Concept development and transformative agency in the forging of a Campus Sustainability Statement: Insights from a Change Laboratory research-intervention

John F. Scahill BSc, MSc, Dip.Eng, C.Eng, MIEI

July 2021

This thesis is submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

Department of Educational Research,

Lancaster University, UK.

Concept development and transformative agency in the forging of a Campus Sustainability Statement: Insights from a Change Laboratory research-intervention

John F. Scahill BSc, MSc, Dip.Eng, C.Eng, MIEI

This thesis results entirely from my own work and has not been offered previously for any other degree or diploma.

July 31,2021

John F. Scahill BSc, MSc, Dip.Eng, C.Eng, MIEI

Concept development and transformative agency in the forging of a Campus Sustainability Statement: Insights from a Change Laboratory research-intervention

Doctor of Philosophy July 2021

Abstract

With HEIs increasingly expected to provide leadership and guidance on the global challenges of climate change and sustainability, a body of literature has emerged concerned with embedding and implementing sustainability in HE. Prominent narratives in that literature discuss different approaches to implementing and embedding sustainability, identify the associated drivers and challenges, and debate the nature of the role that HE should play. However, relatively little attention has been focused on the processes by which stakeholders come together and develop their own concepts and frameworks, or how doing so develops the agency of those stakeholders to drive action in an institution

This thesis examines how stakeholders jointly developed a Campus Sustainability Statement (CSS) in their institution—subsequently launched in February 2017—and how doing so involved manifesting their transformative agency. It draws upon data from a Change Laboratory research-intervention project, in which participants came together in workshops to discuss and enact sustainability-related change in their institution over the course of five months, leading to several outcomes including proposals for academic programmes and a university research centre as well as the CSS. The analysis, which draws on workshop recordings and semi-structured interviews, uses a framework of concept development and transformative agency derived from the tradition of activity theory. The analysis first explores how the series of workshops unfolded; narrows the focus to consider the development of

the CSS concept and associated manifestations of agency; and then highlights how the development of the CSS concept and participants' agency were related.

The thesis derives a range of themes relating to the relationship between the development of agency and the concept, highlighting how certain forms of agency can lead to major conceptual shifts while others typically lead to refinement. Manifestations of agency such as resisting and criticising in particular, played an important role in developing the CSS concept. The formulation of the CSS was heavily shaped by early criticism of the researcher's initial ideas; principled resistance changed the direction of the research-intervention at key moments; and ongoing criticism served to encourage refinement of the concept throughout much of the research-intervention. Conversely, the CSS was specifically developed by participants in ways that were designed to embed agency into the concept.

This work contributes to the literature on implementing SHE by emphasising the important role that collaborative concept development has to play in terms of addressing terminological barriers, engendering support from staff and developing the transformative agency of those involved in the process.

Contents

Acknowledgements

I would like to thank my supervisor Dr Brett Bligh for his unfailing patience and attention to detail; he has encouraged me towards greater clarity and his knowledge of educational research, activity theory and the Change Laboratory methodology have been invaluable.

I would also like to thank my wife and best friend Karen, whose stalwart support through all sorts of challenges have made it possible to complete this journey.

List of abbreviations

AASHE	Association for the Advancement of Sustainability in Higher Education
ACUPCC	American College and University Presidents Climate Commitment
AISHE	Assessment Instrument for **Sustainability** in Higher Education
AT	Activity Theory
CD	Concept development
CHAT	Cultural Historical Activity Theory
CSS	Campus Sustainability Statement
CSTS	Centre for the STudy of Sustainability
DES	Department of education and Science
EB	Executive Board
EE	Environmental Education
EfS	Education for Sustainability
ELC	Expansive Learning Cycle
EMAS	Eco Management Audit System
EMS	Environmental Management System
ESD	Education for Sustainable Development
ESE	Environment and Sustainability Education
GASU	Graphical Assessment of sustainability (in Universities)
GB	Governing Body
GMIT	Galway Mayo Institute of Technology
HE	Higher Education
HEI	Higher Education Institute
HEREE	Higher Education Research, Enhancement and Evaluation.
HESD	Higher Education for Sustainable Development
IJSHE	The international Journal of Sustainability in Higher education.
ISO	International Organisation for Standardization
JCP	The Journal of Cleaner production
NSESD	National Strategy for Education for Sustainable Development
RCE	Regional Centre for expertise (on ESD)
SD	Sustainable Development
SHE	Sustainability in Higher Education
SSI	Semi Structured Interview
STARS	Sustainability Tracking Assessment and Rating System
TA	Transformative agency
TBL	Triple Bottom line
UN	United Nations
UNESCO	United Nation Educational Cultural and Organisation
UNU-IASS	United Nations University Institute of Advanced Study of Sustainability
ZPD	Zone of proximal development

List of Tables

List of Figures

Chapter 1 Introduction

> *The kind of education we need, begins with the recognition that the crisis of global ecology is first and foremost a crisis of values, ideas, perspectives, and knowledge, which makes it a crisis of education, not one in education.*
>
> Orr (1994, p5)

1.1 Introduction

This thesis draws on a Change Laboratory research intervention which was conducted over a 5-month period on the Mayo Campus of the Galway Mayo Institute of Technology (GMIT) in 2016. The aims of the underlying project were to explore how a research intervention could be used to foster and embed sustainability and Education for Sustainable Development (ESD) into the practices of the campus. In this context, the process must be judged as being quite successful, as a number of outcomes from the project have had a significant impact on the practices and activities of Institute staff.

Among the project outcomes that have impacted staff are: the development of a number of sustainability-related programmes, which are now being offered by the Institute: the completion of a feasibility study into the creation of a Centre for the Study of Community sustainability on the Mayo Campus; the development of a number of 'sustainability paragraphs' that explicitly describe linkages between certain programmes and sustainability; and the focus of this study - the development and adoption of a Campus Sustainability Statement (CSS) for the Mayo Campus. These outcomes are in addition to numerous contributions from campus staff, who were project participants, to various Institute policy initiatives on the strategic importance of sustainability for the future of GMIT.

However, this thesis is not about celebrating these outcomes, but rather, it is about understanding some of the dynamics of the processes that led to them.

In particular, this thesis examines and analyses the development of one of these outcomes, the Mayo Campus Sustainability Statement. This thesis explores how the development of the statement unfolded during the intervention and focuses on analysing the relationship between the conceptual development of the statement and the associated development of the participants' collaborative agency.

The Mayo Campus Sustainability Statement (CSS) was adopted by the campus management in June 2016 and was officially launched on the campus in February 2017. (see Fig 1.1)

Fig 1.1 Launch of the Mayo Campus Sustainability Statement by environmental activist Duncan Stewart on the 22nd Feb., 2017

1.2 Personal Motivation

I have been interested in the field of sustainability for many years, and since joining the staff of GMIT in 2008, it has become an important issue for me in relation to both my teaching practices, and my roles as coordinator of various programmes.

My interest stems from an uneasy feeling that much of what we are doing and what we expect to continue doing as citizens in society is simply unsustainable. There are millions of people starving in some areas of our world and millions more are being abused and tortured because of their race, colour or creed. The growth rate of the world population is unprecedented, and we have an almost universal reliance on fuels that are largely unsustainable. There are individuals who are worth more than small nations and more concerningly, about 1% of the population control or own 43% of the total global wealth (Shorrocks, Davies and Lluberas, 2020). Without any insights into global economics, simple common sense tells us that something must change, or our current trajectory is going to lead to unknown and likely catastrophic consequences for many of the inhabitants of planet earth.

Sustainability has always been an important feature in my career to date, both when I worked in private practice and since joining the academic staff in GMIT. In private practice, I worked as a mechanical and electrical building services design engineer and I spent much of my time looking at the impact that buildings have on CO2 emissions. This sparked my interest in sustainability and motivated me to gain expertise in and focus on low energy and sustainable technology solutions.

I joined GMIT as a lecturer in the construction department, where I teach technical subjects such as Building Energy systems, Sustainable Building technology, and Computer Aided Design (CAD). In my teaching practice, I focus on emphasising the necessity and importance of the incorporation of low energy and sustainable technology solutions into all aspects of construction.

My journey into higher education research began when I completed a post graduate certificate in teaching and learning in Higher Education in 2011. The programme opened up the world of education to me, and gave me the knowledge and the confidence to lead the development of a new sustainability focused construction programme, the B.Sc in Sustainable Building Technology, which has been running in GMIT since 2012.

Since moving from a 'hard science' and engineering professional background to the social sciences, my understanding of what sustainability actually implies has completely changed. Like Janet Moore (2005), who made a similar disciplinary transition, I now have a better understanding of the sheer breadth and depth of what the concept of sustainability encompasses. As she puts it:

> *"Sustainability also encompasses how things happen—classroom dynamics, decision-making processes, organizational structures, leadership strategies, strategic planning initiatives and collaboratively envisioning the future."*

It was not until I gained some appreciation of this bigger picture, that I began to grasp the extent of the issues and realised that some of the underlying problems are social in nature and cannot be resolved, through 'hard science' approaches alone.

Knowing that I enjoyed working with education theory and developing educational programmes, I took an obvious next step and decided to undertake a PhD in Higher Education (HE), and joined the HEREE programme in Lancaster University, in 2013 (Higher Education, Research, Enhancement and Evaluation[1]). When I started the programme, I was unsure about what area of research I would focus on for my project, and my early assignments were on

[1] https://www.lancaster.ac.uk/educational-research/study/phd/phd-in-higher-education-research-evaluation-and-enhancement/

national policy and first year student experience initiatives. While I was interested in both sustainability and higher education, it was not until I discovered Education for Sustainable Development (ESD) in 2014 and realised the link between them, that I really became interested in researching in this area.

Initially, I completed a study on the presence of ESD and related terms in digital documents that were available on the websites of 21 Irish HEIs. On its completion and following some discussions with staff from a range of Irish HEIs, I realised that there was a lot of activity happening in relation to Sustainability in Higher Education (SHE) in Ireland, but the extent and nature of the work being conducted was not always evident on the various Institutes' websites or the documents contained therein.

The completion of my initial project had just followed the publication of the National Strategy for Education for Sustainable Development by the Irish Department of Education and Science. This signalled to me that sustainability and ESD was an area that was now truly being recognised as important at a national level, which further motivated me to pursue research in this area.

After lecturing for a few years, my interests began to shift somewhat away from my own disciplinary silo (construction/engineering) towards HE. I began looking at how sustainability could be fostered and embedded at a practice level and at what strategies and approaches were being adopted nationally and internationally to this end. By this stage, I was becoming aware that there was a network of colleagues in my own institution, who were also interested and involved in various aspects of sustainability, such as teaching pro-sustainability modules like ecology, encouraging environmental activism, and the Green Campus Programme (a

national programme where HEIs in Ireland can apply to receive one or more Green flags for demonstrating continuous improvement in relation to campus sustainability[2]).

I decided that I wanted to do a research project that would explore how a group of staff could work together to promote sustainability in their workplace. Thus, the focus of the thesis is on institutional approach, strategy, and policy development rather than pedagogy and individual teaching and learning approaches. The thesis explores how academics at a school level in an institution can take ownership in defining what sustainability means in their context and contribute to the institutional sustainability agenda. The project therefore concerns how academic staff can exercise their agency to influence the creation of systems and strategies that will promote the adoption of pro-sustainability teaching practices and curriculum initiatives. Such systems and strategies might subsequently lead to a range of future initiatives (such as in curriculum, pedagogy and outreach) but here it is the systems and strategies themselves that remain the point of focus.

When I started out, I did not know what form the research might take, or what methodology I would use. I explored a number of options such as Action Research and Communities of Practice, but finally decided on the Change Laboratory methodology (I outline my reasons for this in Section 1.5).

When I started the process I did not know what kind of outcomes (if any) to expect, but in retrospect, I am glad that I decided on it as a methodology and am very happy with the outcomes that were achieved, which have had a significant impact on my own career and practices, as well as some notable effects on the Mayo Campus and the Institute as a whole (see Section 8.6 in the conclusion).

[2] https://www.greencampusireland.org/about/

While there were a number of impactful outcomes from the project, I chose the development of the Campus Sustainability Statement (CSS) as the most suitable outcome for analysis as, unlike some of the other outcomes, it was completely developed during the CL intervention.

1.3 Policy Context

Numerous international and global conferences on environmental issues have taken place over the past 50 years and one of the outcomes of these conferences is the recognition of the necessity and importance of the role of education. In addition to, and partly as a result of these conferences, a number of international declarations have been made by university leaders, higher education associations, and government ministers, committing to a step change towards sustainability (Tilbury, 2008).

According to Tilbury (2008, p.3)

> "*These documents call for universities and colleges to operate ethically and be more accountable to its stakeholders. They argue for better environmental and carbon management on campuses; the training of employees; the reorientation of the curriculum towards education for sustainable development; and a greater contribution to social agendas through research and public engagement*".

In parallel with these initiatives, the UN promoted the 'decade of education for sustainable development' (DESD) which ran from 2005-2014. Its goal was to "integrate the principles and practices of sustainable development into all aspects of education and learning, to encourage changes in knowledge, values and attitudes with the vision of enabling a more sustainable and just society for all" (Buckler and Creech, 2014). Globally there was wide engagement with the DESD, and this was supported locally by the international network of Regional Centres of Expertise on ESD that has been set up by the United Nations University Institute of Advanced Study of Sustainability (UNU-IASS).

In response to these global movements, Irish HEIs have been developing their capacity to engage with the sustainable development agenda by delivering environmental and sustainability- related modules and programmes and participating in a range of sustainability-related research projects. To further encourage and support this, the Department of Education and Science (DES) published the Irish National Strategy for Education for Sustainable Development (NSESD) in July 2014. The objective of the NSESD 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 Science, (2014, p.3)

The strategy sets out nine key principles to underpin the overall objective of increasing SD related activity in the Irish education sector, and identifies eight priority action areas, one of which is Higher Education and Research.

Recommendations are made for each of the priority action areas, and six (18-23) are made which relate specifically to the "Higher Education and Research" priority area. The recommendations include increasing the delivery and provision of SD related undergraduate and postgraduate programmes, increasing the level of research activity in the area, and increasing collaboration between HEIs and industry, both nationally and internationally. It was in response to this call, that I originally conceived the idea of carrying out a research project in the Institute that would explore ways to develop sustainability and SD related practices.

1.4 Scholarly Context

There is a growing body of knowledge in the field of sustainability in higher education (SHE) and a range of journals have published a number of important works on this area in the last few years. These include: *The Journal of Cleaner Production* (JCP), *The International Journal of Sustainability in Higher Education* (IJSHE) and *Sustainability*. Among the many publications in the area, a number of comprehensive literature reviews have been carried out on various aspects of the implementation of sustainability in higher education (Tilbury 2008; Karatzoglou 2013; Amaral et *al.* 2015; Lozano *et al.* 2015; Hoover and Harder 2015; Viegas *et al.* 2016; Blanco-Portela *et al.* 2017; Appleton 2017; Thürer *et al.* 2018; Berchin *et al.* 2018; Omazic 2021). Each review explores different aspects of SHE, such as curriculum and pedagogy, the evolving role of HE, institutional commitment and implementation approaches, systemic drivers such as declarations, charters and initiatives (DCIs), and the challenges and barriers that face HEIs when attempting to implement or embed sustainability into everyday practices.

Among the most frequently encountered barriers to ESD are the issues of terminology, values, and disciplinary contestation of what sustainability is, and how, or if, HEIs should go about engaging with it.

1.5 Practice Context

The Galway Mayo Institute of Technology (GMIT) is medium sized HEI (c. 12,000 students) based on five campuses in the west of Ireland. I am based in the Mayo Campus which accommodates about 1000 students from a range of disciplines including, nursing, outdoor education, business, social care, computing, construction, and history and geography. In terms of sustainability the Mayo campus has been leading the way in GMIT for many years. In 2011, it was the first IoT in Ireland to receive a Green Campus Flag for waste, and energy management, and has since received additional Green Campus Flags for biodiversity and

transport. It was also the first IoT to boast an outdoor classroom, built by the staff and students from willow, to focus on the benefits of the outdoors as a valuable, rich learning space. As mentioned previously, after working on the campus and having been exposed to and involved with the green campus activities, I had become aware that there were a number of my colleagues who were also interested in and committed to sustainability and ESD.

This interest and commitment of the staff coupled with my own interests encouraged me to consider carrying out a research project that focused on exploring how sustainability could be more explicitly fostered and promoted in the practices and activities of the staff on the campus.

As outlined earlier, once I decided to do a research project, I needed to choose a methodology and select suitable research questions. In light of the type of project that I wanted to do, I realised that I would need to adopt a theoretical framework and research approach that would allow individuals to consider the issues around sustainability from a practice perspective. It is for this reason that I considered using Wengers' (1998) Community of Practice Theory, as well as Action Research (Reason and Bradbury 2008) as potential methodologies. However, after carrying out further research, I decided that the Change Laboratory methodology aligned very well with the type of research that I wanted to pursue. For this and other reasons, I decided to use this methodology.

Firstly, the CL is a research intervention methodology that aims to support groups to change their work practices through a structured engagement process, and this seemed to be a good fit for what I was interested in trying to do. Also, as someone who was not experienced at research interventions, the structured nature of the process was reassuring. Secondly, from a theoretical point of view, the CL has a basis in Cultural Historical Activity Theory (CHAT), in which the importance of the historical development of existing practices is central, and this seemed very relevant when trying to embed sustainability practices.

The CL is a research intervention methodology that aims to support a group of people to develop and change their work practices through workshop participation. The participants engage in dialogue and debate among themselves, with members of management and with an interventionist researcher (Daniels, Cole and Wertsch 2007, p.370). It facilitates intensive, deep transformations as well as continuous incremental improvement. The method is not only aimed at producing intellectual solutions or changes of practice through the development of new concepts and practices, but also, "at building up the practitioner's collaborative transformative agency and motivation based on a new understanding of the idea of the activity and a new perspective of its future development." (Virkkunen & Newnham 2013, p10)

As there were already a lot of sustainability-related activities being carried out on the campus I hoped that running a CL intervention would provide an opportunity for interested staff members to work together and collaboratively develop new concepts or practices, that could be used on the campus to enhance and support these activities.

Thus, I felt that the Change Laboratory was an appropriate methodology to undertake a research project with participants from a range of disciplines who were interested in, or at least amenable to exploring how to embed sustainability into their practices and those of the staff on the campus.

In this project, I traced and analysed the process in which a group of staff from a range of disciplines worked together in a series of workshops in a CL intervention, to collaboratively develop new concepts that fostered engagement with sustainability and ESD, and additionally developed the participants' agency and motivation.

1.6 Research questions

The research questions that guide this study are:

R.Q. 1

What are the relationships between concept development and participant transformative agency, in a research intervention focused on fostering sustainability in higher education?

R.Q. 1.1

How did participants develop the concept of the 'Campus Sustainability Statement'?

R.Q. 1.2

How did the participants express their transformative agency during the process of developing the 'Campus Sustainability Statement'?

By answering these questions, I hope to make a contribution to knowledge in relation to how the formation of a collaboratively developed new concept, such as a campus sustainability statement can facilitate and act as a sustainability framework that allows participants and staff to engage with and develop a shared vision of sustainability. The CSS concept permits participants to work together to build sustainability capacity at a campus level, while at the same time allowing them to have and maintain differing views about sustainability.

Additionally, analysing the relationships between the conceptual development of the CSS and the development of the participants' agency provides insights into the complex inter-relationship between these by exposing the effect of concept development on the expression of particular forms of transformative agency.

1.7 Thesis overview

The thesis is presented in eight chapters beginning with this chapter where I set out my project in terms of why I undertook it, its context both in relation to my workplace and nationally,

the development of the research questions, the project goals and finally how the project will be reported in the thesis.

In Chapter 2, I present my literature review, which broadly seeks to explore and identify the issues that impact the implementation of sustainability in HEIs. These I set out under the following five headings: Sustainability Terminology, The Role of Higher Education in a sustainable future, Drivers of Sustainability in Higher Education, Challenges and Barriers to sustainability in Higher Education and finally, Strategies and Approaches for the implementation of sustainability in Higher Education.

In Chapter 3, I begin by outlining my epistemological position and ontological stance, and then I outline the theoretical framework that underpins the Change Laboratory, which is the formative intervention that I use in this research. I then discuss the two lenses through which I carry out my analysis of the data from the intervention - concept development and transformative agency.

In Chapter 4, I describe my research design and I outline my reasons for choosing the Change Laboratory approach. I then introduce the Change Laboratory methodology and outline my approach to data gathering and collection, data analysis, carrying out semi structured interviews, the issues of 'insiderness' and finally the ethical implications of the completion of the project.

In Chapter 5, I present the study data in the form of a natural history, where I comprehensively describe and document the sessions that took place within the intervention under three headings: Design, where I detail the intended plan; Report, where I describe what actually happened; and Outcomes, where I summarise what came out of each session and its implications for the following session.

In Chapter 6, I trace the development of the concept of the Campus Sustainability Statement, as it happened during the course of the CL intervention. I then analyse its development using the two conceptual lenses outlined above - concept development and transformative agency - to answer the research sub-questions.

In Chapter 7, I collate my analysis from Chapter 6 and synthesise my thematic findings, which address my main research question and establish my core contribution to knowledge, which I then appraise against the literature reviewed in Chapter 2.

In Chapter 8, I conclude my thesis with a reflection on my contributions to new knowledge, and I discuss the limitations of the study and its implications for theory, policy, practice and potential future research.

Chapter 2 Literature Review

2.1 Introduction

This project addresses the relatively new field of "sustainability in higher education." The main aim is to explore and contribute to the academic literature regarding how academic practices can be changed, modified, or enhanced, so that they may support and develop campus engagement with the ideas and concepts of sustainability and sustainable development.

Boote and Beile (2015) argue that among other things a literature review "sets the broad context of the study, clearly demarcates what is and what is not within the scope of the investigation and justifies those decisions. It also situates an existing literature in a broader scholarly and historical context." (p4) The purpose of this review is to demonstrate that this study has a strong literary foundation and that the findings from the research will make an original contribution.

This review concentrates on literature that explores how sustainability is integrated into academic and institutional practices in Higher Education (HE). It does not address what academics should do in relation to teaching sustainability but rather how they can achieve agency and be empowered in their workplaces to engage with sustainability. Thus, the review does not address sustainability pedagogy or institutional/sectoral sustainability policies or targets.

The review begins with an examination of the definitions and terminology associated with sustainability and sustainable development and what these terms mean in the HE context. I then review the role of HE in relation to sustainability and follow this with an examination of the main drivers and barriers to embedding sustainability in Higher Education. Next, I review and critique the main approaches used to implement SHE and I conclude the review with a gap analysis and an outline of the how this project addresses the findings.

The review process consisted of four activities: scoping, searching, filtering, and analysis. In the following sub-sections I briefly outline how I carried out these activities, and then introduce the topics that I chose to focus on. The topics are individually reviewed in sections 2.2 to 2.6 and their implications for the study are discussed in Section 2.7.

2.1.1 Scoping

Scoping is the process of deciding which areas of the literature to review and which to exclude, and for this project, it evolved in an iterative manner. When I started the review I had just become aware of the concept and term "Education for Sustainable Development" (ESD - see later section for detailed explanation) and was very enthusiastic and excited about its potential for contributing to my project. Thus, my initial scoping searches focused primarily on papers that addressed "ESD" in higher education and this resulted in a large number of papers on a wide range of related topics. As the review developed (using the search strategies outlined below) I refined the scope and after exploring a number of options I decided that the main focus of the review should be on issues that impact the approaches and strategies that are used to implement and embed ESD and sustainability in HE settings. During the process I considered a number of alternative approaches. I could, for instance, have focused on sustainability/ESD pedagogy but, I believe that while this is an essential aspect, the focus of this project is on how to enable and empower academic staff and lecturers to embed sustainability in their activities, rather than how they might carry them out.

2.1.2 Searching

The process consisted of two distinct but complementary elements: informal "manual" searches and a structured database search. What I mean here by an "informal manual search" is the searching that was carried out on an on-going basis during the project and following up

references from papers and articles that I had read. This process is generally called snowballing, and it resulted in the discovery of a significant number of the papers that I make reference to throughout this work. Occasionally, the informal search was aided by manually reviewing the abstracts of particular journals. For example, once the importance of the International Journal of Sustainability in Higher Education (IJSHE) became clear, I reviewed the abstracts of all of the relevant papers since its inception in 2002. I also followed up on email alert recommendations from "Google Scholar", "Academia.edu", "Mendeley"[3], and "Researchgate"[4]. Reviewing the papers from the informal search provided me with a broad overview of the area of sustainability in Higher Education and it allowed me to gradually identify what the most appropriate topic for the structured search would be.

Subsequently, for the formal structured search, I focused on finding papers and articles that address how sustainability is embedded or integrated into Higher Education Institutions. For this, I decided to use the Scopus Database (through the library of Lancaster University). When doing the search I explored a number of different search term options. I looked at and compared descriptive terms such as "implementation", "integration", "embedding", and "enhancing". I decided on implementation, as it resulted in approximately double the number of hits compared to the next nearest term (enhancing). I also compared "Sustainability", "Sustainable Development", "Education for Sustainable Development" and "ESD" and decided on the term "Sustainability" for similar reasons (Sustainable Development was the next most popular term). I carried out the structured search based on three terms: "Implementation" AND "Sustainability" AND "Higher Education". This search resulted in 343 returns (14/02/19), which were then filtered and processed as described below.

[3] Reference management software and Journal article database.
[4] Social networking site for scientists and researchers

2.1.3 Filtering

The aim of the filtering process was to remove papers that were not relevant to the research and reduce the number of papers for consideration. I was interested in finding papers that examine the implementation of sustainability initiatives in higher education, hence I focused on papers that address how sustainability was applied to HE settings. This included topics such as surveys, conference proceedings, reviews of innovative empirical interventions or case studies, and literature reviews. Examples of papers that were discarded included those focussed on pedagogy (teaching, learning, assessment, competences, attitudes, awareness, graduate attributes etc), programmes, national and international policies, national reviews and the Sustainable Development Goals.

I read the abstract of each of the selected papers and discarded papers which were not deemed relevant. This reduced the number of papers from the main search to 54. (Some of these papers had been also been discovered through the informal manual search process.). These papers were then combined with other papers (from the manual search) and this made up the body of literature that was reviewed (91 texts).

2.1.4 Analysis

Once the appropriate papers were identified I analysed them using a full-text approach (Booth et al. 2012) reading each text in full, copying passages into an Excel spreadsheet and applying inductive descriptive codes.

I also analysed the data against a set of deductive codes which I developed during the initial manual search. To do this I decided to focus the analytical searches on the following headings:

- Sustainability terminology and definitions (to identify and define the main issues);

- Perceptions of sustainability in higher education (SHE) (to identify the stakeholders and the diversity of opinion);
- The role of sustainability in HE (to give the project context);
- Drivers of sustainability in HE (to identify why sustainability is relevant and important);
- Barriers to sustainability in HE (to identify the challenges to embedding SHE);
- Approaches to integrating/embedding/incorporating/infusing sustainability in HE.

2.1.5 Structure of the literature review

To position this project in the existing literature I present the review under the following headings:

- Sustainability terminology (Section 2.2, provides an overview of the sustainability and sustainable development terminology and definitions used in the HE sector);
- Sustainability and the role of Higher education (Section 2.3, addresses the role and responsibility of higher education in relation to sustainability);
- Sustainability drivers in higher education (Section 2.4, why sustainability is considered so important and what the keys drivers for embedding sustainability in HE are);
- Barriers to sustainability in higher education (Section 2.5, what the problems are, and why HE has struggled to embrace sustainability);
- Strategies and approaches to implementing sustainability in higher education (Section 2.6, overview and summary of the main strategies and approaches used by HEIs for the implementation of sustainability) I suggest that while each approach has its merits and limitations, none of the approaches explore the agentic development of academic staff or how concepts of sustainability are developed during implementation processes;
- Implications for the study. In Section 2.7, I conclude the chapter with a summary of the main issues and key themes that I have identified in literature, and their impact and influence on the design of this project.

2.2 Sustainability Terminology

"Sustainable development is now like 'democracy': it is universally desired, diversely understood, extremely difficult to achieve, and won't go away"

William Lafferty (Lafferty 2004)

The focus of this project is on how to embed sustainability in HE academic practices. Sustainability, both as a term and as a concept has multiple interpretations, it is context sensitive and can be interpreted to have a wide range of meanings. The absence of an agreed definition is a very significant and problematic issue. It creates communications problems (Djordjevic and Cotton 2011) and contributes to an overall lack of understanding and awareness of what sustainability issues are and more importantly, how they can be addressed and dealt with. For this reason, it is important to look at how the term is used, what it is taken to mean and, how it is applied in the HE context.

2.2.1 Sustainability and Sustainable Development.

Strictly speaking, sustainability and sustainable development (SD) are not the same thing (Lozano, 2008), however, in the HE literature, the terms are often used interchangeably (Mader et al. 2013; Holden et al. 2014; Wu and Shen 2016; Viegas *et al.* 2016). Both terms are subject to a range of interpretations (Gibson 2000; Leal Fihlo 2011b; Sidiropoulos 2012). and can mean different things to different people (Leal Filho 2011). Johnston *et al.* (2007) estimate that approximately 300 definitions of sustainability and sustainable development occur in the area of environmental management and similar fields.

Ralph and Stubbs (2014, p72) describe sustainability as "a paradigm for thinking about the future in which the economic, environmental and social dimensions are intertwined, not

separate, and are balanced in the pursuit of an improved quality of life." Wu and Shen (2016) define sustainability (attributed to Rhodes (2006)) as "the effort to frame social and economic policy so as to preserve, with minimum disturbance, the earth's bounty – its resources, inhabitants and environments – for the benefit of both present and future generations".

These definitions are very similar to the broadly accepted, albeit contentious definition of **sustainable development** proposed in the report of the Brundtland Commission of 1987:

> '*Sustainable development is the development which 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, p42)

Sidiropoulos (2012, p.45) states that: "Sustainable development (SD) is regarded as the vehicle for shifting away from the dominant (growth oriented) model of development towards one that is able to balance needs of people (social development), planet (environmental development) and profit (economic development). However, SD cannot be absolutely defined and there is no "one size fits all."

From a conceptual point of view, for the purposes of this dissertation, my understanding of the relationship between the two terms aligns with that of Reid (1995); Lozano-Ros (2003); and Martin (2003), as quoted in Lozano (2008), and is neatly summed up by the vignette "sustainable development is the journey to achieve sustainability."

Both concepts revolve around the convergence of three entities: people (social); planet (environment); and profit (economy), which are popularly known as the three pillars of sustainability or the triple bottom line (TBL). The way these entities interact and how their connections are framed determine if the model of sustainability is considered "weak" or "strong."

"Weak sustainability (mechanistic/functional approach) assumes that human and natural capital are interchangeable entities and that sustainability is achieved as a coincidence of the three pillars. This form is regarded by many proponents (Barrett 1996; Flavin 2010; Meadows, Randers and Meadows 2004; Orr 2009; Steiner and Posch 2006; Thogersen and Crompton 2009), including the author, as unlikely to restore the earth's natural capital for future generations.". Sidiropoulos (2011) points out that this interpretation of sustainability is adopted by many leading business groups, including the World Business Council for Sustainable Development.

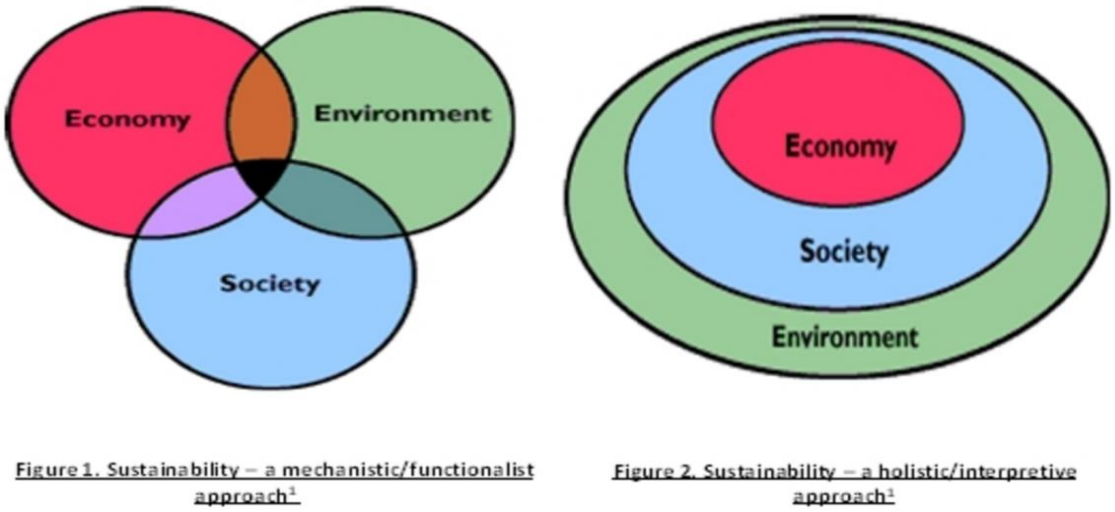


Figure 1. Sustainability – a mechanistic/functionalist approach[1]

Figure 2. Sustainability – a holistic/interpretive approach[1]

Fig 2.1 Weak and strong forms of sustainability
(image Sidiroplous (2011) attrib Porter & Cordoba 2009)

The "strong form" on the other hand, is a holistic approach which situates the economy centrally, but depicts it as subordinate to and nested within society, which in turn is nested within the environment. Sidiropoulos (2011, p249) points out that this form of sustainability "requires a radical shift in mindset away from a primary concern for self as an autonomous competitive unit in the context of an inexhaustible, mechanistic, environment towards a mindset of self in the context of an interconnected, finite system" (Bathurst and Edwards 2009; Orr 2009). The fundamental difference in focus between these two forms of

sustainability (a coincidence of the three pillars as against an unequivocal hierarchical relationship) reflects the chasm that exists when it comes to perceptions of the concept.

In addition to the generally accepted troika of environment, society and economy, other conceptual frameworks of sustainability exist. These include a variety of additional pillars or dimensions such as: time (the fourth dimension) (Lozano 2018); culture (Besong 2017; Mader et al. 2013); Diversity (Macquarie Unuiversity 2009); and Technology and Institutional aspects (Segalas et al. 2012).

Indeed, the range of meanings and understandings about what the terms "sustainability" and "sustainable development" mean, are a significant and problematic issue in HE (Mader et al. 2013; Gale *et al.* 2015; Owens and Legere 2015; Cheeseman *et al.* 2019). The significance and extent of this conceptual multiplicity are further discussed in Section 2.5.

2.2.2 Sustainability terminology in the higher education context.

Having examined the definitions of the terms, it is now time to look at how they are interpreted in the context of HE. "Education is considered a key – a sine qua non- to sustainable development" (UNESCO 2005, p.13) and the concept and nuances associated with higher education in the context of sustainable development and global sustainability is a much discussed and hotly debated subject (Tilbury 2002; Stevenson 2006; Kopnina 2011; Sterling 2012; Kopnina & Meijers 2014; Hume & Barry 2015; Kopnina 2015; Agbedahin 2019) .

Hume & Barry (2015) provide a comprehensive overview of how, over the past 50 years, the concept of Education for Sustainable Development (ESD) has evolved from Nature Study and Environmental Education (EE). They suggest that EE emerged "in the mid to late 1960s as a response to environmental problems caused through processes of modernity such as industrialization, consumerism, and urbanization." (ibid, p1). The evolution was driven by

numerous international conferences and declarations such as the 1972 UN Conference on the Human Environment in Stockholm (UN, 1972) the Belgrage Charter (UN, 1975), The Tblisi Declaration (UNESCO, 1977), The Brundtland Report (Brundtland 1987) and the 1992 UN conference of Environment and Development in Rio (Agenda 21, UN, 1992). One of the first steps in this evoloution was Environmental Education (Hume and Barry 2015), which aimed, according to Stapp (1969), to produce a motivated and knowledeable citizenry concerning the biophysical environment, its problems, and their solutions (Hume & Barry 2015). Environmenatal education was associated primarily with science education to the 1990s (Gough 2013) and this only began to change after more socioecological approaches emerged, which saw the natural science perspective as a simplification, and inadequate to address the complex multilayered environmental problems (Kyburtz Gruber 2013). The necessary inclusion of the social sciences in the study of sustainability has given rise to the emergence of a range of sustainability "educations" such as "Environment and Sustainability Education" (ESE) (Wals et al. 2017); "Education for Sustainability" (EfS) (Wilson 2012; Littledyke et al. 2013; Kopnina & Meijers 2014; Akins *et al.* 2019); and "Education for Sustainable Development" (ESD). The term Higher Education for Sustainable Development (HESD) is also used by authors to specifically refer to ESD in HE (Seatter *et al.* 2014; Disterheft *et al.* 2015; Lambrechts et al 2018).

There is clearly overlap between these "educations" and based on a comprehensive literature review carried out during the UN Decade for Education for Sustainable Development (DESD) (2005-2014) Wu and Shen (2016) state that the three most commonly used terms in this field are : "education for sustainability"; "education for sustainable development"; and "sustainability education"; and that they are, in effect, interchangeable and synonymous.

The description of ESD given below is from Eco-UNESCO,[5] and it provides an insight into the scope and range of meanings associated with the term:

> *"Education for Sustainable Development (ESD), using a wide definition of education (both formal and non-formal), is both a part of Sustainable Development and a tool for achieving the Sustainable Development goals throughout the world and at all levels (national, regional, and local). It refers to a process of learning that allows making decisions that take into account long-term economic and ecological effects, as well as the equity of all communities. It also aims at building the capacity and commitment needed for building sustainable societies."*
>
> (Eco-UNESCO, 2007)

In other examples of defining and describing ESD, Kopnina (2014, p. 191) quotes Stevenson (2006) and states that ESD programs are supposed to focus on the "triple bottom line, finding a balance between social/economic/environmental (SEE) aspects of sustainable development."

While this interpretation seems to be broadly accepted in the literature, the value of the concept of ESD is not universally accepted. Kopnina (2011 p.1) argues that from an educational point of view ESD dilutes the focus of traditional environmental education by including social and economic issues, and she suggests that this may, in fact, be counterproductive in terms of addressing the anthropogenic causes of environmental problems. Hesselink at al. (2000); Breiting (2009); Johnson (2011); Wesselink and Wals (2011) also discuss the potential tension between the objectives of EE and ESD.

One last term that is worthy of mention, and which is frequently referenced in the literature is the "**Sustainable** (and occasionally sustainability) **University**" (Tilbury *et al.* 2005; Ferrer-

[5] ECO-UNESCO is Ireland's Environmental Education and Youth Organisation affiliated to the World Federation of UNESCO (United Nations Educational, Scientific and Cultural Organisation) Clubs, Centres and Associations (WFUCA).

