1997), 549–74.

[13]Mark White, 'Sustainability: I know it when I see it', *Ecological Economics* 86 (2013), 213–17; Christian Becker, 'The meaning of sustainability', in Christian Becker (ed.), *Sustainability ethics and sustainability research* (Dordrecht, 2012), 9–15.

[14]Melanie DuPuis and Tamara Ball, 'How not what: teaching sustainability as process', *Sustainability: Science, Practice and Policy* 9 (1) (2013), 64–75.

[15]Yosef Jabareen, 'A new conceptual framework for sustainable development', *Environment, Development and Sustainability* 10 (2) (2008), 179–92.

[16]Timothy Beatley and Kristy Manning, *The ecology of place: planning for environment, ecology and Community* (Washington, DC, 1994).

[17]Qizilbash Mozaffar, 'Sustainable development: concepts and rankings', *Journal of Development Studies* 37 (3) (2001), 134–61.

[18]Michael Redclift, *Sustainable development: exploring the contradictions* (London and New York, 1987).

[19]Philip Berke and Maria Conroy, 'Are we planning for sustainable development? An evaluation of 30 comprehensive plans', *Journal of the American Planning Association* 66 (1) (2000), 21–33.

[20]Heather Farley and Zachary Smith, *Sustainability: if it's everything, is it nothing?* (New York, 2014).

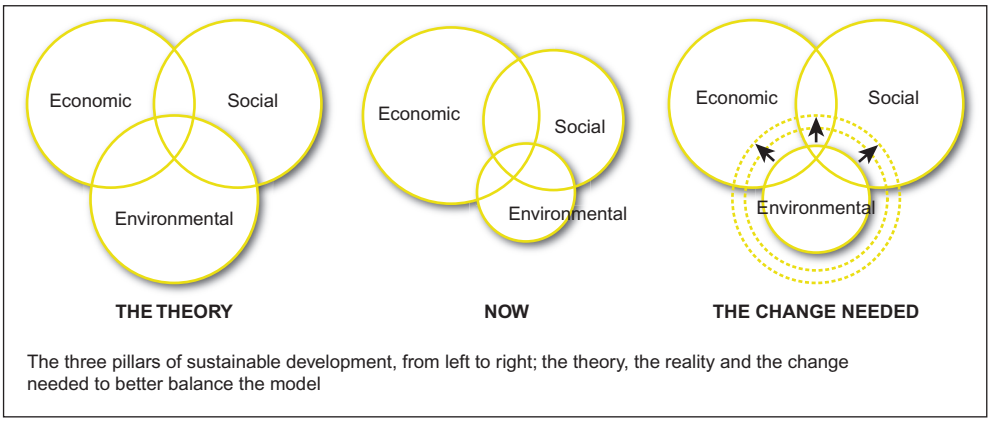
[21]*The IUCN Programme 2005–2008: Many voices, one Earth*, adopted at the World Conservation Congress, Bangkok, Thailand, 17–25 November 2004, 9 (hereafter cited as IUCN 2004, 9).

[22]IUCN 2004, 9.

[23]IUCN 2004, 9.

[24]Molly Scott Cato, *Green economics: an introduction to theory policy and practice* (London, 2009); Ott, 'The case for strong sustainability'.

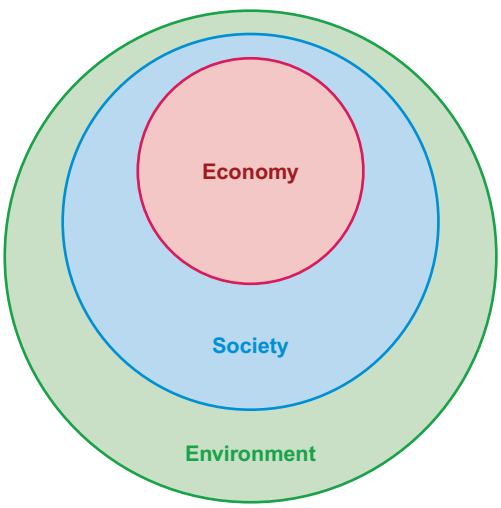
Figure 1. Sustainable development represented as overlapping circles.



Source: The IUCN Programme 2005–2008: Many voices, one Earth, adopted at the World Conservation Congress, Bangkok, Thailand, 17–25 November 2004.

Other definitions that refer to the three components of sustainable development include the triple bottom line[25] and the triple P concept: Planet, People and Profit.[26] Importantly, advancing the triple P concept, the SDGs (see Appendix 1) aim to stimulate action over the next 15 years where the focus is on People, Planet, Prosperity, Peace and Partnership.[27]

Figure 2. Concentric circles model.



Source: Based on original by Molly Scott Cato, *Green economics: an introduction to theory policy and practice* (London, 2009); Konrad Ott, 'The case for strong sustainability', in Konrad Ott and Philipp Thapa (eds), *Greifswald's environmental ethics* (Greifswald, 2003).

[25]Elkington, *Cannibals with forks*, 1997.
[26]Ismail Serageldin, Andrew Steer, Michael Cernea, John Dixon, Ernst Lutz, Sergio Margulis, Mohan Munasinghe and Colin Rees, *Making development sustainable: from concepts to action* (Washington, DC, 1994).
[27]United Nations, *Transforming our world: the 2030 Agenda for Sustainable Development* (2015), 3–5.

In the course of evaluating the progress of implementing Agenda 21, the Commission on Sustainable Development of the United Nations defined sustainable development as having not three but four dimensions,[28] adding institutions as a fourth dimension of sustainable development. Since institutions shape development,[29] the addition of the institutional component was a significant development and contributed towards a more accurate understanding of sustainable development.[30] In support of the addition of the institutional component of sustainable development, at the annual lecture of the United Nations University, World Institute for Development and Economics Research, Nancy Birdsall stated:

> A major challenge of the twenty-first century will be to strengthen and reform the institutions, rules and customs by which nations and peoples complement the global market with collective management of the problems, including persistent and unjust inequality … Global and regional institutions need to be reformed. To play their role in managing a global social contract the World Bank and the IMF need to become more representative and accountable to those most affected by their programmes.[31]

Advanced in the 1990s, the five-capital perspective on sustainable development extends the hierarchical relationship shown in Fig. 2. Essentially, there are five types of capital from which we derive the goods and services we need to improve the quality of our lives.[32] The five capitals (resources) have a strict hierarchy, since a capital that is lower down the list is *dependent* on the capitals listed previously. Since natural capital is the basis not only of production but of life itself, it is the first capital listed in the five-capital model. Therefore, natural capital must be prioritised in terms of achieving sustainability. Consequently, the environmental component of sustainable development is the first component listed in the conceptual framework for sustainability (see Fig. 3). Human capital (people's health, knowledge, skills and motivation) and social capital (institutions that help maintain and develop human capital) are the second and third most important capitals respectively. Prioritised after natural, human and social capital, manufacturing capital consists of material goods or fixed assets that contribute to the production process. The fifth capital is financial capital (banknotes, shares and bonds), which enables the other types of capital to be owned and traded. But unlike the other types of capital, financial capital has no value itself, but is representative of natural, human, social or manufactured capital.[33] Importantly, 'the economy, or more accurately, society, has chosen not

[28]Joachim Spangenberg, 'Environmental space and the prism of sustainability: frameworks for indicators measuring sustainable development', *Ecological Indicators* 2 (3) (2002), 295–309.

[29]Nancy Birdsall, 'The world is not flat: inequality and injustice in our global economy', UNU- WILDER Annual Lecture, United Nations University, World Institute for Development Economic Research (UNU-WILDER); John Fien, *Environmental education: a pathway to sustainability* (Deakin University, 1993).

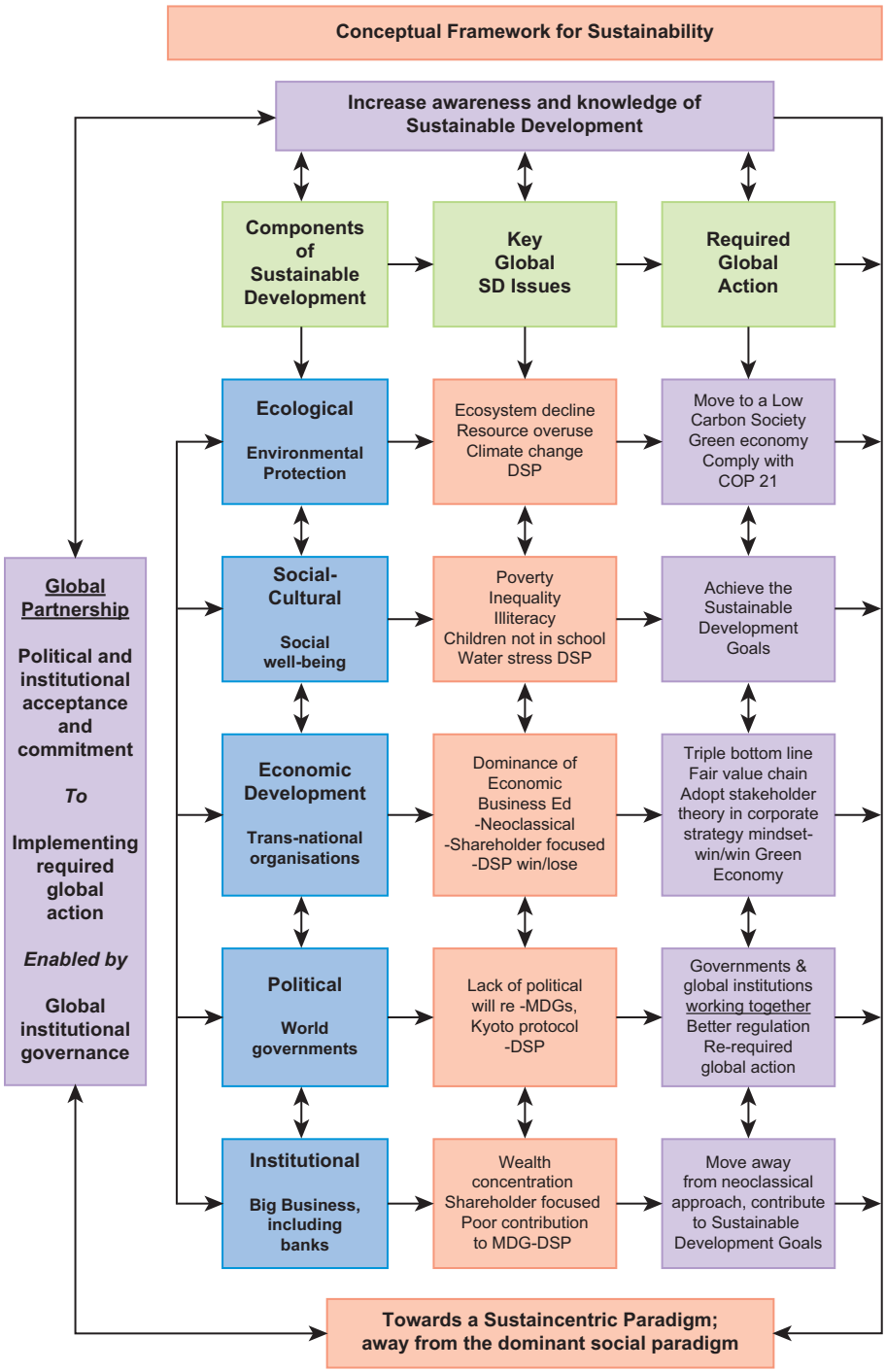
[30]Helen Foley, 'Understanding sustainability: a new conceptual framework for sustainability', Paper presented at the 26th Irish Environmental Researchers' Colloquium, 22–24 March 2016, University of Limerick, Limerick, 1–15: 4.