Balas *et al.* 2008; Hopkinson 2009; Nejati and Nejati 2013; Wright and Horst 2013; Sylvestre et al. 2014; Amaral et al. 2015; Baker-Shelley et al. 2017; Mosier and Ruxton. 2018). Many of these authors refer to this term as a concept, but it is not clear what the concept is. In some studies, the term is used as an aspirational idea (Sylvestre et al. 2014) to explore what faculty and academics think a sustainable University should be in terms of teaching and research, whereas others include the sustainable operation of the physical campus (Nejati and Nejati (2013); Amaral et al. 2015).

In addition to incorporating sustainability into teaching and learning practices, many European Universities have implemented a certified Environmental Management System (EMS) such as ISO 14000 or the European Environmental Management Auditing System (EMAS). Mälardalen University (Sweden, ISO 14000) and the University of Zittau/Goerlitz (Germany, EMAS) were among the first to get certified in 1999 (Delakowitz and Hoffman 2000).

There is a range of specific terms that relate to sustainability in the HE context. Terms such as ESD, EfS and Sustainable Education are clearly about education, and often focus on pedagogy, curriculum and competences rather than the creation of the workspace to develop and apply these. It is for this reason that I adopt the approach taken by Hoover and Harder (2015) and Wright (2004) and use the term '**sustainability in higher education'** (and the shorthand "SHE") as the general term to describe approaches and initiatives to integrate or embed sustainability in HE.

2.3 The role of Higher Education in a sustainable future

In order to meaningfully understand how sustainability can be embedded in HE, it is important to be aware of how stakeholders view the role of HE in relation to the realisation of a sustainable future. From the literature it is clear that Universities, and HE in general, have a significant role to play through engagement with sustainability and sustainable development (UNESCO 2005; Lozano 2006; Sidiropolous 2010; Leal Filho 2011; Sterling et al. 2013; Karatzoglou 2013). Many writers suggest that HEIs have moral and ethical responsibilities in relation to sustainability and must engage with it to create a just and sustainable future for society (Cortese 2003; Baker-Shelley et al. 2017; Findler *et al.* 2019). But what is the nature and extent of this engagement, and how do the various HE stakeholders perceive the role of the sector? To answer this question, I firstly examine the role of HE from a sectoral and institutional perspective. I then look at how this role is perceived by faculty and academic staff and the implications that this has on HE and academic practices.

2.3.1 Sectoral and Institutional Roles

Many studies on the role of HE in relation to sustainability and the perceptions of various stakeholders have been carried out over the last number of years (Dabija *et al.* 2017; Fisher and Mcadams 2015; Sammalisto et al. 2015; Zeegers and Clark 2014; Sylvestre et al. 2014; Shephard and Furnari 2013; Karatzoglou 2013; Wright and Horst 2013; Segalas et al. 2012; Nejati *et al.* 2011; Wright 2010). In 2015, a special issue of the Journal of Cleaner Production dedicated to SHE emphasized the variety of roles universities are playing in fostering broader, sustainable communities (Ramos *et al.* 2015).

Universities are traditionally focused on research, teaching and training future leaders (Cortese 2003; Steel *et al.* 2004; Koehn and Uitto 2014). Tziganuk and Gliedt (2017, p1192) point out that "this role is being expanded to include solutions-oriented research, creating

change agents and integrating stakeholders into the program through sustainability co-creation" (Reeger and Bunders 2009**;** Stephens *et al.* 2008; Trencher *et al.* 2014; Trencher *et al.* 2016; Yarime *et al.* 2012)**.** Sustainability co-creation is defined as "a role where the university collaborates with diverse social actors to create societal transformations with the goal of materializing sustainable development in a specific location, region, or societal sub-sector" (Trencher *et al.* 2014, p. 152).

Other roles are also identified in the literature, Dentoni and Bitzer (2015, p. 68) state that academics can "act as knowledge experts, agenda-setting advisors and facilitators" when addressing global concerns, and can foster relationships between communities and universities in ways that "co-create sustainability", strengthening universities' sustainability by engaging in multi-stakeholder initiatives (Berchin *et al.* 2018). Calder and Clugston (2003) posit that higher education needs to play the key role in society of discerning truth, imparting values and preparing learners to gain knowledge and skills to achieve a sustainable world. Aleixo et al. (2018) reported that faculty members in Portuguese HEIs believed that HE has an important role in empowering the community and community engagement. Studies by Wright (2010) and Wright and Horst (2013) reveal that University presidents and leaders believe that in addition to the education and research missions, universities should serve as role models for sustainability. Baker-Shelley et al (2017, p.268) argue that "public universities in particular must aim for deeper sustainability because they have a moral obligation: they are recipients of public funds, have non-profit status, and are expected to serve the interests of society."

A number of papers discuss the role of HE in the context of the objectives of ESD. In addition to the core role of HEIs in creating and disseminating knowledge, ESD promotes experiences and shapes behaviours (Stough *et al.* 2018; Teixeira 2014), generating environmental awareness and critical thinking (Nasibulina 2015) that encourage students to shape sustainable

societies (Kitamura 2014). Holm *et al.* (2015) states that the objective for ESD in HE is to promote the development of graduates into critical and creative thinkers (Lozano 2006a; Rieckmann 2012).They further point out that the objective for ESD in HE is to ensure that graduates will develop the skills to take economic, ecological, and social aspects into account when making decisions (Sibbel 2009) and gain competence in systemic, anticipatory, and critical thinking (Rieckmann 2012).

Many of the roles that are listed above are clearly part of the classical notion of the research and teaching role that is the raison d'etre of the HE sector. However, some of the roles call for actions that are outside of the traditional HE boundaries, such as: actions in the community; being role models; empowering the community through engagement; shaping behaviours; generating environmental awareness; and encouraging students to shape sustainable societies. These actions go beyond traditional pedagogy and are only possible because of the unique position that HE has in relation to shaping society in the broader context.

2.3.2 Perceptions of Faculty and Academic Staff.

My project is about embedding sustainability in the practices of academic staff in a HE setting and for this reason I focus on literature that reviews academic and staff perceptions of sustainability rather than those of policy makers and legislators. Staff perceptions will clearly influence the ways and extent to which HEIS engage with sustainability at a practice level. Sammalisto et al. (2015) state that faculty and staff increasingly recognize the SD concept, but its perceived relevance to their role varies within and between universities. Cebrián et al. (2015) found that among academics, the role and position in the university, individual research interests, and the academic freedom to teach and research, can be enablers or barriers (to SHE), depending on an academic's personal motivation, perceived relevance of sustainability

to the subject area and academic interests. She further suggests that, in line with findings by Christie *et al.* (2013) and Cotton *et al.* (2009) that the use of ESD pedagogy by academics is conditioned by their existing values and beliefs on teaching and learning, as well as the nature of their subject area.

Shephard & Furnari (2013), carried out a study in a New Zealand University exploring what University teachers think about education for sustainability. They identified significant and qualitatively different viewpoints regarding EfS. These ranged from those who would advocate for the mandatory inclusion of sustainability in all programmes to those who could be described as anthropocentric university teachers who were mindful of their academic freedom and responsibility to be both critic and conscience of society. In a separate study in a Canadian University, Sylvestre et al. (2014) found that while some of the tensions among faculty members' perceptions of what a "Sustainable University" are were **specifically related to sustainability**, others were the result of differing beliefs about the **nature of education** and the **role of the University in Society**.

In an international study of academics involved in teacher training, Sinakou *et al.* (2018) found that even among those in the field of ESD there was no consensus as to the meaning of the SD concept. They also found that those academics do not see the SD concept holistically, with a tendency to recognize the social and economic dimensions more than the environmental ones. This view is supported by the findings of a study of Engineering Education for sustainable development experts by Segalas et al. (2012), who concluded that experts consider institutional and social aspects are more relevant to sustainability than environmental and technological ones. However, in another study which shows the problematic and contested nature of the SD concept. Cotton *et al.* (2007) found that among lecturers at the University of Plymouth, there was a greater understanding of the environmental issues of

sustainability, with more ambiguity about the social and economic issues (other studies have also reported similar findings e.g., Reid & Petoc (2006) and Kemper et al. (2018)). These studies highlight the range and degree of conceptual multiplicity present among academic staff, and this issue will be addressed in more detail in the Section 2.5 in the review of barriers to SHE.

It is also worth noting that some studies (Cotton *et al.* 2009; Christie *et al.* 2013; Cebrián et al. 2015) have highlighted a disparity between the principles of ESD and the role of HE. In a study carried out by Cebrián et al. (2015), freedom of thought and critical thinking, key aspects of HE, were seen as contradicting ESD principles. Several of the participants in the study made reference to ESD being value-laden, and consequently in danger of giving students a pro-sustainability view rather than an informed unbiased view and fostering critical thinking skills.

It is clear from the literature that there are a wide variety of views on the role that HE should play in achieving a sustainable future. This is of itself problematic in terms of finding acceptable ways to embed or integrate sustainability into HE. This study addresses this problem by looking at how people with diverse views can work together to find a solution that is acceptable to all.

Having looked at the definitions and how the terminology is interpreted in the HE sector, I now turn my attention to examining the factors that are perceived as drivers of and barriers to the incorporation of sustainability in Higher Education.

2.4 Drivers of Sustainability in Higher Education

2.4.1 Introduction

By their nature, change initiatives are driven processes, and the outcome of any change initiative will be a unique product of the conflicting influences of the drivers and barriers at play each case. There are factors that can support the process (drivers) or hamper the process (barriers) and these are strongly related to each other (Verhulst and Lambrechts 2015). One factor can be a driver in one situation and a barrier in a different context (de Caluwe and Vermaak 2006). To understand how a change such as embedding sustainability in HE can be carried out, it is necessary to look at what the key driving factors and barriers are, and how they influence process. Exploring these factors provides insights into why people participate and engage in SHE. Identifying and understanding how these factors can work together is beneficial when analysing the range of strategies and approaches that can be adopted when embedding sustainability in higher education practices.

In the literature, many papers examine the drivers (and barriers) to SHE and there are many identified, however, there is very little published on defining what a driver is in the context of SHE. For the purposes of this review I shall define a **change driver** as "an internal or external pressure that shapes change to an organization. This includes change to strategy, plans, designs, products, services and operations[6]." Ferrer-Balas *et al. (*2008) among others (Lozano and von Haartman 2018) identify and categorise drivers based on whether they are **internal** or **external**. This classification, while simple, is very useful because it allows us to analyse and separate the drivers into those which are "imposed" on HE (over which individual HEIS have no control) and those which can emanate from and can be influenced or supported from within the institution.

[6] https://simplicable.com/new/change-drivers

2.4.2 External drivers

I present the external drivers under three headings; 1) **International,** which includes network organisations and international declarations, charters, and initiatives (DCIs), 2) **National,** which is policy and strategy and **3) Institutional and stakeholder.**

2.4.2.1 International

Internationally, there are many **organisations promoting ESD** in the HE sector, with a focus on promoting transformational learning (COPERNICUS[7]) and leadership (AASHE, see below) in sustainability and sustainable development in HE. Their activities are primarily aimed at developing sustainability networks, professional development, and collaborative research and funding projects. In the United States there is the US Partnership for Education for Sustainable Development[8], the Association for the Advancement of Sustainability in Higher Education (AASHE), and the American College and University Presidents Climate Commitment (ACUPCC) (Dyer and Dyer 2017) and, in Europe, the Copernicus alliance. Globally, the **UN** (through the United Nations University Institute for Advanced Study of Sustainability) have set up a global network of **Regional Centres of Expertise on ESD (RCEs)** and a network of higher education institutions called the Promotion of Sustainability in Postgraduate Education and Research Network[9]. Holm *et al.*(2015) noted that the UN declared Decade for Education for Sustainable Development 2004-2014 (UN DESD 2011), for which regional and national strategies have been developed. This has been a global driver for ESD in the HE sector. Since the DESD, the UN has published the Roadmap for the implementation of the Global Action Programme (UNESCO 2014), which seeks to generate and scale up education for SD, and to accelerate progress towards sustainability (Leal Filho *et*

[7] http://www.copernicus-alliance.org/
[8] www.uspartnership.org
[9] ProSPER.Net

al. 2017). The UN has also published the Sustainable Development Goals (SDGS) which a number of authors suggest may be beneficial to HEIS when engaging with ESD (Moon et al. 2018; Leal Filho *et al.* 2018).

Engaging with and **signing international Declarations, Charters or initiatives** (DCIs) has also been identified as a driver of SHE by a number of studies, e.g. Müller-Christ *et al.* (2014); Holm *et al.* (2015); Lozano et al. (2015). According to Grindsted and Holm (2012a, p33) "the idea that the university is morally obliged to teach, do research, and to run the University in a way that promotes sustainability is expressed in all SHE declarations." They point out that the "moral obligation" is a cornerstone theme for SHE declarations and has been identified in numerous studies (Clugston 1999; Cortese 1999; Calder and Clugston 2003; Wright 2002 and 2004; Corcoran and Wals 2004; Clarke and Kouri 2009; Waas et al. 2009; Lozano et al. 2011). Wright (2004) notes that "perhaps the unifying theme among all declarations and policies is the ethical and moral responsibility of universities to be leaders in promoting sustainability".

However as Lozano *et al.* (2015) warns, signing a declaration or endorsing an initiative does not ensure that the signatory institutions implement SD within their systems (Bekessy et al. (2007) Wright (2004)). Berchin *et al. (*2018) argues that **international sustainability conferences** can also play a critical role in overcoming the main barriers to implementing sustainability and sustainable development initiatives within HEIs (barriers are addressed in Section 2.5).

2.4.2.2 National

In addition to focusing on the role of and function of universities in relation to sustainable development, Declarations have impacted on the emergence of national legislation and policy

(Grindsted 2011). Legislation, guidance documents, and government directives (Sammalisto and Arvidsson 2005) can also be a driving force for SHE and these are influenced by the culture of the country and by local and global economic factors. The "National Strategy on Education for Sustainable Development in Ireland 2014-2020" (NSESD) was published in July 2014. The strategy makes a series of pragmatic recommendations that aim to ensure that the (Irish) education system (from primary school through to third level) contributes to a sustainable future through ESD (Department of Education and Skills, 2014). Different countries will respond to international influences differently e.g. partly as a result of the DESD, all the Nordic countries either have ESD strategies or include enhancement of ESD in their overall national sustainability strategy (Holm et al. 2012).

2.4.2.3 Institutional and Stakeholder Drivers

In terms of institutional drivers, Sammalisto and Arvidsson (2005) cite **certification, external reputation, image, good will, and credibility** as drivers for the implementation of Environmental Management Systems in HE. Ferrer-Balas *et al.* (2008), suggest that Institutional size can also act as a driver, as smaller HEIs (<10,000) may be able to respond to the need for transformation more quickly due to reduced organisational complexity. Ferrer-Balas *et al.* (2008) and Sammalisto and Arvidsson (2005) also note that **peer pressure** from competing institutions and funding availability can also act as a driver of SHE.

From the stakeholder perspective, Verhulst and Lambrechts (2015) found that **external funding for sustainability projects** was an important driver for SHE. Ferrer-Balas *et al.* (2008) points out that in addition to sources of funding, **employment availability** from corporations or government bodies willing to pay for sustainability-focused research, may drive a university-wide transformation, as well as employers who demand university graduates with particular strengths in sustainability. There is also growing evidence that both institutions

and students **expect** to see environmental and sustainability issues addressed in HE (Bone and Agombar 2011).

2.4.3 Internal Drivers

According to DeSimone and Popoff (2000), external drivers result in reactive measures, while internal ones lead towards more proactive change. According to Ralph and Stubbs (2014), one of the most compelling internal drivers for integrating sustainability into universities, is the ethical obligation that universities have to address the global challenges of environmental degradation. Baker-Shelley et al. (2017) argue that public universities in particular must aim for deeper sustainability because they have a moral obligation, as they are recipients of public funds, have non-profit status, and are expected to serve the interests of society. The majority of the internal drivers identified in the literature related to issues that were management driven or controlled, with a small number of staff or individual action drivers also identified. These are discussed below.

2.4.3.1 Management Drivers

A number of authors cite "leadership" as one of the main drivers for successfully implementing SHE. Adams (2013) highlights the importance of pro-active leadership, whereas Ferrer-Balas *et al.* (2008) suggest that visionary **leadership** is a key driver. They also point to the development and promotion of cooperation and collaboration between units (rather than competition) and the presences of a coordination unit in the institution.

Consistent effective communication (Adams 2013; Vargas et al. 2019) and a clear **commitment** from senior management are also considered key drivers for SHE (Hoover and Harder 2015). Branzei, Vertinsky and Zietsma (2000), as cited in Millar et al. (2012), also stressed the importance of senior management's involvement and their **personal**

commitment as leaders toward sustainable practices within a company for the success of any sustainability initiative."

Many authors (Adams 2013; Mader et al. 2013; Too and Bajracharya 2015; Godemann *et al.* 2014; Aleixo et al. 2018), state that **engagement by the participants and stakeholders** is the major driver of SHE. Indeed, the purpose of clear communications about commitment and leadership from management is to foment and encourage stakeholder engagement.

A wide range of approaches to promoting and developing staff engagement have been identified in the literature. The most notable are:

- Promoting inter and **multidisciplinarity** in research and courses (Adams 2013);
- The provision of **coordination units** or process to help keep projects alive and distribute responsibility (Ferrer-Balas *et al.* 2008);
- The inclusion of sustainability in the **HEI strategy** (Adams 2013);
- Signing a **sustainability declaration** or charter can also be seen as an internal driver as it allows members of the University to specify the meaning of HESD through initiating internal discussions and negotiations about its integration at the Institute (Müller-Christ *et al.* 2014);
- The development of **mission statements** and **sustainability guidelines** are identified by Müller-Christ *et al.* (2014) and Velazquez *et al.* (2006) as key internal drivers, and note that they can be derived from the content of declarations that the HEI are signed up to;
- In addition to leadership, Cebrián Bernat et al. (2015) cite **organisational support, quality assurance processes**, **professional development,** and creating reward structures as necessary strategies towards academic staff engagement in the sustainability agenda.

Verhulst and Boks (2014) propose that **employee empowerment** can be a significant change driver or success factor for the implementation of SHE. Employee empowerment is a motivational tool whereby administrators, faculty, staff, and others become sustainability proponents (Akins *et al.* 2019).

In line with the calls for multi and interdisciplinary approaches, Müller-Christ *et al.* (2014) and Wright (2002) cite the need for the **whole-university approach** that connects curriculum, campus, research, and community strategies and action. One way to encourage this is to engage with a **sustainability rating system.** Verhulst and Lambrechts (2015) suggest that such systems (of which there are many (e.g. GASU (Lozano 2006b), AISHE (Roorda and Martens 2008) and STAUNCH (Lozano and Peattie 2009)) can act as drivers, however none of them have been adopted very widely (Holm *et al.* 2015).

Another approach identified in the literature is to harness the inherent competitive nature of HE and Universities through engagement with University sustainability ranking systems (Grindsted 2011; Ragazzi and Ghidini 2017) such as the UI Green Metric [10].

2.4.3.2 Staff Drivers

While management can employ a range of measures to encourage staff engagement with SHE, it is ultimately down to the level of commitment of each staff member as to how this is demonstrated. Individual commitment has been identified as a key driver (Verhulst and Lambrechts 2015) and the role of these individual **leaders and "sustainability champions"** are vital in achieving the challenge of embedding sustainability within HE (Christensen et al. 2009; Ferrer-Balas et al. 2008; UNESCO, 2006; Lozano 2006b).

[10] UI Green Metric World University Rankings http://greenmetric.ui.ac.id/

Sammalisto and Arvidsson (2005) reported that Internal driving forces such as **interest and engagement** from faculty and staff, management and board, and students were the three most frequently reported driving forces in 1999.

Individuals working collectively or in groups can also drive SHE; for example the green campus/green flag initiatives have been a significant contributor to SHE for many years (Dahle and Neumeyer 2001; Leal Filho *et al.* 2015; Amaral *et al.* 2020).

Existing networks of people such as **interdisciplinary research groups** that reach across the university to include a critical mass of campus actors, which Ferrer-Balas *et al. (*2008) refer to as "connectors," may also help support and encourage the interdisciplinary work that is needed for the successful implementation of SHE.

2.5 Challenges and Barriers to Sustainability in Higher Education

2.5.1 Introduction

Higher Education Institutions (HEIs) that engage in embracing SHE will invariably face a series of barriers and challenges when implementing initiatives (Brandli *et al.* 2015). Understanding and dealing with these in a systematic way is important to ensure their success (Avila *et al.* 2017). For the purposes of this review I define barriers as "the reasons underlying the resistance to change", the change, in this case is the incorporation of sustainability initiatives across a broad range of HE activities. Verhulst and Lambrechts (2015, p191) state that "Resistance as a phenomenon is considered as the most important obstacle in organisational change management, whereby it forms a key element of the study of organisational change." Many scholars and practitioners have directly linked the failure of change process with resistance to change (ibid) and a number of papers identify and refer to "resistance to change" as an independently identified barrier (Dahle and Neumeyer 2001; Djordjevic and Cotton 2011; Brandli *et al.* 2015; Leal Filho *et al.* 2017; Aleixo et al. 2018). However, the authors do not offer explicit definitions of the term "resistance to change" and so for the purposes of this review, like the other authors, I include the term in its general sense alongside other more clearly defined barriers.

Many studies that explore the barriers and challenges associated with implementing SHE have been published, and a number of these have attempted to categorise and group them under a range of headings: e.g. Figueiró & Raufflet (2015) used a four tier approach which looked at organisational challenges, terminological issues, capabilities, and pedagogical issues. Other authors have taken different approaches; Leal Filho et al. (2012) considered barriers in terms of perception, attitude, perspective, focus, and cost-effectiveness and Gale et al. (2015) identified and focused on a number of structural impediments. While these categorisation

systems have their merits, I do not find them adequate or comprehensive enough to embrace the variety of barriers identified in the literature.

For this reason, I propose to adopt the approach taken by Akins *et al.* (2019) and adapt the system proposed by Verhulst and Lambrechts (2015) which groups the barriers into three broad clusters: those related to **lack of awareness**; those related **to the structure** of higher education; and those that relate to the **lack of resources**. The categorisation system is both comprehensive and flexible enough to incorporate the majority of barriers identified in this literature review and I present it in the form of a modified version of Verhulst and Lambrechts original table, which I have extended to include additional barriers identified by other researchers in Table 2.1. (I have also indicated a number of barriers that could be considered generic, see Section 2.5.2)

The categorisation system provides a useful framework with which to discuss the issues. However, the authors of the original table acknowledge the limitations of using the "laundry list" approach, as it does not reflect the reality of HEIs and the way that these barriers may change over time, interact with each other, and effect conditions (ibid). I would also like to point out that due to their nature and the way that some of the barriers interact, it is my opinion that some could reasonably be positioned in more than one cluster.

There is no distinction made between internal and external barriers, and while there are barriers such as funding opportunities, legislation & policy issues, and societal expectations (Ferrer-Balas *et al.* 2008) which are clearly external, I agree with Ralph and Stubbs (2014) assessment, that barriers are primarily internal issues.

Cluster		Theme identified (from Verhulst and Lambrecht 2015)		Additional themes identified (theme and author)
Related to lack of awareness or under-standing	*1*	*Lack of interest and involvement*		*Poor commitment from management (Leal Filho 2011)*
	2	*Lack of support*		
	3	*Lack of professionalisation*	*3a*	*Lack of professional training in ESD (UE4SD 2014)*
	4	*Lack of policy making*		
	5	*Lack of standard definition of SD in HE*		*Terminological (Figueiró & Raufflet 2015)*
	6	*Lack of recognition*		
	7	*SD seen as a threat to academic freedom*		
	8	*SD not seen as relevant*		
Related to the structure of HE	*9*	*Conservative disciplinary structure of HEI*		
	10	*Inefficient communication*	*10a*	*Organisational (Figueiró & Raufflet 2015)*
	11	*Resistance to change*		
	12	*Focus on short term profit*	*12a*	*Lack of added Value (Leal Filho 2011a) Lack of appreciation of long terms benefits (Wright 2010)*
	13	*Lack of interdisciplinary research*		
	14	*Overcrowded curriculum*		
	15	*Focus on content-based learning*	*15a*	*Pedagogical challenges (Figueiró & Raufflet 2015)*
Related to lack of resources	*16*	*Lack of money*		
	17	*High work pressure and lack of time*	*17a*	*Competitive environment of HE Moore (2005)*
	18	*Lack of access to information*		
	19	*Lack of consistent legislation*		
	20	*Lack of performance indicators*		
	21	*Technical problems*		
	22	*Lack of Physical space.*		
Generic	*23*	*High staff turnover*		*Evangelinos and Jones (2009),*
		Resistance as a generic barrier		*Figueiró and Raufflet (2015); Verhulst and Lambrechts (2015);* (Brandli *et al.*, 2015)*; Djordjevic and Cotton (2011),*
		Overcrowding of the curriculum		Læssøe *et al.* (2009)*, Jones et al. (2008)*
		Financial constraints and competition for limited resources		*Wright (2010); Wright and Horst (2013); Ralph and Stubbs (2014)*
		*Human factor (*communication, empowerment, involvement)		(Verhulst and Lambrechts 2015),
		Bureaucracy and cultural issues		*Nejati et al. (2011).*

Table 2.1 Barriers for the integration of SD in Higher Education adapted from Verhulst and Lambrechts (2015)

2.5.2 Generic Barriers

Several scholars have indicated that many of the barriers that occur during the implementation of sustainability are "generic" in that they apply to an organisation's ability to deal with **any new change** initiative (Doppelt 2003; Dunphy et al. 2007; Post and Altman 1994; Stone 2006). I agree with this and suggest that barriers such as high staff turnover, overcrowding of the curriculum (Læssøe *et al.* 2009), financial constraints, competition for limited resources, bureaucracy, and cultural issues (Nejati *et al.* 2011) are generic and not specifically related to SHE, which I will now focus on.

2.5.3 Barriers Related to Lack of Awareness

In addition to the problems associated with the lack of knowledge and understanding of sustainability and SD, barriers that are the result of a lack of awareness also exist. These include the issues that arise as a result of the lack of agreed definitions and the consequent communications problems this can create. Other issues such as the perceived lack of relevance of sustainability and the associated lack of professionalization and training are also included. These are briefly discussed below.

2.5.2.1 Lack of Agreed Definition and Understanding

Lozano (2018) states that there are no clear definitions of sustainability in organisations and the same is true for HE as was outlined in Section 2.2.1. It is widely acknowledged that terminological issues are problematic in HE (Mader et al. 2013; Figueiró and Raufflet 2015; Gale et al. 2015; Owens and Legere 2015; Cheeseman *et al.* 2019) and it is clear that this can lead to problems when trying to get groups of people to agree on a set of ideas or a course of action. Gale et al. (2015) refers to this as "conceptual multiplicity" but also refers to it as "disciplinary contestation", which highlights the additional problems that multi-disciplinarity

brings. He states that because concepts, world views, and values relating to 'sustainability' are variously constituted in different contexts (disciplines), they can create confusion over what sustainability is. According to Ralph and Stubbs (2014) a lack of clarity (on definitions) can lead to a lack of staff commitment to implementing sustainability programmes (Evangelinos and Jones 2009; Wright 2010). Mader (2013) suggests that the complexity and difficulty of interpreting the concept makes it difficult to develop assessment methods or measures to evaluate sustainability and the sustainability of different projects.

2.5.3.2 Communication Problems

One of the most obvious problems related to lack of definitions and lack of clarity are issues with communication. Djordjevic and Cotton (2011) conclude that if two parties do not share the same understanding about the meaning or value of sustainability, actions carried out based on the receipt of communication may be at odds with the original intentions. Leal Filho (2011a) notes two challenges concerning communication: (a) interpreting sustainability with a wider meaning, and not, for example, solely in ecological terms; and (b) translating the "added" value of sustainability to different stakeholders.

Issues with communications are also listed as a barrier in Section 2.5.4, but the focus is on systemic issues related to structural inefficiencies in communications frameworks rather than difficulties related to shared understanding.

2.5.3.3 Lack of Recognition, Relevance, Importance and Support

In a study in a UK University, Cebrián Bernat (2014, p199) found that the lack of understanding and knowledge of sustainability is one of the main challenges faced by academics in engaging with EfS. In an international study of the barriers to the implementation of

sustainability at universities, which identified 25 categories of obstacles, Leal Filho *et al.* (2017) found that "lack of support from management" and "lack of awareness and concern" were ranked by the participants as numbers 1 and 3 in terms of highest relevance. Brandli *et al.* (2015) identify the lack of interest in sustainability and that little importance is attributed to it. Djordjevic and Cotton (2011) found that some academic staff believed that there was conflict between the goals of sustainability and the stated university mission (sustainability as a box ticking exercise) which made it difficult for staff to engage with it deeply. In a separate study in a UK university, Jones et al. (2008) found that some academics believed that there was a conflict between (academic) programme and ESD agenda.

2.5.3.4 Lack of Professionalization, Professional Training and CPD

Figueiró and Raufflet (2015) identify concerns about the "education of the educators" and the capacity of management educators to promote sustainability through pedagogy, and they point out that the limited training of management educators in sustainability constitutes a frequently-cited challenge.

2.5.4 Barriers Related to the Structure of HE

Barriers that Verhulst and Lambrechts (2015) list under those related to the structure of HE include: organisational rigidity (conservative traditional and conventional); the conservative disciplinary structures of HE; the lack of interdisciplinary research; inefficient communications issues, (both across the disciplines in terms of coordination and cooperation); top down bottom up sharing of information; resistance to change by education and research; overcrowding of the curriculum; and pedagogical challenges, as well as a focus on short termism in decision making.

In addition to the issue of conceptual multiplicity identified in Section 2.5.3, Gale et al. (2015) identify three further "structural" impediments to implementing SHE. The first is **Intra-institutional fragmentation**, in which disciplines seek to defend their knowledge base and resist the cross-boundary and interdisciplinary dialogue that sustainability demands. This finding is echoed by Moore (2005) who also identifies disciplinarity as an institutional barrier to the implementation of sustainability education. The second is termed "**Economic embeddedness"** and is a result of the effects of economic globalisation on the HE sector, where universities are playing a more "direct and subservient role" in capital accumulation, which transforms higher education into just another market opportunity. The third impediment identified is termed "Habits of reasoning", which Gale et al. (2015) explain "is the human cognitive predisposition to employ heuristics or 'rules of thumb' in personal and institutional decision-making rather than engage in the sustained critical reflection HEfS require."

Many authors suggest that sustainability education benefits from an holistic approach where environmental, global, social and cultural issues are explored from an inter, multi and/or transdisciplinary perspective e.g. Green (2015); Dlouhá et al. (2017); Cheeseman *et al.* (2019). Figueiró and Raufflet (2015) state that a transdisciplinary approach cannot be taught in an isolated or disciplinary way and this creates challenges as different disciplines understand the subject very differently (Dobson and Tomkinson 2012). HESI (2017) have also noted that institutional structures and hierarchies within universities often impede interdisciplinary and trans-disciplinary research and studies.

In terms of structural issues leading to inefficient communications, Avila *et al.* (2017) identify the lack of specific hierarchically multileveled trans and multidisciplinary working groups,

committees, and sustainability offices. Such offices can provide coordinated guidance and help prevent interdepartmental conflicts of interest.

There is a large corpus of literature dedicated to addressing the numerous pedagogical issues and challenges associated with how sustainability is best addressed from a teaching perspective. Some of the issues relate to the curriculum e.g. Figueiró and Raufflet (2015); Cebrián Bernat (2016) Besong (2017) and others to pedagogy e.g. Segalàs et al. (2012); Seatter *et al.* (2014); Shephard et al. (2018).

In addition to the previous authors who also cite resistance as a barrier, Hugé et al. (2018) couples it with institutional inertia, which is, in effect, resistance at an institutional level.
Other barriers which relate to the structure of HE include the "needs and expectations of staff members", (Djordjevic and Cotton 2011) and the "lack of reporting and accountability mechanisms" (Avila *et al.* 2017).

2.5.5 Barriers Related to Lack of Resources

Barriers related to lack of resources are identified by numerous authors, and appear under three broad categories: financial resources, e.g. Shriberg and Harris (2012); Aleixo (2018) lack of time (for staff engagement and training) e.g. Jones et al. (2008); Larrán Jorge *et al.* (2015); Cebrián Bernat (2014) and lack of physical resources and infrastructure, e.g. Horhota *et al.* (2014).

Avila *et al.* (2017) cite Elliott and Wright (2013) who found that among Canadian student union leaders, the greatest barrier to university sustainability was a lack of financial resources and that this was almost always the first (and main) barrier mentioned by the respondents. Obviously, funding and appropriate resources allocation are essential for the success of any

change initiative and lack of such resources is likely to be indicative of underlying issues, such as lack of senior management commitment and interest, which have been highlighted earlier. Under this heading, Verhulst and Lambrechts (2015) also identify other issues such as lack of access to information; lack of consistent legislation; lack of performance indicators and measuring instruments; as well as technical problems. While these can be construed as resource issues, they could equally be placed in either of the first two categories.

2.6 Strategies for the Implementation of Sustainability in Higher Education.

The environment, climate change and sustainability related issues are controversial and emotive topics and some have commented that "the higher education sector is one of the hardest sectors in which to institutionalize sustainability"

Junyent & de Ciurana (2008, p764).

2.61. Introduction

Organisational change is a challenging and complex task, and in addition to the challenges that every change initiative faces (engaging, motivating, and overcoming social inertia and resistance to change) implementing sustainability changes brings additional conceptual and axiological issues that must be addressed. Organisations can employ a variety of strategies to implement a desired change. A strategy here is simply defined as "a plan of action to achieve a long term or overall aim." Many implementation strategies involve a mixture of top down and bottom up elements, the level of success or failure of which is typically seen as being influenced by both organisational aspects, such as leadership commitment and resources allocation, as well as issues particular to individuals such as world view, values, commitment and subject area-discipline.

Implementing sustainability initiatives and practices in a university or other third level institution may take many forms ranging from what has been described as a holistic "whole institution approach" such as those taken at Gloucestershire University, or the Royal Melbourne Institute of Technology (RMIT) (Appleton 2017) to the more piece-meal, ad-hoc approaches (Dlouhá et al. 2017), where elements of sustainability are incorporated into modules in particular programmes by lecturers who are personally committed to the principles of sustainability and sustainable development. Again, the degree of embeddedness will be a function of many factors (as reviewed in the previous section), and how these "influencing factors" (Verhulst and Lambrechts 2015) interact with the specific dynamics of an institution will determine the particular way in which an institution will engage with

sustainability. It is beyond the scope of this project to review all of the possible approaches, but it is appropriate to identify the main approaches and acknowledge their role and contribution to promoting SHE.

A number of comprehensive literature reviews examining the promotion and implementation of SHE have been carried out in recent years (Tilbury 2008; Karatzoglou 2013; Amaral et al. 2015; Lozano *et al.* 2015; Hoover and Harder 2015; Viegas *et al.* 2016; Blanco-Portela *et al.* 2017; Appleton 2017; Thürer *et al.* 2018; Berchin *et al.* 2018; Omazic 2021). Each review explored different aspects of SHE, such as the evolving role of HE; institutional commitment and implementation; systemic drivers and barriers; the role of declaration, charters and initiatives (DCIs); and the role of international conferences.

Two of these studies Lozano *et al.* (2015) and Berchin *et al.* (2018) propose categorisation systems that can be used to describe the range of strategies used by HEIs to implement sustainability. Lozano *et al.* (2015) propose a seven-tier system including 1) Institutional framework, 2) Campus operations, 3) Education, 4) Research, 5) Outreach and collaboration, 6) On campus experiences, 7) Assessment and reporting, whereas Berchin *et al.* (2018), proposes a six-tier system, in which the first five categories are very similar to that of Lozano's System. Berchin, however, does not include "on campus experiences" as a category, which I agree with because I believe that this type of approach can easily be accommodated in the "Campus operations" category. Lozano's categories combine "outreach" and "collaboration" whereas Berchin proposes two separate categories "Outreach" and "knowledge dissemination". I propose that there is enough crossover between these two that one category title is sufficient to describe this: "Outreach and Collaboration", which will also include knowledge dissemination. Finally, I propose to add "ranking" to Lozano's last category, "Assessment and reporting." Therefore, I propose that the two systems should be merged to

form a "hybrid" system that can be represented by six expanded category definitions which I present in table 2.2.

In a separate study Lozano (2018, p5) carried out an exploratory literature review on SHE implementation and found that in the sample analysed the highest number of papers focused on education, then campus operations, policy, outreach, assessment, and reporting. There were some papers which focused on research, but very few "on campus experiences" (2 out of 62). He also pointed out that half of the papers reviewed, focused on only one of the elements, 21 focused on two elements, 3 on three elements, 3 on four, 2 on five, 1 on six, and only 1 on all the elements. This indicates that in the majority of cases sustainability is incorporated into HEIs' in a compartmentalised way, i.e., generally focusing on only one or two elements. This is also supported by findings by Buckler and Creech (2014) and Dlouhá et al. (2017), who report that the incorporation of ESD into institutional practices is often on a piecemeal and ad-hoc basis. These findings are consistent with my own literature review findings, where education, and single approach studies, were the most frequently encountered type of study on the implementation of SHE.

In a separate study, Appleton (2017) carried out a review of what she described as "Whole Institution Approaches" to sustainability in universities and colleges which focused on HEIs that were members of the Environmental Association for Universities and Colleges (EAUC). In the study she focused on the structural and strategic aspects of whole institution approaches. While the study is quite small (16 HEIs) it does provide a picture of how sustainability can be integrated across the range of HEI activities.