[31]Birdsall, 'The world is not flat', 34–6.

[32]Forum for the future, 'The five capital model'.

[33]Andy Johnson, Heloise Buckland, Fiona Brooks and Elizabeth White, *Learning and skills for sustainable development: developing a sustainable literate society, guidance for higher education institutions* (Forum for the Future, 2004), 12; William Timpson, Brian Dunbar, Gailmarie Kimmel, Brett Bruyere, Peter Newman and Hillary Mizia, *147 practical tips for teaching sustainability: connecting the environment, the economy, and society* (Madison, WI, 2006); Forum for the future, 'The five capital model'.

Figure 3. Conceptual Framework for Sustainability.



Source: Helen Foley, 'Understanding sustainability: a new conceptual framework for sustainability', Paper presented at the 26th Irish Environmental Researchers' Colloquium, 22 to 24 March 2016, University of Limerick.

to invest in natural, human or social capital or indeed in manufactured capital as assiduously as it has in financial capital'.[34] Achieving sustainability will require complying with the resource prioritisation outlined in the five-capital model.

THE INTERDEPENDANCY AND COMPLEXITY OF SUSTAINABILITY

Understanding sustainability also requires comprehending the interconnectivity of the five components of sustainable development (see Fig. 3, columns one, two and three). Scholarship on sustainability often overlooks the multidisciplinary and complex nature of sustainability.[35] In reality, both human social systems and ecological systems are complex adaptive systems.[36] Human societies and ecological systems are so interconnected that they are co-adaptive, reacting to each other and to previous interactions and reactions in a network of feedbacks; consequently, the study of sustainable development must be grounded in complex adaptive systems epistemology.[37] The interconnectivity of human societies and ecological systems is reinforced by the German Advisory Council on Global Change, who have indicated, 'Without resolute counteraction, climate change will overstretch many societies' adaptive capabilities within the coming decades'.[38]

Drawing on the literature, the pursuit of sustainable development must be global,[39] where there is simultaneous[40] and interdependent pursuit of the social, environmental, economic,[41] political[42] and institutional[43] dimensions of sustainable development. Consequently, sustainable development can be defined as, 'The global, simultaneous and interdependent pursuit of equitable sociocultural, environmental, economic, political and institutional goals relevant to achieving sustainability'.

Building on this definition, a more comprehensive and accurate conceptualisation of sustainability requires capturing the key issues (see Fig. 3, column two), and taking action (see Fig. 3, column three) relevant to the five components of sustainable development.

[34]Johnson, *Learning and skills for sustainable development*, 12.

[35]Timpson, *Practical tips for teaching sustainability*, 147.

[36]Lance Gunderson and C.S. Holling (eds), *Panarchy: understanding transformations in human and natural systems* (Washington, DC, 2002); Wayne Reeves, *Learning-centered design: a cognitive view on managing complexity in product, information and environmental design* (London, 1999).

[37]Ann Dale and Lenore Newman, 'Sustainable development, education and literacy', *International Journal of Sustainability in Higher Education* 6 (4) (2005), 351–62.

[38]Schubert, *World in transition: climate change as a security risk*, 1.

[39]Bedrick Moldan, 'The outcome of the world summit on sustainable development (WSSD) and global education', Global Education in Europe to 2015: Strategy, Policies and Perspectives, Maastricht Global Education Congress, 15–17 November 2002, 35.

[40]Inno Onwueme and Bruno Borsari, 'The sustainability asymptogram: a new philosophical framework for policy, outreach and education in sustainability', *International Journal of Sustainability in Higher Education* 8 (1) (2007), 44–52.

[41]Damjan Krajnc and Peter Glavic, 'A model for integrated assessment of sustainable development', *Resources, Conservation and Recycling* 43 (2) (2005), 189–208; Simon Bell and Stephen Morse, *Sustainability indicators: measuring the immeasurable* (2nd edn, London, 2000); Elkington, *Cannibals with forks*, 1997.

[42]UNESCO, *Education for sustainability. From Rio to Johannesburg: lessons learnt from a decade of commitment* (Paris, 2002), 11.

[43]Birdsall, 'The world is not flat', 34–36; Spangenberg, 'Environmental space and the prism of sustainability'; Jeffrey Sacks, 'Interview', Today with Pat Kenny, RTÉ Radio 1, 15 August 2010.

ECONOMIC, INSTITUTIONAL AND POLITICAL COMPONENTS OF SUSTAINABLE DEVELOPMENT: KEY ISSUES

The present development model embodies a weak sustainability perspective, where the prevailing way of living is mainly left unquestioned.[44] Of concern, business actors and interest groups are keen to promote the so-called business interpretation of sustainability,[45] which is the same as the weak sustainability perspective (the present development path).[46] Key global issues driving the present development path and the economic, institutional and political components of sustainable development include the dominance of economic consideration, which is usually shareholder-focused, influenced by neoclassical theory, resulting in wealth concentration and inequality. The dominance of the present economic development path is also facilitated by policy-making, which is related to tax secrecy and tax avoidance (see Fig. 3, column 2).

Economic development and shareholder theory

As shown in Fig. 1, there is an overemphasis on economic development which, for the most part, ignores environmental protection and social development. A key issue (see economic component, Fig. 3) influencing the present development path is the historical adherence to shareholder theory. Shareholder value theory proposes that the primary duty of management is to maximise shareholder returns,[47] but shareholder value maximisation has been criticised by prominent CEOs and top management.[48] In contrast, required action towards sustainability necessitates the embodiment of enlightened stakeholder theory (see Fig. 3, column three), which adopts a stakeholder perspective and focuses on the maximisation of the long-term value of the firm.[49]

Neoclassical theory

Historically, the present development path of weak sustainability has been influenced by ideas advanced by Adam Smith in an inquiry into the nature and causes of the Wealth of Nations, published in 1776.[50] Indeed, the fundamentals of a pro-capitalist ideology and the predominant strands of orthodox economic theory have remained essentially unchanged for about 300 years.[51] Fundamental to the dominant social paradigm is a Western neoliberal economy. Neoliberalism has been broadly defined as a theory of political economic practices which

[44]Ernst Ulrich Von Weizsäcker, Amory Lovins and Hunter Lovins, *Factor four: doubling wealth, halving resource use* (London, 1998).