Strategy	Description	Examples
Institutional Framework/ Agenda	Based on the development of an institutional agenda which outline the commitments to SHE, includes policies, vision, mission, sustainability office, signing of declaration charters or Initiatives (DCIs). Includes internal monitoring and evaluation of progress.	Having an Institute "Sustainability Strategy" Signing of a declaration or charter e.g. Tailloires, Copernicus) Having a dedicated sustainability office or officer.
Campus Operations and campus greening	Campus operations: include energy use and energy efficiency, green- house gas emissions, sustainable buildings, waste, recycling, water and water management, food purchasing, transport, accessibility for disabled people, and equality and diversity, on campus SD initiatives for staff and students	Estates based approach where estates office drive sustainable operations through buildings and facilities management. Campus operations are used as exemplar for demonstration and teaching. Campus operation improvements through "Green campus" type initiatives with staff and student input.
Education and Teaching	Teaching, learning and assessment, curriculum, pedagogy, competence acquisition, integration into all programmes, dedicated courses and programmes, promoting trans-disciplinarity.	Dedicated programme and modules on Sustainability at both under-graduate and graduate level. Integration of ESD into general curriculum. Add-ons for modules and programme
Research	Research centres, research funding, holistic thinking, international recognition, SD research used in teaching, publications, patents, new knowledge and technologies, collaboration, and trans-disciplinarity;	Specialist research centres and projects.
Outreach, collaboration & Knowledge dissemination	Exchange programmes, joint degrees with other universities, joint research, SD partnerships, share the results of sustainability programs and actions. The dissemination of sustainability reports and the construction of online platforms for communication with the society.	Shared platforms with enterprises, NGO and government organisations, eg the UN Regional Centre of Expertise (RCE), SD events open to the community; Conferences seminars, workshops. Joint events (e.g. conferences seminars, workshops) with other institutions and stakeholders
Assessment, Reporting and Rankings	SHE assessment, communication, environmental reports, sustainability reports, national environmental or sustainability HEIs rankings, and international environmental or sustainability HEIs rankings.	SD integration instruments such as AISHE (Assessment Instrument for Sustainability in Higher Education) or the Global Reporting Initiative (GRI) sustainability guidelines. Eco management and Audit schemes such as EMAS or ISO 14001. University sustainability rankings
Reference to original source/category from Lozano (2015) and Berchin (2018)		

Table 2.2 Strategies for the implementation of Sustainability in Higher Education.
Modified table based on Lozano* et al. *(2015) and Berchin* et al. *(2018)

It could be argued that the "whole institution approach", i.e. having sustainability woven into all aspects of the institutional activities, is the ultimate goal of all of the other strategies, and so I had considered that it be included as an additional category. However, as there was not enough information regarding what exactly "whole institution approaches" actually are, or about the institutions reviewed in the study to confidently talk about them as having engaged with all of the 6 strategies identified, I decided against this.

Approaches that are driven by senior management are generally termed top down, whereas initiatives that are started through student initiatives are often termed bottom up. Brinkhurst *et al.* (2011) suggest that the leadership roles of faculty and staff, are also significant internal agents of change on University campuses. They posit that these stakeholders, who understand how Universities operate and function, have diverse technical expertise, and connect the institutional top and bottom, represent a powerful "middle out" transformative force, when their capacity and agency are enabled.

It is worth noting that the differences between these strategy classifications described above are not clear cut, and they are not mutually exclusive. All attempts to implement sustainability in HE will consist of a combination of one or more of these approaches. While the proposed hybrid system does have its limitations, it provides a useful comparative framework to enable critique and analysis of the merits and weaknesses of each strategy. While such an analysis is beyond the scope of this study, it is useful to have this framework to refer to in the following chapters where I analyse and discuss the findings of this study.

2.7 Implications for the study

In reviewing the literature that relates to sustainability and sustainable development terminology, I found reference to many different definitions and interpretations. For example, there are significant differences between the concepts of the "weak" and "strong" forms of sustainability, and there are also many different terms applied to various sustainability related "educations". The range of terms demonstrate that different groups have different priorities, and this can be problematic when trying to implement Institute or sector wide sustainability initiatives.

These issues of interpretation will have a clear impact on the way that stakeholders perceive the role of HE in relation to sustainability, and the way that they perceive their own roles when it comes to working on and delivering sustainability initiatives and interventions. The review identified that multi- and trans- disciplinary collaborative approaches are very beneficial when driving the implementation of SHE. Successful implementation of initiatives that require engagement from experts from a wide range of disciplines will require good communication and a shared goal, both of which are predicated on the need for a shared framework where terminology can be understood from all perspectives.

Table 2.2 provides a summary of the range of strategies that HEIs have adopted in relation to the implementation of sustainability. These range from the "Institutional framework/agenda" which outline commitments to SHE, to "Assessment, reporting and ranking", where HEIs sign up to assessment or reporting instruments such as AISHE or STARS (Sustainability Tracking, Assessment & Rating System).

The majority of the strategies identified in the literature acknowledge the contested nature of the terminology and build initiatives and interventions around this, that accept this as a challenge that must be addressed and dealt with using existing frameworks. However, none of the interventions or approaches reviewed, explore the creation of new concepts that can be used to create a new framework that can guide actions, that encourage the implementation of sustainability practices in HE.

The literature reviewed has indicated that conceptual fragmentation is a significant issue in this field, and consequently presents a serious obstacle to embedding sustainability in higher education. In response to this, I suggest that a project, that explores how concepts are collaboratively developed and refined in order to create a framework that can act as a guide to action, has the potential to address the problematic issues associated with conceptual fragmentation, while at the same time build and develop stakeholder engagement.

In the next chapter, I consider the kind of intervention that could facilitate such a project and explore its theoretical underpinnings.

Chapter 3 Theoretical framework

3.1 Introduction

In Chapter I, I outlined the research questions for the project, then in Chapter 2, I identified the relevance of these questions to the academic literature. Here, I will outline the theoretical concepts and framework that I use to analyse my empirical investigation. My project explores how sustainability can be implemented in the work practices of the teaching staff of a small third-level higher education institution in Ireland. As I have highlighted in Chapter 2, sustainability is a contested concept with numerous interpretive and axiological issues. Attempting to embed such a concept in the practices of academic teaching staff will, at a minimum, require a shared understanding of the problem and an agreed approach to the solutions. These are complex problems, and they can only be addressed by examining the narrative and circumstances of the agents who have led to the development of the existing practices. It is for this reason that I have chosen to use Cultural Historical Activity Theory as my theoretical framework. It permits the study of activity systems in the context of their cultural and historical development.

This work draws on a number of theoretical concepts and frameworks, which I will now outline along with a description of how I intend to present the chapter.

- **Activity Theory**, specifically Cultural and Historical Activity Theory (CHAT), which concerns conceptualising human activity and action, while also understanding that they are continually changing and developing. CHAT provides a dialectical framework for the theorisation of participants who change their own activity by purposefully and collaboratively intervening in social reality (Langemeyer and Roth 2006:21).

- **Activity Systems** are used to model the underlying reality of work practices and form the unit of analysis for Activity theory. Activity systems represent a purposeful, collective, sustained unit of human effort. The model used is Engeström's triangular activity system, which models activity in terms of the interrelationship between subject, object, tools, rules, community, and division of labour. The model explores the tensions between these elements and related activity systems and maps them in terms of **contradictions**.
- **Expansive Learning** is a framework for understanding change and development in activity systems. It involves the redesigning of activities to address and overcome dilemmas that are confronted in existing activity systems. It is a process theory, where activity systems are re-envisaged and recreated by participants and will be used in designing the intervention.
- **Dual stimulation** is a mechanism for problem solving and understanding how people can intentionally break out of conflictual situations, particularly conflicts of motive, that arise in activity systems (Sannino 2015a).
- The **Change Laboratory** is a research intervention methodology that aims to support a group of people to change their work practices in workshops and is built around the interlocking notions of expansive learning and double stimulation.
- **Transformative agency** is a process framework which involves collectively recognising and addressing tensions and problems in activity systems, examining them, and seeking solutions (Haapasaari, Engeström and Kerosuo 2016). It can be explored as a succession of manifestations and used for understanding how people can develop their own agency.
- **Concept formation and Development.** "Concepts can be understood as culturally evolved crystallisations of generalisations and knowledge about forms of

> variations that are important in human activities, tested in human practice." Virkkunen and Newnham (2013, p42). Concepts can be used as tools for regulating and mastering processes in human activity. The formation and development of new concepts in an organisation changes the set of alternative activities available, and thus offers new ways for producing and defining possibilities (ibid).

The concepts outlined above, underpin the theoretical framework of my project and they serve two complementary purposes. In relation to research design, I draw on the ideas and concepts associated with activity theory, expansive learning, and dual stimulation. Whereas concept development and transformative agency are then central to my data analysis.

Prior to discussing the above conceptual frameworks, I set out my ontological and epistemological positions, which underpin my understanding of how the world exists and how it can be explored. I then briefly outline my reasons for choosing activity theory and the alternative frameworks which I considered for this project, and I close the chapter with a summary and a description of the implications for this study.

3.2 Ontological and epistemological assumptions.

3.2.1 Ontological Position

My initial academic background was in life sciences, and then in engineering. I find it somewhat surprising therefore, to find myself setting out my ontological position in terms of dialectics. I would have been a "card carrying" positivist for much of my professional career as an engineer, and I must admit that I find it hard to abandon that position! However, since I started teaching, and studying education philosophy and the social sciences, I have come to

the opinion that once you leave the "physical sciences," the "scientific method" is not adequate to capture and describe the nuanced realities of the "social/psychological/cultural entities with which practitioners of the human sciences deal" (Lincoln and Guba 2016, p38). The reason is that the underlying reality of social life does not conform to the regularity assumptions that underpin the scientific mind.

A dialectics[11] ontology is a belief that 'reality consists of dialectical processes of self-movement of developing systems of interaction' (Tolman 1981, in Virkkunen and Newnham 2013, p. 30); In other words, that the world is in a constant state of flux and contradictions serve as the driving force of change and development, much as we see in Darwin's theory of evolution (Hasted 2019). Thus, the dialectic view of development defines development as the potential to overcome contradictions (Virkkunen and Newnham 2013).

3.2.2 Epistemological Position

My epistemological position broadly aligns with that of social constructivism. According to Cohen et al. (2007, p.19) the role of the scientist in the constructivist paradigm is to "understand, explain, and demystify social reality through the eyes of different participants," and this understanding can lead to the creation of new knowledge.

Yet, I wish to further refine my position and differentiate between "constructivism" (taken here to be the broader paradigmatic categorisation) which focuses on the individual and their own perceptions, and social constructionism, which is reliant on multi-voicedness and dialogue, and more accurately describes my position. Gergen (1995, pp. 98-99) argues that the difference lies in 'where and how reality is constructed', positing that the focal point for

[11] Dialectics" is a term used to describe a method of philosophical argument that involves some sort of contradictory process between opposing sides.

a social constructionist is at the 'interstices of dialogue and action'. Gergen further points out "that the social construction of reality depends upon a community of speakers/actors, who share in the repertoire of meaning provided by their culture" (ibid).

Lincoln and Guba (2016, p40) posit that "transactional subjectivism is the basic epistemological presupposition of constructivism." They argue that "the relationship between the knower and the knowable (to-be-known) is highly person- and context-specific and that "realities" taken to exist, depend on a transaction between the knower and the 'to-be-known', in the particular context in which the encounter between them takes place". These transactions are highly subjective, mediated by the knower's prior experience and knowledge (including their social position, political, and cultural values), and by the knower's interpretation (construction) of the situation. As they neatly summarise, "Knowledge is not "discovered" but rather created; it exists only in the time/space framework in which it is generated" (Lincoln and Guba 2016, p40).

Combining these ontological and epistemological positions with my over-arching interest in exploring how new knowledge could be collaboratively developed in a group context, led me to consider a theoretical framework that considers context and prior experiences in the development and co-construction of new knowledge and meaning, such as Cultural Historical Activity Theory (CHAT) or more particularly Activity Theory (AT).

I now outline the reasons that I decided to use activity theory for this project, and I also briefly mention other learning theory frameworks that I considered but discounted.

3.2.3 Reasons for choosing Activity Theory

Bligh and Flood (2017) provide an outline of the reasons for using, choosing and valuing activity theory in an empirical HE research project. Using their categorisation system, I outline why I chose Activity Theory for this project.

- Activity Theory aligns with and is consistent with my **epistemological** position. In Chapter 1, I described my interest in this project and identified the aim as exploring existing practices and changing social conditions with a view to creating new practices in which sustainability is embedded as a core principle.
- Activity Theory is ***methodologically appropriate*** as a theoretical framework for a Change Laboratory intervention. In Chapter 4, I outline and describe the methodological considerations for the design of this intervention and the centrality of Activity Theory.
- Activity Theory has a **developmental focus** and can be used to understand the process of change and transformation associated with an undertaking such as embedding sustainability in HE practices.
- Activity Theory provides a framework that can deal with and reflect the situational **complexity** of the intervention and its impacts on practice. This is of particular benefit when dealing with the issues of conceptual multiplicity in relation to meaning and the terminology associated with sustainability.
- Activity Theory has a comparative advantage over other theories as it supports the identification and aggravation of contradictions for developing social activity, as discrete from the pursuit of consensus and completion (Moffitt 2018).
- I aspire to **investigate the theory** in terms of its potential usefulness and analytical capacity in relation to the implementation of sustainability initiatives. There is a

paucity of published research work on projects where Activity Theory is used to analyse the process of embedding sustainability initiatives in HE.

3.2.4 Other frameworks considered, Action Research and Communities of Practice

Action Research is, in the words of Reason and Bradbury (2008, p4) " a participatory process concerned with developing practical knowing in the pursuit of worthwhile human purposes. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities". However for this project it was considered to be too focused on the top down influences in its approach to the pursuit of consensual dialogue and its perceived finality of outcomes (Moffitt 2018).
As Moffit notes, Action Research is unlikely to yield or sustain transformative agency, instead sustaining the existing political status quo through participants seeking consensus and compromise (Al-Haddad and Kotnour 2015). In Action research, the participants would also have focused on individual tasks rather than collaborative and societal activity (Virkkunen, 2006, p44), which was likely to result in isolated or disjointed change endeavours, rather than engaging in expansive learning and the development of new concepts, which are central to this project.

Another framework which I considered was Wengers' (1998) Community of Practice Theory. The theory posits that communities of practice share specific structural attributes (Tummons 2012), namely mutual engagement (how they interact), 'joint enterprise (mutual endeavour); and shared repertoire (habits, discourses, routines, ways of talking, tools, structures and other artefacts) (Wenger 1998). While this framework could be applicable to the task of exploring how a group of people can embed sustainability in small HEI setting, it is not

designed to explore the development of new concepts or transformative agency. Hasted (2019) cites Engeström's (2007) critique of Wenger in relation to the 'ahistorical' weakness to the argument, i.e. the lack of situating communities in the history of real societies and patterns of work. This is of particular significance in relation to sustainability education practices which have been evolving independently among different groups over many years.

3.3 Cultural Historical Activity Theory (CHAT) and Activity Theory

Many of the concepts used in Activity theory originated in Russia in the 1920s. These concepts did not receive much academic attention from Western Scholars until the post-cold war "social awakening" (Daniels, Cole and Wertsch 2007). The traditions of CHAT and AT are historically linked to the work of Russian Psychologist Lev Vygotsky, and are "attempts to provide an account of learning and development as a mediated process". (Daniels, Cole and Wertsch 2007, p2).

According to Sannino (2011) activity theory

> *"may be traced back to Marx's idea of revolutionary practice, emphasizing that theory is not only meant to analyze and explain the world but also to generate new practices and promote change."*

"It provides a framework within which to understand object-oriented, collective, and social environments" (Engeström, Miettinen and Punamaki 1999). CHAT has developed from the works of Lev Vygotsky and Alexei Leontiev, who challenged the then dominant theories of behaviourism with the intention of developing a non-deterministic theory of consciousness to improve the human condition (Moffitt 2018).

Since the 1980s, researchers such as Michael Cole and Yrjö Engeström have further developed AT to "*develop conceptual tools to understand dialogue, multiple perspectives, and networks of interacting activity Systems*" (Engeström 2009). Engeström refers to this as "third generation" activity theory and he sees it as the "applications of activity systems analysis in developmental research where the investigator often takes a participatory and interventionist role in the participants' activity to help participants experience change" (Yamagata-Lynch 2010, p23).

Third generation CHAT is often understood in terms of five key principles, as outlined by Engeström (2001). These principles are: collective and object oriented activity; multi-voicedness; historicity; contradictions: and expansive learning.

Before I outline the principles of CHAT (see sections 3.3.1, 3.3.2,3.3.3,3.5 and 3.6), I will briefly discuss AT in terms of its interpretation as Theory and as Methodology.

According to Maxwell and Mittapalli (2008 p876) "a theory, in both everyday and scientific use, is normally used to denote a model or set of concepts and propositions that pertains to some actual phenomena; a theory can provide understanding of these phenomena or form the basis for action with respect to them". Activity Theory fits this categorisation because it attempts to model activity systems and uses a set of interrelated concepts and relational propositions to describe activities and activity systems. Hashim and Jones (2007) posit that AT is a theoretical framework for the analysis and understanding of human interactions, through their use of tools and artefacts.

As theory, AT has many uses. In a study on the use of AT in empirical HE research, Bligh and Flood (2017) found that AT was frequently used for the purposes of abstractioning (categorising phenomenon with reference to particular aspects), explanation (providing concepts taken to underpin some phenomenon) and for contextualisation (positioning a phenomenon against some wider backdrop), but it was rarely used as a hypothetical or normative theory and never used in the context of predicting or forecasting outcomes.

AT can also be considered to be a process theory, which focusses on change and development. It has a particular emphasis on questions of "how", such as how change emerges from attempts to overcome contradictions in activity, or how joint subjectivity is developed.

Hashim and Jones (2007) also propose that AT offers a holistic and contextual method of discovery that can be used to support qualitative and interpretative research. They also point out that AT "is particularly relevant in situations that have a significant historical and cultural context and where the participants, their purposes and their tools are in a process of rapid and constant change" (ibid p1). This application as a method for understanding group activities undergoing change is central to the Change Laboratory methodology used in this project, where activity theory is used to analyse activities by (a subset of) the stakeholders involved in the activities under consideration, with the aim of allowing those stakeholders identify and implement avenues of a change in the activity system.

Yet activity theory is not just a set of concepts, Activity theory also refers to a community of researchers who have focussed on using and developing the theory for several decades (clustered for example around the International Society for Cultural historical Activity Research [ISCAR] and journals like Mind, Culture and Activity). It is noticeable that a core priority for that community has been to use activity theory in the pursuit of research interventions: in particular, designing methodologies that use the theory to create new

concepts and develop the participants agency, as exemplified in the Change Laboratory methodology (Bligh and Flood 2015).

The primary focus of the work described in this thesis is on exploring how to embed sustainability practices into a HE setting, through the creation of new concepts and the development of participant agency. Thus, the main contributions to knowledge are related to the literature that discusses the relationship between sustainability and higher education. However, this study also makes a contribution to the broader field of Activity theory in terms of drawing out and exploring the relationship between the creation of new concepts (see Section 3.9) and the development of participants agency (see Section 3.7). Researchers in the Activity Theory community will likely find the relationships I highlighted between concept development and transformative agency of interest when reading this work.

3.3.1 Collective and Object-oriented activity

Vygotsky's ideas about the cultural mediation of actions paved the way for a new understanding of the relationship between culture, society, and individual agency. Objects took on new meaning and "became cultural entities and the object orientedness of action became the key to understanding the human psyche" (Engeström 2001,p134). Leontiev developed the organisational and hierarchical structure of activity by differentiating between three concepts: collective activity, individual actions, and operations. For Leontiev, activity refers to collective and sustained effort regulated by an object of activity (the motive) and having both sense and meaning (Bligh and Flood 2015). Leontiev suggested that activity generates actions, and that actions derive their meaning from their place within activity (ibid). Actions are divisible into lower level units called operations which are routine processes providing an adjustment of an action to an ongoing situation, which may be described as the condition (Kaptelinin and Nardi 2012). Engeström (2016) cites Leontiev's example of a tribal

hunt to illustrate the relationship between activity (hunting), division of labour, and the actions required. One group chases the game (action: chasing) towards another group that ambush and kill the game (action: killing) in the collective activity of hunting. The duration of the actions are finite, with a definite beginning and end. The collective activity of hunting on the other hand, reproduces itself without a predetermined endpoint by generating seemingly similar actions over and over again.

The relationship between these three concepts is illustrated below in Fig 3.1

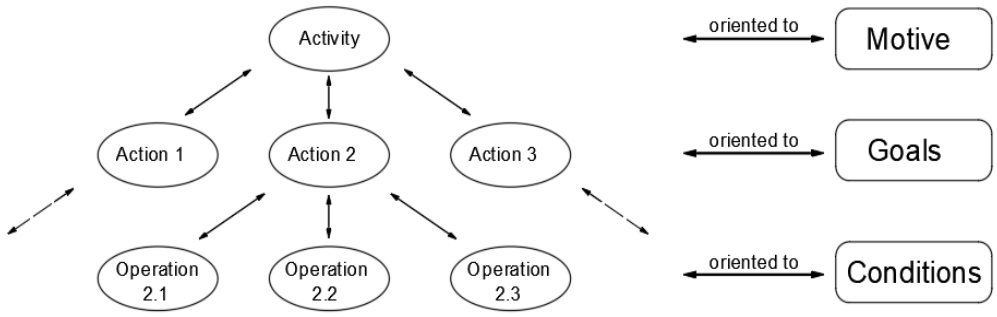


Figure 3.1 Hierarchical structure of activities (taken from Kaptelinin and Nardi 2012, p.28)

"According to Leontiev, object-orientedness is the constituting characteristic of activity" (Engeström, Miettinen and Punamaki 1999, p339).

Activity systems realise and reproduce themselves by generating actions and operations (Engeström 2001). An activity will be associated with a number of actions, each of which will in turn, consist of a number of operations. The separation between actions and operations is relative rather than absolute (Kaptelinin and Nardi 2012) and an action may become an operation once is has been automized. An action can also be associated with more than one activity, but action is given meaning by the activity with which it is associated.

3.3.2 Multi-voicedness

The second principle is the multi-voicedness of the activity systems. An activity system is always a community of multiple points of view, traditions, and interests (Engeström 2001). Participants in an activity will have diverse experiences and goals. Multi-voicedness relates to the different experiences that participants have because of their varied interactions with objects, rules, and division of labour. "Participants also carry their own diverse histories, and the activity system itself carries multiple layers and strands of history engraved in its artifacts, rules and conventions" (ibid, p136). In interacting activity systems, multi-voicedness is multiplied and it is a source of trouble and innovation, uncovering and aggravating contradictions which demand actions of translation and negotiation to be resolved.

3.3.3 Historicity

The third principle is historicity. Activity systems develop and are transformed over long periods of time. The interrelationships between the subject, rules, and divisions of labour will have developed in response to challenges that arose during the creation of the activity system. The narrative of these rich interactions tell the story of the activity and provide means for understanding current problems and future potential (Engeström 2001).

Knowing is inseparable from doing in the historical context of activity (Nicolini, Gherardi & Yanow 2003, p8), with artefacts carrying markers of successive historical influences (Blackler 2009, p31). This research examines how academic staff can embed the concepts of sustainability into their practices. To meaningfully explore this question, it is essential to examine how the current practices and activities came to be, and what influenced the development process. Thus, historicity is fundamental in progressing from the abstract to the concrete, theoretically tracing the origins of activity's most simple explanation (Engeström

et al. 2014, p122). This genesis is described as a 'germ cell' is the most simple representation capable of developing (Vygotsky's and Davydov's work on germ cells is discussed by (Daniels 2007, p314). In CHAT, the germ cell is enriched to expose contradictions whilst examining concretisation. When abstract concepts are concretised, their links with other phenomena are better appreciated, generating further contradictions (Moffitt 2018, p29).

3.4 Activity Systems

Engeström's model is a development of Vygotsky's mediated triangle model of action (Subject-Artefact-Object), which considers the inter-related processes of production, distribution, exchange, and consumption. Engeström considers that Vygotsky's original Subject-Artefact-Object model only represents the directly productive aspects of activity and overlooks other aspects that are socially mediated Bligh and Flood (2015).

The diagram below graphically illustrates Engeström's triangular Activity Systems model.

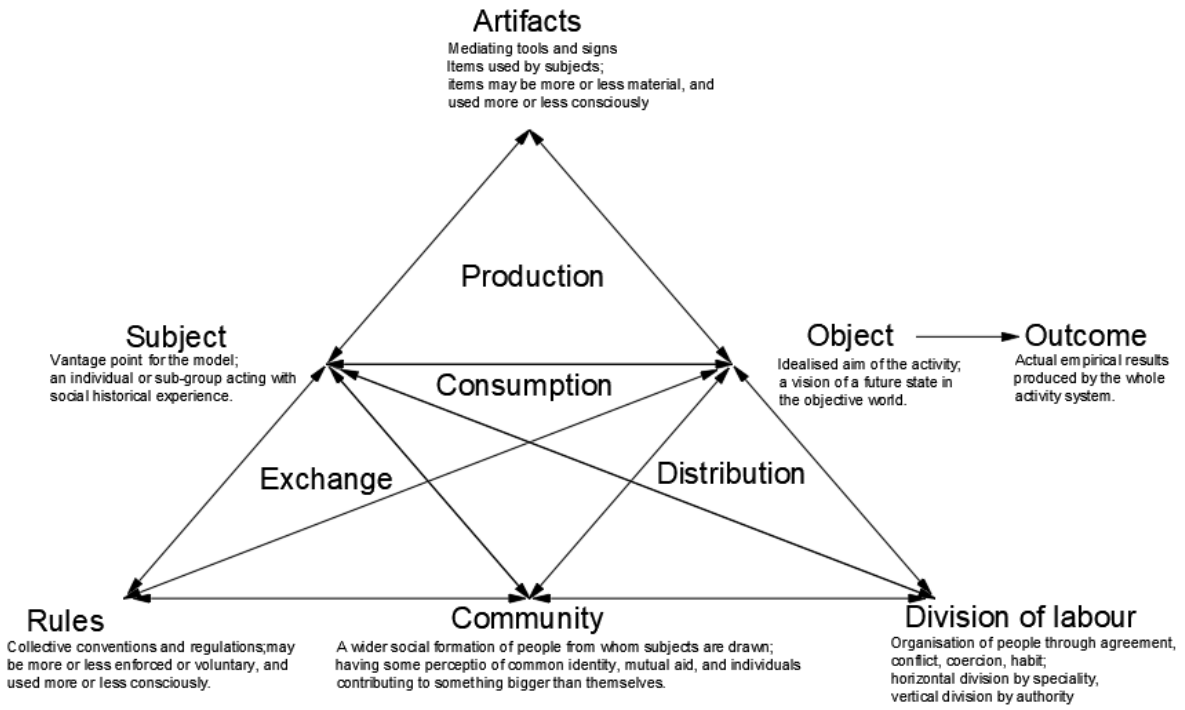


Fig 3.2* Engeström's *triangular Activity System describing the structure of human activity*. (Bligh and Flood 2015) used here as the u*nit of analysis

The model consists of four sub-triangles (referred to as functions from now on). At the top of the diagram is the Subject-Artifacts-Object triangle which represents the basic relationship between the subjects (people carrying out the activity); the object (the purpose of the activity); the mediating artifacts (culturally evolved tools and signs); and the outcomes (intended and unintended consequences of the activity). The three other triangles represent the functions, distribution, exchange, and consumption.

- distribution: the division of objects, artefacts, and people according to social regulations (as a mediated triangle community→division of labour→object);
- exchange: the further division of objects, artefacts, communication, and interaction according to individual need (subject→rules→community);
- consumption: the use of a product to satisfy a human need (community→subject→object).

Bligh and Flood (2015).

A crucially important consideration with this model is that it must be understood as an inter-related, dynamic system rather than a list of static composite elements (Bligh and Flood 2015). Engeström (1987) places mediation and activities evolving, dialectical and dynamic nature at the vanguard of CHATS activity system model (Moffitt 2018). This is illustrated by the triadic nature of each of the system's functions.

In terms of this project, Figure 3.3 illustrates the Change Laboratory intervention carried out on the Mayo Campus represented as an idealised activity system, using Engeström's *triangular*

Activity System model. The diagram represents how the project was initially conceived and serves as a useful illustration of how the activity system model can be used to describe human activity. How the project actually unfolded is of course, the focus of subsequent chapters of this thesis. The figure is an idealised illustration of how the campus activities can be represented using Engeström's triangular Activity System model, with the subjects being the researcher- interventionist and the CL participants together, and the object being how to transform existing campus activities.

The object relates directly to the main research question, which at the initial stage concerned exploring how a change laboratory research intervention can be used to foster sustainability in higher education.

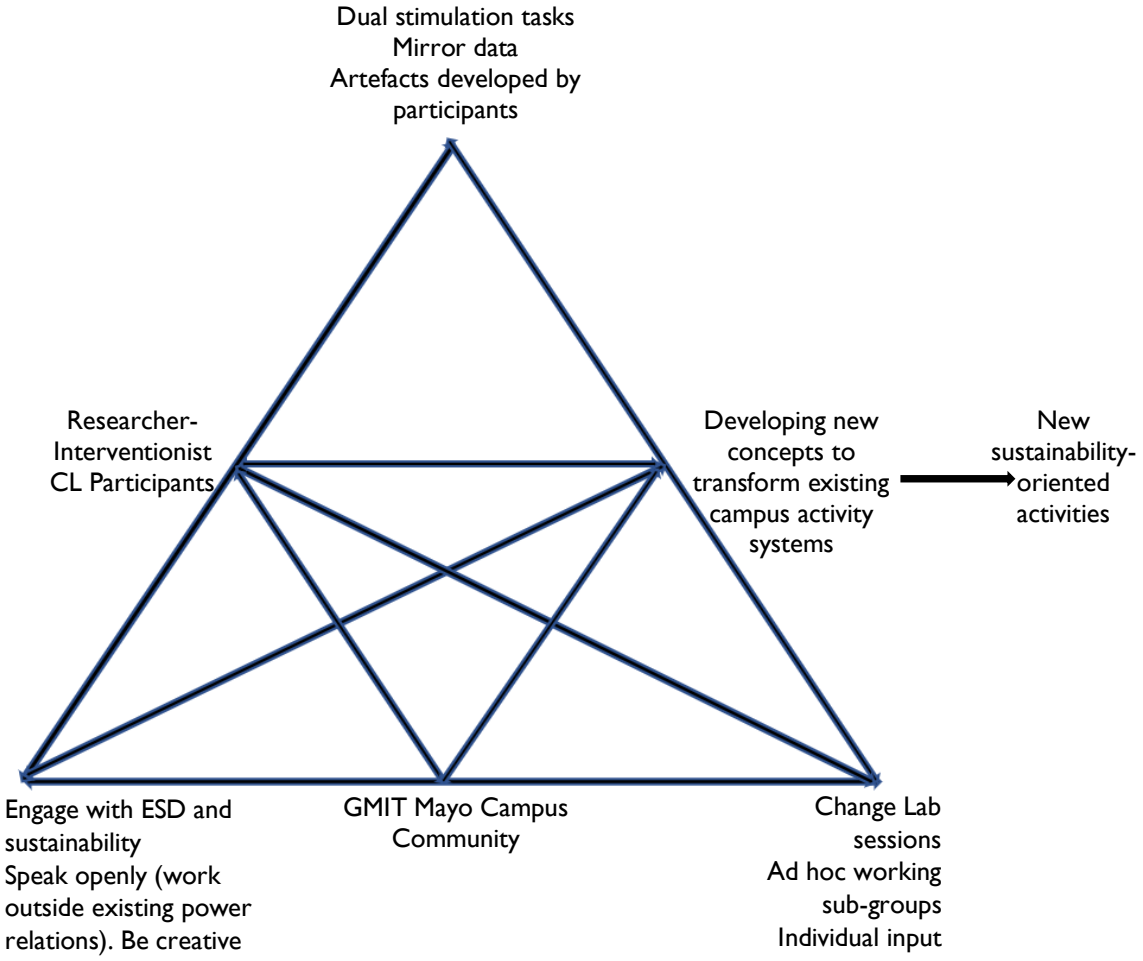


Figure 3.3 Mayo Campus Change Laboratory modelled using Engeström's *triangular Activity System model.*

It should be reinforced that Figure 3.3 represents an initial conceptualisation of the project, because as the project proceeded, the research questions evolved and became more refined and nuanced.

Activity systems evolve through development and change and Engeström suggests that systemic contradictions drive these changes. People experience contradictions in activity systems as a variety of disturbances: as dilemmas, conflicts, inner doubts, or double-binds (Virkkunen and Newnham 2013). In order to overcome these contradictions, people change their activity system. Thus, CHAT's activity systems model can be used to analyse how activity, iteratively and "continuously changes and is changed by its own elements through time and circumstance" (Moffitt 2018, p 25).

3.5 Contradictions

Contradictions are one of the five key principles of CHAT, specifically their importance in driving change and development. Systemic contradictions and tensions are inherent in human activities and do not occur accidentally or arbitrarily (Engeström 1996). They influence human activity by bringing pressures that can encourage development, stunt development, or become the reason for changing the nature of an activity (Engeström 1993). They are seen as *systemic underlying issues* that manifest themselves in people in various ways and have particular implications for change and dialectical analysis. They define interdependent, mutually defining, and historically accumulating layered tensions in activity, which arise in particular socio-historical conditions (Moffitt 2018). In CHAT, contradictions are collaboratively abstracted from data such as audio and visual (AV) media and jointly created artefacts, which are exposed and aggravated by analysing their manifestations (Engeström and Sannino 2011, p372)

"Contradictions are not the same as problems or conflicts. Contradictions are historically accumulating structural tensions within and between activity systems. The primary

contradiction of activities in capitalism is that between the use value and exchange value of commodities. This primary contradiction pervades all elements of our activity systems." (Engeström 2011, p608)

Contradictions may not be directly apparent but require sustained effort for aggravation and exposure (Moffitt 2018). They are considered systemic features of activity that are manifested in subjective experience (as dilemmas that people experience), however, to analyse their systemic form requires further in-depth analysis, and interventions can be used to further aggravate them as a precursor to change. In activity theory, Engeström suggests that a hierarchical order of contradictions can be distinguished, in which they can be conceptualised in four forms (Bonneau 2013, p10) illustrated in Figure 3.3 all of which can form the starting point for formative interventions (Postholm 2015 p.51).

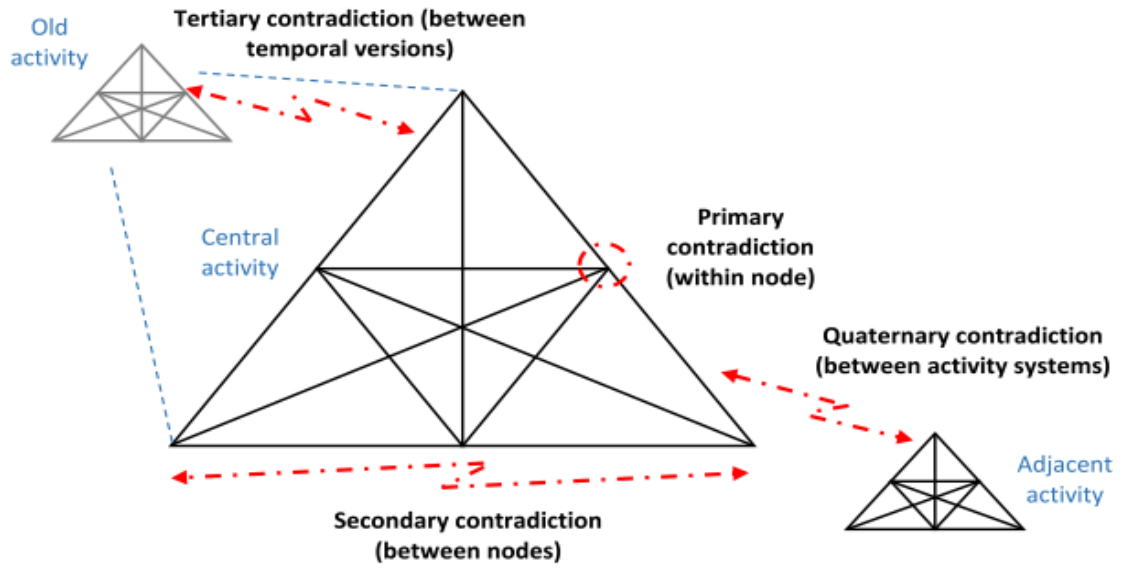


Figure 3.4 Examples of contradictions within and between a generic constellation of activities, known as an "activity setting" adapted by Moffitt (2018) from Yamagata-Lynch (2010, p24)

To illustrate the difference between the four types, I will use teaching a business module as an example of an activity system, where the required change is the incorporation of sustainability principles and content into the module.

As illustrated in Fig 3.4, **primary contradiction** are within elements of the activity, often value-system conflicts within capitalism, the contradiction is typically between a pole of use-value for practitioners and one of exchange-value in some market (Bligh and Flood, 2015).

In this case, sustainability could be considered as having a high use value by enabling students to have better awareness of an increasingly important global issue, but traditionally, it would not be seen as having a high exchange value for business graduates and might not be valued within the assessed outcomes of the course. The contradiction is between the need to incorporate sustainability into the course because of its benefits to the world, versus the need to cover the existing curriculum content and meet accreditation outcomes.

Secondary Contradictions are identified between elements of an activity system. A change in the required output (object), for example, might generate secondary contradictions with other activity nodes such as mediating tools (different artefacts would be required for teaching) and division of labour (existing programme schedules and timetables versus new timetabling requirements)

Tertiary contradictions would exist when moving between versions of the activity, and a number of versions may be required to finally get to the required output.

Quaternary contradictions. The new activity may generate contradictions with other teaching activities where sustainability is already addressed or where it is challenged.

In this research, the notion of contradictions is highly relevant, as sustainability, ESD, and ESD related pedagogy are the subject of a wide range of differing views. Engineers are likely to see sustainability in a different light to businesspeople or accountants and each may have their own take on how best the sustainability agenda can be served in HE.

Contradictions are theoretically differentiated from dilemmas and associated phenomena using conceptions by Putnam et al. (2016 p.63). Many of these describe how contradictions are subjectively manifested, and are summarised in Table 3.1

Notion	Theoretical features	Seminal works
Contradictions	Mutually interdependent and mutually defining layered tensions in activity systems, arising from socio-historical conditions. Purposefully exposed and aggravated, as drivers of development and change.	(Putnam 2013)
Dialectics	The notion (and study of) interdependent syntheses of opposing forces in social activity, exhibited as moments about opposing poles. Studied as the simultaneous reliance of binary opposites in activity	Langemeyer & Roth (2006, p31)
Dilemmas	Reproduced and socially shared expressions, describing perceptions of subject's incompatible experiences and observations in activity	(Yamagata-Lynch, 2007, p456)
Paradoxes	Contradictions which are persistent through time, with unresolved conditions driving apparently irrational behaviours in activity	(Fairhurst *et al.*, 2016,p 173)
Conflicts	Exhibitions of behavioural resistance, disagreement or criticism in reaction to perceived or real incompatibility, termed critical conflicts when they result in a point of paralysis.	(Behfar *et al.*, 2008, p170)
Double Binds	Processes in learning and work where participants repeatedly face equally unacceptable alternatives, which cannot be resolved with existing activity.	(Schulz, 2008, p 457)

Table 3.1 Features and implication of contradictions, dilemmas, dialectics, double binds and paradoxes *(adapted from Putnam et al. 2016, p70 and Engeström & Sannino 2011b, p368)*

In this research three of these notions are of particular interest, conflict, dialectics and contradictions. As you will see later in the following chapters (e.g. Section 6.3.1.1), the initial suggestions to develop a mission statement for the campus elicited conflicting views among the CL participants (resistance and disagreement) which identified underlying contradictions.

Exposing and aggravating these contradictions provided a starting point and an opportunity to engage in dialectical discourse and explore and consider the development of new activities and solutions.

In the remainder of the thesis, and particularly in Chapters 5 and 6, many examples are provided of participants encountering dilemmas and engaging in conflict, and it was recognised from the outset that this was a legitimate and important aspect of the project rather than something to be avoided.

Moving beyond contradictions and transforming the activity in the context of its historical development is the fifth principle of CHAT and is known as expansive learning (Engeström 2001)

3.6 Expansive learning

Expansive learning is a systemic change where the object of the activity is changed ("expanded"). Effectively, it is the activity system that "learns", though it profoundly changes the people who participate. It is often seen as generating new concepts and agency among the participants. Engeström (2008) suggests that expansive learning should be understood as the "construction and resolution of successively evolving tensions or contradictions in a complex system" (p 131). It can be considered a means of conceptualising workplace learning which supports organisational change (Engeström 2014). When systematically applied in the context of a change laboratory intervention, this "resolution of successfully evolving tensions and contradictions" (Engeström 2008) equates with progress towards achieving the desired change in work practice. Engestrom has also described expansive learning as "learning what is not yet there" (Engeström, 2014).

Engeström and Sannino (2010, p 7) describe "the 'what' of expansive learning as consisting of a triplet: expanded pattern of activity, corresponding theoretical concept, and new types of agency." Thus, successful engagement with expansive learning results in: the development of new activities which can be modelled as just outlined; the creation of new concepts which, I will discuss further in a later section; and transformative agency, which I discuss in the next section. Because of the new conceptual development associated with Expansive learning, it is frequently referred to in the context of ascending from the abstract to the concrete, and this will also be discussed in the concept development section.

Engeström's work suggests that expansive learning follows a cyclical pattern that includes the following actions (Bligh and Flood, 2015):

1. *Questioning and criticising*: people reject established wisdom, current practices, and existing plans;
2. *Analysis*: this has two related components, examining the historical reasons and causes for the present situation and identifying explanations of the existing order. Historical-genetic analysis traces the origins and evolution of activity to understand how past development led to the current situation. Actual-empirical analysis identifies the inner systemic relationships of activity, in order to explain the current situation;
3. *Modelling*: people pose a new, simplified model that aims to explain the situation in a public form and to suggest potential solutions;
4. *Examination*: people work with the model (in discussion or in practice) to better comprehend its dynamics, potential, and limitations;
5. *Implementation*: people render the model more concrete by applying it practically and conceptually, thereby enriching and extending it;
6. *Process reflection*: people evaluate their current process, generating critique and identifying further requirements;
7. *Consolidation and generalisation*: people attempt to embed stable forms of new practice.

The cycle of expansive learning is graphically illustrated in Figure 3.4 below.

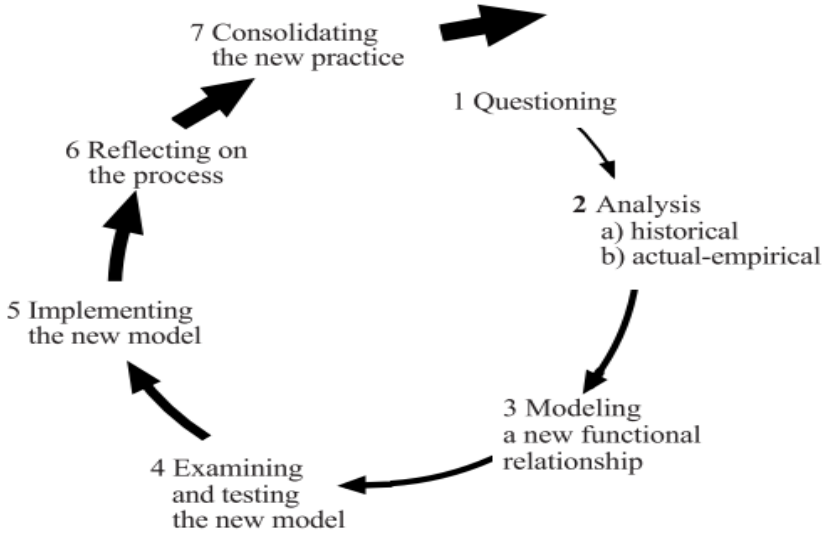


Figure 3.5 The cycle of expansive learning
Adapted by Virkkunen & Newnham 2013, taken form Engeström et al. 1999 p384)

This research intervention is based on the Change Laboratory methodology which is designed to foster expansive learning through a structured and iterative process (see Section 3.8).

3.6.1 Dual Stimulation

Dual stimulation is a Vygotskian principle and methodology, which uses artefacts and tools to stimulate learning. It is based on Vygotskys' work (1978) around the function of mental stimuli in childrens' learning. In its simplest form, dual stimulation involves a primary stimulus, which is the task to be addressed, often described as the problem to be solved, and a secondary stimulus which is a (neutral) tool or artefact that is introduced to help solve the problem. The second stimulus provides support to address conflicting motives that the first stimulus uncovers, and both stimuli are discursively combined to build agency (Sannino 2015b).

Dual stimulation has a number of key features. In addition to being a method, it is "a principle of volitional action, which distinctly characterises all higher mental functions." (Sannino 2015b,

p2). It also comprises conflictual aspects, particularly conflicts of motive and it is the resolution of these that make dual stimulation particularly interesting and useful when exploring the development of agency (ibid). Examples of double stimulation include: tying a knot for the purposes of remembering (Vygotsky 1999); the throwing of dice (Vygotsky 1960 and1997); the use of a clock in Lewin's famous waiting experiment (Vygotsky 1987); and the use of a cheat sheet by students to improve exam performance (Daniels, Cole and Wertsch 2007, p367).

To appreciate the role of the second stimulus in the dual stimulation approach, another Vygotskian concept must be introduced: that of the zone of proximal development (ZPD). Vygotsky posited that there is a (learning) zone between what a learner can do (alone) and what they cannot do without help. He termed this the ZPD, and it represents the zone where a person can learn to solve problems with the help of some outside influence or factor. In a formative intervention such as a CL, this external influence is provided by the introduction of the second stimulus. The participants do not focus directly on the second stimulus per se, but rather on its potential to mediate the task at hand (the first stimulus). Thus, the introduction of the second stimulus aims to increase the volition of the participants and thus move them further on in their ZPD.

Dual stimulation is used by participants in formative interventions to break out of critical conflicts in work and learning (Moffitt 2018). In formative interventions "double stimulation as the core mechanism, implies that the participants gain agency and take charge of the process" (Engeström 2011, p606). Dual stimulation can be considered as the primary means by which transformative agency is achieved (ibid), which will be discussed in the next section. The use of dual stimulation is important here, because this project is designed around a succession of dual stimulation tasks, set out in the Change Laboratory methodology, which I will discuss further in the section below and in the following chapter.

3.7 Transformative Agency

Within the framework of activity theory, Virkkunen (2006) defines transformative agency as collaboratively "breaking away from the given frame of action and taking the initiative to transform it" (p.49). According to Haapasaari et al. (2016) it is "produced and maintained in collective change efforts and evolves over time (p232)". Engeström et al. (2014) points out that:

> "Transformative agency *differs from conventional notions of agency in that it stems from encounters with and examinations of disturbances, conflicts, and contradictions in the collective activity". Transformative agency develops the participants joint activity by "explicating and envisioning new possibilities" (p 124).*

Transformative agency was considered important for this project, because the aim of the project is to explore and break out of existing practices and develop new ones that embed sustainability in the practices of the academic staff in the Mayo Campus. Developing new practices involves engaging with the challenges and barriers identified in Section 2.5, such as issues concerning terminology, and intra-institutional and disciplinary fragmentation. This intervention sought to develop participants' transformative agency through engagement with a series of dual stimulation tasks, undertaken as part of an expansive learning process (in a Change Laboratory intervention), as theorised by Engeström *et al.* (1996).

3.5.1 Manifestations of Transformative Agency

Haapasaari et al. (2016) expand on an earlier typology by Engeström (2011) and identify six types of expression of participants' transformative agency, which are specific to and characteristic of CL interventions (ibid):

- Resisting the management or the interventionist, which may involve questioning, opposition or rejection.
- Criticising the current activity and organisation and identifying problems with the current ways of working.
- Explicating new possibilities or potentials in the activity.
- Envisioning new patterns or models of the activity.
- Committing to concrete actions aimed at changing the activity. This is typically manifested in the use of commissive speech acts (Sannino 2008, p247).
- Taking consequential actions to change the activity.

These expressions inform later chapters, where I study how participants in a Change Laboratory engage in expansive learning through processes of formation of transformative agency (Haapasaari et al. 2016).

3.5.2 Turning points

In the context of transformative agency, a turning point (Virkkunen 1995) can be defined as "a qualitative change in the nature of the participants' discourse and a jump in the quantity and quality of their expressions of transformative agency." (Haapasaari 2016, p 243). A turning point may lead to a narrowing or a widening of the discussion (Haapasaari et al. 2014) and participants may begin to outline the object of their activity in new ways (Kärkkäinen (1999). Indicators of turning points are disturbance clusters with an intensified interplay of voices (ibid) and can indicate significant events in the development of transformative agency.

3.8 The Change Laboratory Methodology

Having outlined my epistemological and ontological assumptions and the main objective of my research interests I required a methodology that is theoretically commensurate these and the Change Laboratory provides this. The centrality of Cultural Historical Activity Theory and its focus on the historical development of activity systems make the CL an ideal choice for an intervention which aims to explore and develop new activities in an institutional context. As Virkkunen & Newnham (2013 p43) point out "The central theoretical concept in the Change Laboratory, the general model of the organization of human activity, (Engeström's triangular activity model) is an instrument for theoretical thinking about the development and developmental possibilities of the practitioners' activity, as well as for modelling its structure and inner contradictions". Daniels, Cole and Wertsch (2007 p370) point out that "The Change Laboratory method develops work practices by the participants in dialogue and debate among themselves, with their management, with their clients, and not least – with the interventionist researchers. It facilitates both intensive, deep transformations and continuous incremental improvement. "

Bligh and Flood (2015) suggest that the Change Laboratory is intended to comprise an intervention-research methodology which is closely coupled to both expansive learning and activity theory. It is an attempt to facilitate expansive learning, and an opportunity to enrich underlying theoretical perspectives by testing them in practice and is therefore an example of the practical-critical activity of ascending from the abstract to the concrete that underpins the dialectical materialist approach to knowledge production.

My methodological and theoretical considerations were largely influenced by the prescriptive guidance given by Virkkunen & Newnham (2013) but also, from applied examples such as

those described by Postholm (2015); Bligh and Flood (2015); Moffitt (2018); Hasted (2019); Pattison (2020).

The Change laboratory methodology is notable for its ability to oscillate between aspects of top down and bottom up thinking (Bligh and Flood 2015) and this makes it an appropriate choice for my research project, as it is an intervention where staff and management will work together to jointly develop new concepts and activities.

3.9 Concept Development

Creating new forms of activity through the expansive learning cycle (ELC) requires and involves the creation of new conceptual models and concepts. Virkkunen and Newnham (2013) distinguish between two types of concepts: empirical and theoretical. Empirical concepts (classificatory) or notions, are "used to describe, catalogue, relate, and subsume, in definitions what is immediately given and perceivable" (ibid, p42). However, theoretical concepts (also known as design concepts) are associated with higher levels of intellectual activity and "model an organization of functional relationships of interaction that form a system." (ibid). It is the formation and development of this type of concept that is of interest to this project. The principle of developing a concept from a "germ cell", (a unit captures the minimal combination of internal relationships and the unity of opposites that still manifest the qualities and the dynamic of the whole (Davydov 1990; Engeström, Nummijoki and Sannino 2012)) is known as ascending from the abstract to the concrete (reification). It involves a stepwise historical process of developing detailed knowledge of a complex phenomenon and its attendant interconnections (Virkkunen and Newnham 2013) and as previously outlined, is an underlying principle of expansive learning.

In order to develop a concept, the "entire aggregate of knowledge about the objects to which the given concept pertains" must be mastered (Davydov 1990, p12). Concepts develop as the knowledge and understanding of them expand (ibid).

From a terminology point of view, it is worth noting that Daniels et al. (2007) and Engeström (2020) refer to the terms "scientific concept" and "everyday concept" to describe what I have identified (based on Virkkunen and Newnham (2013)) as "theoretical" and "empirical" concepts. When identifying the characteristics, strengths, and weaknesses of each type of concept, Daniels et al. (2007) proposes that concepts develop simultaneously from two opposing directions. On the one hand, descending from the direction of the general verbal definition of the scientific concept to the concrete phenomenon which the concept represents, while on the other hand, ascending from the domain of personal experience to conscious awareness, abstraction, and generalisation. He further suggests that "true concept" development only takes place when the theoretical learning of scientific concepts "connects" with spontaneous concepts formed in empirical learning[12]. Further detailed analysis and critique of concept development are provided by (Daniels et al. 2007) and (Engeström 2020).

Simply put, one can say that empirical concepts enable the mastery of existing practices, but theoretical concepts are also needed for the creation of new practices (Virkkunen and Newnham 2013).

[12] "Vygotsky's followers developed a doctrine of two types of learning: empirical and theoretical. Empirical learning is based on a process of comparing a number of different objects, picking out their common observable characteristics, and, based on this, formulating a general concept about this class of objects" (Karpov and Bransford, 1995). In this case it is taken to mean learning from everyday practical experiences.

3.10 Implications for this study.

The preceding sections have introduced and described the theoretical framework that will guide this study. I have outlined how I perceive the world to be understood and how I understand the generation of knowledge. In the next chapter, I consider how such a theoretical framework can be used to frame and design a Change Laboratory research intervention aimed at exploring the relationship between concept development and the development of participants transformative agency, focused on fostering sustainability practices in a HE institutional setting.

Chapter 4 Methodology

4.1 Introduction

In Chapter 3, I outlined my ontological and epistemological positions, the reasons for which I had decided to use the CL methodology, the theoretical frameworks that underpin the CL, and the analytical lens that I will use to analyse the data in the following chapters. In this chapter, I outline the CL methodology, and how I applied it to the design of my own project. In the following sections, I discuss these issues, which include site and participant selection, data collection, data analysis, and finally the limitations of the research design.

The Change Laboratory is a prescriptive iterative, researcher facilitated, group-work based intervention. The intervention was carried out from January 2016 to May 2106 and involved an introductory session, and 8 formal CL workshop sessions. In addition to the sessions, there were a number of "sub-committee" meetings that were held outside of the main sessions. An introductory session was held in December 2015, in which the process was explained to the prospective participants, and they were introduced to the theory and practice of the CL.

4.2 The Change Laboratory Methodology

The reasons for choosing the CL and the associated underlying theoretical framework have been outlined and discussed in Chapter 3. Here I am going to outline the methodology and how it links with the overall aims of my project.

The methodological approaches to the CL intervention used in this research were largely based on the principles outlined in 'The Change Laboratory-A Tool for Collaborative

Development of Work and Education' (Virkkunen, J. & Newnham 2013, pp.10-11). According to the authors

> *"The Change laboratory method is not aimed at producing just an intellectual solution or a change of practice, but also at building up the practitioner's collaborative transformative agency and motivation based on a new understanding of the idea of the activity and a new perspective of its future development."*
>
> *…."the purpose of the intervention is not only to create a change in the activity but also, and more importantly, to deepen the understanding of the nature and causes of the problems in it. A successful CL intervention thus leads to a reconceptualization of the problems and a new understanding of the activity thereby also bringing to the fore the other aspects of its effectiveness and efficiency*
>
> *….At its best, a CL intervention produces new concepts and solutions, the utilisation of which, takes time, and requires further work."*

The research questions concern fostering sustainability in higher education practices. As outlined in the literature review, this is a complex challenge, and many different approaches have been tried to achieve this. Sustainability education and ESD require a holistic and multi-disciplinary approach. The area is relatively new and, as yet, could be considered "uncharted waters" in the Higher education curriculum Ryan & Tilbury (2013).

The CL with its prescriptive, yet flexible, approach offers a unique opportunity to answer the research questions. The CL is prescriptive in that it sets out a format and methodology that is to be used to address a particular problem. It is flexible in the sense that the participants can work together to create new understanding and knowledge about the problem at hand. For complex issues such as sustainability and ESD, this methodology offers great potential because of its collaborative approach, which is predicated on input from a variety of stakeholders.

4.2.1 Recommended Change Laboratory Methodology

The format used for each session is based on the methodology outlined by Virkkunen & Newnham (2013). Typically, they recommend the format illustrated in Figure 4.1.

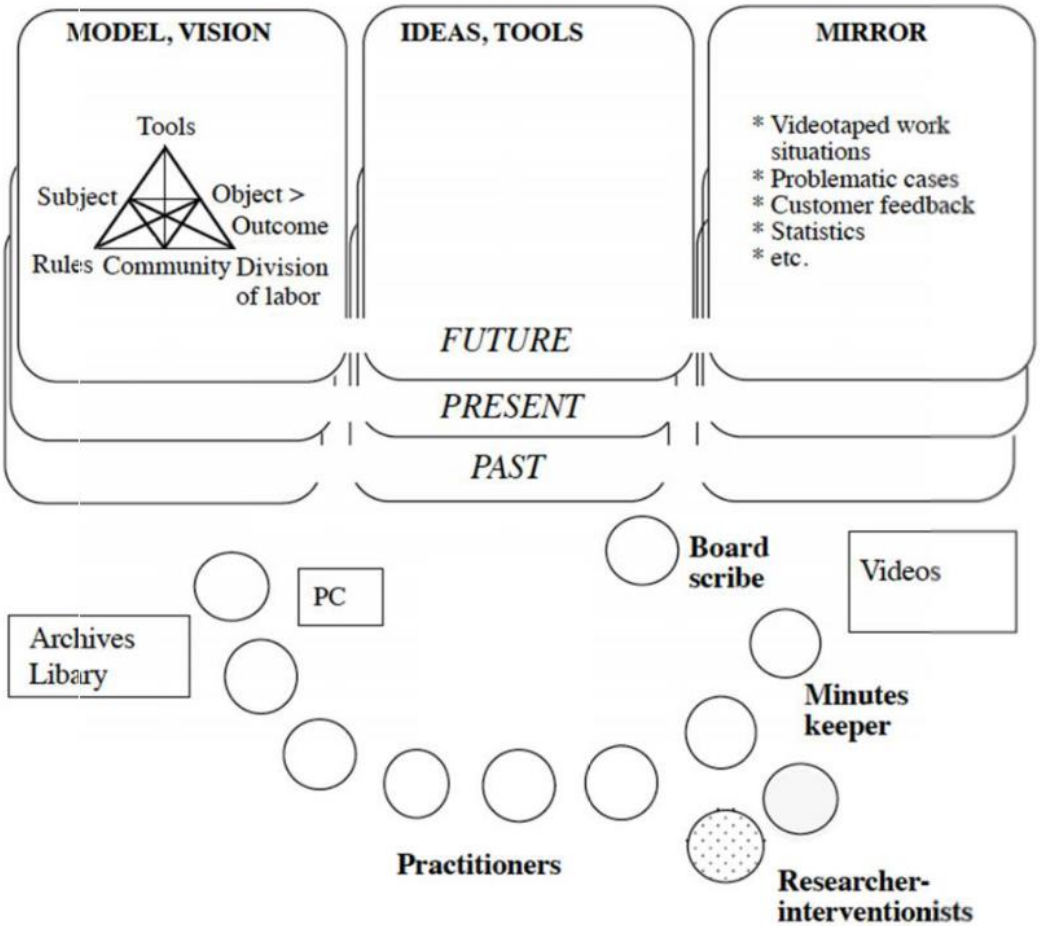


Figure 4.1 Suggested format for typical Change Laboratory Session taken from Virkkunen & Newnham 2013, adapted from Engeström et al. 1996 p.11)

Figure 4.1 illustrates a typical format suggested for a Change Laboratory session, and it consists of a number of named roles and actors: practitioners, minutes keeper, board scribe and researcher interventionist. In this change laboratory intervention, there were a few changes necessary as the researcher was carrying out the project as a sole researcher and, consequently, there was some modifications and doubling up of roles. The practitioners in

this case were the participants, who were in the main academic staff (lecturers) with up to two administrators and management representatives present at any session.

The group did not have a dedicated minute keeper and so in the first number of sessions, one or more of the participants were asked to take on this role and record the minutes, when the meeting commenced. It soon became apparent that this was not a popular position and people did not volunteer for the role immediately. After the second meeting, the researcher decided that a "live" minute taker was not, in fact, necessary. This was because the researcher reviewed the video footage between sessions and produced minutes and outcomes which were then sent on to each participant before the next meeting.

In this project, the researcher/interventionist was effectively also the board scribe and so did not normally stand behind the practitioners during the sessions. However, The researcher/interventionist did circulate around practitioners and between groups when the session required break out discussions (such as in sessions 1,2 and 3).

The researcher always had access to a whiteboard or a flipchart during the sessions and would normally write down the keys points and issues being raised during the session.

Activity theory prompt sheets, illustrating Engeström's *triangular Activity System diagram (as illustrated in Fig 3.2), are often used as second stimuli in CL interventions.* During the initial sessions, these were available, but there was little engagement with these, and as the process progressed, their relevance and importance seemed to fade. The researcher focused on using other objects and artefacts to promote dual stimulation.

4.2.2 Dissemination of session minutes and agendas

Between each session the researcher reviewed the video footage and minuted the salient points raised at the previous session. If a participant wanted something noted or minutes, it was included. The minutes were emailed to each participant's staff email address, along with the agenda for the next meeting and any ancillary information or artefacts, such as journal articles etc.

4.2.3 Mirror Data and 2nd stimuli

As per the methodology, mirror data was used in conjunction with 'dual stimulation' to enable the CL participants to participate in an expansive learning cycle (ELC) with a view to creating new work practices and activities to address the research questions.

The exact content/format of the mirror data and dual stimulation used varied with the session and its requirements (a summary of the details are provided in Table 4.2 and the specific details are described in Chapter 5). Each session started with the researcher setting a task or series of tasks that the group would address during the session (first stimulus). Mirror data was then introduced either as a presentation (Power-point or Prezi), written documentation or as verbal/written submissions given by participants regarding their own experiences and practices. The second stimulus was also introduced by the researcher and again consisted of a range of stimuli including: reference to the activity theory prompt sheets and the change laboratory stages, journal articles, posters, and items or notes from previous meetings or verbal contributions.

4.3 Research Design

It is suggested by Virkkunen, J. & Newnham (2013) that, for practical reasons, the size of a CL intervention be restricted to no more than 15 or 20 participants. While there are no

formal rules regarding the number of sessions, it is suggested that between 5 and 10 are normally sufficient. The number of sessions will be largely influenced by the iterative outcomes of the process and the advancement through the stages of the ELC. Hence, it is difficult to predict the number of sessions that will be required when setting out. For planning purposes, the researcher suggested at the introductory session that the intervention would consist of 8 sessions, at two week intervals (see Table 5.1 for details)

4.3.1 Site selection

As outlined in earlier chapters, the overall aim of this project is to explore how a research intervention could be used to foster and embed sustainability into the academic practices. I chose the campus as the most appropriate site for the intervention for a number of reasons, which I now outline.

The Campus has a strong track record on environmental issues and has been very successful with the Green Campus programme since 2008. It has been awarded three Green Flags to date (for Energy, Waste and Water, Biodiversity and more recently Transport). The researcher has been involved with the Green Campus programme and knew that the majority of the staff who participated in and supported the programme were interested in the whole area of the environment and sustainability.

Additionally, over the years the management team of the Mayo Campus has been asked by the senior management of the Institute to develop a campus strategy to define it, within the context of the larger institution. A number of strategies have been developed over the years and a key feature of the strategies proposed, is the consistent focus on the environment and environmental education. While no formal agenda existed per se, it was generally acknowledged among the staff that a number of the Mayo campus programmes were focused on the environment. This apparent 'readiness' and tacit interest by the staff and management,

was the first thing that suggested to me that the Mayo campus might be a suitable site to host such an intervention.

I did consider other sites. For instance, I considered running the CL on the main campus in Galway, based in the School of Engineering, to which I was affiliated through my discipline, However, I decided against it, mainly because of the practical issues, such as organising sessions in a school I was not familiar with, getting technical support, and concerns about being able attract enough interest in the staff to participate. In hindsight I believe that I made the right call, as the inter and cross disciplinary input that featured prominently in the study, would have been largely absent, had I run the intervention in the School of Engineering.

4.3.2 Participant selection

There are two important criteria for selecting participants for a CL intervention, firstly trying to ensure that there is an appropriate range of voices (from a range of roles which include both management and staff) and secondly, trying to ensure that they "are dealing with the same object in their daily work and are involved in realizing the same final outcome despite differences in their occupation, task or hierarchical position" (Virkkunen & Newnham, 2013, p.65). These are often seen as conflicting (ibid.). However, for this project I believe that I was fortunate, since there was an interest in the subject area by both management and staff "hierarchies".This not seem to negatively impact the session discussions.

Participation in the CL process was open to staff from the Mayo campus. Based on the suggested figure of 20 participants and the idea that there was likely to be some redundancy at the proposed meetings, I stopped seeking participants once I had 22 volunteers. There were 58 full time academic staff in the Mayo campus at the time (supported by a number of part-time staff), delivering programmes in Business, Construction, Outdoor Education, Heritage and Environment, Social Care, Nursing, Digital Media and Information Technology

Systems. The participants for this research project were enlisted through direct contact by the researcher. It was decided that a direct selective approach be used to enlist participants. The selection was based on previously exhibited interest in the general area of sustainability and environmental issues.

The participants were contacted individually, and the following criteria was used to select potential participants

1. Membership of the Green Campus Committee
2. Membership of the informal environmental and sustainability group
3. Staff who were teaching subjects directly related to the environment or who had a previous record (on the campus) of environmental or sustainability related activities.
4. Anyone who expressed an interest in being part of the research project (an email was circulated among staff outlining that a research project on ESD and sustainability was going to take place on the campus).

The Change laboratory sessions were carried out over a period of 6 months in total, starting with an introductory session in December 2015 and culminating with the final session at the end of May 2016. A table showing the profiles of the staff who attended, and the dates of the sessions is given below (Table 4.1).

To keep the range of participation as wide and diverse as possible, the original intention was to have at least one participant from each programme board. However, this did not work out because the class schedule for of the (part time) programmes clashed with designed session time. Sessions were scheduled for Wednesday afternoons because this time is normally reserved for staff meetings and sports activities, and, generally, lectures are not scheduled at this time.

No.	Date of session	16/ 12/ 15	13/ 01/ 16	27/ 01/ 16	10/ 02 16	24/ 02/ 16	16/ 03/ 16	06/ 04/ 16	03/ 05/ 16	30/ 05/ 16	Total	SSI
	Session No.	**Int ro.**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
	Session Location	SR 1	SR1	BR	BR	BR	CL R	BR	SR R	CLR		
	Participant Discipline											
1	Information Technology A		✓	✓		✓	✓	✓			5	✓
2	Information Technology B		✓	✓	✓		✓	✓	✓	✓	7	✓
3	Information Technology C	✓		✓		✓			✓		3	✓
4	Outdoor Education A		✓			✓	✓		✓	✓	5	✓
5	Outdoor Education B	✓	✓	✓	✓	✓					4	✓
6	Social Care A		✓		✓		✓		✓		4	
7	Social Care B	✓		✓	✓	✓	✓	✓	✓	✓	7	✓
8	Social Care C	✓							✓		1	✓
9	Social Care D	✓	✓	✓	✓	✓	✓			✓	6	✓
10	Business	✓	✓	✓	✓		✓	✓	✓	✓	7	✓
11	Nursing	✓	✓				✓	✓		✓	4	✓
12	Heritage A	✓	✓	✓	✓	✓			✓		5	✓
10	Heritage B	✓	✓	✓	✓	✓		✓	✓	✓	7	✓
13	Heritage C								✓	✓	2	✓
14	Environment	✓	✓		✓	✓		✓		✓	5	R
15	Construction	✓	✓	✓	✓	✓	✓	✓	✓		7	✓
16	Management A		✓		✓	✓	✓			✓	5	✓
17	Management B	✓	✓	✓		✓	✓	✓			5	✓
18	Admin A	✓			✓						1	✓
19	Admin B	✓	✓		✓			✓	✓		4	X
	Researcher	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	Total(Inc res.)	15	16	12	14	13	12	11	13	11		

Table 4.1 Participant profiles and attendance

Explanatory notes meanings of symbols on following page

Table 4.1 Notes:

✓: attended on date or was interviewed

R : refused to be interviewed at the time of the other interviews, the participant stated that this was due to time commitments.

SR1: Seminar room 1. 30 seater flat seminar/class room with digital and overhead projector facilities as well as white boards and fliboards.

CLR; Community living room, an informal space (used for social care education) with chairs, couches and living room artefacts, as well as projecting facilities and flipboards etc.

BR: The Campus boardroom with a single long desk capable of seating up to 26 persons. Room is complete with projectors, whiteboards etc.

SRR: Student resource room. A converted small classroom, that is normally available for students to study in between formal classes. Kitted out with chairs and single desks, projection facilities and flipboards.

SSI: Participated in a post intervention semi-structured Interview

Academic staff member 13 expressed interest in the process but was not available during the sessions as they clashed with his class commitments. He kept abreast of the meetings by reading the communications and minutes sheets circulated by email between each session.

Note:

Pseudonyms are used where participants are mentioned by name in the text.

When quoting participants in the text, I use the following denotation, which refers to the session in which the statement comes from.

S2 Heritage Lecturer B

Refers to a statement made in Session Two, by lecturer B from the heritage programme.

4.3.3 Session Design

Here I present a brief overview of the approach I took in designing the sessions, where I outline the key intentions of the session, the tasks involved in each and comment on key issues that influenced the design.

4.3.1.1 Introductory session and website

An introductory session held in December 2015, which was attended by 15 people. Its purpose was to explain the project, the process and what was expected from them, should they agree to participate. Prior to the session, each participant had been was emailed a number of research papers and journal articles that provided background on the topic of sustainability and ESD in HE, as well as information on the practical aspects of the Change Laboratory process. The session consisted of a presentation followed by questions and answers. The presentation provided an introduction to the PhD research questions, a description of the proposed methodology, and an outline of what was expected from the participants in terms of input, attendance and work, should they agree to participate.

The researcher explained that the "norm" for a change Laboratory is between 6-10 sessions with 10-20 participants. It was explained that the for the process to work well, it would be highly desirable that anyone who had agreed to participate would attend all, or as many sessions, as possible. A website was set up which all of the participants had access to. This served as a group file resource, a location for centrally storing session records (such as minutes and agendas), and as a blog space. While the website did serve as a place where resources could be stored and accessed, however, the interactive aspects of the site did not gain any traction with the group during the subsequent sessions.

4.3.1.2 Session design principles

The CL sessions were designed to guide the participants through the ELC (see Section 3.6 for details), which is the backbone of the CL methodology, and each session was designed to engage with dual stimulation and respond to the needs of the appropriate stage. In table 4.2, I present a summary of the design details for each session. Information is provided on the location and date of the session, the number of participants, the main tasks (1st stimuli), the 2nd stimuli and the details of the mirror data used. In table 5.1, I present the sessions mapped onto the stages of the ELC, both as they were anticipated at the outset, based on a schedule given to the participants at the introductory session, and, as they were interpreted by the researcher, after analysing all of the session data.

Because of the developmental nature of the process, it is only possible to plan in advance the tasks and stimuli for the first one or two sessions, because the outcomes of these sessions will determine the direction and subject matter of the following sessions. In the first session, the main intention was to get the participants questioning and criticising the existing sustainability related practices on the campus. This carried over into Session Two where participants started to analyse why this was and that carried over into Session Three (see Table 5.1). Detailed information on each session is provided in Chapter 5, where I present each session in the form of a natural history account.

After each session, the researcher reviewed the recordings and prepared the minutes and notes, and an agenda for the following session, in line with the next stage of ELC. Once this was done, the researcher emailed the minutes, the agendas and any additional material needed for the next session to all participants, thus ensuring that all were kept up to speed even if they missed a session.

Session: no	Stage of the ELC.	First Stimulus or session Tasks	2nd Stimulus	Mirror Data
Introduction 60 minutes, 15 participants				
13/01/16 Session One 133 mins ,15 p.	*Questioning and criticising*	*Discuss the concepts of sustainability in HE* *How does ESD relate to you own practices?* *Status of SHE in the Mayo Campus*	*Visual prompts* *Hard copies of a range of SHE documents and journal articles*	*The answers given by the participants recorded and displayed on flipchart sheet*
27/01/16 Session Two 97 mins, 11 p.	*Analysis*	*What would a sustainable IoT look like?* *Identify SHE practice priorities for the campus* *What are the barriers to SHE on the campus?*	*Visual prompts* *Hard copies of a range of SHE documents and journal articles*	*Powerpoint presentation and summary of Session One material*
10/2/16 Session Three 110 mins,134 p.	*Modelling*	*Develop a mission statement for the Mayo Campus. Discuss the potential of the practice proposals identified in Session Two.*	*Sample definition of HESD* *Reference to examples of how other HEIs implement SHE*	*Hard copy summaries of the SHE related activities of the participants provided*
24/02/16 Session Four 91 mins,12 p.		*Consider the proposals made a the previous session, the 'Mission Statement', Institute strategy and new programme development.*	*ELC diagram, Institute Strategy, A previous SHE related proposal for the campus.*	*Material generated in previous sessions.*
16/03/16 Session Five 86 mins,11 p.	*Examination*	*Sense check purpose of the mission statement?* *How can the CL be operationalised?*	*Outlining the main research objective*	*Material generated in the previous session.*
6/4/16 Session Six 64 mins, 10 p.		*How can the CL be operationalised?*	*Reference to examples of how other HEIs implement SHE*	*Material generated in the previous session.*
3/5/16 Session Seven 49 mins, 12 p.	*Implementation* *Process reflection*	*Reflect on the proposed wording of the CSS* *Reflect on the proposed sustainability paragraphs* *How can the (CL) process be built upon*	*Reflecting on how the statement and the paragraphs address the overall task*	*The statement* *The sustainability paragraphs* *Summary of outputs*
30/5/16 Session Eight 87 mins,10 p.	*Implementation* *Process reflection* *Consolidation*	*Review the work and outcomes of the process and reflect on how these might be continued.*	*The emphasis on reflection in the context of the ELC.*	*The wording of the proposed statement, and sustainability paragraphs*

Table 4.2 Summary of Change Laboratory session design (refer also to Table 5.1)

4.3.4 Insiderness

The study must be considered as insider research as I work in the campus and have worked with a number of the participant lecturers on various projects over the years. This brings with it some benefits and opportunities, but also challenges and limitations.

The benefits of insider research include better access to naturalistic data and respondents, and greater access to actors implicit meanings. Trowler (2012) suggests that (with insider research) there may be an increased chance of having a beneficial impact on university practices, especially if the project involves action research or when the research questions address the implications for policy and practice of the projects findings (LSE Public policy group, 2011)", as is the case in this project.

In terms of challenges, my own beliefs about sustainability, climate change and the environment clearly influenced the way that I approached the research project and this will no doubt have had some influence on the way that I interpreted and analysed the data.

Being an insider will also have methodological implications, and in this case may be exacerbated by the fact that I carried out this project alone. As outlined previously, I acted as researcher interventionist and board scribe during the sessions. I was unable to impartially view the process as it happened. However, the video recordings did help to ameliorate any impact this might have had.

4.4 Data collection methods

4.4.1 Recording of the sessions

Each of the 8 sessions were recorded using digital video, with some sessions recorded using a combination of both video and audio recording. The original intention was to carry out all of the sessions in the board room (which was a suitable shape and size), but this could not be achieved for timetabling reasons.

The first session was recorded using an on-line video camera, set-up at the front of the room. This did not prove very satisfactory as the recording was of poor quality and it was difficult (but not impossible) to make out (and transcribe) what the participants were saying all around the room. The second and subsequent sessions were recorded using 2 HD video cameras, set up at both ends of the room to ensure that people at the front and back of the room were clearly audible. On occasions during sessions 4 and 5, one or other of the cameras stopped working (for a variety of technical reasons). However, in both cases one camera was always active.

4.4.2 Session notes and board scribing

For much of the CL sessions, the researcher was positioned between the participants and a whiteboard (for electronic presentations) or a flipchart, which was used to record the ideas and suggestions of the group. The flipchart sheets were used during the sessions as prompts and reminders and were occasionally displayed on the wall or presentation boards as either mirror data or as second stimuli. All of the sheets were retained by the researcher as data. In some of the sessions there were breakout discussion groups, and the researcher would circulate among the groups to offer help or support. During each session, the researcher took notes and recorded significant ideas and reflection that occurred to him while observing

the process. These notes and reflections were particularly beneficial between sessions when designing tasks and preparing for the following session.

4.4.3 Follow up Semi Structured Interviews

As outlined previously, approximately six months after the CL intervention, the researcher carried out semi-structured interviews with each of the participants. The interviews were designed to provide additional material to complement the analysis of the CL process. The main aim of the CL process was to develop new work practices that would support the integration of sustainability into the teaching and learning practices on the campus. To try and determine if the intervention had any lasting effects, it was decided to carry out semi structured interviews with the participants approximately six months after the final session.

The time lapse between the CL sessions and the interviews was beneficial in terms of assessing the medium-term impacts of the intervention on the participants' practice. However, in terms of shedding light on any specifics that happened during the individual sessions, the time lapse was simply too long, as individuals could not (in general) remember many of the particulars of the sessions.

The semi structured interviews were carried out in the offices of the participants or in the researcher's office and were recorded using a digital recording device. A questionnaire was developed for the interviews and circulated to the participants prior to the interviews so that they could consider the questions in advance. The interviews were carried out using a series of questions which focused on four key themes: Participation in the process, expansive learning, development of agency (personal and collective), and concept development.

The questions ranged from quite general regarding the CL process as a whole, to specific questions that related to their experience of the process, their perception of the outcomes

and, its influence on their teaching practice. During the interview each interviewee was given an opportunity to express and develop their opinions.