[45]Michael Porter and Claas van der Linde, 'Green and competitive: ending the stalemate', *Harvard Business Review* 73 (5) (1995), 120–29; Charles Holiday, Stephan Schimdheiny and Philip Watts, *Walking the talk. The business case for sustainable development* (Sheffield, UK, 2002); John Elkington, 'The link between accountability and sustainability: theory put into practice', *Conference on the Practice of Social Reporting for Business, ISEA,* 19 January 1999, Commonwealth Conference Centre, London.

[46]Foley, 'Understanding sustainability', 2016.

[47]Jeff Smith, 'The shareholders vs. stakeholders debate', *MIT Sloan Management Review* 44 (4) (2003), 85–90.

[48]Steve Denning, 'The dumbest idea in the world: maximizing shareholder value', *Forbes*, 28 November 2011, available at: http://www.forbes.com/sites/stevedenning/2011/11/28/maximizing-shareholder-value-the-dumbest-idea-in-the-world/#246b60432224 (18 August 2014).

[49]Eric Pichet, 'Enlightened shareholder theory: whose interests should be served by the supporters of corporate governance?' *Corporate Ownership and Control* 8 (2/3) (2008), 353–62.

[50]Adam Smith, *An inquiry into the nature and causes of the wealth of nations* (London, 1776).

[51]Peter Senker, 'Research papers: the triumph of neoliberalism and the world dominance of capitalism', *Prometheus: Critical Studies in Innovation* 33 (2) (2015), 97–111.

proposes that human well-being can best be advanced by the maximisation of entrepreneurial freedoms within an institutional framework characterised by private property rights, individual liberty, free markets and free trade.[52] Importantly, critical scholars dispute whether the neoliberal development path is adequate in addressing social and environmental challenges.[53] An alternative approach to studying the dynamics of the modern world economy is to view the world economy as a complex network of interlocking systems.[54]

Wealth concentration

Influenced by neoclassical and shareholder theory, the present economic development path has resulted in wealth concentration. In 2015 the most profitable 2,000 companies, from 60 countries (known as the Global 2000), accounted for *disclosed* combined revenues of $39 trillion, profits of $3 trillion, with assets worth $162 trillion and a market value of $48 trillion.[55] While the United Nations have estimated it would cost $30 billion a year to address world hunger,[56] this equates to one per cent of the Global 2000 profit figure of $3 trillion.[57]

Business education

Since today's business students are tomorrow's business decision-makers and leaders, movement towards stakeholder governance also needs to manifest within business and management education, but to date, 'Sustainability has not yet become embedded in the mainstream of business related education'.[58] Business education is predominately underpinned by shareholder theory and supports weak sustainability. The call and need for business and management education to be reflective of sustainability issues is not new and is supported by previous research.[59]

Political will at the international level

Political will at national and international levels is not addressing the challenge of inequality. Within the context of the 2030 Agenda for Sustainable Development, addressing a special meeting on inequality convened by the UN Economic and Social Council (ECOSOC), Jan Eliasson, the deputy secretary general of the United Nations, stated,

[52]David Harvey, *A brief history of neoliberalism*.

[53]Helen Kopnina, 'Metaphors of nature and economic development: critical education for sustainable business', *Sustainability* 6 (2014), 7496–513.

[54]Senker, 'The triumph of neoliberalism', 111.

[55]Frobes, 'The world's biggest public companies', 6 May 2015, available at: http://www.forbes.com/sites/liyanchen/2015/05/06/the-worlds-largest-companies/#14f495194fe5 (16 March 2016).

[56]FAO, 'The world only needs 30 billion dollars a year to eradicate the scourge of hunger', Food and Agricultural Organisation of the United Nations, 3 June 2008, available at: http://www.fao.org/newsroom/en/news/2008/1000853/index.html (26 July 2012).

[57]Foley, 'Understanding sustainability', 2016.

[58]Jose Alcaraz and Eappen Thiruvattal, 'The United Nations' principles for responsible management education: a global call for sustainability', *Academy of Management Learning & Education* 9 (3) (2010), 542–50.

[59]Alcaraz, 'The United Nations' principles for responsible management education'; World Resource Institute, *World resources 1994–1995: a guide to the global environment* (New York, 1994); Thomas Gladwin, James Kennelly and Tara Krause, 'Shifting paradigms for sustainable development: implications for management theory and research', *Academy of Management Review* 20 (4) (1995), 877–80.

> Large disparities in income, wealth, power and opportunity plague our work for progress, both internationally and nationally, so do also large gaps in access to education, healthcare, water, sanitation, food, energy, and social protection … inequality is not just a statistic or a value-free measure of economic activity'.[60]

Although policymaking has been used by many countries to address inequality, including the use of debt restructuring, fiscal stimulus and low interest rates,[61] inequality is also driven by illicit financial flows, financial manipulations and tax evasion.[62]

ENVIRONMENTAL COMPONENT OF SUSTAINABLE DEVELOPMENT: KEY ISSUES

Key global issues inextricably linked to the present development path and particularly relevant to the environmental component of sustainable development include ecosystem decline, resource overuse and climate change (see Fig. 3, column 2).

Ecosystem decline and resource overuse

According to the Global Footprint Network, humanity uses the equivalent of 1.6 planets to provide the resources we use. Based on moderate UN scenarios, two Earths will be required by 2030.[63] Ecological overshoot is concerned with converting resources into waste faster than waste can be converted into resources. The most noticeable effects of overshoot are collapsing fisheries, diminishing forest cover, depletion of fresh-water systems and the build-up of carbon dioxide emissions, which is creating global climate change. Importantly, overshoot also contributes to resource conflicts and wars, mass migrations, famine, disease and other human tragedies which disproportionately impact the poor, who cannot buy their way out of the problem by getting resources from somewhere else.[64] In addition, according to the *Living planet report 2014*, the living planet index (LPI) (which measures more than 10,000 representative populations of mammals, birds, reptiles, amphibians and fish), has declined by 52 per cent since 1970.[65]

Climate change

Christine Lagarde, director of the International Monetary Fund, has stated that climate change 'is by far the greatest economic challenge of the 21st century. The science is sobering … make no mistake, without concerted action, the very

[60]Jan Eliasson, 'UN calls for political will to overcome inequality hindering sustainable development for all', United Nations, 2016, special meeting on inequality convened by the UN Economic and Social Council (ECOSOC), available at: http://www.un.org/apps/news/story.asp?NewsID=53576#.V5OOhNIrLIU (22 August 2016).

[61]Eliasson, 'UN calls for political will to overcome inequality'.

[62]Eliasson, 'UN calls for political will to overcome inequality'.

[63]Global Footprint Network, 'World footprint: do we fit on the planet?', 2016, available at: http://www.footprintnetwork.org/en/index.php/GFN/page/world_footprint/ (21 June 2016).

[64]Global Footprint Network, 'Advancing the science of sustainability', 2015, available at: www.footprintnetwork.org/en/index.php/GFN/ (11 March 2015).

[65]World Wildlife Fund, *Living planet report: species and spaces, people and places* (World Wildlife Fund International, 2014).

future of our planet is in peril'.[66] According to the Intergovernmental Panel on Climate Change, climate change is unequivocal, climate change is a global challenge which has both social and environmental consequences. Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850. In the Northern Hemisphere, 1983 to 2012 was likely the warmest 30-year period of the last 1,400 years.[67] From an Irish perspective, Ireland's 2020 target is to achieve a 20 per cent reduction of greenhouse gas emissions. Of concern, trends indicate that Ireland is projected to exceed its annual binding limits in 2016 and 2017.[68]

SOCIAL COMPONENT OF SUSTAINABLE DEVELOPMENT: KEY ISSUES

Key global issues relevant to the present development path and the social component of sustainable development include poverty, inequality, illiteracy, children not in school and water stress (see Fig. 3, column 2).

Poverty and inequality

As detailed in the Outlook on the Global Agenda 2014, after rising societal tensions in the Middle East and North Africa, widening income disparities were identified as the second greatest worldwide risk in 2014 and 2015.[69] In terms of wealth inequality in 2014, the wealth of 85 of the richest people on the planet added together was equal to the wealth of the poorest half of the world population;[70] in 2015 this figure dropped to 80, which was down from 388 people in 2010.[71] Although the world produces more than enough food to feed everybody, due to unequal distribution and waste (one-third of food is wasted),[72] almost a billion people suffer from hunger.[73]

In contrast, the richest one per cent increased their share of income in 24 out of 26 countries between 1980 and 2012.[74] Additionally, according to the Tax Justice Network, at least $21 trillion (possibly $32 trillion) of unreported private financial wealth was owned by wealthy individuals via tax havens at the end of 2010.[75]

[66]Christine Lagarde, 'A new global economy for a new generation', International Monetary Fund, 23 January 2013, available at: https://www.imf.org/en/News/Articles/2015/09/28/04/53/sp012313 (2 September 2016).

[67]Intergovernmental Panel on Climate Change, *Climate Change 2013. The Physical Science Basis: Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Summary for Policymakers*, 2013.

[68]Environmental Protection Agency, 'Greenhouse gas emission projections to 2020: an update', 1 March 2016, available at: https://www.epa.ie/pubs/reports/air/airemissions/2020_GHG_Projections_2016_Bulletin.pdf (2 September 2016).

[69]World Economic Forum (2014).

[70]Oxfam, 'Working for the few: political capture and economic inequality', 178 Oxfam Briefing Paper—Summary (2014), 2.

[71]Oxfam, 'Richest 1% will own more than all the rest by 2016', Oxfam International, 2015, available at: https://www.oxfam.org/en/pressroom/pressreleases/2015–01–19/richest-1-will-own-more-all-rest-2016 (11 August 2016).

[72]FAO, *Statistical Yearbook 2013*, Food and Agricultural Organisation (Rome, 2013).

[73]Holger Hoff, *Understanding the nexus. Background paper for the Bonn 2011 conference: the water, energy and food security nexus* (Stockholm, 2011).

[74]Oxfam, 'Working for the few'.

[75]Tax Justice Network, 'Global super rich hide up to $32 trillion offshore to avoid taxes', 2016, available at: https://www.popularresistance.org/panama-papers-and-the-shadow-world-of-finance/ (23 March 2016).

Illiteracy

In terms of global illiteracy, 17 per cent of the world's adult population cannot read or write (two-thirds are women), while 775 million adults and 122 million youths globally are illiterate.[76]

Children not in school

Education is a right which is enshrined in Article 26 of the 1948 Universal Declaration of Human Rights.[77] According to the Education for All Global Monitoring Report, 58 million children globally are out of school and around 100 million children do not complete primary education.[78] In terms of addressing children out of school, Sustainable Development Goal 4, specific target 4.1 aims to ensure that all girls and boys complete free, equitable and quality primary and secondary education, leading to relevant and effective learning outcomes by 2030.[79]

Water stress

Regarding access to water, 768 million people are living without a safe, clean water supply.[80] Of additional concern, it has been predicted that by 2030 almost half of the world's population of almost 4 billion people will be living in areas of high water stress.[81] Human rights, the green economy, sustainable development and gender are among the most salient legal and policy frameworks to be considered by policy-makers when addressing the water and jobs nexus.[82]

REQUIRED ACTION FOR ADDRESSING KEY GLOBAL SUSTAINABILITY ISSUES

As addressed earlier, the components of sustainability are interrelated; consequently, the implementation of required actions will positively impact the environmental, social and economic components of sustainable development, facilitated by political and institutional commitment. Required action for addressing key global issues includes (see Fig. 3, column 3):

1. *Implementing the sustainable development goals*: These goals become applicable in January 2016 and are now a new universal set of goals, targets and indicators that United Nations member states will be expected to use to frame their agendas and political policies regarding sustainable development.[83] The conceptual framework also links the components of sustainable development with the five pillars (People, Planet, Prosperity, Peace and Partnership) of the global SDGs policy framework.