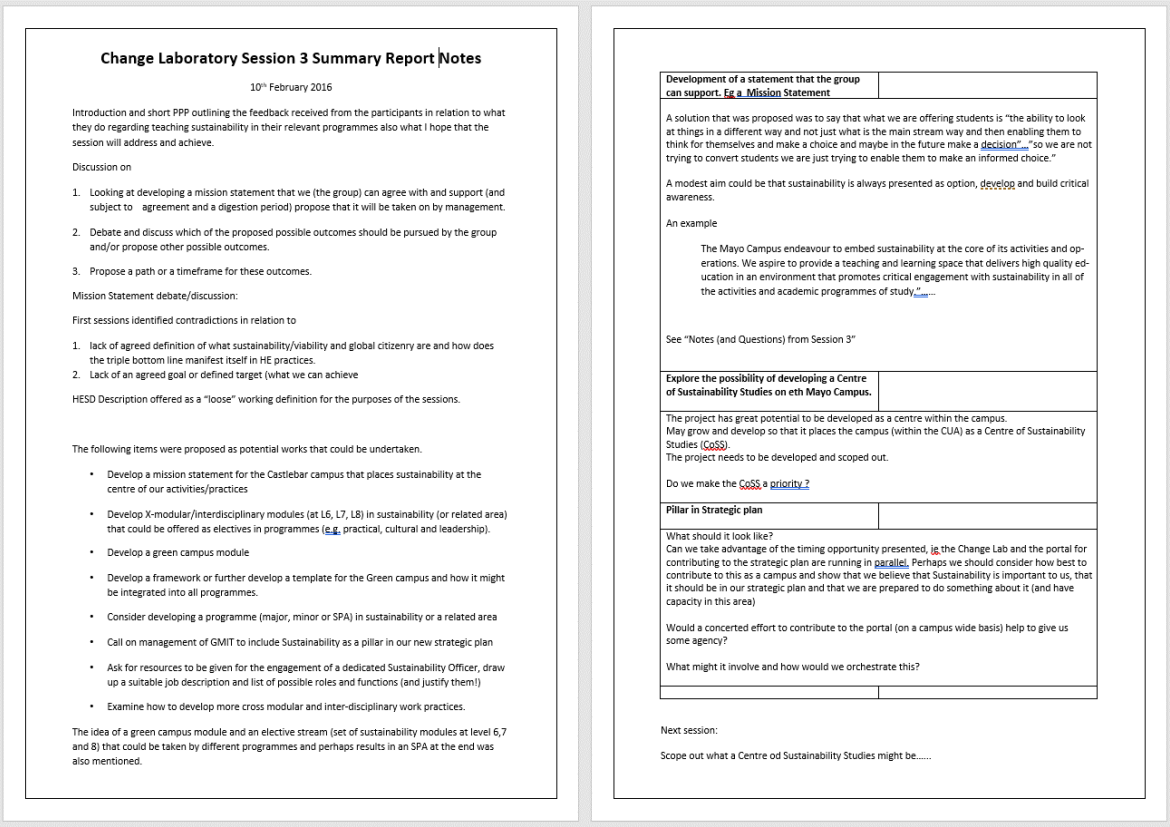
4.5 Data analysis

Change Laboratory interventions generate a lot of raw data including video footage, session notes and minutes, flipchart sheets and session transcripts, in addition to the transcripts from the post intervention individual SSIs that were carried out six months after the end of the process. This amount of data necessitated a multistage analysis process, which I describe in the four stages outlined below.

1. Inter-session analysis of the video footage and notes, to guide the tasks and activities in the follow-on sessions.
2. Post intervention analysis of the video footage and the transcripts, with the intention of identifying and extracting information relating to three aspects of the processes.
    a. Stage in the Expansive Learning Cycle as previously referred to Chapter 3 (Engeström & Sannino 2010, p.7)
    b. Stage of concept development, using a framework emerging from the content of the data itself (inductive coding)
    c. Types of expression of transformative agency (Virkkunen and Newnham, 2006; Haapasaari et al. 2016) (deductive coding)
3. Analysis of the post intervention semi structured interviews, to determine the participants' perceptions of intervention, and based on this, to identify the process outcomes (see table 5.16)
4. Thematic analysis of the relationships between the development of the concept of the Campus Sustainability Statement and the associated expressions of transformative agency, as identified in 2b and 2c above)

4.5.1 Inter-session analysis

The first analysis was effectively carried out during the process itself by the researcher when he reviewed the session material and decided upon the content of the minutes that were to be sent out to the participants prior to the following session. The time spent analysing the material at this point needed to be sufficient to allow accurate and reflective minutes and summaries to be generated, while also taking a realistic degree of time and effort given the time pressures on the researcher and the limited time between sessions. The analysis involved the researcher reviewing the session video footage in conjunction with any notes taken during the session and making notes which were then compiled into a summary report which was emailed to the participants, as soon as practicable, after the sessions. An example is illustrated below, in Figure 4.2.



Change Laboratory Session 3 Summary Report Notes

10th February 2016

Introduction and short PPP outlining the feedback received from the participants in relation to what they do regarding teaching sustainability in their relevant programmes also what I hope that the session will address and achieve.

Discussion on

1. Looking at developing a mission statement that we (the group) can agree with and support (and subject to agreement and a digestion period) propose that it will be taken on by management.
2. Debate and discuss which of the proposed possible outcomes should be pursued by the group and/or propose other possible outcomes.
3. Propose a path or a timeframe for these outcomes.

Mission Statement debate/discussion:

First sessions identified contradictions in relation to

1. lack of agreed definition of what sustainability/viability and global citizenry are and how does the triple bottom line manifest itself in HE practices.
2. Lack of an agreed goal or defined target (what we can achieve

HESD Description offered as a "loose" working definition for the purposes of the sessions.

The following items were proposed as potential works that could be undertaken.

- Develop a mission statement for the Castlebar campus that places sustainability at the centre of our activities/practices
- Develop X-modular/interdisciplinary modules (at L6, L7, L8) in sustainability (or related area) that could be offered as electives in programmes (e.g. practical, cultural and leadership).
- Develop a green campus module
- Develop a framework or further develop a template for the Green campus and how it might be integrated into all programmes.
- Consider developing a programme (major, minor or SPA) in sustainability or a related area
- Call on management of GMIT to include Sustainability as a pillar in our new strategic plan
- Ask for resources to be given for the engagement of a dedicated Sustainability Officer, draw up a suitable job description and list of possible roles and functions (and justify them!)
- Examine how to develop more cross modular and inter-disciplinary work practices.

The idea of a green campus module and an elective stream (set of sustainability modules at level 6,7 and 8) that could be taken by different programmes and perhaps results in an SPA at the end was also mentioned.

Development of a statement that the group can support. Eg a Mission Statement	
A solution that was proposed was to say that what we are offering students is "the ability to look at things in a different way and not just what is the main stream way and then enabling them to think for themselves and make a choice and maybe in the future make a decision"..."so we are not trying to convert students we are just trying to enable them to make an informed choice." A modest aim could be that sustainability is always presented as option, develop and build critical awareness. An example The Mayo Campus endeavour to embed sustainability at the core of its activities and operations. We aspire to provide a teaching and learning space that delivers high quality education in an environment that promotes critical engagement with sustainability in all of the activities and academic programmes of study." See "Notes (and Questions) from Session 3"	
Explore the possibility of developing a Centre of Sustainability Studies on eth Mayo Campus.	
The project has great potential to be developed as a centre within the campus. May grow and develop so that it places the campus (within the CUA) as a Centre of Sustainability Studies (CoSS). The project needs to be developed and scoped out. Do we make the CoSS a priority ?	
Pillar in Strategic plan	
What should it look like? Can we take advantage of the timing opportunity presented, ie the Change Lab and the portal for contributing to the strategic plan are running in parallel. Perhaps we should consider how best to contribute to this as a campus and show that we believe that Sustainability is important to us, that it should be in our strategic plan and that we are prepared to do something about it (and have capacity in this area) Would a concerted effort to contribute to the portal (on a campus wide basis) help to give us some agency? What might it involve and how would we orchestrate this?	

Next session:

Scope out what a Centre od Sustainability Studies might be.....

Figure 4.2 Sample of inter session summary report.

4.5.2 Post intervention analysis.

The second analysis was carried out after the sessions were completed and consisted of the researcher viewing and re-viewing the video contents of each session, along with reading and re-reading the transcripts from each session. The data was analysed in terms of the three frameworks outlined previously and listed below.

4.5.2.1 Expansive Learning Cycle

In terms of the **expansive learning cycle**, the initial aim was to see if the overall intervention could be mapped onto Engeström's ELC, and if it could, to identify which sessions correspnded with each of the ELC stages. It is common for there to be more than one ELC happening in a CL, and in this particular intervention, there were a number of new concepts being developed. However, for the purposes of this project, the ELC mapping which I present in Tables 5.1 and 6.1 in Chapters 5 and 6, was made, based on the way that the interaction in each session and its outcomes fitted into the overall context of the intervention, rather than just the development of the any particular concept. Thus the mapping identified in Tables 5.1 and 6.1 represents a reflection of the most prominent types of expansive learning action dispayed in each session. Thus for example, Sessions 5 and 6 are both mapped against the "examining" stage of the ELC because the main focus of the work carried out during these sessions, was on how to better comprehend the dynamics, potential and limitations of the models developed in earlier sessions.

4.5.2.2 Concept Development

In terms of analysing the data in relation to *concept development,* I focus on the development of a single concept, the CSS. I reviewed the relevant sections of the videos and the associated

transcripts with the single purpose of discerning the development process of the CSS. This was carried out by interpreting both the content and context in which the dialogue occurred. This process required making judgments on the meanings of particular speaking turns, which involved a number of repeat viewings of the footage as well as reviews of the transcripts.

The concept development framework that I developed in this study was based on analysing the data using an inductive approach that employed open, axial and selective coding. Each session was analysed to identify key anchor points or moments where important statements were made or where significant developments occurred (open coding). In this project I identified 23 such moments in relation to the development of the CSS.

For example, in the last session (Session Eight) one of the participants commented on proposed wording of the sustainability statement as being "soft" and suggested using words that were more definitive and committal. This started a discussion among the group about the exact wording of the statement, which ultimately resulted in the final wording of the statement being changed. I identified this being a significant moment which changed the direction of the development process and I labelled it as "The importance of expressing commitment" (see Figure 3.4 below for sample of coding system used)

Using an axial coding approach, I reviewed the data and grouped the moments into 5 categories, which I theorise to be the five stages of the development of the concept. The designated category headings were chosen to be indicative of the perceived process stage (selective).

In the first two sessions I identified 8 moments and attributed these to two different categories, the first focussed on discussions and debates around what sustainability is ("Stage 1 Discussing the definition of the term sustainability") and the second, focussed on "identifying a framework" that could be used to accommodate the wide range of views expressed by the participants.

In the remaining 6 sessions I identified a further 15 moments which I categorised under three headings, which corresponds to the final three stages, Stage 3 "A mission statement for the campus" (11 moments), Stage 4 "Mission statement to campus sustainability statement" (2 moments), Stage 5 "A commitment to embedding sustainability in the campus"(2 moments).

A sample of the coding system used is provided in Figure 4.3. The sample relates to the speaking turns associated with the two key moments of concept development in stage 5 "The importance of expressing commitment" and "Conceptual ownership and editorial propriety". Identifying the individual moments in each session required a number of viewings of both the video recordings and the transcriptions. Text relating to each identified moment was highlighted using colour (see Section 6.2).

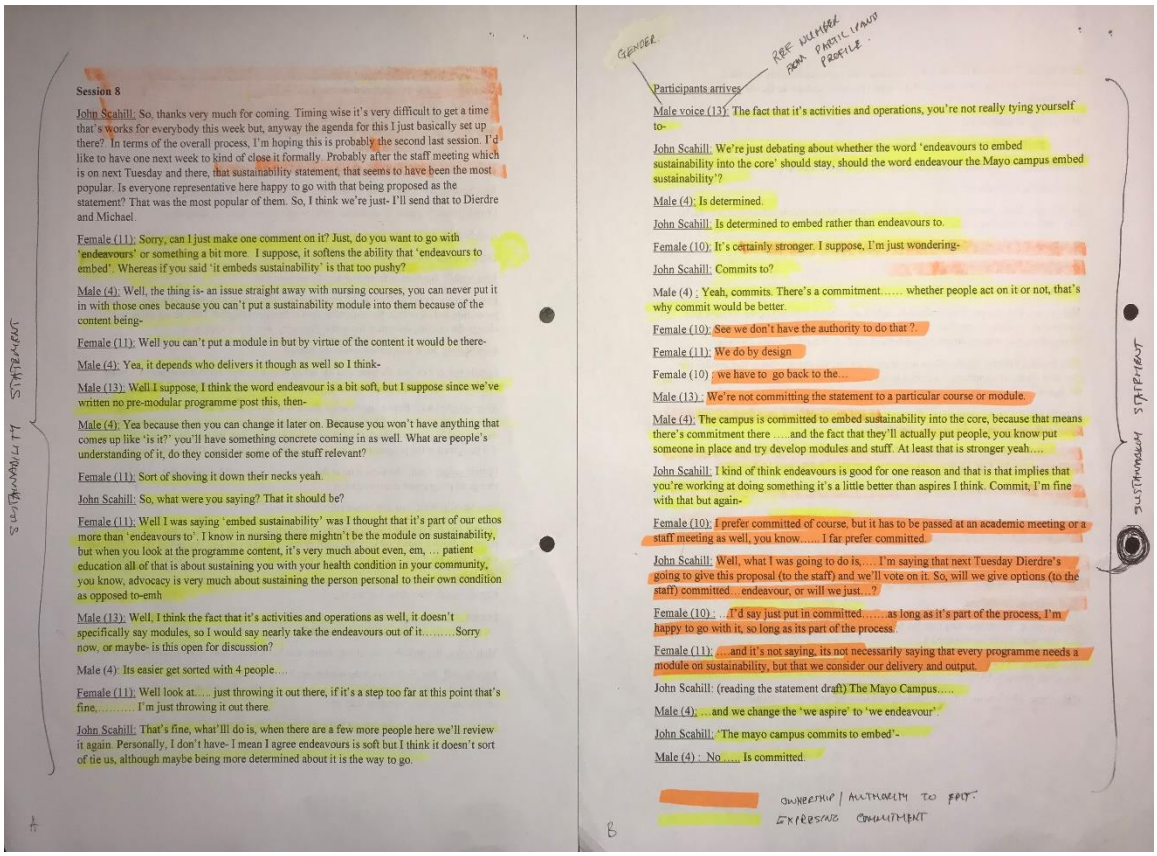


Figure 4.3 Data coding sample, concept development

4.5.2.3 Development of Transformative agency

In contrast to the inductive coding approach employed for the analysis of the development of the concept, I used a deductive coding approach in relation to analysing the development of the participants transformative agency based on the six "expression type" framework proposed by Haapasaari et al. (2016).

The expression typologies are: resisting, criticising, explicating (proposing or generating new ideas or suggestions), envisioning (describing how they might work) committing to concrete action and taking consequential action. Using the typology framework, I viewed the video recordings and read the session transcripts and identified the occurrences of each type of transformative agency.

One particular difficulty in applying this framework arises because it is noticeable in the data that there is a lot of overlap between what could be described as criticising, and what could be described as resistance. Indeed, prior to the work of Haapasaari et al., (2016), the TA typology consisted of only five types. Yet, notwithstanding the overlaps and difficulties of coding, an attempt was made to maintain the distinction between resisting and criticising because this would allow for differentiation between clear expressions of resistance (to new ideas or activities) and expressions whose intent was to criticise current (existing) activities, with the aim of highlighting the need for a change.

The video recordings and transcripts from each session were viewed and notes were taken in relation to identifying the individual expression of TA using Haapasaari's framework. In the case of some of the expressions of TA, the videos and transcripts were viewed a number of times and compared with other occurrences, to ensure that the determination was consistent within the study (see Section 6.3).

An example of the text associated with an occurrence of resisting (highlighted in blue) is provided in the following sample. As can be seen, even in short sequences of speaking turns,

multiple manifestations of TA can be observed during a focussed discussion (which in this part of the session was focused on the sustainability statement).

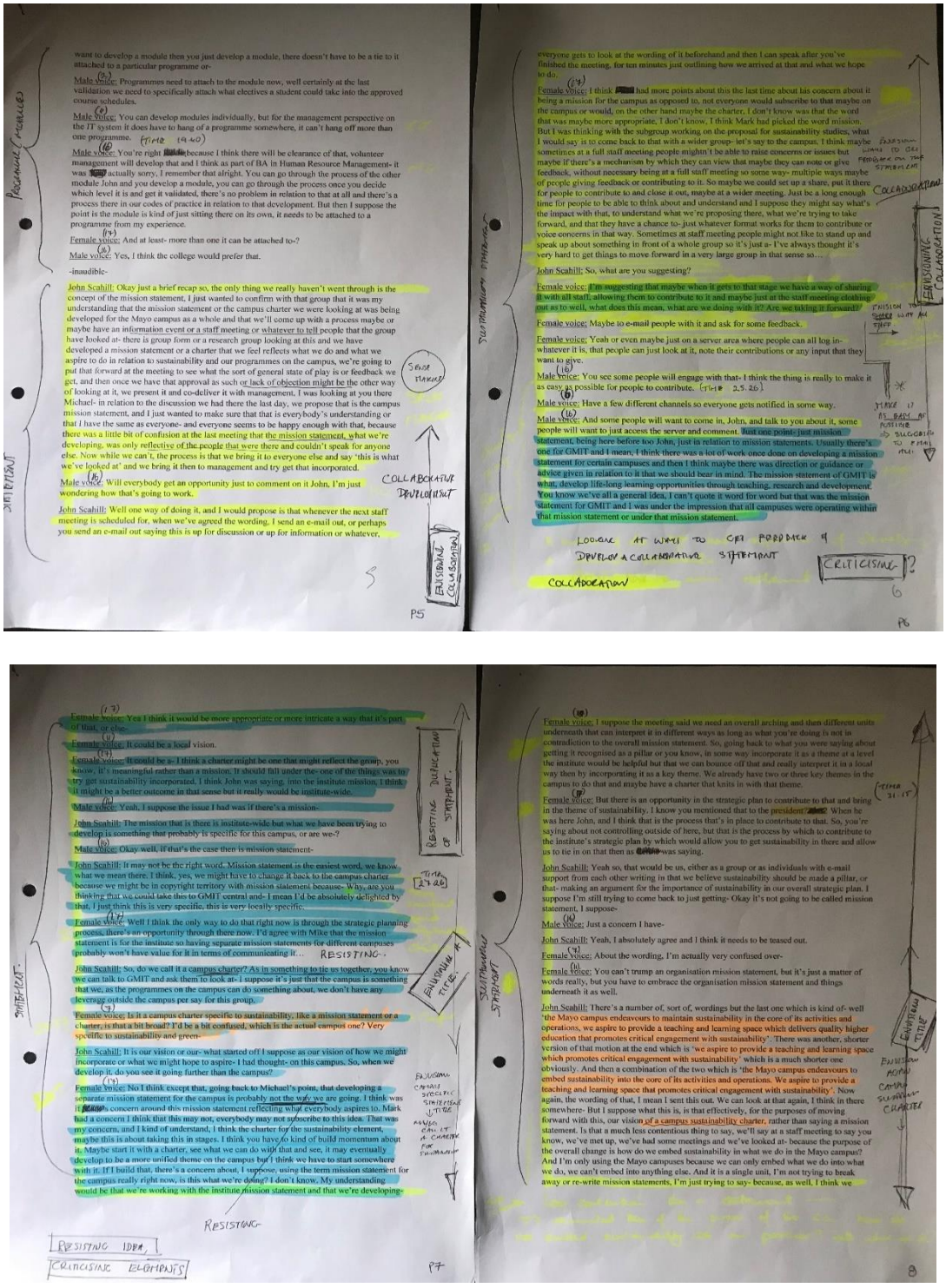


Figure 4.4 Data coding samples, development of transformative agency (Session Five, timeframe minutes 19 to 34)

4.5.3 Analysis of semi structured interviews

The third stage involved the analysis of the contents of the semi structured interviews, which were carried out with the participants a number of months after the sessions were completed. This involved systematically analysing the transcripts of the recorded interviews and looking for themes or observations that would shed light on the participants perception of the process. The aim of the analysis was to determine what impact the intervention had on the participants and their practices, using and inductive coding approach the analysis focused on the following four themes: participation in the process, expansive learning, development of agency (personal and collective), and concept development. As a result of this analysis, the researcher identified 13 process outcomes, which are presented in Section 5.3.1 and Table 5.16

4.5.4 Thematic analysis of the relationship between concept development and the development of Transformative agency.

Analysing and identifying the relationships between the development of the CSS and the associated expressions of transformative agency constituted the final stage of the analysis.

This analysis built on the prior coding already described in Sections 4.5.2.2 and 4.5.2.3 above. I sought to find juxtapositions between the stages of the development of the concept and the manifestations of transformative agency by placing them against the timeline of the research intervention. I then developed thematic codes inductively by noting how the previously developed codes were related (see Section 7.2)

In terms of triangulation of data sources, the only source of primary data used for the analysis of the development of the concept of the CSS was the session video recordings, which were transcribed solely for the purpose of analysing the verbal content. The thematic analysis comparisons between the expressions of transformative agency and the stage of concept

development were carried out on a session-by-session basis in chronological order as they occurred (in parallel).

Tracing and analysing both the development of the CSS and associated development of the participants transformative agency provided answers for the two research sub questions. Analysing the relationship between the two of these, provided an answer to the main research question, which is presented in Chapter 7.

4.6 Ethical Consideration

Ethical approval (using the FASS Guidelines for ethical approval of research) for the project work was sought and obtained from both Lancaster University and GMIT. The research work was carried out in line with the ethical frameworks of both Lancaster University and GMIT. All participants in the CL intervention were issued with participant information sheets prior to the CL sessions and prior to agreeing to the semi structured interviews, with consent forms being signed by all participants. Participants were made aware that they could withdraw from the process at any stage.

The subject matter of the research is sustainability, and this term includes reference to issues such as the environment, climate change and of course what the word "sustainability" actually means. Concepts such as these vary from person and many people will have different and sometime conflicting views on what these terms mean. This was a primary consideration of the researcher during the CL process and every effort was made to facilitate all points of view in a balanced, non-judgmental manner.

4.7 Limitations

As with all research projects, there are a number of limitations that need to be considered. It was my first time to carry out a CL and while it went relatively smoothly and largely to plan, there were things about the intervention that the researcher would have done differently with the benefit of hindsight. For example, I would have tried to stick more rigidly with the practice of having a designated scribe at each session. I had not arranged for someone to do this and had asked for a volunteer from the participants to do this in the first two sessions. Understandably, there was not much enthusiasm for the job, and I did not have a scribe for the last six sessions. It did not disadvantage me from a data point of view but meant that I had extra work to do when reviewing the footage between sessions.

This leads me to my next comment, which is about being a sole researcher. Change laboratory interventions are often carried out by teams of researchers and were I to undertake another, I would seek to have at least one other researcher, and a scribe available.
As described earlier, the mapping activities and associated analysis, particularly in relation to classifying the overarching ELC requires context specific judgement (which the video footage is very useful for) and this, too, would benefit from an additional researcher.

Inconsistency in attendance, at the CL, was an issue that is worth mentioning. Table 4.1 shows the attendance of the participants. It can be seen from table 4.1, that, other than the researcher, nobody attended every session. However, 5 persons attended 7 of the sessions, 1 person attended 6, 6 attended 5, 4 attended 4 and the remaining five participants attended 3 or less sessions. Due to the fact that a summary of the contents of each session (in the form of minutes) was distributed electronically after each meeting, and an agenda for the next meeting was also circulated, it was believed by the researcher that participants who were

interested in contributing to the overall process were still able to do so even if they missed sessions, by reviewing the minutes and any additional communications (e.g. the requests for information after Session Two).

I reflect again on the limitations of this research project in Section 8.4.

4. 8 Summary

Here, I have presented my research design, as well as outlining how I selected the site and the participants, gathered the data and analyzed it. In the next chapter I will present the data gathered during the sessions in the form of a natural history, where I comprehensively describe and document the sessions that took place within the intervention under three headings: Design, Report, and Outcomes. This data is then analysed in Chapter 6 to answer research sub questions 1 and 2.

Chapter 5 Data presentation and process outcomes

5.1 Introduction

In this chapter, I present a summary of the data that was gathered during the Change Laboratory research-intervention. The aim here is to present a holistic view of the whole CL process as it evolved and developed through each session. In Chapter 6, I will build on this presentation, and narrow the focus to the development of one particular concept, which I will analyse in terms of how the concept developed through the process, and how the participants' transformative agency was developed and expressed. The analysed results are then discussed in Chapter 7 in the context of the wider literature, and in terms of claims of contribution to knowledge.

As established in Chapter 4, the CL intervention and the follow up participant interviews generated a lot of raw data in the form of video footage, audio recordings, session presentations (PowerPoint or Prezi), summary tables, charts, and the full transcripts of each session and interview. In this chapter, the data from each session is summarised and presented in narrative form with some additional tables for clarity, under the following headings:

- **Design:** detailing the intended plan.
- **Report:** describing what happened, including incidents of concept development, and expressions of transformative agency.
- **Outcomes**: summarising what came out of the session, the implications for the following session and any planned actions.

In addition to the data generated during the individual sessions, the CL also produced a number of process outcomes, five of which I outlined in Chapter 1. In addition to these, I

have identified eight other distinct outcomes, all of which I present grouped together in Table 5.16, under the following three headings: Tangible Outcomes, Pedagogical or Practice Outcomes, and Social and Personal Outcomes.

In an additional table (5.17) the development of the four "tangible" process outcomes is tracked, and it provides the reader with an overview of the development of the outcomes throughout the process.

The overall design intention was to encourage the development of new work practices, by taking the participants through an ELC, in a structured CL intervention. The evolution of this and how the actions that occurred in each session are aligned with the stages of the ELC are mapped in table 5.1 below.

It is worth noting that mapping the actions from the sessions to the stages of the ELC is not a simple issue, as many sessions have overlap between stages and some stages take more than one session to complete. Also, there may be more than one ELC occurring within a session (different concepts evolve at different rates). In spite of these limitations, the mapping exercise shown in Table 5.1 provides a useful guide for understanding the flow of the overall process, as it highlights the dominant stage of the ELC as it actually occurred in practice, as each session unfolded. Prior to the start of the CL, the actual number of sessions that would be required was unknown, however, a plan with a set number of sessions was prepared at the outset and presented at the introductory session to the participants. The idea was to give the participants an indication of the time requirements for their involvement, so that they could plan and schedule for the meetings. This initial plan is also shown in Table 5.1.

<table>
<tr><th colspan="3">Mapping the stages of the Expansive learning cycle to the sessions</th></tr>
<tr><th>Description of stage &
Initial design intention.</th><th>Session number, dates and intervals</th><th>Actual stage observed during CL</th></tr>
<tr><td>Stage 1 Questioning and criticising: people reject established wisdom, current practices, and existing plans;</td><td>Session One
Planned 11/01/16
Actual 13/01/16</td><td rowspan="2">Stage 1 Questioning and criticising:</td></tr>
<tr><td>Stage 1 Questioning and criticising: people reject established wisdom, current practices, and existing plans;</td><td>Session Two
2-week interval
Planned 25/01/16
Actual 27/01/16</td></tr>
<tr><td>Stage 2 Analysis: people investigate and represent the structure and history of the present situation;</td><td>Session Three
2-week interval
Planned 8/02/16
Actual 10/02/16</td><td>Stage 2 Analysis</td></tr>
<tr><td>Stage 3 Modelling: people pose a new, simplified model that aims to explain the situation in a public form and to suggest potential solutions;</td><td>Session Four
2-week interval
Planned 22/02/16
Actual 24/02/16</td><td>Stage 3 Modelling</td></tr>
<tr><td>Stage 4 Examination: people work with the model to better comprehend its dynamics, potential and limitations;</td><td>Session Five
3-week interval
Planned 07/03/16
Actual 16/03/16</td><td rowspan="2">* Stage 4 Examining</td></tr>
<tr><td>Stage 5 Implementation and Reflection: people render the model more concrete by applying it practically and conceptually, so enriching and extending it;</td><td>Session Six
3 weeks
Planned 04/04/21
Actual 6/4/16</td></tr>
<tr><td>Stage 6 Process reflection: people evaluate their current process, generating critique and identifying further requirements;</td><td>Session Seven
4 weeks
Planned 18/04/16
Actual 3/5/16</td><td>Stage 5 Implementation
Stage 6 Process reflection</td></tr>
<tr><td>Stage 7Consolidation and generalisation: people attempt to embed stable forms of new practice.</td><td>Session Eight
3 weeks
Planned 03/05/16
Actual 30/05/16</td><td>Stage 5 Implementation
Stage 6 Process reflection
Stage 7 Consolidation and generalisation.</td></tr>
</table>

* Sessions 4 and 5 focus on Examining and are presented together in Section 5.2.5

Table 5.1 Stages of the Expansive Learning Cycle mapped onto the CL research sessions

5.2 The Change Laboratory Process

After the introductory session, which is outlined in Section 4.3.3., there were 8 formal sessions carried out. Following each session, once the researcher had reviewed the video footage, the minutes, along with an agenda for the next meeting and any associated documentation was emailed to the participants.

5.2.1 Session One

5.2.1.1 Design

The tasks in the first session were designed to align with the first stage of the ELC, - "questioning and criticising". The aim being to orient the actions of the participants towards the goal of questioning and criticising their current practice activities. Bearing in mind the main research question RQ 1, the focus of the first session was on getting the participants to think, examine and question how they, and the Institute, are currently dealing with and addressing the whole notion of sustainability and ESD, and to what extent, if any, sustainability is embedded in the practices of the Campus.

Fig 5.1 Session One group discussion

The participants were asked to complete three tasks that were designed to encourage them to question the established practices in relation to sustainability and ESD in the Mayo Campus. The first task, 1A, asked the participants to consider their understanding of the concepts of sustainability and ESD in HE. The second task, 1B, asked them to consider what they are passionate about in relation to sustainability and what sustainability topics are addressed in the programmes they teach on. The third task, 1C, sought to elicit their opinion on how the Mayo Campus was currently addressing and dealing with ESD and sustainability. To facilitate a group discussion on task 1A, the participants were divided into three randomly allocated subgroups (3 x 5 member groups) and asked to report back to the main group via a nominated spokesperson. In relation to question 2, each participant was given an opportunity to respond individually. It was intended that the third question would be answered in groups, but due to time constraints, it was not formally addressed during the session. Details of the three tasks are given in table 5.2.

5.2.1.2 Report

Session One was held in a large flat classroom and was attended by 15 participants consisting of two members of management, 1 member of the administration staff and 12 lecturing staff from a wide variety of academic disciplines. Other than the introductory session, none of the participants had any experience of being involved in a CL.

After the introduction by the researcher, the participants were set three tasks (see Table 5.2) Before engaging with the tasks, one of the participants asked "Are we all starting with a common definition of sustainability?" This question set the tone for much of the session, which was effectively focused on teasing out what "sustainability" meant to each of the participants. A wide range of views were expressed by the participants and reported back through the groups.

<table>
<tr><th colspan="3">Session One Design</th></tr>
<tr><td>Expansive learning action:</td><td colspan="2">Questioning</td></tr>
<tr><td>First Stimuli</td><td>2nd Stimuli</td><td>Mirror data</td></tr>
<tr><td>Task 1A.
Consider and discuss the concepts of sustainability and ESD in general, and, in relation to HE nationally and internationally.</td><td rowspan="3">A number of visual prompts (printed on large format A1 sheets) were placed on boards and walls in the room e.g. a table of thee graduate outcomes from the document “Ed. for Sustainable Dev., Guidance for UK higher Education providers 2014.
Hard copies of a variety of sustainability and ESD journal articles were available on each table.</td><td>NA</td></tr>
<tr><td>Task 1B
What are you passionate about in relation to sustainability/ESD, and how does how it relate to your own teaching practices. What sustainability related topics are offered on the programmes on which you teach?</td><td rowspan="2">The answers to the questions posed by tasks 1A and 1B were recorded on flipchart sheets. which were made visible to the participants to serve as mirror data.</td></tr>
<tr><td>Task 1C
How do you think the Mayo campus is addressing and dealing with sustainability and ESD at the moment e.g. strengths, weaknesses, role of management, staff, students.</td></tr>
<tr><td>Social organisation</td><td colspan="2">15 Participants in a flat classroom, split into three subgroups for detailed discussion on Task 1A.
Task 1B addressed as individual participants</td></tr>
</table>

Table 5.2 Summary of design for Session One

The vast majority of the participants focused on the environmental and social issues of sustainability, with only one participant mentioning economic sustainability.

“ we thought that sustainability can have various different contexts, we talked about environmental sustainability as well, our goal would be to create awareness among students

about environmental sustainability, promoting the idea that it is worth doing…you know within your own environment for example recycling…. (our interest as a group) wasn't for the green effect, you know, it's like a fashion icon to have a green flag attached to your institution, but we felt that as academics here it was for love of the environment and sustaining the environment"

S1 Lecturer Nursing

All of the participants engaged well, and a wide range of views were expressed by the three groups. In relation to Task 1A Group 1 discussed environmental awareness, how we must evolve our actions and habits to keep our environment safe, the importance of culture in sustainability and the role of hobbies in maintaining a healthy lifestyle. Group 3 discussed how education can engage with sustainability both explicitly, through sustainability-related pedagogy and curriculum, and also implicitly through activities such as critical thinking and futures planning.

In relation to Task 1B, each participant spoke about their own experiences and passions, and how sustainability was addressed in the programmes they taught on. It was clear from this that many of the participants were very engaged with and passionate about sustainability. It was also clear from the range of views expressed, that there were multiple interpretations of the term sustainability, and how it is applied in the various programmes on the Campus and in HE in general.

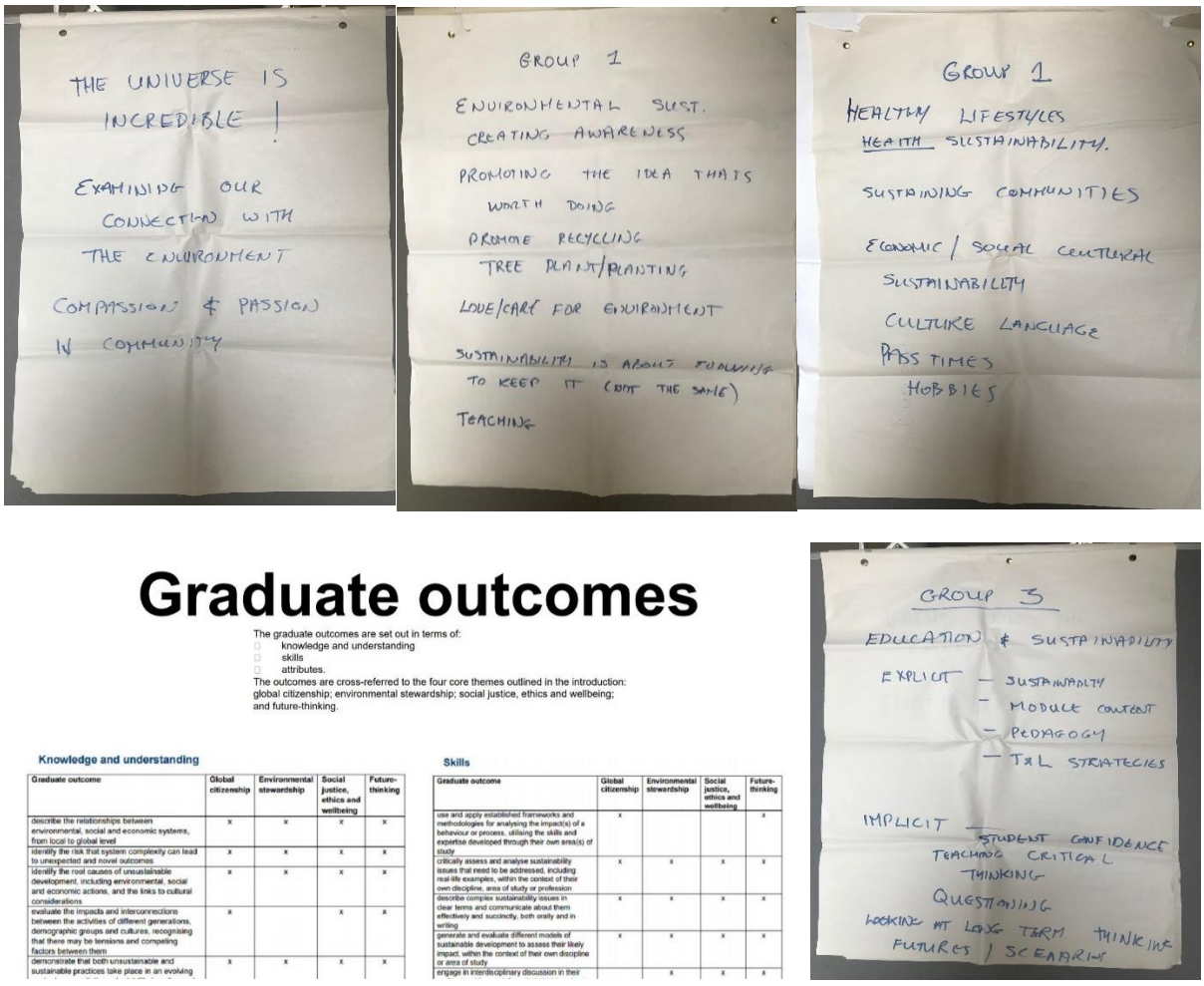


Fig 5.2 Examples of the range of feedback from the groups, recorded on flipcharts and an excerpt from a visual prompt ("Graduate outcomes" taken from Education for Sustainable Development, Guidance for UK higher Education providers 2014.)

As time had run out by the end of the session, the participants were asked to consider Task 1C as preparation for the next session and also to consider what, if given a blank canvas, a truly holistic sustainable campus would look like.

Due to the nature of the tasks, there were no concepts developed at this session.

The expressions of transformative agency as identified by Haapasaari et al., (2016) are presented in Table 5.3 below. The main expression observed related to criticisms of the Institute's lack of formal planning or incorporation of sustainability into teaching and learning practices or policies.

Session One Types of expression of Transformative agency	
Type of expression	**Incidents observed**
Resisting (the interventionist or the management.)	Not observed
Criticising (current activities and identifying problems)	Multiple interpretations and applications of the term sustainability, but no structure or formal plans.
Explicating (new possibilities or potentials in the activity).	Not observed
Envisioning	Not observed
Committing (to concrete actions aimed at changing the activity.).	Not observed
Taking consequential actions (to change the activity).	Not observed

Table 5.3 Expression of transformative agency during Session One

In terms of design intention, apart from running out of time for task 1C, the session went according to plan. The participants questioned and criticised their own practices and relationship with sustainability, as well as the practices carried out on the campus, and in the wider Institute.

5.2.1.3 Outcomes

A lot of good data was collected in relation to tasks 1A and 1B. It was acknowledged that many of the lecturers were already engaging with sustainability topics and ideas in their teaching practices, but it was on an ad-hoc basis depending on their own personal interest or commitment. The discussions and debates highlighted the perceived need among the participants for a shared general definition or framework for sustainability and while a lot of

the session was devoted to exploring this, it was clear that there was still a long way to go before consensus would be reached.