[76]UNESCO, 'Education: Statistics on literacy', 2016, available at: http://www.unesco.org/new/en/education/themes/education-building-blocks/literacy/resources/statistics (9 May 2016).

[77]UNESCO, *The global literacy challenge: a profile of youth and adult literacy at the mid-point of the United Nations Literacy Decade 2003–2012* (2008).

[78]UNESCO, *Education for all: EFA Global Monitoring Report 2015* (2015).

[79]United Nations, 'Transforming our world: the 2030 Agenda for Sustainable Development', 3–5, available at: https://sustainabledevelopment.un.org/post2015/transformingourworld, 2015 (20 March, 2015).

[80]79 WHO/UNICEF (2013), Joint Monitoring Programme for Water Supply and Sanitation (JMP), 2013, available at: www.wssinfo.org (26 October 2016).

[81]OECD, *Better policies for better lives: cool, clean water*, 2016, available at: http://www.oecd.org/general/coolcleanwater.htm (29 October 2016).

[82]UNESCO, *The United Nations world water development report 2016: water and jobs* (Paris, 2016), 1–148: 5.

[83]UNDP, *implementation of the 2030 agenda for sustainable development*, 2016.

2. *Adopting a stakeholder economic development model*: In terms of achieving sustainability, companies need to change their focus from increasing shareholder value to a broader focus on all stakeholders.[84] This is particularly true in terms of the need for ethical value chain governance, where the pay of poor people in value chains needs to be increased.[85] In terms of achieving sustainability, our future lies in building sustainable enterprises and an economic reality that connects industry, society and the environment.[86]
3. *Pursuing a green economy*: According to the GLOBE Foundation, the green economy, estimated to be worth $5.2 trillion, is an economic model that focuses on the creation of green jobs, real sustainable economic growth, the prevention of environmental pollution, global warming, resource depletion and ecological degradation.[87] Additionally, transitioning to a 'green economy' is more than a short-term response to current global crises. The green economy can be a long-term strategy for sustainable development and poverty alleviation.[88]
4. *Addressing climate change*: The importance of climate change was again highlighted in Paris in December 2015 at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change, commonly known as COP 21. COP 21, it is hoped, will avert some of the worst effects of global warming and shift economies around the world to cleaner energy sources.[89] On 22 April 2016, 175 countries including the European Union signed the Paris Agreement.[90] The global call to action in terms of addressing anthropogenic climate change is now imperative, since climate change represents an urgent and potentially irreversible threat to human societies and the planet and thus requires the widest possible co-operation from all countries, where deep reductions in global emissions are now urgently needed.[91]
5. *Global partnership and governance*: Within the context of the 2030 Sustainable Development Agenda, according to the deputy secretary general of the United Nations, Jan Eliasson, progress is plagued by large disparities in income, wealth, power and opportunity.[92] Importantly, without revenues, governments are unable to provide critical social

[84]Tim Koller, Marc Goedhart and David Wesselš *Valuation: measuring and managing the value of companies* (6th edn, New Jersey, 2015).

[85]Jonathan Mitchell, Jodie Keane and Christopher Coles, *Trading up: how a value chain approach can benefit the rural poor*, COPLA Global: Overseas Development Institute, 2009.

[86]Peter Senge and Goran Carstedt 'Innovating our way to the next industrial revolution', *Sloan Management Review* 42 (2) (2001), 24–38; S.L. Hart, 'Beyond greening: strategies for a sustainable world', *Harvard Business Review* 75 (1) (1997), 67–76.

[87]GLOBE Foundation, 'Building a strong low-carbon future', 2010, available at: http://globe.ca/wp-content/uploads/2012/10/bcge_report_feb_2010.pdf (6th June 2015).

[88]Rupert Maclean, John Fien and Jose Roberto Guevara (eds), 'Skills development for inclusive and sustainable growth in developing Asia-Pacific', *Technical and Vocational Education and Training: Issues, Concerns and Prospects* 19, 2013, available at: https://www.adb.org/sites/default/files/publication/30071/skills-development-inclusive-growth-asia-pacific.pdf (26 October 2016).

[89]Alexandra Zavis, Chris Megerian and William Yardley, 'Nearly 200 nations join together to fight climate change in historic Paris agreement', *Los Angeles Times*, 12 December 2015.

[90]United Nations, List of parties that signed the Paris Agreement on 22 April 2016: United Nation Paris Climate Agreement signing ceremony 2016, available at: http://www.un.org/sustainabledevelopment/blog/2016/04/parisagreementsingatures/#prettyPhoto (8 November 2016).

[91]UNFCCC, 'Adoption of the Paris Agreement', United Nations Framework Convention on Climate Change, 2015, available at: https://unfccc.int/resource/docs/2015/cop21/eng/l09.pdf (3 August 2016).