In terms of process, time management became an issue during the session which meant that Task 1C was not completed. The quality of the video recording (which used a fixed webcam) was not of a high standard, and as a result, the subsequent sessions were recorded using (two) tripod mounted HD video recording cameras.

5.2.2 Session Two

5.2.2.1 Design

The main aim of this session was to continue the "questioning and criticizing" stage of the ELC, which had started in Session One, and move into the analysis stage of the ELC. Analysis has two strands, historical-genetic analysis, which traces the origins and

Session Two Design		
Expansive learning action:	Questioning and Criticising and Analysis	
First Stimuli	**2nd Stimuli**	**Mirror data**
Task 2A. What do you think a sustainable IoT (or campus) would look like? (what would the term sustainable refer to in this context? What do you think would differentiate a sustainable campus from a "normal" campus?	Hard copies of various ESD and sustainability books and journal articles were available at the session	The introductory PowerPoint presentation of the summaries of the participants engagement in the first session.
Task 2B What aspects of sustainability (e.g. curriculum, pedagogy, promoting global citizenship, civic engagement etc) would you like to see brought to the fore in the Mayo Campus? I. What do you see as the main barriers to your vision for a sustainability focused Campus? II. Outline a narrative that describes where we are in relation to the delivery of ESD in HE; nationally, institutionally, at a campus level.	The answers to Task 1 were recorded on a flipchart and were made visible to participants to suggest a range of potential solutions.	
Social organisation	11 Participants in the board room, split into two subgroups.	

Table 5.4 Summary of design for Session Two

evolution of the activity, to understand how past developments led to the current situation, and actual-empirical analysis, which identifies the inner systemic relationships of the activity, to explain the current situation.

Fig 5.3 Session Two group discussion

Here, the design intention was to get the participants to investigate the structure and history of the way that they, and the Institute deal with sustainability and related issues. Task 2A was designed to stimulate the participants to question the notion of what a sustainable IoT or campus would look like. The researcher chose to base the task on an institutional object to help focus the participants on the overall CL task at hand (embedding sustainability in practices), and move them away from abstract definitions and discussions about sustainability. The task also provides the participants with an opportunity to identify what elements of sustainability that they think are important for an Institute or campus.

Task 2B was effectively a development of Task 1C, which had not been undertaken in Session One, and, was designed to get the participants to start analysing those aspects of sustainability education practices they see as important, what the barriers are, and how they see the current practices in relation to national standards or norms.

5.2.2.2 Report

Session Two took place two weeks after the first session in the Campus board room. There were 11 participants plus the researcher (9 in common with Session One, refer to Table 4.1 for details), and it lasted 97 minutes. The minutes/summary of outcomes of the first meeting,

along with an agenda for the second meeting, were emailed to each participant prior to the session. The session started with an introductory presentation which outlined the ELC and the CL process, the tasks for the session and reviewed the outputs from the first session.

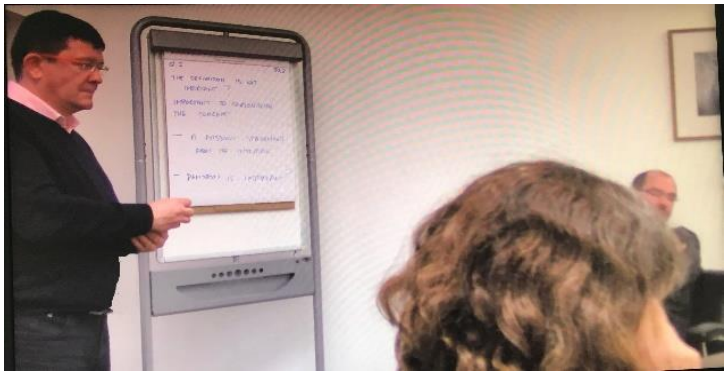
Much of the "analysis" in the session centred around (discussing) the meaning of the term sustainability and attempting to find an agreed definition. However, it was very clear that among the participants there were different views on what the term meant, and, on the need for (and importance of) having a definition (see Fig 5.4).

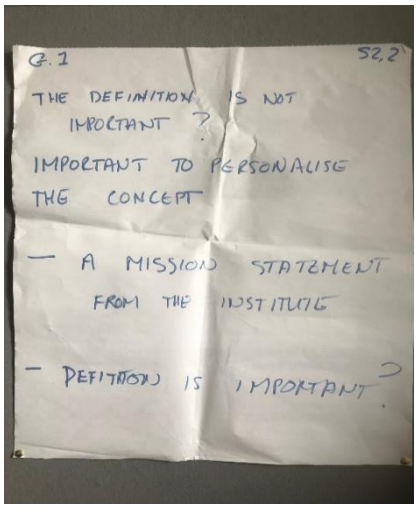
One lecturer, who felt a definition was important, stated:

> *"…when we talk about a sustainable campus what do we mean,… ? what are we looking for, what do we expect it to look like? and until we can articulate that then…."*
>
> S2 Lecturer Construction

In contrast, another lecturer from the same group stated:

> *"you would be reducing it by defining it in one sense, it's a very broad term".*
>
> S2 IT Lecturer A





The first time the concept of a mission statement was suggested in the CL was at the end of Session Two, above and right.

Fig 5.4 Session Two images

There was also a wide range views expressed in relation to what a sustainable IoT/campus would look like and how it would operate and function.

Many of the participants felt that a lot of good work in relation to sustainability and ESD was already being carried out on the Campus in the various programmes, but that there was no plan or formal structure in place to tie it together.

During the session, many concepts were proposed and discussed and are listed in see Section 5.2.2.4. The most significant, in terms of this project, was the concept of a "mission statement", which arose during the discussion on definitions, as a way of addressing the need for consensus, without being too prescriptive. It was proposed as a framework, which would provide an alternative to a definition, but yet allow for a variety of personal interpretations.

The manifestations of transformative agency are summarised in Table 5.5

5.2.2.4 Outcomes

By the end of the session, all of the participants had engaged with the tasks, and, as a result a number of concepts had been conceived:

- A mission statement
- A Centre for the study of sustainability in the campus
- New programme and module development e.g. a green Campus module
- Making programme linkages to sustainability more explicit both in the Institute literature and online
- Integrating more with the local community and carrying out projects with local groups and organisations such as the local authority

Session Two Types of expression of Transformative agency	
Type of expression	**Incidents observed**
Resisting (the interventionist or the management.)	Not observed
Criticising (current activities and identifying problems)	Criticisms of existing practices include the numerous barriers identified by the group such as • Lack of any formal approach or institutional framework for addressing sustainability and ESD • Sustainability seen by some as incompatible with the current growth economics model. • Diverse range of attitudes, opinions and values in relation to sustainability • Lack of an agreed definition of sustainability • Lack of institutional green practices and policies
Explicating (new possibilities or potentials in the activity).	There were some new ideas and suggestions made that would support improved practices • A mission statement • A centre for the study of sustainability • New module and programme development • Linking with the community on sustainability projects
Envisioning	Not observed
Committing (to concrete actions to change the activity.).	Not observed
Taking consequential actions (to change the activity).	Not observed

Table 5.5 Expressions of transformative agency during Session Two

At the end of the session, it was suggested that a number of these concepts had the potential to be developed into outputs of the overall CL process.

While the design intention was to avoid lengthy debates on definitions, the perceived need for a shared general definition or framework was repeatedly raised by the participants during the discussions, even while addressing the tasks. Notwithstanding the fact that there was a lot of time spent on discussing and debating the definitions and terminology, little agreement was reached by the end of the session and the researcher felt that this was likely to remain the case if the discussions were allowed to continue unabated. Therefore, the researcher decided that the design of the following session should firmly steer the group away from the debate on definitions and terminology, by focusing on discussing options that could accommodate a wider range of views, such as a mission statement

Having reviewed video footage from the session, the researcher formed the opinion that there was not enough benefit being gained from the use of mirror data. To rectify this for Session Three, the researcher contacted each participant directly and asked them to consider, review, and summarise how their own practices linked in and related to sustainability, and to forward the summaries to the researcher for presentation and use as mirror data in the next session.

5.2.3 Session Three

5.2.3.1 Design

The aim of this session was to continue analysing the current situation and move into the modelling stage of the ELC, where the participants would work on developing ways in which they could incorporate and embed sustainability and ESD into the staff practices in the campus. The session was designed to do this by focusing on and further analysing and developing the proposals suggested in the previous session, with particular emphasis on the mission statement.

Fig 5.5 Session Three

To move the terminology discussions away from purely focusing on the term sustainability, the researcher provided a definition for "Higher Education for Sustainable Development" (Riekmans 2012), in the hope that this would act as a second stimulus for the development of a wider framework such as the mission statement.

Following on from the researcher's request after Session Two, 9 of the participants submitted written summaries of how their teaching practices related to sustainability and ESD. These were collated and presented as mirror data as part of the introductory presentation.

Session Three Design		
Expansive learning action:	Analysing and Modelling	
First Stimuli	**2nd Stimuli**	**Mirror data**
Task 3A. Develop a mission statement that the group can support that could be taken to management either as a starting point or as a sample template.	A sample definition of Higher Education for Sustainable Development (Riekmans 2012) was presented in the introduction	A Powerpoint presentation at start of session outlined teaching practices from nine participants that directly related to sustainability. Hard copies of the presentation were also distributed at the meeting.
Task 3B Debate and discuss which of the proposed possible outcomes (outlined in Session Two) should be pursued by the group (and/or propose other possible/achievable outcomes.).	Examples of how other HEIS were implementing and embedding sustainability were given and referred to in a number of documents made available at the session.	
Social organisation	13 Participants in the board room	

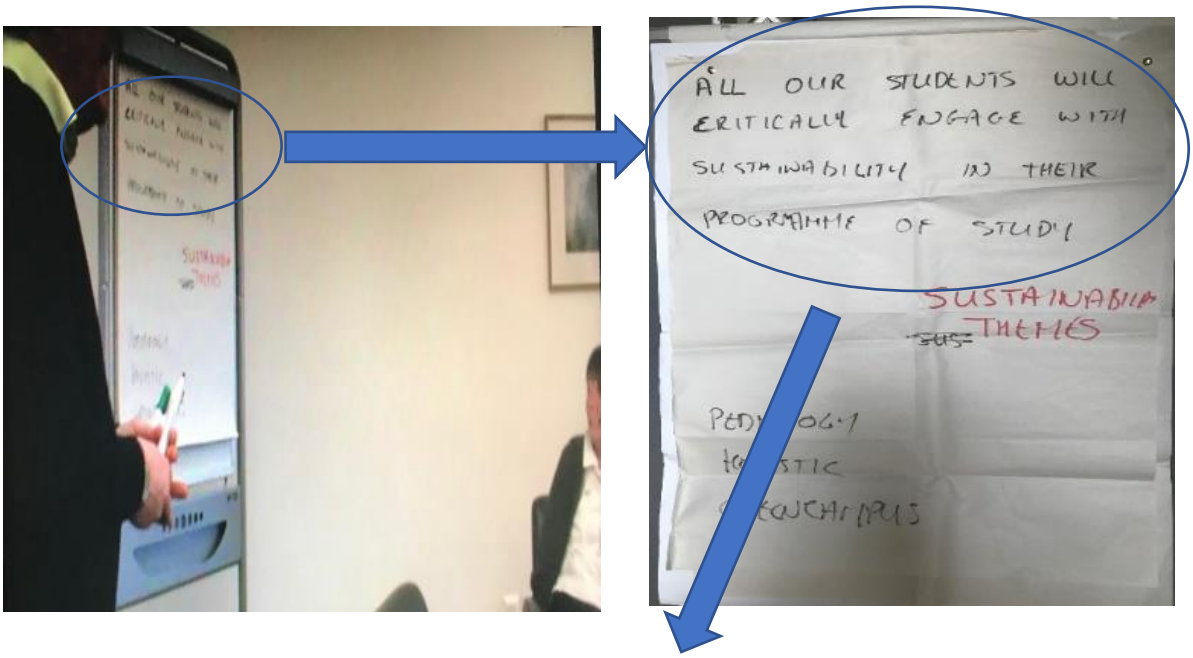
Table 5.6 Summary of design for Session Three

5.2.3.2 Report

The session took place in the campus board room with 13 participants (8 in common with Session Two), it lasted 110 minutes. The session started with an introductory presentation which outlined the ELC and the CL process, the tasks for the session, and reviewed the outputs from the first session.

The session was spent analysing and discussing tasks 3A and 3B. The longest discussion on a single topic was about the proposed mission statement, Task 3A, which ran for 52 minutes.

After the initial stages of the mission statement discussion, the researcher proposed the first iteration of the statement.



"***All our students will critically engage with sustainability in their programme of study***"

Fig 5.6 First iterations of the statement & Images from Session Three

This was subsequently discussed and developed during the session. A second line for the statement was proposed that would include operations and process and help make sure that there is consistency in relation to the message.

"The campus will endeavour to make sustainability a core value of its operation"

The group had effectively achieved the first goal of the session, which was to create/develop a statement that they could all support and take to management, that could provide a sense of direction.

The remainder of the session centred around discussing the other practice proposals made at the previous session, and the following concepts were discussed and developed:

- The development of a centre for the study of sustainability
- The development of sustainability related modules and programmes
- Appointing a dedicated sustainability officer in the Institute
- Aligning Institute strategy with sustainability

The participants agreed in principle to contribute to the Institute's online "Strategy Portal", which had been recently introduced by the Institute President, to encourage staff to engage with the development of the Institute's strategic vision. The aim was to propose that sustainability be positioned as a pillar in the new Institute strategic plan, rather than as an add-on or optional tick box.

The manifestations of transformative agency are summarised below in 5.7

5.2.3.3 Outcomes

At the end of the session, a number of concepts were proposed that could be further developed in the CL process and used to embed sustainability into the practices of the staff. These included: a draft iteration of a mission statement; a proposal for a centre for the study of sustainability; proposals to develop new modules and programmes; proposals for contributing to the development of the Institute strategy; and a proposal for the engagement of a dedicated sustainability officer.

The outcomes from this session were important because they signalled a turning point away from general questioning and critical discussions, to a more concrete developmental stage,

where initially abstract concepts now began to take shape. The early draft of the mission statement provided a solid platform on which to build, and there were also a number of other feasible ideas which could be developed to respond to the overall aims of the CL.

Session Three Types of expression of Transformative agency	
Type of expression	**Incidents observed**
Resisting (the interventionist or the management.)	One participant resisted the idea of the mission statement on a number of grounds: they are primarily associated with the corporate sector, they can be emblematic in nature rather than having any meaning and, they are often associated with the "growth economics" model.
Criticising (current activities and identifying problems)	Previous criticisms in relation to the diversity of views and values among the participants reiterated. In relation to the proposed mission statement, the need for this diversity to be acknowledged, as well as the importance of articulating a shared or common purpose. The participants felt that the statement should be a simple, honest and realistic expression of the participants' beliefs.
Explicating (new possibilities or potentials in the activity).	Two new possibilities were generated • Aligning Institute policy with sustainability • Appointing a dedicated sustainability officer
Envisioning	• The wording of the mission statement • What a Centre for the study of sustainability might look like • The development of sustainability related modules • The role of a dedicated sustainability officer
Committing (to actions aimed at changing the activity.).	The participants agreed to contribute to the Institute online Strategy Portal.
Taking consequential actions (to change the activity).	Not observed

Table 5.7 Expressions of transformative agency during Session Three

5.2.4 Session Four

5.2.4.1 Design

In terms of the ELC, the primary aim of Session Four was modelling, which means using the ideas that were conceived in Session Three to construct simplified models or germ cells, that offer possible solutions to the overall aim of the CL intervention.

Fig 5.7 Image from Session Four

To support this process, the researcher provided the participants with a number of tools, in the form of three documents. These tools were intended to provide the participants with additional information that could be used to provide a second stimulus. The following documents were emailed in advance to the participants and hard copies were made available at the session.

1. "Education for Sustainable Development and holistic Curriculum change", a review and guide. It included summaries of three relevant HEI UK case studies (HEA, 2011).

2. A document previously generated by one of the participants on an idea for developing a Centre for the study of Community Sustainability in the Mayo Campus.
3. A list of possible wordings for the proposed statement (prepared by the researcher after the last session.).

Descriptions of the tasks, the 2nd stimuli and the mirror data used in the session are presented below in Table 5.8.

Session Four Design		
Expansive learning action:	Modelling	
First Stimuli	**2nd Stimuli**	**Mirror data**
Task 4A. Consider the title and wording of the "mission statement"	The ELC diagram and the emphasis on modelling.	Draft wording from Session 3
Task 4B Discuss the proposal for a Centre of Sustainability Studies.	A document was provided that was previously generated by one of the participants on an idea for developing a Centre for the study of Community Sustainability in the Mayo Campus	
Task 4C How can we influence Institute strategy to ensure that sustainability is considered a pillar rather than an add on?	Description of the thematic areas on the Institute strategy portal provided at the session.	Researcher outlined his own strategy submission.
Task 4D What can we do to develop cross modular/interdisciplinary modules on Sustainability at L6, L7 and L8 and/or as a standalone or Special Purpose Awards.	Document with examples of how other HEIs embed sustainability provided at the session to the participants.	Introductory Powerpoint presentation
Social organisation	12 Participants in the board room	

Table 5.8 Summary of design for Session Four

5.2.4.2 Report

The session was attended by 12 participants (8 in common with Session Three) and lasted 91 minutes. The session actions built upon the modelling work that was started in Session Three and focused on modelling potential ways that sustainability could be embedded in the campus practices. The session started with a Powerpoint presentation which outlined the tasks and made explicit reference to Stage three (modelling) of the ELC.

The four tasks were discussed and debated in depth during the session, with incremental progress being made with respect to each. In terms of the operationalisation of any outcome from the project, the participants felt it was important not to be seen to be pushing people to do something that they do not want to do. It was suggested that implementation should be incremental, start small and hope that people will become more involved as it gains momentum.

The early part of the session involved a lively debate and discussion about the idea of the mission statement and its wording. A number of proposed wordings were suggested and at the end of the session there were three options under consideration.

A number of the participants suggested (and volunteered to work outside the CL session on setting it up) that a student survey should be carried out to help inform the development of new practices and activities. However, agreement on the need for the survey and the type and nature of the survey could not be achieved during the session.

A sub-committee was formed at the session to prepare a proposal calling for the completion of a feasibility study on the creation of a "Centre for the Study of Sustainability" (CSTS) in the Mayo Campus. The CSTS sub-committee was chaired by a participant who was a member of the campus management team. The sub-committee agreed to bring the proposal, once

completed, to senior management to see if funding could be secured to complete the feasibility study.

A new concept that was proposed at this session was that each programme board would write a paragraph (referred to from now on as the "sustainability paragraph") that would be located on their programme page on the Institute's website. It would outline how sustainability is relevant to and embedded in each programme and it was seen as a way of operationalising the CL, as well as, promoting the sustainability credentials of the programme.

The manifestations of transformative agency are summarised in Table 5.9

5.2.4.3 Outcomes

At the end of the session, it was clear that a number of strong models had been created and were ready to be further developed for implementation on the campus.

The models included:

- A 2nd iteration of the draft wording of the mission statement which included three options;
- The creation of a subcommittee to develop the idea of a CSTS on the Mayo Campus;
- The development of a sustainability paragraph for each programme's webpage;

The participants were now manifesting agency in a new way by committing to take action and carry out work outside of the sessions, by engaging with the strategy portal and the CSTS subcommittee.

Session Four Types of expression of Transformative agency	
Type of expression	**Incidents observed**
Resisting (the interventionist or the management.)	There was some resistance to the idea of the survey expressed mainly around whether it was necessary and if it would actually help the activities being developed in the CL process.
Criticising (current activities and identifying problems)	The exact wording of the statement proposed in Session Three was critiqued and criticised (with a view to making it more reflective of the participants intentions).
Explicating (new possibilities or potentials in the activity).	The development of a sustainability paragraph on the webpage of each programme. Carrying out a student survey
Envisioning	• Continuing to develop the wording of the mission statement • Creating a subcommittee to prepare a proposal calling for the completion of a feasibility study into the creation of a CSTS in the Mayo campus. • How to influence Institute policy and strategy by encouraging other academic staff (from outside of the change lab) to engage with the online strategy portal.
Committing (to concrete actions aimed at changing the activity.).	Five participants' agreement to form a subcommittee to prepare a proposal calling for the completion of a feasibility study into the creation of a CSTS in the Mayo campus. On-going participation with the strategy portal.
Taking consequential actions (to change the activity).	Not observed

Table 5.9 Expressions of transformative agency during Session Four

5.2.5 Session Five and Session Six

5.2.5.1 Design

Fig 5.8 Session Five

Session Six was effectively a continuation of Session Five and so I present the data from both sessions together. The main design aim was to continue to develop the model proposals from the earlier sessions and examine them to find ways that they could be implemented in the Mayo Campus. The actions in these sessions thus align with the "examining" stage of the ELC, which involves people working with the models, either through discussion or practice, to better comprehend their dynamics, potential and limitations.

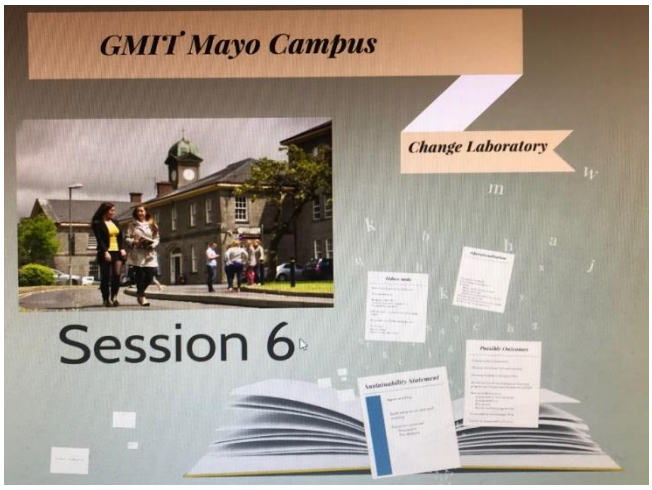


Fig 5.9 Prezi Screenshot from Session Six

Prior to Session Five, the participants were provided with additional materials (via email) in the form of documentation, which were to be used as tools for dual stimulation. The materials included two academic journal papers that included research findings on lecturers' perspectives on sustainable Universities and Education for Sustainability. The participants were also issued with the UN Sustainable Development Goals (SDGs) publication as background information to broaden the discussions on sustainability.

To set the context for Session Five, and as a "sense checking exercise", prior to directly engaging with examining the details of the models, the researcher asked the participants to consider why the mission statement was being developed, and what they thought its final purpose might be (Task 5A). The intention was to get the group to examine their motivation for the development of the statement. The researcher believed that this would focus the group and help further develop a sense of common purpose and shared understanding among the participants. The second task in Session Five involved examining ways that the proposals made in Session Four could be operationalised on the campus. Session Six continued with this examination, albeit with a focus on the proposals that resulted from the Session Five deliberations.

Details of the tasks and tools from Sessions 5 and 6 are presented in Table 5.10.

5.2.5.2 Report

In Session Five, there were 11 participants (7 in common with the previous session), it lasted 86 minutes, and it was one of only two sessions (along with Session Eight) which did not start with a formal presentation. For timetabling reasons, it was (the first session) held in the "community living room" which is a bespoke informal learning space.

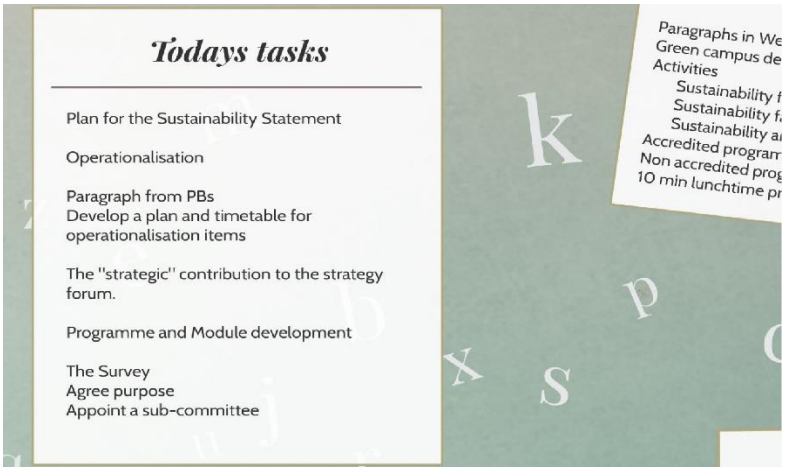


Fig 5.10 Prezi Slide 2 from Session Six, Tasks

Session Six occurred two weeks after Session Five, it was attended by 10 participants (7 in common with the previous session), it lasted for 69 minutes and took place in the boardroom.

<table>
<tr><th colspan="3">Session Five & 6 Design</th></tr>
<tr><td>Expansive learning action:</td><td colspan="2">Examining</td></tr>
<tr><td>First Stimuli</td><td>2nd Stimuli</td><td>Mirror data</td></tr>
<tr><td>Task 5A.
What is the purpose of developing a mission statement?</td><td>Research objective: how can the CL foster an expansive learning process to embed sustainability into practices in an organisation setting in HE.</td><td>The proposed wordings of the statement</td></tr>
<tr><td>Task 5B
How will the operationalization of the outcomes of the CL process be achieved through;
• The statement,
• The sustainability paragraph,
• Strategic alignment?
• The CSTS proposal,</td><td rowspan="2">Document with examples of how other HEIs embed sustainability provided at the session to the participants.

Document with examples of how other HEIs embed sustainability provided at the session to the participants.</td><td>The minutes and notes from the previous session</td></tr>
<tr><td>Task 6A
How can we move forward and operationalise/implement the models?
• The statement
• The sustainability paragraph
• Strategic Alignment
• Programme development
• The survey</td><td>The minutes, notes and recorded outcomes from Session Five.</td></tr>
<tr><td>Social organisation</td><td colspan="2">Session Five, 11 Participants in the community living room
Session Six, 10 participants in the board room</td></tr>
</table>

Table 5.10 Summary of design for Sessions 5 and 6

Session Five opened with an examination of the development of the proposed statement and what its final purpose would be. The general understanding, of what the statement was about, developed as the discussion evolved, and a number of points emerged that required further examination and discussion. The participants felt that the statement needed to be developed in the context of existing Institute strategy and the Mayo Campus strategic thematic areas. The participants accepted that the statement only reflected the views of those in the CL, and they indicated that they would like the statement to be adopted by the wider campus (and perhaps the Institute). There was a concern raised that some staff might wish to object to such a statement, and to address this, it was agreed that all staff should be provided with the opportunity to comment on the statement.

The participants also questioned the title and felt that it should not be called a mission statement, as this was too corporate. The term charter was also suggested, but after some debate, it was decided that it should be referred to as a "sustainability statement" for the Mayo Campus (or the Mayo Campus Sustainability Statement (CSS)).

In Session Five, there was a detailed discussion on the proposal to create a "sustainability paragraph" and in Session Six, one participant from each programme represented at the CL was tasked (as a volunteer) with liaising with the relevant programme board to develop the paragraph.

In Session Five, three participants volunteered to work on the development of a student survey and brought some suggestions forward for discussion at Session Six. While the idea of having survey information was considered to be potentially useful, the proposal was shelved because of lack of clarity as to its exact purpose and role.

In sessions 5 and 6 there was a noticeable increase in agency among the participants. They were taking increasing actions outside of the sessions. They were becoming involved in

external subcommittee work, discussions with other staff members about sustainability, liaising with their own programme board, and trying to influence other staff members to contribute to the Institute strategic plan.

Session Six Prezi Slide 5 Session Six Prezi Slide 4

Fig 5.11 Prezi Slides from Session Six

There were no new concepts developed during sessions 5 or 6.

The expressions of transformative agency observed in both sessions are presented in Table 5.11

Session Five & 6 Types of expression of Transformative agency	
Type of expression	**Incidents observed**
Resisting (the interventionist or the management.)	Resistance to the mission statement because the Institute already has an Institute wide mission statement, therefore developing a campus mission statement would be inappropriate (Session Five)
Criticising (current activities and identifying problems)	In Session Five, in addition to the resistance to the title, there were numerous criticisms about the "mission statement" including: the title, how representative of staff are they, and who do they represent?, poor experience of previous mission statement development activities in the Institute, which resulted in the development of statements that had little or no impact.

	In Session Six there were many criticisms of the proposal to carry out a student survey, including criticisms of the nature and type of questions proposed, how representative any survey would be, and how useful would the information be.
Explicating (new possibilities or potentials in the activity).	Not observed
Envisioning	• Examining the need for the CSS to be circulated to all staff for review and feedback, and exploring a range of options for the title of the statement (Session Five) • The development of the CSTS was being carried out by the sub-committee (both sessions) • The development of a survey (Session Five only) • How participants might engage with their programme boards (PBs) to develop the sustainability paragraph (A little in Session Five, much of Session Six devoted to this)
Committing (to concrete actions aimed at changing the activity.)	Session Five • To work on developing the survey • To encourage staff outside of the CL to engage with the portal in relation to aligning Institute strategy with sustainability Session Six • To engage with their respective PBs to develop the sustainability paragraphs • To explore the possibility of development of sustainability related modules or programmes in the context of current Campus and Institute policy
Taking actions	Not observed

Table 5.11 Expressions of transformative agency during Session Five & 6

5.2.5.3 Outcomes

At the end of the Session six, three options of the draft wording of the sustainability statement had been agreed. These were distributed by the researcher via email, along with an introduction/overview of the project, to all of the campus staff for comment and feedback.

1. *The Mayo Campus endeavours to embed sustainability into the core of its activities and operations. We aspire to provide a teaching and learning space that delivers quality higher education that promotes critical engagement with sustainability.*
2. *We aspire to provide a teaching and learning space that promotes critical engagement with sustainability.*
3. *The Mayo Campus endeavours to embed sustainability into the core of its activities and operations. We aspire to provide a teaching and learning space that promotes critical engagement with sustainability.*

A number of participants had volunteered to go back to their respective programme boards and develop an appropriate programme specific sustainability paragraph.

Two participants had also agreed to explore the need for, and potential of, new modules and programme development, and report back at the next session.

Due to time pressures for the participants, it was agreed that Session Seven would not be held until May (in four weeks) by which time lectures would have ended.

From an ELC point of view, the distribution of the "sustainability statement" and the participants' engagement with their respective programme boards to create sustainability paragraphs should be considered "implementation". However, as it occurred after Session Six, I am including it as part of the data presentation for Session Seven.

5.2.6 Session Seven

5.2.6.1 Design

The aim of this session was to reflect on the outputs from the previous session and get agreement on how the group could move forward with the implementation of the ideas in a meaningful way.

Fig 5.12 Session Seven

Session Seven Design		
Expansive learning actions:	Implementation and reflection	
First Stimuli	**2nd Stimuli**	**Mirror data**
Task 7A. Reflect on the proposed wordings for the "Sustainability statement"	The emphasis on reflecting on how the statement and the paragraphs address the overall task of embedding sustainability into practices	The proposed statement
Task 7B Reflect on and review the paragraphs proposed by the various programme boards.		The proposed paragraphs articulating the linkages of each programme to sustainability
Task 7C How can we build on what we have done to continue the work into next year?		Summary of outputs to date (in the session agenda document)
Social organisation	12 Participants in a small lecture room	

Table 5.12 Summary of design for Session Seven

5.2.6.2 Report

A month had passed since Session Six, and much work had been carried out in the intervening time on the implementation of the various proposals. The session was attended by 12 participants (6 in common with Session Six) and it focused on reflecting on how the implementation work was progressing and examining ways that the project could be extended or continued into the next academic year.

There were two positive email comments received by the researcher from the staff regarding the draft wordings of the sustainability statement. While this represents a modest response, the absence of any objection, addressed the concerns raised in the previous session and was taken as tacit approval by the staff. One of the comments favoured option 3, and as this was also the researcher's preference, it was proposed that wording option 3 be put forward to management for adoption by the campus at the next general staff meeting.

> *'The Mayo Campus endeavours to embed sustainability into the core of its activities and operations. We aspire to provide a teaching and learning space that promotes critical engagement with sustainability.'*

As agreed at the previous session, five of the programme boards had returned with proposals for the wording of the sustainability paragraph (some via email) and three more were in discussion. The participants tasked with exploring new programme development reported that it was not a current priority of the campus management. The CSTS sub-committee reported that they had completed a feasibility study proposal, and they were going to present it to the Institute's executive board for approval at their next meeting. The session finished up with a discussion on how the project might be continued. The participants proposed a number of conceptual ideas that could be developed to extend the life of the project. These were discussed in detail and recorded in the meeting notes.

The main concepts discussed are listed under the explicating heading in Table 5.13 which presents the expression of transformative agency observed during Session Seven.

Session Seven Types of expression of Transformative agency	
Type of expression	**Incidents observed**
Resisting (the interventionist or the management.)	Not observed
Criticising (current activities and identifying problems)	Not observed
Explicating (new possibilities or potentials in the activity).	Many ideas were proposed to continue the project including • Create a green campus booklet that links with all programmes • Developing a staff development package that focuses on ESD • Develop a dedicated sustainability module • Introduce a sustainability related award for staff or students
Envisioning	• The development of the CSTS was being carried out by the sub-committee • How participants might engage with their programme boards (PBs) to develop the sustainability paragraph (A little in Session Five, much of Session Six devoted to this)
Committing (to concrete actions aimed at changing the activity.).	To continue to explore the possibility of development of sustainability related modules or programmes as standalone offerings CSTS subcommittee to report back at next meeting
Taking consequential actions (to change the activity).	Some participants had reported engaging with their respective PBs to develop the sustainability paragraphs

Table 5.13 Expressions of transformative agency during Session Seven

5.2.6.3 Outcomes

The participants committed to continue working on developing the sustainability paragraph proposals for each programme. While it had been proposed by the researcher that wording option 3 of the "sustainability statement" was to be issued to management for adoption at the next campus staff meeting, it was not formally agreed. To resolve this, the researcher decided to put it on the agenda for the next meeting with a view to achieving formal agreement.

The participants also agreed to consider what actions or projects could be undertaken to continue the momentum and outputs that the CL had generated.

5.2.7 Session Eight

5.2.7.1 Design

The aim of Session Eight in terms of the ELC was to reflect on and evaluate the implementation of the models to date. In practical terms, this meant reviewing and finalising the outcomes that had been proposed during the sessions.

Prior to the session, the researcher had anticipated that another session would be necessary to close out the process, however, after the session, it did not seem necessary and hence this was the final session of the intervention.

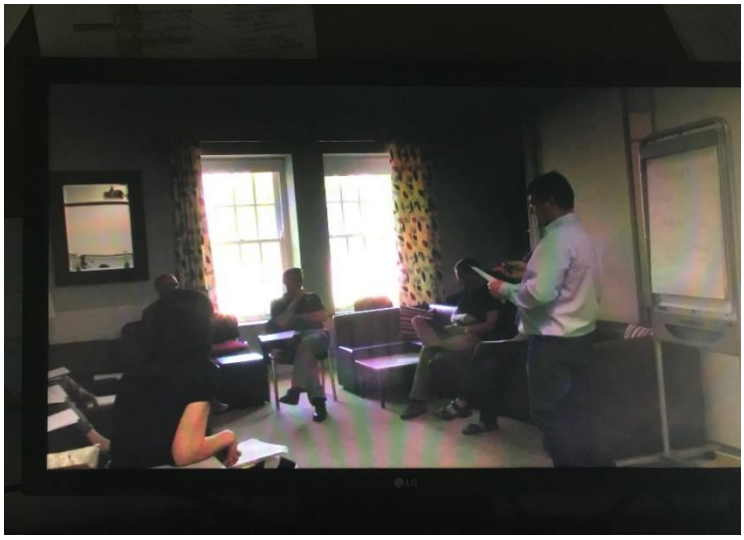


Fig 5.13 Session Eight

The session task involved reviewing the process outcomes and reflecting on how these could be continued through actions and initiative (See table 5.14), after the CL had finished.

Session Eight Design		
Expansive learning actions:	Implementation, reflection and consolidation	
First Stimuli	**2nd Stimuli**	**Mirror data**
Task 8A. Review the work and outcomes of the process and reflect on how these might be continued.	The emphasis on reflection in the context of the ELC.	The wording of the proposed statement, and sustainability paragraphs
Social organisation	10 Participants in the community living room,	

Table 5.14 Summary of design for Session Eight

5.2.7.2 Report

The session took place in the community living room and was attended by 10 participants. The session agenda had been circulated to the participants before the meeting, and it contained summaries of the following CL outcomes: the final wording of the Sustainability Statement, the proposed wording of the sustainability paragraphs, a summary of the proposed module development plans, and an update from the CSTS sub-committee.

After some final tweaking, the wording of the Sustainability statement was amended to the following.

> *The Mayo Campus is committed to embedding sustainability into the core of its activities and operations. We endeavour to provide a teaching and learning space that promotes critical engagement with sustainability.*

It was agreed that it would be sent to management for discussion at the next staff meeting with the hope that it would be approved and adopted.

Six of the eight programmes represented had agreed the wording for their sustainability paragraph and were happy that the statement be used in promotional literature now being developed, while two were still in discussion.

Sample wording of the sustainability linkage paragraph for two programmes is given below:

> *'Working towards sustainable development is crucial for the healthcare sector and for society in general. As the largest group of employees in the healthcare sector, nurses can have a profound influence on these agendas. Sustainability in the context of health and well-being, the nursing profession, the acute and chronically ill, the community and the workplace are integral to all of our curricula designs.'*

'The Outdoor Education programme promotes a holistic approach to sustainability, through equipping graduates with the ability to facilitate the re-connection of individuals and groups with the natural environment. The Outdoor Education (OE) Programme believes that connecting (or re-connecting for others) with nature is the first step in helping individuals and society in general to value the environment. The OE programme believes that valuing and understanding the environment rather than commodifying it, is a first step in helping others come to understand sustainability and the subsequent engagement that individuals within society have to make.'

A new subcommittee with 4 members, independent of the CL, was formed to work on the development of sustainability related modules and programmes in the campus, and they agreed to meet in the following week to discuss and plan development work.

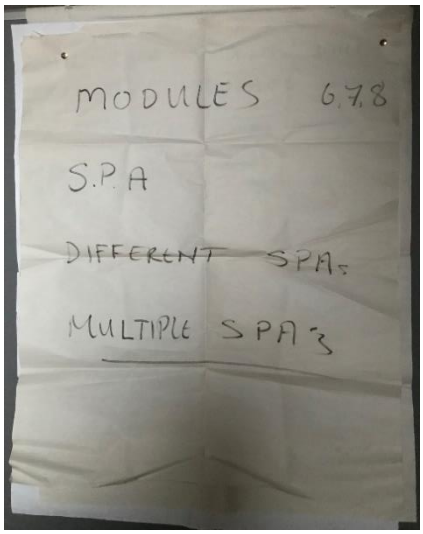


Fig 5.14 Flipchart from Session Eight

The CSTS subcommittee reported that the proposal to the executive board (EB) was approved and that the Institute had allocated resources to carry out the study in the next academic year. The positive response by the EB was warmly welcomed by the group and resulted in the group making suggestions and further developing the CSTS concept.