[92]Eliasson, 'UN calls for political will to overcome inequality'.

services such as health and education.[93] At the international level new instruments are required, including good governance, transparency, use of information technology, global co-operation on taxes, and closing down abuse on tax secrecy and tax havens.[94] In terms of creating a more sustainable international tax environment, the OECD/G20 Base Erosion and Profit Shifting (BEPS) project provides governments with solutions for closing the gaps in existing international rules that allow corporate profits to disappear or be artificially shifted to low/no tax environments, where little or no economic activity takes place.[95]

TRANSITION FROM THE DOMINANT SOCIAL PARADIGM TOWARDS A SUSTAINCENTRIC PARADIGM

As indicated in Fig. 3, all key issues and required action are connected to the external frame of the conceptual framework, and together contribute towards a shift to a sustaincentric paradigm. Since the present development path has been fundamentally influenced by the dominant social paradigm, understanding sustainability also requires viewing sustainability from a paradigmatic perspective. Leister Milbrath defined the dominant social paradigm as, 'A society's belief structure that organises the way people perceive and interpret the functioning of the world around them'.[96] The prevailing dominant social paradigm is that which was engendered during the Enlightenment and has informed both scientific and social analysis since that time.[97] Within the context of the dominant social paradigm,

> The transition to an ecological sustainable society will involve a historically unprecedented revolution in institutions, systems, lifestyles and values. Much of Western culture has to be totally reversed in a few decades. We have to replace a long list of cultural traits by their opposites, particularly obsessions with material affluence, getting richer, competing, winning, exercising power and controlling nature.[98]

The transition to an ecological, sustainable society is a formidable challenge, since the dominant social paradigm is so widely held that individuals are only vaguely aware of the direction it gives to their behaviour,[99] though it provides legitimisation and justification for the institutions of society and as such acts as an ideology.[100]

[93]Jeffery Sachs, 'UN calls for political will to overcome inequality hindering sustainable development for all', United Nations, 2016, special meeting on inequality convened by the UN Economic and Social Council (ECOSOC), available at: http://www.un.org/apps/news/story.asp?NewsID=53576#.V5OOhNIrLIU (11 July 2016).

[94]Sachs, 'UN calls for political will to overcome inequality'.

[95]Organisation for Economic Co-operation and Development, 'OECD presents outputs of OECD/G20 BEPS Project for discussion at G20 finance ministers meeting: reforms to the international tax system for curbing avoidance by multinational enterprises', 2015, available at: http://www.oecd.org/tax/oecd-presents-outputs-of-oecd-g20-beps-project-for-discussion-at-g20-finance-ministers-meeting.htm (2 August 2016).

[96]Milbrath, *Envisioning a sustainable society*, 116.

[97]Milbrath, *Envisioning a sustainable society*, 1989.

[98]Fine, *Environmental education: a pathway to sustainability*, 39.

[99]Howard Perlmutter and Eric Trist, 'Paradigms for societal transition', *Human Relations* 39 (1) (1986), 1–27.

[100]Stephen Cotgrove, *Catastrophe or cornucopia: the environment, politics and the future* (New York 1982).

> Paradigms are not only beliefs about what the world is like and guides to action; they also serve the function of legitimating or justifying courses of action. That is to say, they function as ideologies .... Hence, conflicts over what constitutes the paradigm by which action should be guided and judged to be reasonable is [sic] itself a part of the political process. The struggle to universalize a paradigm is part of the struggle for power.[101]

According to Thomas Gladwin, *et al.*, sustainable development is a process of achieving human development in an inclusive, connected, equitable, prudent and secure manner.[102] As an alternative to the dominant social paradigm, 'Sustaincentrism represents the perspective that is most congruent with the representations of sustainable development'.[103] In addition, the conventional technocentric paradigm (or dominant social paradigm) views humans and nature as being disassociated (as opposed to interdependent), where the human role is one of dominance (as opposed to stewardship). In terms of economic structure, the sustaincentric paradigm favours the green economy over the free market and conserving as opposed to exploiting natural capital, while in terms of poverty alleviation, sustaincentrism favours equal opportunity over growth trickle (see Appendix 2 for more detail).[104] Sustaincentrism supports moral and ethical pluralism,[105] in adherence with the theory of intergenerational equity,

> The human species hold the natural environment of our planet in common with other species, other people, and with past, present and future generations. As members of the present generation, we are both trustees, responsible for the robustness and integrity of our planet, and beneficiaries, with the right to use and benefit from it for ourselves.[106]

Importantly, movement towards a sustaincentric paradigm is a choice to use the planet's resources in a sustainable way. Without a transition away from the dominant social paradigm the degradation and integrity of ecosystems will continue.

CONCEPTUAL FRAMEWORK FOR SUSTAINABILITY

As outlined in this paper and illustrated in Fig. 3, within the context of the present unsustainable path there is a need for a transition from the dominant social paradigm towards the sustaincentric paradigm. The inside of the conceptual framework is made up of three columns which are interconnected, indicated by arrows pointing from left to right. All arrows connect the internal columns with the external structure of the conceptual framework, which converge into increasing awareness and knowledge of sustainable development, thereby contributing to a shift towards a sustaincentric paradigm.

The first column of the conceptual framework for sustainability lists the five components under each other; each component is then linked to the global issues and actions required to address it. The components listed in the conceptual framework include:

[101]Cotgrove, *Catastrophe or cornucopia*, 88.
[102]Thomas Gladwin, James Kennelly and Tara-Shelomith Krause, 'Shifting paradigms for sustainable development: implications for management theory and research', *Academy of Management Review* 20 (4) (1995), 874–907.
[103]Gladwin *et al.*, 'Shifting paradigms for sustainable development', 894.
[104]Gladwin *et al.*, 'Shifting paradigms for sustainable development'.
[105]Gladwin *et al.*, 'Shifting paradigms for sustainable development'.
[106]Edith Brown Weiss, 'In fairness to future generations and sustainable development', *American University International Law Review* 8 (1) (1992), 20.

- The Ecological (environmental protection) component; where the *key issues* are climate change, ecosystem decline and resource overuse, which have been influenced by the dominant social paradigm (DSP). *Global action*, in terms of addressing these key issues, includes moving to a low carbon society, the embodiment of the green economy and complying with COP 21.
- The Social/Cultural (Social Well-being) component; where the *key issues* are poverty, inequality, illiteracy, children not in school and water stress, which have been influenced by the DSP. *Required action* includes implementing the sustainable development goals (SDGs).
- The Economic Development component; where the *key issues* include the dominance of economic short-term goals and neoclassical theory, where both are shareholder focused, with an emphasis on a win / lose perspective, shaped by the DSP. *Required action* includes addressing the triple bottom line, the implementation of fair value chains, the adoption of stakeholder theory in corporate strategy, embodying a positive mindset or win / win perspective and shifting to a green economy.
- The Political (World Governments) component; where the *key issues* are lack of political will regarding the millennium development goals (now replaced by the sustainable development goals), inadequate progress in terms of complying with the Kyoto protocol (now replaced by COP 21), where both issues are influenced by the DSP. *Required action* includes, governments and global institutions working together, facilitated by better regulation in terms of achieving the required global action.
- The Institutional (Big Business including banks) component; where the *key issues* are wealth concentration, increasing CO2 emissions and poor contribution to achieving the millennium development goals, influenced historically and presently by the DSP. *Required action* includes, moving away from the neoclassical approach and proactively contributing to the achievement of the sustainable development goals.

All the required actions feed into the external framework, which is concerned with increasing awareness and knowledge of sustainable development regarding the five components and associated issues and actions required, thereby enabling a shift from the dominant social paradigm towards the sustaincentric paradigm. It is emphasised in the framework that the shift towards sustainability will not occur without political and institutional acceptance and commitment to implementing the required action, utilising integrative systems of management enabled by institutional governance and global partnership. As indicated by the United Nations System Task Team, a 'more coherent, transparent and representative global governance regime will be critical to achieve sustainable development in all its dimensions'.[107]

CONCLUSION

The SDGs and COP 21 have again highlighted the criticality of sustainable development, where the transition towards sustainability is an imperative strategic global goal. The embodiment of sustainability now requires integrated and transformational leadership from economic, political, educational and institutional actors. Within the context of the dominant social paradigm, the conceptual framework outlined in this paper captures the complexity of the

[107]OHCHR, OHRLLS, UNDESA, UNEP and UNFPA, *Global governance and governance of the global commons in the global partnership for development beyond 2015* (New York, 2012), 8.

interrelated components of sustainable development and the associated global issues and required actions needed in a transition to a sustaincentric path. Without a transition to the sustaincentric paradigm, the negative consequences of environmental degradation, growing inequality and profit maximisation for the few will continue unabated, further exacerbating the fragility of international and global relations. It is time for global leaders to take the words of John Fitzgerald Kennedy seriously, for the supreme reality of our time is the vulnerability of our planet.[108]

[108]John Fitzgerald Kennedy, 'President's Address before a Joint Session of the Dáil and Seanad, Dublin, 28 June 1963', US Department of State Bulletin (1963).

APPENDIX 1

Sustainable Development Goals

1	End poverty in all its forms everywhere
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
3	Ensure healthy lives and promote well-being for all at all ages
4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5	Achieve gender equality and empower all women and girls
6	Ensure availability and sustainable management of water and sanitation for all
7	Ensure access to affordable, reliable, sustainable and modern energy for all
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9	Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation
10	Reduce inequality within and among countries
11	Make cities and human settlements inclusive, safe, resilient and sustainable
12	Ensure sustainable consumption and production patterns
13	Take urgent action to combat climate change and its impacts
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17	Strengthen the means of implementation and revitalise the global partnership for sustainable development

Source: United Nations, *Transforming our world: the 2030 agenda for sustainable development* (New York, 2015).

APPENDIX 2

Alternative Environmental Paradigms

Key Assumptions	Technocentrism/ Dominant social paradigm	Sustaincentrism	Ecocentrism
A. Ontological and ethical			
1. Metaphor of Earth	Vast machine	Life support system	Mother/web of life
2. Perception of Earth	Dead/passive	Home/managed	Alive/sensitive
3. System composition	Atomistic/parts	Parts and wholes	Organic/wholes
4. System structure	Hierarchical	Holarchical	Heterarchical
5. Humans & nature	Disassociation	Interdependence	Indisassiciation
6. Human role	Domination	Stewardship	Plain member
7. Value of nature	Anthropocentrism	Inherentism	Intrinsicalism
8. Ethical grounding	Narrow homocentric	Broad homocentric	Whole Earth
9. Time/space scales	Short/near	Multiscale	Indefinite
10. Logic/reason	Egoistic/rational	Vision/network	Holism/spiritualism
B. Scientific and technological			
1. Resilience of nature	Tough/robust	Varied/fragile	Highly vulnerable
2. Carrying capacity limits	No limits	Approaching	Already exceeded
3. Population size	No problem	Stabilise now	Freeze/reduce
4.Growth pattern	Exponential	Logistic	Hyperbolic
5. Severity of problems	Trivial	Consequential	Catastrophic
6. Urgency of solutions	Little/wait	Great/decades	Extraordinary/now
7. Risk orientation	Risk taking	Precaution	Risk aversion
8. Faith in technology	Optimism	Skepticism	Pessimism
9. Technological pathway	Big/centralised	Benign/decoupled	Small/decentralised
10. Human vs natural capital	Full substitutes	Partial substitutes	Complements
C. Economic and psychological			
1. Primary objective	Efficient allocation	Quality of life	Ecological integrity
2. The good life	Materialism	Post materialism	Anti materialism
3. Human nature	Homo economicus	Homo sapient	Homo animalist
4. Economic structure	Free market	Green economy	Steady state
5. Role of growth	Good/necessary	Mixed/modify	Bad/eliminate
6.Poverty alleviation	Growth trickle	Equal opportunity	Redistribution
7. Natural capital	Exploit/convert	Conserve/maintain	Enhance/expand
8. Discount rate	High/normal	Low/complement	Zero/inappropriate
9. Trade orientation	Global	National	Bioregional
10. Political structure	Centralised	Devolved	Decentralise

Source: Thomas Gladwin, James Kennelly and Tara-Shelomith Krause, 'Shifting paradigms for sustainable development: implications for management theory and research', *Academy of Management Review* 20 (4) (1995), 877–94: 883.