The group considered a number of possibilities to keep the project momentum going, including the development of new modules and programmes (subcommittee in place), organising public lectures and talks, organising a conference, and linking the green campus booklet with each programme through the sustainability paragraph.

The expressions of transformative agency observed in Session Eight are presented in table 5.15

Session Eight Types of expression of Transformative agency	
Type of expression	**Incidents observed**
Resisting (the interventionist or the management.)	Not observed
Criticising (current activities and identifying problems)	The exact wording of the statement was criticised as not being strong enough
Explicating (new possibilities or potentials in the activity).	In addition to briefly discussing the ideas suggested during Session Seven for the continuation of the project, the group suggested organising events such as public lectures and talks and a sustainability or ESD conference.
Envisioning	The wording of the CSS was revised and finalised In light of the go ahead for the CSTS feasibility study, a number of new ideas for the type of work that the CSTS might undertake were explored by the group.
Committing (to concrete actions aimed at changing the activity.).	Wording of the CSS strengthened, and changed to demonstrate commitment by including the words committed and endeavours. Committing to the formation of a module/programme development sub-committee Committing to undertake and/or participate in the completion of a feasibility study into the creation of a Centre for the STudy of Sustainability
Taking consequential actions (to change the activity).	Participants had reported engaging with their respective PBs to develop the sustainability paragraphs CSTS sub-committee reported that the feasibility study proposal was approved for completion and that funding had been allocated

Table 5.15 Expressions of transformative agency during Session Eight

5.2.7.3 Outcomes

After the session, the minutes were circulated among the participants and outlined the following outcomes:

- The finally agreed wording of the statement
- The paragraphs from each programme board
- An agenda for inter-disciplinary programme development and list of the staff who had agreed to work on same
- A list of actions and tasks that the CSTS steering committee would like to see carried out as part of the approved feasibility study
- A list of activities that were happening or planned to happen on the campus that were in line with or supportive of continuing the aims of the project e.g. the Outdoor Education conference that was being held in the campus later that month

After the session, the researcher worked with the CSTS sub-committee to form an advisory panel for the further development of the CSTS project.

The sustainability statement was adopted by the Mayo Campus at a staff meeting on the 16th of June 2016, and formally publicly launched the following February. The programme development subcommittee went on to develop a programme proposal that led to the development of numerous Climate Change related programmes that are currently being offered in the Institute.

From a process point of view, the final stage of the ELC is "consolidation" of the new activities, which can occur over months or years (Virkkunen and Newnham, 2013) and is often not mapped directly onto a session. To help capture what constituted early consolidation in this project, the researcher carried out semi structured interviews (SSIs) approximately six months after the last session.

By Session Eight, the main aim of the project had been achieved ie a number of concepts and activities to embed sustainability in the campus practices had been developed. Other than considering how to keep the aims of the project "alive" in general terms, there was no methodological reason to have another session and thus Session Eight was the final session in the CL.

5.3 Semi Structured Interviews

Semi structured interviews (SSI) were carried out with 17 of the participants approximately six months after the CL sessions were completed. The main purpose was to determine what the perceived outcomes from the process were, and what were the participants' experiences of participation. The data from the interviews was reviewed and 13 unique independent outcomes were identified. They are grouped together under three different headings: 1) Tangible, 2) Practice and Pedagogical, and 3) Personal and Social, and are presented in Table 5.16. For the sake of clarity and brevity, I am going to refer to the "perceived" process outcomes simply as process outcomes from now on.

In the following section, the outcomes are presented under the three headings listed above. The data and outcomes presented under the third heading, "Personal and Social" outcomes are very much influenced by the experience of the participants and thus share content and overlap with the data presented in Section 5.3.2 Experiences of participation. To avoid repetition, only experiences that are not captured in the "Personal and Social" outcomes section are presented in Section 5.3.2.

5.3.1 Process Outcomes.

During the interviews, each participant articulated their views on what they believed the outcomes of the process were. The researcher has identified similarities among these outcomes and has grouped them together under three different headings;

- Tangible: those with tangible outputs eg the sustainability statement or paragraphs,
- Practice and Pedagogical: outcomes that influence or affect practice or pedagogy.
- Personal and Social: outcomes that influence personal or social behaviour.

	Process outcomes
	Tangible or physical outcomes
1	The creation of the Campus Sustainability Statement.
2	The creation of a report requesting management to commission a feasibility study for the creation of a Centre for community sustainability.
3	The development of statements by each programme board which explicitly highlights the linkages between the programmes and sustainability.
4	Development work on new modules (sustainability, cross-disciplinary projects).
5	Contributions to the Institute Strategy portal about the need to focus on and incorporate sustainability at a strategic and policy level in the Institute.
	Practice and pedagogical outcomes
6	Influence and impact on teaching practices of the participants
7	Making sustainability an **established concept** in the campus, mainstream rather than extreme (concetization).
8	Recognising that Sustainability and ESD were **already embedded** in many of the programmes
9	Recognising that there was a lot of **existing ESD expertise** already on campus.
10	Realisation by participants that their **own areas of expertise (and field) is actually relevant** and that it could be a driver for the ESD and sustainability agenda.
	Personal and social outcomes
11	Social **connection** with others who had similar interests.
12	The process promoted a broader understanding of what sustainability is, beyond the traditional environmental view, and an awareness of what it can mean to others from different disciplines and backgrounds.
13	Some participants felt **empowered** by the process and one felt **validated**.

Table 5.16 Process outcomes

5.3.1.1 Tangible Outcomes

Five of the outcomes identified were categorised as tangible outcomes, in that it was possible to observe tangible outputs, these were (as listed in table 5.16)

1. **The Campus Sustainability Statement**
2. **The sustainability paragraphs**
3. **The CSTS sub-group report and the consequential approval for and funding to carry out a feasibility study into the creation of a centre for the study of community sustainability**
4. **The interdisciplinary programme development group which was formed after the CL**
5. **Contributions to the Institute online Strategy Portal**

All of the participants interviewed acknowledged the development of the Campus Sustainability Statement, and most acknowledged the feasibility study as a significant output from the process. Six participants identified programme or module development, and three identified the programme sustainability paragraphs as significant outcomes. Only two participants mentioned the contributions to the strategy portal as a process outcome. The development of these outcomes occurred incrementally, in stages that spanned the entire CL process, so for comparative and analytical purposes, a summary of the development stages of these outcomes is presented against the time line of the CL sessions in Table 5.17.

The "practice and pedagogical", and "personal and social" outcomes identified in table 5.16 developed in a more gradual way, that was not directly linked to specific events in the sessions. Many of these outcomes were only identified by the SSIs, which were carried out after the intervention, hence are not tabulated or presented in the context of the CL sessions timeline.

Session ➡	1	2	3	4	5	6	7	8
Outcome								
1 Sustainability Statement.	-	Idea of a "mission statement" suggested	The idea of developing a mission statement for the campus gains traction		Change from mission statement to sustainability statement.	Proposed wording emailed to all staff for feedback		Wording finalised (Statement adopted at a subsequent staff meeting)
2 Centre for the Study of Sustainability	-	Idea that sustainability could be a central theme in the campus		CSTS Sub-committee formed to work on a proposal			CSTS Sub-committee to present proposal to the EB & the Governing Body (GB)	Funding approved for the completion of a feasibility study by the executive board.
3 Programme linkages to sustainability	-			Suggestion that highlighting the linkages would be a form of operationalisation.	Members to discuss idea with each PB and develop paragraphs		Five PBs have agreed wording for the paragraphs	All PB's to consider including a statement, 5 have agreed.
4 Module Development work	-		Suggestions that programmes or modules could be developed that would focus on sustainability.			Two members to investigate potential for programme development		Sub-committee formed to look at development of cross and interdisciplinary sustainability related modules.
5 Contribut. to Strategy portal			Participants contribute and encourage other staff members to contribute to the Institute online strategy portal (until it closed)					

Table 5.17 Summary of development of the "tangible" process outcomes

5.3.1.2 Practice and pedagogical outcomes

Of the eight "intangible" outcomes identified, five are categorised under the heading of Practice and pedagogy. These were outcomes that were identified by the participants as impacting their teaching practices or pedagogical approaches. The impacts were in part because of the participants' attendance and engagement with the session and the associated subgroups, but also, as a consequence of the participants' interactions with each other outside of the sessions in both collegial and social settings.

Outcome 6. Impact on the teaching practices of the participants

Six participants reported that they had taken ideas raised in the CL and used them afterwards in their teaching practice.

> *"I have given more time to the topic in my teaching and probably have a broader view of the topic than I had before".*
>
> Lecturer Business programme

> *"Yes, I have brough the whole concept of sustainability forward into my lectures"*
>
> Lecturer B IT Programme

Outcome 7. Making sustainability an established concept in the campus.

One of the most widely reported outcomes of the process was the perception among many of the participants, that the process had made sustainability and ESD a mainstream topic on the campus.

"I think it tweaked the entire ethos of the campus, it nudged it in the direction of sustainability, you are now pushing on a more open door than you were a year ago…. You might have been called Tree Hugger 10 years ago, you were just pushing the car along a journey that had already started…. Sustainability is now an established concept in the college. The statement was great, the green campus had started it, but it is now entrenched….In the canteen people now discuss sustainability issues".

Lecturer C IT Programme

Outcome 8. Recognising that sustainability is already embedded in many programmes

Another significant outcome was that many of the participants realised that sustainability and ESD were already embedded in many of the programmes on the campus. This insight accompanied the realisation that there was a lot of expertise on ESD and sustainability present on the campus already. A consequent outcome of this is that certain commonalities between programmes were identified. This created a sense that sustainability is a space shared by all the participants regardless of the disciplinary background.

"although it took time because of all of our different viewpoints on sustainability and how we understood that, I think the common outcome might be that recognition of how we are all, from every perspective that was represented there, feeding into the one thing, but that might be the common outcome…. It took a lot of meetings to clarify and dig down into what sustainability was and , when we all dig deep enough, we were all working in the same space."

Lecturer Nursing Programme

Outcome 9. Recognition that there was a lot of existing expertise already on the campus

Many of the participants acknowledged that taking part in the process opened their eyes to the level, range, and extent of the existing sustainability expertise on the campus.

> *"…it came to the fore that there was a lot of expertise on the campus already that could be channelled into something as well"*
>
> Lecturer Construction Programme

Outcome 10. Recognition of relevance of own area of expertise (and field) to sustainability.

For some participants, there was also the realisation that their own discipline area is highly relevant to sustainability and ESD. This realisation of course feeds into the personal and CPD outcomes

> *"Initially I went there with an interest in what sustainability was, from a green mindset….. It (the CL) has been hugely beneficial to me as a lecturer to think about how technology can facilitate the concept of sustainability, it made me aware of the scope of technology".*
>
> Lecturer B IT Programme

5.3.1.1.3 Personal and social outcomes

Outcome 11. Social connections with others who had similar interests

16 of the interviewees reported that they believed that relationships between the participants were strengthened as a result of participation in the process. Many also reported an increased social and collegial connection with the other participants as a result of discovering a new shared interest in sustainability.

"…. I think there were already good relations and it allowed us to develop together. This allowed us a good opportunity to collaborate".

Lecturer Business programme

"…. we don't often get the opportunities to work together and interact with your colleagues. It also alerted you to who was interested and who had similar ideas."

Lecturer B Outdoor Education

"Yes, that as one of the outcomes, networking and the advancement of a certain culture of sustainability"

Lecturer B Social care

"Yes I certainly would (think relationships were formed), I think it was a great way of bringing people together and will be useful for developing the future of this campus."

Management participant B

Outcome 12. Participants broadened their personal understanding of sustainability.

Many participants, including those who had considered themselves familiar with sustainability before the CL, felt that their understanding of sustainability became richer and deeper as a result of participating.

*"…it was an opportunity to look at the topic in our hectic schedule. Great cross fertilisation, it widened my views of sustainability, e.g. when I saw the nurses there **I** was wondering what the hell are they doing here?, it opened up my understanding of sustainability in the broader context. It was a very supportive environment. It was an opportunity to sit down with people who had expertise in a huge amount of areas. It gave us time to discuss important issues."*

Lecturer B Outdoor education

" … *at the outset I didn't identify at all, I thought that sustainability was in another space, that was to do with greenness and recycling and sustainable buildings ……and I became involved because I was interested in all of that, in healthy societies, but it was only as the process began and entered maybe its third meeting that I saw what my role in healthcare and as an educator in healthcare matters in all of that... in terms of sustainable health and wellbeing, and then, healthcare interventions, and how they impact on wider society and sustainability. I'd never gone there before. So that was a huge outcome for me. It all made sense and I realised that it is something that we are doing all of the time, but I hadn't attached it to sustainability in its broader sense"*

Lecturer Nursing programme

Outcome 13. Participants felt empowered by the process.

Three of the participants reported that they felt that the process was empowering for themselves and two felt that the process was empowering for all of the participants. One participant reported that they felt that their own work to date on sustainability had to some extent been validated by the process.

"It was empowering and good for self-development, it forced us to dig a little bit deeper. Every meeting we dug deeper to understand sustainability, our understanding developed iteratively. If we was… examined in any other way than the Change Lab, you might have got very linear views, that might not have made the marriage across all of the disciplines that were realised through the Change Lab process, by listening, participating, discussing and debating and then together moving forward on a new level of understanding. "

Lecturer Nursing programme

"The process made my life easier. 15 years ago I was considered a tree hugger, now it's less contentious. I felt that because of the process, what I do in relation to Western Care (a community organisation) was now actually part of my job. I felt it validated what I am doing in the wider community by recognising it"

Lecturer C IT Programme

5.3.2 Experience of participation

Many of the participants commented on how they enjoyed engaging in an open discursive process, and, that in their experience, this was not "normal" in the context of change management in the Institute.

One of the participants commented on the benefits of the cross-disciplinarity of the group and the fact that staff and management were working together to bring things forward. Another lecturer commented on how they felt that the process was very suitable for addressing complex issues such as sustainability.

> *"If it had been interviews (individuals) or working groups it would not have got the richness of understanding, and I would not have got the richness of understanding that I have now about sustainability. The developmental process was there without a doubt, this method certainly suits a complex topic such as sustainability, it might not have suited a much simpler topic."*
>
> Lecturer Nursing programme

None of the participants felt that they were driving the process, many felt that they were either observers or passengers. The majority felt that their role was to partake in dialogue, raise ideas and be a conduit to their own programme boards.

> *"At the outset I didn't feel I had a specific role. As my understanding evolved, my potential role revealed itself."*
>
> Lecturer Nursing programme

"…more of an interloper, I didn't see I had a major role, I was observing… and once I saw it wasn't going to be an extension of the green campus I thought yeah, that is interesting, and something worth engaging with and getting involved with."

Lecturer A Outdoor Education

The majority of the participants reported that they felt it was an open, collaborative and inclusive process and that they were listened to appropriately during it and a number of participants acknowledged the role and steering function of the researcher.

"People went to the meetings because they did see structure and had faith in your capacity to deliver. These things tend to often be talk shops where strong characters take over…..with this there was structure and facilitation. It was a great process, but you had the right people and good facilitation. The meetings were always positive, nobody felt intimidated, the atmosphere was very conducive to the way that it worked "

Lecturer B Outdoor Education

However, one participant reported that they felt the adversarial nature of one of the discussions in one of the early sessions meant that their contributions were not listened to.

It was recognised as being primarily a bottom-up approach (even though there were management representatives at the meetings). The process (despite many participants (including the researcher) not knowing where the process would lead) was kept moving and any controversial issues were dealt with in a conciliatory manner, that ensured all sides stayed engaged.

At the end of each interview, the researcher asked the participants why they had initially agreed to participate in the process. The responses are summarised below in table 5.18

No of respondents	Reason stated
15	Interest in sustainability/Environment
1	Shared pain (empathy from a PhD student in another programme)
1	Interest in the process
1	Interest in self-development
1	Because you asked!

Table 5.18 Reasons given by participants for participating in the research-intervention

5.4 Follow up activities by the group participants

After the process finished, a number of the participants remained involved in activities that were started in the CL, such as programme development, and work on the feasibility study report for the CSTS.

As it turned out, the approved teaching hour allocation for the completion of the feasibility study was given to the researcher who set about forming a steering group to guide and oversee the study. The steering group consisted of the head of centre as Chairperson, the researcher as coordinator, and a group of 13 members of staff, 11 of whom were academics (8 from the Change Lab, one member of the support staff and the Green Campus Programme Coordinator. The steering group met fortnightly to discuss the requirements of the study and review interim progress reports. The follow up activities and their implications for this project are discussed again in the concluding chapter.

5.5 Summary of data presentation chapter

In this chapter, I have presented the data from the CL sessions in the form of summary descriptions of each session, under the headings; design intention, session report, and session outcomes. The sessions are presented using the ELC framework, and each session is mapped onto the appropriate stage/stages of the ELC. The data from each session is presented with a focus on the development of concepts, transformative agency, and any significant process outcomes.

Follow up SSIs were carried out to determine how the participants experienced the CL process and what they perceived as the significant process outcomes. The process outcomes identified were presented under three headings, tangible, practice and pedagogy and personal and social.

In the next chapter (data analysis), I focus on one of the tangible outcomes to frame the analysis of the data, in order to answer the two research sub- questions; RQ1.1 How did the participants develop the concept of the 'Campus Sustainability Statement'? and RQ1.2 How did the participants express their transformative agency during the process of developing the 'Campus Sustainability Statement'?

These answers, in conjunction with the analysis and the remaining outcomes, will be explored in the discussion Chapter, to answer the main research question; What are the relationships between concept development and participant transformative agency in a research intervention focused on fostering sustainability in Higher Education?

Chapter 6 Data analysis.

6.1 Introduction

In this Chapter I provide an analysis of the data presented in the previous chapter. The purpose of the analysis is to support answering research sub questions one and two. This will underpin the arguments that will be made to answer the main research question in the following discussion, thereby synthesising and arguing for the core contribution to knowledge. The analysis in this chapter focuses on tracing the formation of a concept and the associated development of transformative agency (as described in Chapter 3), that occurs during an expansive learning process in a Change Laboratory research intervention (CL).

As described in the previous chapter, the CL resulted in the creation of many new concepts during the intervention, and four of these were developed into what I have described as the tangible outcomes (see Table 5.16). For the purpose of the analysis, I focus on the development of one of these concepts, the Campus Sustainability Statement (CSS).
I do this because it was fully developed during the course of the CL sessions, therefore, its development can be completely traced from formal conception in Session Two, to the agreed final wording in Session Eight. This is not the case for the other three major concepts, that were developed during the CL, as they all involved engagement with external groups or sub-committees, and, in some cases, were not fully developed by the time the CL had finished.

The concept of the CSS was developed during the process in five stages, each of which are described and analysed in detail in Section 6.2. In Section 6.3, I focus on analysing the expressions of TA that were specifically associated with the development of the concept of the CSS. This account builds on the presentation of the transformative agency data, presented in Chapter 5. A summary of the chapter is provided in Section 6.4.

Fig 6.1 The Mayo Campus Sustainability Statement, unveiled 22nd Feb 2017

The Mayo CSS (See Figures 6.1 and 6.2) was formally launched at a public unveiling ceremony on the Mayo Campus on the 22nd February 2017, by environmental activist Duncan Stewart.

6.2 Concept formation and development

The concept of the CSS was formally conceived in Session Two, but the circumstance that gave rise to it, happened in the first session. After Session Two, it was discussed in every session, and it was the concept to which most time was devoted during the CL (23.7% of the time spent on speaking turns, excluding Session One). There were five key stages in the development of the statement, and these are presented in Table 6.1, and are detailed in the following sections. The first two stages identified the need for the concept, and what it might look like in the form of a germ cell idea, whereas stages 3, 4 and 5 focused explicitly on developing the concept. A germ cell here is taken to mean a simplified model that explains the problematic situation and offers a perspective for resolving or transforming it (Virkkunen & Newnham, 2013). For this reason, I refer to stages 1 and 2 in terms of concept formation

and stages 3,4 and 5 as true concept development. However, in the following text, I will usually use the term concept development to refer to both stages. The formation and development of this concept is traced through the five stages, which are outlined in Table 6.1. The stages are identified as;

- 6.2.1 Discussing the definition of the term sustainability
- 6.2.2 Identifying a shared framework
- 6.2.3 A 'mission statement' for the campus
- 6.2.4 From a mission statement to a Campus Sustainability Statement.
- 6.2.5 A commitment to the action of embedding sustainability in the campus.

Each of the stages outlined above, involved multiple moments of iterative formation and development, around which, the concept ultimately evolved. I present the analysis as a set of key moment narratives for each of the stages of the development (see summary in Table 6.2).

Fig 6.2 Launch of the Mayo Campus Sustainability Statement by environmental activist Duncan Stewart on the 22nd Feb 2017

Sustainability Statement concept development summary									
ELC Action ⟹	***Quest. & Criticising***		***Analysis***		***Modelling***		***Examining***		***Implementation Reflection Consolidation***	
	Stage 1		***Stage 2***		***Stage 3***		***Stage 4***			***Stage 5***
Development of the concept of the Mayo Campus Sustain-ability Statement	***Discussing the definition of the term sustainability*** *Exploring the meaning of the term sustainability and how people understand it in relation to their own practices*		***Identifying a shared framework*** *The mission statement concept is first suggested as an alternative framework to a definition.*		***A Mission statement for the Campus*** *The concept is developed into a mission statement for the campus.* *Wordings are proposed, reviewed and revised.*		***From a mission statement to a Campus Sustainability Statement*** *Concept develops from a "mission statement" to a "Campus Sustainability Statement."* *Draft wordings agreed and issued to all staff for comment and feedback.*		--	***A commitment to the action of embedding sustainability in the campus.*** *The concept is refined and commitment to action is made more explicit through the use of terms such as "committed to" and "endeavours".* *Final wording agreed for submission to management for consideration and adoption at a staff meeting*
Session Timeline	**1**		**2**		**3**	**4**	**5**	**6**		**7** **8**

Table 6.1 Timeline and key events in the formation and development of the Mayo Campus Sustainability Statement

6.2.1 Discussing the definition of the term sustainability

The purpose of the research-intervention was to explore how an expansive learning process could be fostered and used to embed sustainability into the practices of the staff on the Mayo Campus, through concept development and the development of participants' transformative agency.

The key moments of concept development identified in this stage are presented in Table 6.2

Stage 1	***Moments***
Discussing the definition of term sustainability	1. Exploring the participants' understanding of the terminology. 2. Identifying what aspects of sustainability the participants were passionate about. 3. Identifying and establishing the existing activities and practices. 4. Recognising the lack of a sustainability framework or policies.

Table 6.2 Stage 1 key moments of concept development

The need for conceptual clarity in relation to ***the participants' understanding of the terminology*** (and for a concept such as the sustainability statement) grew out of the first question from one of the participants in Session One.

> *"are we all starting with a common definition of sustainability?"*
>
> S1 Management participant A

In order to progress and develop either plans or concepts that would have the same shared meaning among participants, this participant was suggesting that it was going to be necessary to have agreed terminology and a common starting point. Rather than try to define a term as broad as sustainability per se, the researcher suggested using the "Brundtland" definition of Sustainable Development as a starting point for the discussion, as this was a widely, albeit contentiously accepted, definition.

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

It was acknowledged that sustainability has different meanings in different disciplines, and that this can be problematic when attempting to collaborate in the development of shared goals or visions. Many participants commented that sustainability is often associated with environmental issues. The participants felt that it was important to move away from this narrow context, and recognise that it is in fact, much wider, as it crosses disciplines and is relevant in all fields of study.

The differentiation between **"**sustainability" and "viability" was also discussed to highlight the problematic nature of the word. As one participant argued, business sustainability can refer to the question of whether a business will be in existence at some point in the future, whereas, holistic sustainability, asks questions about the existence of the future and what it will look like. The researcher suggested that the "business sustainability" type of sustainability interpretation be referred to as "viability" to avoid conceptual confusion, and this was accepted by the participants.

This simple differentiation, between two concepts of what sustainability can mean, highlighted to the researcher the need for conceptual clarity, and influenced the task design in subsequent sessions.

All of the participants described ***what aspects of sustainability they were passionate about.*** It became clear that many of the participants were personally very committed to the various interpretations of sustainability, and were actively engaging with it, in their day to day teaching practices.

> *"I am not keen on taking the idea of sustainability as a box ticking exercise, in order to achieve targets and look good and all the rest of it. I think you need to have a deeper purpose beyond that to make a contribution.… in terms of applying it to myself, I am aligned with environmental sustainability… and there are things I teach specifically such as the idea of cultural sustainability…traditions and crafts and the importance of the built heritage and I think there are a lot of lessons to be learned from the past in terms of understanding sustainability too".*
>
> S1 Heritage lecturer B

> *"I suppose the passion I would have is, I just think the universe is so absolutely incredible, so I teach on community and sustainability…we take the three strands environment, economic and community and I really think that if we were looking at the programme as a whole, a lot of it is around compassion rather than passion and I think that is very much the social element or the community element……and we try to include that in the whole programme"*
>
> S1 Social care lecturer A

As discussed in Chapter 5.2.1, to begin the research-intervention, it was necessary to ***establish what the existing activities and practices*** on the campus were, and to find a starting point from which all could agree to proceed. When describing the campus activities and practices, a number of the participants referred to the work of the members of the Green Campus group who were responsible for a number of very successful initiatives, including being the first IoT campus in Ireland to achieve a "Green Flag", the construction of an outdoor classroom (another first in Ireland), the discontinuation of the use of artificial pesticides on campus by the estates office, and the implementation of a printer cartridge recycling scheme. It was acknowledged that other than these activities, there were very few formal sustainability focused educational activities being carried out in the campus. Many of the participants identified sustainability related activities that they carried out in their own teaching practices, including environmental awareness in outdoor education; theory of sustainable development in the Heritage programme; and sustainable building technologies in the construction programme. One lecturer who taught on business modules commented:

> *"…I teach on…...operations management… in a case study we were looking at the implications of the supply chain in the fashion industry, on both the environment and on climate change."*
>
> *Management Participant A*

Thus, it was recognised that because there was a lot of interest among individual staff members, there actually was a lot of activity in this area, but it was being done on a piecemeal basis, by individuals in their own modules, rather than to any formal plan or structure.

Having reviewed the session footage and notes, the researcher identified the ***lack of a sustainability framework or policies*** as being a significant barrier to formally embedding sustainability in the practices of the campus. It was clear from the participants' input, some of which had been unprompted, that there was significant interest, commitment, and activity in relation to sustainability on the campus. However, the lack of a framework or formal structure effectively meant people are left in disparate pockets of activity, working with different definitions and concepts, rather than being brought together to allow the development of a shared conceptual understanding, which would lead to the collaborative development of visions or goals. The researcher felt that it would be useful to use some time in subsequent sessions to work on bringing together such a shared conceptual understanding, and so, one of the aims of the following session became to focus on identifying a shared framework.

6.2.2 Identifying a shared framework

Having recognised the problems of conceptual fragmentation, and with the researcher consequently using task designs to prompt the discussion, the participants moved on to considering what such a framework would look like in the context of a HEI, that could be considered a "sustainable IoT or campus". The key moments of the development process identified in stage 2 are presented in Table 6.3:

Stage 2	***Moments***
Identifying a framework	1. The challenge of incorporating sustainability into all programmes 2. Recognition that sustainability needs to be visible across all campus activities, and not just in programmes 3. The role and importance of a definition 4. The concept of a mission statement,

Table 6.3 Stage 2 key moments of concept development

There was still a lot of uncertainty about what the term sustainability meant, particularly in the context of the teaching practices in the campus. The challenges of ***incorporating sustainability into all programmes*** or modules was highlighted in the session, in particular, the challenges in relation to incorporation into traditional programmes, such as business:

> *" that could end up leaving you with some tension between irreconcilable concepts, between trying to teach business students, for example, sustainability, and trying to teach them a certain type of economics, at the same time"*
>
> S2 Social Care Lecturer B

It was felt that ***sustainability needs to be visible across the whole range of activities of the organisation*** since students learn from the whole experience. Being on campus, eating in the canteen, traveling to the campus, all these activities have sustainability implications, which impact what a sustainable campus would look like.

> *"Students learn from the totality of their experience, it's not just from the curriculum, and so it's not what they learn in class here, it's also the whole experience they have here….."*
>
> S2 Heritage Lecturer B

It was felt that lecturers should have more than a passive role in these campus activities and should encourage students to think critically about these issues.

Subsequently, the focus turned to ***debates around the role and importance of definitions.*** The starting point for that discussion was when a participant in Session Two stated:

> *"sustainability is a contested term..."*
>
> S2 Heritage Lecturer B

While some of the participants felt that a definition was necessary and important:

> *"I would certainly need some sort of a definition of sustainability, bigger than just what we see from a building/construction aspect, because that is the only bit of it that I know, I'd like to see where that fits into the bigger picture, and to do that I just sort of think that we need a definition in terms of what we mean by sustainability….*
>
> *…when we talk about a sustainable campus, what do we mean?… what are we looking for? what do we expect it to look like?... and until we can articulate that then…."*
>
> S2 Construction Lecturer

Others claimed that it was not important:

> *"We were saying that the definition of sustainability is not important…"*
>
> *"…..you would be reducing it by defining it in one sense, it's a very broad term."*
>
> S2 IT Lecturer A

After some further debate, the group consensus was that one needs to personalise the meaning, and make it relevant to one's own situation, rather than necessarily have an exact definition.

One group proposed that a **mission statement** might be a way of addressing the need for consensus, without being too prescriptive.

" …we felt that there should be a mission statement….it would be useful in that it would provide a framework, by which we are the individuals that drive it, and you are open to interpret that mission in terms of your own practices"

S2 Outdoor Education Lecturer B

This is the first time a "mission statement" is mentioned in the CL, and, as can be seen from the flipchart record in Fig 5.4, the idea for the mission statement sits *in between* the group stating that a definition is not important, and then stating that it is important. It was acknowledged and accepted that different people in the group have different views of what sustainability means, how important definitions are, and how it can be engaged with from a HE point of view.

At this stage the groups had discussed the challenges of incorporating sustainability into certain programmes. They had also expressed a range of opinions on the necessity or value of sustainability definitions. A proposal by one of the groups that a mission statement could be developed that would serve as a framework, received broad support from all. The appeal of the statement seemed to be that it took the focus away from definitions and allowed individuals the freedom to interpret sustainability as they saw fit. The mission statement, therefore, formed the focus of the next stage of the development process.

6.2.3 A mission statement for the campus

Once the germ cell concept of developing a mission statement had been suggested, in the context of providing a framework within which to work together, the group moved on to confront the necessary tasks involved in exploring and developing such a statement. This stage of the development process consisted of a detailed analysis and discussion about what such a

statement would be, and what it would mean for the participants. The germ cell notion of a mission statement was considered and explored in detail in the context of the campus, until a generally acceptable early version of the concept was agreed upon. The wording and how such a statement might form part of the operationalisation of the overall CL project was also considered.

During the course of sessions 3 and 4 there was a series of rich and fruitful debates which ultimately led to the creation of a number of proposals for the wording of the statement. The concept of the statement was now beginning to take shape, and it was moving away from being a germ cell idea, to becoming a more refined, nuanced concept, as it was collaboratively honed by the participants

There were 11 significant moments identified in this stage of the development, and these are identified in Table 6.4 and ***italicised in bold*** in the following text.

Stage 3	Moments
A mission statement for the campus	1. Sustainability in the context of HE 2. The problems with a mission statement 3. The need for conceptual clarity 4. Proposal to offer the students the ability to "look at things in a different way" 5. Influence of participants' beliefs 6. The statement should have meaning to guide actions. 7. The importance of being honest and realistic 8. Focus on creating awareness and a common purpose. 9. Students experience education holistically. 10. Statement to reflect both student engagement and campus operations. 11. Influence of green campus acknowledged as being very important

Table 6.4 Stage 3 Key moments of concept development

At the start of the statement development discussions, the researcher attempted to focus the participants on ***sustainability in the context of HE,*** rather than on the abstract definitions that had been explored in previous sessions. This was done through the introduction of a definition of "Higher Education for Sustainable Development", which is narrower, and places the concepts of sustainability in the context of higher education.

> *"Higher education for sustainable development (HESD) aims at enabling people to not only acquire and generate knowledge, but also to reflect on further effects and the complexity of behaviour and decisions in a future oriented and global perspective of responsibility."*
>
> Rieckmann (2012)

In Session Three, the whole ***concept of the mission statement was problematised*** as follows:

> *"..this is the kind of corporate stuff that has been popular for the last 15 years, mission statements, the question is - what actual function do they serve?... are they emblems that one presents to the public as a statement of virtue? …but whether that actually means anything, that's an entirely different thing…*
>
> Social Care lecturer B

This comment highlights two questions about the appropriateness of using a corporate concept such as a mission statement, to express an aspiration in relation to sustainability: Firstly, are "mission statements" just emblematic, or do they have meaning for those who proffer them? and secondly, if they are to genuinely reflect values and meaning, how can this be made clear, so that it is consistent with the organisation's understanding of the terminology? The first question set the tone for the debates about developing such a mission statement that followed.

The second question highlighted ***the need for conceptual clarity*** and the ensuing debate about this, prompted the following observations.

> *"This causes a problem, because if we are going to have conceptual clarity we either have a concept of sustainability so tame and so co-opted that Donald Trump will agree with it, or we have a concept of sustainability that is so subversive and unsettling to the status quo, that it is very troubling and it renders our capacity to continue doing and the way we do it disabled".*
>
> *"There are the two polarities, the natural thing in group dynamics is that we move somewhere into the middle, so we end up with a bit of a thing that's a little bit dangerous and a little OK, and then it's a mission statement, and then we've done the mission statement, and we say we are committed to sustainability, and we all feel virtuous, and we have a virtuous statement, but it's not actually transformative at a radical level.*
> *You can't have growth economics and sustainability! That's a very strong statement, but if we are going to have clarity about it, that is where I would start from, so do we either believe in that or not? I think if you put it in stark terms, it clarifies the choices that we are making and the terms that we are using".*
>
> Social Care lecturer B

These comments identify two opposing conceptions of sustainability and highlight the contested nature of the term. It was clear that some participants had very strong views about sustainability and what it means. However, it became clear in the subsequent discussion that these views were not shared by all.

This apparent conceptual impasse was addressed and responded to when one of the participants suggested a ***way to offer the students the ability to look at things in a different way.***

"I am not a fan of, mission statements but it might be something that might focus the group, but the other side of it is, instead of saying we are one extreme or the other …it's just to say that what we are offering students, is the ability to look at things in a different way, and not just in what could be the mainstream way, but enabling them to think for themselves and make a choice, and maybe in the future, make a decision, so we are not like, trying to convert them to one way or the other, but enabling people to make an informed choice".

Green campus/Administration A

This represented a turning point (which I shall refer to in future as turning point A) in the session (see Section 6.3.1 En.1), as the focus was now placed on what the participants could collectively offer the students (encourage critical thinking), rather than the participants' opinions or beliefs.

This proposal received broad agreement from all of the participants, including Social Care lecturer B who said:

"I agree with that, what is good about that, is that it is more realistic, it's actually more accurately saying what we would do. It's not making a claim that we are going to be sustainable, or that we are going to commit ourselves to sustainability education …we are not, but we could do that, it's more realistic and more modest. …….I suppose, this is as good as it gets."…….

……"We should be quite rigorous about our concepts and make sure that they are meaningful…now I think a modest one [Mission statement] makes perfect sense to me. Instead of a big mission we have a tiny little mission, with a really

modest claim. Our claim is modest, but the mission is a dramatic concept… another contradiction, but it can also be a signal of aspiration"

Social Care lecturer B

This proposal represented a pivotal moment in the development process. It provided a way to express an academic/pedagogical aspiration without compromising values, or committing to something that would have been considered unachievable by some of the participants.

Subsequently, there was much time spent on ***debating how the participants' beliefs should or would influence the statement*,** and that it must also be recognised that there are many different beliefs about sustainability. The participants felt that while the statement should be about what they believe in, it would be important to acknowledge that there are many different beliefs about sustainability, and that as a teaching institution, there is an inherent responsibility to present alternative views and promote critical engagement.

"….that is the way it is though, there are different beliefs among the lecturing staff, you are going to be informing people about different things in different ways. By doing that, you are enabling people to make their own decision about what their beliefs are …..but you have to give them opposite views, and a variety of views in order for them to be able to make an informed decision."

Green campus/Administration A

The idea that the mission ***statement should have meaning to guide actions*** (even though it was acknowledged that they often do not), was considered very important to the

participants, as was the need to develop something that would express or articulate a common purpose.

> *"Whatever it is, it has to be meaningful, and guide decision making and guide what we do,…….. in the sense that values guide the decisions that we make… but it does mean as well, that it's more than just a sense making of what we do here…..there will be some difficult decisions, and things won't fit… neatly ……..If we got a common purpose that we could agree on, forget if it was a mission, or a goal or whatever it is, if it was just a common purpose….. and a common definition…."*
>
> Management Participant A

The participants ***expressed the importance of being honest and realistic*** and agreed that a modest starting point was fine, if it represented something that was believed in. Some of the participants also felt that the proposal, while modest, was also radical. Students would not have to agree with sustainability, but they would have to engage with it. The aim would be to focus on creating an awareness, a common purpose, and a modest aim could be that sustainability is always presented as an option, it would serve to develop and build critical awareness.

The wording of the statement was initially developed in Session Three, and further refined and expanded into a number of options during Session Four. One of the first wording proposals of the statement was articulated as;

> "All our students will critically engage with sustainability in their programme of study……..…..achievable, modest, but radical"
>
> Social Care lecturer B

It was acknowledged that the term "will" has a promissory tone, however, the participants felt that they could accept this, as it aligned with their beliefs, and what was being promised, seemed to be a realistic aspiration. It was considered realistic in the context of programmes, rather than in every module, as it was acknowledged that not all lecturers would be interested or engage.

As in stage 2 of the development, it was again acknowledged that ***students experience education holistically***, and that by adding an emphasis on sustainability in the academic experience, it would enhance the overall student experience, as well as complement the green campus initiatives.

The idea of ***keeping it general and simple*** was popular with the participants, because they felt that it would be easier for staff to support it, which in turn would increase the chances of it gaining traction. Furthermore, it would be less likely to meet resistance at programme board level, if it was not seen to be forcing an ideology. It was also suggested that having the statement in place would also provide a tool to drive the sustainability agenda, in that it could be used as something to critique actions and against which to measure compliance.

The idea of having just a single line statement was discussed initially, but it was then suggested that the statement be expanded ***to include reference to the campus endeavouring to make sustainability a core value of its operations***. Participants felt that it was important to have a level of consistency between what is taught in the classroom and what is done on the ground in the Institute. They also felt that the development or adoption of a statement may encourage the Institute to follow the Mayo Campus's lead and pursue green campus flags for activities such as reducing waste and energy usage.

The first draft of the second line of the statement was:

"The campus will endeavour to make sustainability a core value of its operation. "

By the end of Session Three, two sentences had been developed that could be used in the statement. Between Sessions Three and Four, the researcher reviewed the recordings and notes from Session Three and developed two draft statements which were issued for consideration to the participants, prior to Session Four. The relevance and importance of each word in the proposals were discussed and debated in detail for the first 42 minutes of Session Four, and many of the issues that had been raised in Session Three were re-examined and discussed again.

During the debates in Session Four, the ***influence of the green campus was acknowledged as being very important*** and as underpinning all the sustainability activities that were being carried out on the campus, especially from an operational point of view. The fact that there was buy-in and support from the two members of campus management who were participating in the project, was also seen as a very positive indictment of what the group was trying to achieve.

At the end of this stage (end of Session Four) of the development, there were three wording options on the table.

A. *The Mayo Campus endeavours to embed sustainability into the core of its activities and operations. We aspire to provide a teaching and learning space that delivers quality higher education that promotes critical engagement with sustainability.*

B. *We aspire to provide a teaching and learning space that promotes critical engagement with sustainability.*

C. *The Mayo Campus endeavours to embed sustainability into the core of its activities and operations. We aspire to provide a teaching and learning space that promotes critical engagement with sustainability.*

By now, a statement concept had been developed, the aim of which was to say that the Mayo Campus is endeavouring and/or aspiring to embed critical engagement with sustainability.
It was acknowledged that this was a modest, but incremental start, as it provided an aspirational framework, upon which to build. The overall aim being to build on the green campus and individual activities that were being carried out, to ensure students are constantly exposed to sustainability, as well as being encouraged to critically engage with it from an academic point of view.

6.2.4 From a "mission statement" to a "sustainability statement"

By this stage, the idea of developing a mission statement was firmly established. Even though the wording was not yet fully agreed, its purpose, aim and structure had been thoroughly considered, and agreed by the participants. Its purpose was to provide a direction with a common meaning, one that could help guide decisions and actions towards embedding sustainability in the Mayo Campus. Its aim was to ensure that staff and students on the Mayo Campus engage with sustainability both practically and pedagogically. At this point, the focus of the group moved to refining the wording, agreeing an appropriate title and sending it out to all of the staff on the Mayo campus for comment and/or approval.
The next stage of the development became the focus of Session Five, by which time the participants had had three weeks to consider and internalise the proposed wording options.
To begin Session Five, as a sense checking exercise, the researcher asked the participants to

consider why the mission statement was being developed, and what they thought its final purpose would be. The intention was that a re-evaluation would ensure that there were no important issues missed during the initial development stages, and that the mission statement was being developed as fully as possible.

The significant moments of development of this stage are presented in Table 6.5:

Stage 4	Moments
From mission statement to sustainability statement	1. "Mission statement" to "Campus Sustainability Statement" 2. Need for dissemination among the wider staff for feedback and comment

Table 6.5 Stage 4 Key development moments

The main outcome of the sense checking exercise, was that the participants decided that instead of "mission statement", the statement should be ***identified as a sustainability statement for the Mayo Campus,*** as it was felt that this was a much more accurate reflection of what the participants were trying to develop. The participants felt that it should reflect what was being done on the campus and what the campus aspired to do. The main discussion revolved around the suitability of the term "mission statement", which was now becoming increasingly contentious. The previous arguments had been against the corporate nature of the term. Now, the focus was on the fact that the Institute already had a mission statement, and it was felt that it would be inappropriate to develop a campus specific statement. A number of the participants mentioned that they had already been through the process of developing a mission statement in the Institute before, during other institutional development activities, and they had not experienced it as an effective process or outcome.

The idea of changing the title to a charter was also considered, but as one of the participants said

> *"To be honest I think it's kind of a red herring, the whole mission statement, charter [title]…. you know, let's put a working title on it, and if the big wigs, those who are further on up, decide that it's not what we call that then….it needs to be a vision of sustainability….."*
>
> S5 IT Lecturer C

At this point, another lecturer responded with:

> *"….a sustainability statement"*
>
> S5 IT Lecturer A
>
> *"I'm happy to go with 'sustainability statement' for the Mayo Campus, I mean that's fairly firm."*
>
> S5 Management Participant B

This proposal received broad approval from the group, and from then on, the statement was referred to as the "sustainability statement" for the Mayo Campus.

Because it was going to be put forward as a campus wide sustainability statement (i.e. impacting staff who were not directly involved with the change lab), many of the participants felt that it should be made available ***or disseminated to the wider staff for comment and feedback.*** This was agreed, and the three draft wording options were issued via email to the staff for comment and feedback. Other than two positive emails, and a few casual comments made to the researcher by staff during break times, there was no negative feedback received from the wider staff. The CL participants took this to mean that the statement was, in general, acceptable, and the wording that was agreed by the group in Session Seven was:

"The Mayo Campus endeavours to embed sustainability into the core of its activities and operations. We aspire to provide a teaching and learning space that promotes critical engagement with sustainability".

At this stage, the concept had been fully developed, the draft wordings had been issued to the staff for comment and feedback, and the group had reviewed the feedback and agreed in principle on one of the options to be issued to management for consideration and adoption at the next staff meeting.

6.2.5 A commitment to embedding

The final stage of the development of the statement occurred in the last session and centred around two moments which are presented in table 6.6.

Stage 5	***Moment***
A commitment to embedding	1. The importance of expressing commitment 2. Conceptual ownership and editorial propriety

Table 6.6 Stage 5 key moments of concept development

There were two changes made to the wording of the statement in the final session, and, while appearing to be modest and subtle, they are very significant, because of what they represent in terms of the ***expression of commitment*** to carrying out sustainability related activities that they indicate.

The changes arose as a result of a comment made during the final review of the statement, which criticised the proposed wording (see Section 6.3.2.5). Some of the participants felt that

the proposed wording was too non-commital, and so the group agreed to change the wording to include the word commits.

> *"Yeah, 'commits'. There's a commitment, whether people act on it or not, that's why 'commit' would be better."*
>
> *S8 Outdoor Education Lecturer A*

After a short debate among the participants, the wording of the statement was changed to:

> *"The Mayo Campus **is committed to** embedding sustainability into the core of its activities and operations. We **endeavour** to provide a teaching and learning space that promotes critical engagement with sustainability"*

The first word change, from "endeavours" to "is committed to", was intended to represent a significant change in the agency of the group. The word "endeavours" was originally agreed, as it could be used to indicate that the aim was to try to achieve something with effort. Whereas the use of the word "commit" changes the tone and indicates a definite intent or pledge to carry out the tasks in an unequivocal manner.

The second change, from "aspire" to "**endeavour"**, was also intended to indicate a similar shift in commitment, from a word that indicates hopes and ambitions, to a word that indicates trying to achieve something. The significance of these changes is in the expression of commitment, and intention to act. The statement now promises commitment to action in the campus activities and operations, and commitment to trying to, in relation to providing pedagogy that critically engages with sustainability.

The only concern expressed in the final stage of the development was about the ***appropriateness or right to change the wording,*** after it had been sent out to the wider staff for review and comment.

> *"I prefer 'committed' of course, but it has to be passed at an academic meeting or a staff meeting as well ?..... I far prefer 'committed'.*
>
> *S8 Environment Lecturer*

The group agreed that it was, in fact, acceptable to change the wording, as the process was still in the development stage, and the point of distributing it to the staff in the first place, was to get comments and or feedback to feed into this development process. Thus, the statement was still only at a draft stage, as it had not yet been submitted to management for approval or adoption. The Head of Centre (HOC) had agreed to bring the statement to the next full staff meeting and propose it for adoption by the campus.
The meeting was held on the 16th June 2016 and the statement was adopted.

6.2.6 Summary of concept development.

The concept of the CSS as a potential solution to embed sustainability practices on the Mayo campus, was developed over a 5 stage process as presented in Table 6.1. The development process was analysed in terms of the key moments in each stage and these are summarised and presented in table 6.7

The first stages involved identifying the need for such a concept, and these included, the various issues with terminology, the bias towards purely environmental interpretations,

disciplinary contestation, as well as the lack of any formal policies or framework around sustainability practices.

The second stage involved exploring how the needs identified in stage1 could be addressed and resulted in a proposal for the creation of a mission statement, which the participants felt could provide a framework that could guide practices. This proposal represented a germ cell idea that could be expanded and developed in the subsequent sessions.

Once the germ cell had been created, the third stage involved an in-depth examination of the concept, to explore and determine what it might mean for the participants, how it might work, and ultimately how it would be articulated.

By stage four, the concept was well developed, but as its purpose was now clearer, a more appropriate and precise title was needed to accurately describe what it was, and what the participants wanted it to represent. By this stage, the participants felt that the concept was robust enough to be considered for adoption by the campus, and so it was now also important to invite the wider staff on the campus to consider and comment on it.

The final stage of the development involved solemnification by imbuing the concept with a sense of commitment to action which had previously been absent. The participants wanted the concept to demonstrate more than just an aspiration, they wanted it to signal a genuine commitment to embedding sustainability into the activities, operations, and pedagogy of the Mayo Campus.

Table 6.7 provides a summary of the key moments of the five stages of concept development, analysis of which, is offered as an answer to research sub question 1 of the main research question. *How did the participants develop the concept of the 'Campus Sustainability Statement'?*

In the following section, I will explore the development of participants' Transformative Agency, which responds to research sub question 2. These answers will then be used in the following chapter, to discuss the results in the context of the literature reviewed in Chapter 2, to answer the main research question.

Stage	***Moments***
Stage 1 Discussing the definition of the term sustainability	1. Exploring the participants understanding of the terminology, 2. Identifying what aspects of sustainability that the participants were passionate about 3. Identifying and establishing the existing activities and practices 4. Recognising the lack of a sustainability framework or policies
Stage 2 Identifying a framework	1. Challenge of incorporating sustainability into all programmes 2. Need for sustainability to be visible across all campus activities 3. The role and importance of a definition 4. The concept of a mission statement, consensual but not too prescriptive
Stage 3 A mission statement for the campus	1. Sustainability in the context of HE 2. The problems with a mission statement 3. The need for conceptual clarity 4. Proposal to offer the students the ability to "look at things in a different way" 5. Influence of participants' beliefs 6. The statement should have meaning to guide actions. 7. The importance of being honest and realistic 8. Focus on creating awareness and a common purpose. 9. Students experience education holistically. 10. Statement to reflect both student engagement and campus operations. 11. Influence of green campus acknowledged as being very important

Stage 4 From a mission statement to a sust. statement	1. Suitability of the term "mission statement" 2. Need for dissemination among the wider staff for feedback and comment.
Stage 5 A commitment to embedding	1. The importance of expressing commitment 2. Conceptual ownership and editorial propriety

Table 6.7 Summary of the key moments identified during the five stages of the formation and development of the concept of the Campus Sustainability Statement.

6.3 The development of transformative agency

In addition to the creation and development of new concepts, the CL also aims to build up and develop practitioners' transformative agency, through a new understanding of the idea of the activity, and a new perspective on its future development (Virkkunen & Newnham, 2013). The point is that a process of expansive learning—if successful—not only generates new concepts whose purpose is to change the activity, but also develops the collective agency of those who participate, in order that they might pursue those concepts. This project aims to trace the relationship between these two characteristic outcomes of the CL methodology.

Having traced and analysed the development of the concept of the CSS, I now turn my attention to tracing and analysing the associated development of the participants' transformative agency. I will then consider the relationship between these in the following chapter. Transformative agency (TA) is defined by Virkkunen (2006) as, "collaboratively breaking away from the given frame of action and taking the initiative to transform it" (p. 49). The development of this through the process is considered important, because it

demonstrates the effectiveness of the process at empowering people to take charge of their situations.

I will analyse the development of TA using the "manifestations typology" as described by Engeström (2011), and Haapasaari et al (2016), on which I elaborated previously in Section 3.5.1. For present purposes, the reader should recall the following headings:

- **Resisting** the management or the interventionist, which may involve questioning, opposition or rejection.
- **Criticising** the current activity and organisation and identifying problems in the current ways of working.
- **Explicating** new possibilities or potentials in the activity.
- **Envisioning** new patterns or models of the activity.
- **Committing** to concrete actions aimed at changing the activity. This is typically manifested in the use of commissive speech acts (Sannino 2008, 247).
- Taking **consequential actions** to change the activity.

During the intervention, there were many expressions of the six types of transformative agency identified, and these have already been presented on a session-by-session basis in tables 5.3, 5.5, 5.7, 5.9, 5.11,5.13 and 5.15 in Chapter 5. I will now build on that session-by-session account by analysing each of the types of TA individually, in the order of the expressions listed above, (rather than the order in which the manifestations occurred in the research-intervention), I focus my attention on analysing only those expressions of TA that relate specifically to the development of the CSS.

Under each of the heading types identified above, I remind the reader of what each manifestation refers to, before describing the main manifestations in relation to the development of the CSS.

6.3.1 Resisting.

> "Where participants resist the management or the interventionist,
> which may involve questioning, opposition or rejection."
>
> Haapasaari et al. (2016)

There were two manifestations of resistance in relation to the overall development of the CSS, both of which were about the term "mission statement".

6.3.1.1 R.1: Resisting mission statements as corporate

Once the idea of a mission statement had been suggested, (at the end of development stage 2) it was placed on the agenda for discussion at the following session. The term mission statement was immediately problematised because of its associations with corporate language, business and structures.

> *"..if we have a mission statement saying that we are committed to sustainability… how can you run a business programme on the campus? Or how can the campus fulfil its regional mission, which is to support "economic development" when development inherently means growth economics, which is not a sustainable concept".*
>
> *S3 Social Care lecturer B*

The group was resisting the use of a tool, that is strongly associated with corporate identity, to promote sustainability in a HE context. The resistance focused on a number of features of mission statements, such as their actual function i.e. are they meaningful, or just purely

emblematic public presentations? There was also resistance encountered in relation to the need that such a statement would have for conceptual clarity regarding the concept of sustainability. Two examples were offered to illustrate this: how could an organisation that states it is committed to sustainability run business programmes, and, how could it fulfil its local and regional remit, which is to support economic growth, because both of these are based on the growth economics model, which is seen by some as being an unsustainable economic model.

After some preliminary exploration and discussion, the initial resistance was, to some extent, replaced with criticising what mission statements are, which seemed to build on these earlier moments of resistance (see below Cr.4).

6.3.1.2 R.2: Resisting duplication of the term mission statement

In the next stage of the development (stage 4), the idea of a mission statement was again resisted, but this time it was because it acknowledged that the Institute *already had a mission statement*, and it was felt that it would be inappropriate for the Mayo Campus to develop its own mission statement or charter.

> *"The mission statement that is there, is Institute-wide….. but what we have been trying to develop here is something that probably is specific for this campus…?"*
>
> S5 Researcher

> *"I'd agree with [Management participant B] that the [existing] mission statement is for the Institute, so having separate mission statements for different campuses probably won't have value for it, in terms of communicating it…"*
>
> S5 Management participant A

6.3.2 Criticising

> "Criticising the current activity and organisation and identifying problems in the current ways of working."
>
> Haapasaari et al. (2016)

Criticising was the most frequently observed manifestation of transformative agency throughout the whole CL process and was observed in every stage of the development process. It could be argued that every time a critical comment was made on an issue being discussed during the sessions, that these were an expression of transformative agency "criticising". Indeed, this approach has been used for analysis in previous studies e.g. Haapasaari et al., (2014). However, in this study, rather than analysing individual speaking turns, I am only analysing episodes (meaningfully bounded sequences of related speaking turns) of criticising, where the focus of the criticising was related specifically to the development of the CSS.

6.3.2.1 Cr.1: Criticising relating to the lack of agreement on terminology

The problematic issues in relation to how the participants understand sustainability terminology was evident from the first session, which started off with one of the participants asking.

> *"are we all starting with a common definition of sustainability?"*
>
> S1 Management participant A

This was the first of many engagements in the first two sessions where the participants problematised and also sought clarification regarding the issues of terminology and definitions. In Session Two, there were numerous other examples where terminology and definitions were criticised (see also Section 6.2.1). In Session Two, some participants were critical of the idea that sustainability *could* be defined, while others felt that a definition was, in fact, needed, if the group were to proceed and find common ground (see Section 6.22).

> *"I would certainly need some sort of a definition of sustainability, bigger than just what we see from a building/construction aspect, because that is the only bit of it that I know, I'd like to see where that fits into the bigger picture, and to do that I just sort of think that we need a definition in terms of what we mean by sustainability….*
>
> *…when we talk about a sustainable campus, what do we mean,… what are we looking for, what do we expect it to look like?... and until we can articulate that then…."*
>
> S2 Construction Lecturer

6.3.2.2 Cr.2: Criticising relating to the diversity of views

In addition to the issues of definitions and terminology, it became apparent that different participants had different views on what sustainability is and how it can be dealt with through teaching practice and in programmes.

In Session One, participants tended to react to the diversity of views, by articulating that they personally were aligned with one view in particular:

> *"…in terms of applying it to myself, I am aligned with environmental sustainability… and there are things I teach specifically such as the idea of cultural sustainability…traditions and crafts and the importance of the built heritage..."*
>
> S1 Heritage lecturer B

Other participants, by contrast, were focused of the social aspect or community element of sustainability

> *"…we take the three strands environment, economic and community and I really think that if we were looking at the programme as a whole, a lot of it is around compassion rather than passion, and I think that is very much the social element or the community element……and we try to include that in the whole programme"*
>
> S1 Social care lecturer A

Subsequently, participants came to criticise this diversity of views more explicitly, and to notice that some views were irreconcilable with others:

> *" that could end up leaving you with some tension between irreconcilable concepts, between trying to teach business students, for example, sustainability, and trying to teach them a certain type of economics at the same time"*
>
> S2 Social Care Lecturer B

While the diversity of the participants views, and the associated lack of agreement on sustainability terminology and definitions were recognised in Session One, they were only identified as problematic in Session Two, when the participants started to seek common ground to agree on a shared understanding.

6.3.2.3 Cr.3: Criticising the lack of a framework or formal structure.

The first expression of criticising practices, that directly related to the development of the CSS, was observed in the first session, where participants acknowledged that even though there was a lot of sustainability activity being carried out on the campus by the participants, it was occurring in the absence of any structured plan or framework. The range of sustainability related teaching activities was highlighted, (see Section 6.2.1) as were the significant Green Campus activities that were happening. While these were aligned with the national Green Campus mandate, they were independent of any formal Institute framework, as well as being independent of any work being carried out by the individual lecturers in their modules. This type of criticising was observed in both sessions 1 and 2. However, in Session Two, the lack of a formal policy or framework for sustainability was acknowledged as problematic in the Institute, in the context of exploring what a sustainable IoT would look like.

6.3.2.4 Cr.4: Criticising how the mission statement could help accomplish the aims of the group

In the previous section, I describe **resistance** to the idea of mission statements (see Section 6.3.1.1 R.1 above), as that was the starting point of discussion in Session Three. It was only

after the proposal to "look at things in a different way", that the language of resistance gave way, and was replaced by criticising and critical commentary about the form the mission statement would take.

There were many episodes of criticising observed (see Section 6.2.3 for relevant quotations), including:

- Issues in relation to the expression of the participants' beliefs. The participants felt that while the statement should be about what they believed in, it was also important to acknowledge that there were many different beliefs about sustainability, and these should be reflected too.
- The participants felt that the statement should have meaning that could guide actions.
- The statement should articulate a common purpose.
- It should be honest and realistic.
- It should also be general and simple, to increase its chances of gaining traction and being effective.

6.3.2.5 Cr.5: Criticising how the statement wording would be understood.

Criticising the specific wording of the statement was observed on two separate occasions, and on each occasion, it prompted the participants to subsequently envision new wordings. The first episode was observed in Session Four where there was a long and detailed discussion criticising every aspect of the phrasing of the original proposal from Session Three:

"The critical engagement, that's in… every programme…critical engagement… with sustainability, something I would have thought was in all of our activities and academic programmes, it might be a bit strong….. can we stand over that?

S2 Management Participant A

"I think the last bit is kind of repetitive of the first bit, I think bring up the last bit to replace the first bit, you don't need to repeat 'activities' for example. You could aspire to critically engage sustainability…"

S2 Heritage Lecturer A

This type of criticising happened again in Session Eight, when the participants felt that the wording was just not strong enough to express the sentiment that they wished to communicate:

"Sorry, can I just make one comment on it…? Just, do you want to go with 'endeavours' or something a bit more….. I suppose, it softens the ability that 'endeavours to embed'. Whereas if you said 'it embeds sustainability' is that too pushy?"

S8 Nursing Lecturer

This episode led to further envisioning of the statement, as described in Section 6.4.3.2 En.2.

6.3.2.5 Cr.6: Criticising the title

In Session Five after the resistance to the idea of a mission statement referred to in R2, the statement title was discussed and criticised by the participants.

"It could be a-…., I think a charter might be one that might reflect the group, you know, it's meaningful rather than a mission……."

Management participant A

"Is it a campus charter specific to sustainability, like a mission statement or a charter, is that a bit broad? I'd be a bit confused, which is the actual campus one? Very specific to sustainability and green..."

Social Care lecturer A

This ultimately led to the envisioning of a new title which is addressed in Section 6.4.3.3 En.3

6.3.2.6 Cr.7: Criticising the lack of campus wide collaboration

In sessions 4 and 5, a number of participants commented on the fact that the group was not representative of the whole staff on the campus, and so could not impose a new mission statement:

"We can't as a self-selecting group say, by the way, so that all the rest of you know, we have decided that the new mission for the campus is X……people will likely say whoa what is this? We can't do it that way."

S4 Social Care lecturer B

In Session Five, this was again articulated as criticising, as follows, (see also 6.4.3.4 En.4.)

"I think Judd had more points about this the last time, about his concern about it being a mission for the campus, as opposed to….not everyone would subscribe to that"

S5 Management Participant A

6.3.2.7 Cr.8: Criticising of mission statements as having little impact

One of the participants, who had previously been through numerous strategic review processes where institutional mission statements had been developed, expressed his concern that even though he thought the proposed statement was positive (this is before the change to the title of 'sustainability statement'), that in his experience, statements do not necessarily have much impact or illicit strong responses from staff members.

> *"I think it's a lot better than the amount of spin-out meetings we've had about making a mission statement for this college, which have gone on and on, I've gone through about five mission statements for this college at this stage so….-*
> *…..They've been put through ……..you know ….we have a mission statement appearing, and then….. life goes on as normal, so, I'd be surprised if you get many big dissenters to the mission statement."*
>
> S5 IT Lecturer A

That it took until Session Five for anyone to twig or comment on the fact that the Institute already had a mission statement, is perhaps proof of this point!

6.3.3 Explicating

> "Explicating new possibilities or potentials in the activity."
>
> Haapasaari et al. (2016)

There were many episodes of explicating observed during the research-intervention and a number of these resulted in the generation of new concepts. However, only one episode of explicating was observed in relation to the development of the concept, that would ultimately become the CSS.

6.3.3.1 Ex.1: Explicating the potential of a mission statement

In terms of explicating new forms of activity, the germ cell idea for the development of a mission statement as something that could guide practice and provide a framework within which to work, was conceived in Session Two. It arose in the context of the discussions about definitions of sustainability and the lack of an institutional framework. It was only mentioned once by the group during Session Two but was referred back to later in the session by the researcher, as a potential solution, that might provide a shared or common understanding about sustainability.

> *" …we felt that there should be a mission statement ….it would be useful, in that it would provide a framework, by which we are the individuals that drive it, and you are open to interpret that mission in terms of your own practices"*
>
> S2 Outdoor Education Lecturer B

After the session, the researcher highlighted this concept as worth developing because it had many attributes that made it worthy of further investigation. It could provide a framework, it would be open to individual interpretation, individuals could drive it, and on the face of it, it seemed to be an achievable outcome.

For these reasons, I made the exploration and development of a mission statement that the group could support, the first task for Session Three.

6.3.4 Envisioning

> "Envisioning new patterns or models in the activity. Future- oriented suggestions or presentations of a new way of working."
>
> Haapasaari et al. (2016)

There were six episodes of envisioning observed during the development of the CSS. The first related to the initial development of the broad concept of a mission statement, three related to the development of the wording, one related to the title of the statement, and one related to the need to involve all of the staff in the development process.

6.3.4.1 En.1: Envisioning a statement that is phrased in terms of students' opportunities.

The first expressions of envisioning in relation to the statement were prompted by the first task set in Session Three, which asked the participants to develop a mission statement that the group could support. This focus on envisioning was driven by the researcher, who hoped that the group might be able to develop a statement, that could be adopted in some way by the campus. It was hoped that it might be able to generate some form of conceptual alignment around sustainability, among the participants. This episode occurred in the early part of Session Three and involved a detailed discussion about the mission statements and their meaning. The most significant expression of envisioning in this episode occurred at what I have described as turning point A, when it was proposed that a statement might "offer the students the ability to look at things in a different way" (see Section 6.2.3).

This new model of the statement provided the participants with something that they could work with, and agree upon, and was, from a TA point of view, a turning point in the session.

Kärkkäinen, (1999) defines a turning point "as an event in and during which the participants begin to outline the object of their activity in a new way". This proposal provided the participants with a way of using the idea of a mission statement, to offer the students the chance to critically engage with sustainability, without compromising values or beliefs.

6.3.4.2 En.2: Envisioning the specific wording of the statement

In light of the debates and discussions on sustainability terminology and definitions, the development of the precise wording of the statement was considered very important to the participants (see Section 6.3.2.5). This was evidenced by the fact that its development was observed in three separate episodes of envisioning: the initial wording, the development of a number of options, and the agreement of the final wording. The fact that the last episode focuses on the change of two specific words, further reinforces the perceived importance of the exact choice of words.

The development of *the initial wording* of the statement occurred in a two step process (as outlined in Section 6.2.3) and resulted in an initial draft, as follows:

> "All our students will critically engage with sustainability in their programme of study. The campus will endeavour to make sustainability a core value of its operation."

At the end of Session Three, the first draft of the statement contained two aims, which demonstrate how the participants' agency had developed during the session, from the initial proposal, that had just referred to student engagement. This development of agency was a

result of the discursive development process, that allowed the participants to explore (the underlying contradictions) what they felt was important about sustainability, and how it could be supported through the creation of a mission statement.

The next episode of envisioning that relates to the development of the wording occurred in Session Four. The participants had had time between the sessions to consider the whole idea of the statement, and were provided with an opportunity to further debate the issues that they felt needed to be addressed. This episode of envisioning resulted in three possible wording options, which were presented previously in Section 6.2.3.

The final expressions of envisioning, in relation to the development of the wording of the CSS, were observed in Session Eight, when the wording of the statement was changed from:

> *"The Mayo Campus **endeavours to** embed sustainability into the core of its activities and operations. We **aspire to** provide a teaching and learning space that promotes critical engagement with sustainability."*

to

> *"The Mayo Campus **is committed** to embedding sustainability into the core of its activities and operations. We **endeavour to** provide a teaching and learning space that promotes critical engagement with sustainability."*

The importance and impact of this change is further discussed below in Section 6.3.5 Committing.

6.4.3.3 En.3: Envisioning an appropriate title.

As a result of the sense checking exercise carried out in Session Five, much of the time spent on envisioning involved exploring what the participants wanted the statement to represent, and therefore considering what the title should be, to reflect this. After the resistance to the idea of a mission statement referred to in R.2, the proposed title went through a series of iterations. The term 'charter' had been mentioned in a previous session, and one participant asked if the statement was to be a "campus charter" specific to sustainability.

> *"I think a charter (rather than mission statement) might be one that might reflect the group, you know, it's meaningful rather than a mission."*
>
> S5 Management participant A

It went through a series of possible options including "A charter for sustainability", Campus sustainability charter, and even "a sustainability proclamation", until finally it was decided that it should be a "sustainability statement" for the Mayo Campus or "Campus Sustainability Statement" (CSS) (see also 6.2.4). The term charter was disregarded for two reasons, but primarily, because it was perceived as something associated with a list of things that must be adhered to, which did not seem appropriate (see also 6.3.2.5 Cr.5).

6.4.3.4 En.4: Envisioning a collaboratively developed campus wide vision.

It had been suggested in Session Four, that the statement might be limited by the fact that it was developed by a specific group, and was not, therefore, representative of the whole staff. In Session Five, a number of options for sharing the content of the statement with the staff

were explored, including: having a face to face meeting with staff, creating a "share file" on the server, and sending an email to all staff.

> *"So maybe we could set up a sharefile, put it there for people to contribute to, and close it out maybe at a wider meeting. Just be a long enough time for people to be able to think about and understand, and, I suppose, they might say what's the impact with that, to understand what we're proposing there, what we're trying to take forward, and that they have a chance to…Just whatever format works for them to contribute or voice concerns in that way. Sometimes, at staff meetings people might not like to stand up and speak up about something in front of a whole group…"*
>
> Management Participant A

The proposed wording along with a short overview of the project and its aims was shared via email with all of the staff after Session Six.

This episode of envisioning could also be considered a turning point in the process (turning point B), as it shifts the focus of the development away from being a solution that is purely the work of the participants, to being a solution that is collaboratively developed by all of the staff on the campus. This is significant because it clearly demonstrates the development of collaborative transformative agency by the participants. They were now empowered and confident enough to share their work with the entire staff, with a view to seeking their comments and approval (see also 6.3.2.6 Cr.6)

6.3.5 Committing

> "Committing to taking concrete, new actions to change the activity"
>
> Haapasaari et al. (2016)

There were many participants' expressions of committing observed during the CL, e.g. the formation of sub-committees, and participants working with their respective programme boards to develop a sustainability statement. However only one episode was related to the development of the CSS.

6.3.5.1 Co.1: Committing to commit.

I would argue that "committing to taking concrete actions" was demonstrated when the proposed wording of the statement was changed in the final session to include the words, "committed", and, "endeavours". These changes, in relation to campus operations and teaching and learning activities, were an unequivocal expression of commitment by the participants to taking concrete, new actions, in relation to embedding sustainability on the Mayo Campus. While this manifestation is aspirational and somewhat vicarious (in that the CSS had yet to be approved and adopted by the campus staff, and then enacted by them, rather than just by the participants) I believe that it demonstrates a commitment to taking concrete action, albeit in the context of the CSS being approved and adopted by all staff. I remind the reader of the following quotations, which sum up the enthusiasm of the participants for including the word "committed":

> *"Yeah, 'commits.' There's a commitment, whether people act on it or not, that's why' commit' would be better."*
>
> *S8 Outdoor Education Lecturer A*

> *"I prefer 'committed' of course, but it has to be passed at an academic meeting or a staff meeting as well ?..... I far prefer 'committed'."*
>
> *S8 Environment Lecturer*

As outlined in Section 6.2.5 above, I believe that this is a significant episode, which clearly demonstrates the development of the participants' TA, to the extent that they are prepared to publicly acknowledge and record their commitment to embedding sustainability in their workplace.

6.3.6 Consequential Action

> "Reporting having taken consequential actions to change the activity in between or after the laboratory sessions"
>
> Haapasaari et al. (2016)

The final wording of the mission statement was agreed at the last CL session and therefore consequential actions were not observed during the actual CL process.

However, there were many consequential actions taken by the participants as a result of having participated in the CL process, and the development of the CSS was just one of 13 outcomes identified by the researcher (see Table 5.16 in Chapter 5). Based on the narratives described above, and the content of the SSIs as presented in Section 5.3, I think that it is reasonable to infer that outcome 6 "Influence and impact on the teaching practices of the participants" indicates, at least in part, consequential actions based on the development of the Campus Sustainability Statement. I will elaborate more on this and on the outcomes and consequences of the intervention in the conclusion Chapter.

6.3.7 Summary of development of Transformative agency

In the above section, I trace and analyse the development of the participants' transformative agency as the concept of a CSS was developed over 8 sessions of a CL intervention. The sequence of the expressions of transformative agency are presented in Table 6.8.

The genesis of the germ cell idea for the statement, in TA terms, explicating, occurred in Session Two, in response to the need to find or create a definition or concept of sustainability that would allow the participants to develop a shared understanding, provide a common goal, and guide actions, that would embed sustainability in the practices of the staff on the Mayo Campus.

The main expressions of resistance were in relation to the idea of the mission statement, firstly because of the corporate associations, and then because it was seen to be duplicating an extant Institute wide mission statement.

There was a level of criticising expressed at every stage of the development, demonstrating that the participants were actively and critically engaging with the tasks at hand.

Six episodes of envisioning were observed in relation to the actual development of the statement, where it went from being an aspirational "mission statement" to a robustly worded "Campus Sustainability Statement", which explicitly expressed commitment to its goals.

6.4 Summary of chapter

In this chapter I have presented an analysis of the development of the Campus Sustainability Statement in a CL research-intervention, based on the data presented in Chapter 5. I have analysed the data in terms of both the development of the concept and the development of

the participants' transformative agency. The above analysis of the development of the participants' transformative agency is offered as an answer to research sub-question 2: *"How did participants express their transformative agency during the process of developing the 'Campus Sustainability Statement'?*

In the next chapter, I synthesise this analysis with the previously presented analysis of the development of the concept, to answer the main research, and demonstrate how my work contributes to the literature.

ELC Action →	*Quest. & Criticising*	*Analysis*	*Modelling*		*Examining*		*Implementation Reflection Consolidation*	
TA Type	***Stage 1***	***Stage 2***	***Stage 3***		***Stage 4***		***Stage 5***	
Resisting			R.1 Mission statements are too corporate.		R.2 Resisting duplication of a Mission statements			
Criticise	Cr 1 relating to lack of agreement on terminology Cr 2 relating to diversity of views Cr.3 the lack of a framework	Cr 1 relating to lack of agreement on terminology Cr 2 relating to diversity of views Cr.3 the lack of a framework	Cr.4 How the Mission statements could help accomplish the aims. They should: express beliefs, have meaning, guide actions, be honest & realistic.	Cr.5 The wording to make it reflective of the intention.	Cr.6 The title Cr.7 The lack of campus wide collaboration Cr.8 Mission statements as having little impact			Cr.5 The wording as not strong enough
Explicate		Ex.1 A Mission statement						
Envision			En1 A statement phrased in terms of student opportunities. En.2 The wording of the statement, initial draft	En.2 The wording of the statement, development of the options	En.3 An appropriate title. En.4 A collaboratively developed campus wide vision			En.2 The specific wording of the statement, agreeing the final wording.
Commit								Co.1 Committing to commit. Wording to signal commitment
Conseq. Action								
Session →	1	2	3	4	5	6	7	8

Table 6.8 Transformative agency mapped against the session timeline in the development of the Sustainability Statement for the Mayo Campus

Chapter 7 Discussion

7.1 Introduction

The core purpose of this chapter is to set out my original contribution to knowledge. In the previous chapters I considered the development of the Mayo Campus Sustainability Statement. In Chapter 5, I presented the data from the sessions chronologically in summary form, and in Chapter 6, I focused specifically on analysing the development of the Campus Sustainability Statement. My analysis considered both how it was developed as a concept and how the participants expressed the development of their agency through the process. The analyses provided answers to the research sub questions, which, as set out in Section 1.6., are concerned with addressing concept development and transformative agency separately. In this chapter, I want to build on this and discuss my thematic analysis about the relationships between concept development and the development of participants' transformative agency. I will use this to answer the main research question set out below.

Main Research question:

What are the relationships between concept development and participants' transformative agency in a research-intervention, focused on fostering sustainability in higher education?

In Section 7.2 I synthesise my previous analyses of concept development and expressions of transformative agency and present the following five themes that highlight the relationships between those two aspects of the research-intervention:

1. Intense criticising at an early stage led to explicating an original concept.

2. Resistance was a pre-requisite for major conceptual shifts, once the intervention was underway.
3. Conceptual refinement was driven by criticising.
4. Concept development moderated resistance into criticism.
5. Participants tried to embed particular forms of agency into the concepts that they were developing.

In presenting these themes, I provide an answer to the main research question, which, as I argued in chapter 1 and emphasised further in Chapter 2, is an important issue for embedding sustainability into higher education, and yet is a topic about which the present literature is underdeveloped.

To assist with the thematic analysis, I provide Table 7.1, which traces the development of the concept of the CSS and the associated development of participants' transformative agency, and maps them against both the session timelines and the stages of the ELC.

My key argument is that concept development and the development of the participants' transformative agency are intimately and reciprocally linked. In the case of the CSS, the concept developed in response to expressions of transformative agency. However, as the process was unfolding, changes in the concept also triggered reactions in the participants, reactions that resulted in changes in the types of expressions of transformative agency expressed by the participants.

In Section 7.3, I place my findings in the broader context of the literature that I reviewed in Chapter 2 and aim to describe the contribution that this project makes to that literature. I do

this by drawing on the thematic analysis presented in Section 7.2, the developmental analysis from Chapter 6 and the data presented in Chapter 5.

I argue that this study contributes to the literature reviewed in Chapter 2 in the following ways:

- This study demonstrates that the collaborative development of a new concept can be used to overcome the terminological issues that are often seen as barriers in the literature.
- This study offers a new insight into how resistance, while often interpreted as a barrier to embedding SHE, can have a positive impact on the concept development process.
- This study expands the understanding of the mechanisms of participant engagement, which is widely acknowledged as a key driver when implementing sustainability initiatives, through insights into how concept development and transformative agency are related.
- This study offers new insights into how collaborative concept development can bridge interdisciplinary discussions and allow different perspectives to be drawn into a common process.
- This study offers a new insight into stakeholder voice when articulating the role and responsibilities of HE in relation to sustainability.
- This study contributes to the broader literature on the implementation of SHE by demonstrating that the CL is a suitable and effective methodology to use when exploring how to implement or embed sustainability practices in a HE setting.

ELC Action →	Quest. & Criticising	Analysis	Modelling		Examining		Implementation Reflection Consolidation	
Dev..Stage →	Stage 1	Stage 2	Stage 3		Stage 4		Stage 5	
TA Type	**Discussing the definition of the term sustainability**	**Identifying a shared framework**	**A Mission statement for the Campus**		**From a mission statement to a Campus Sustainability Statement**		**A commitment to the action of embedding sustainability in the campus.**	
Resisting ↓			R.1 Mission statements are too corporate		R.2 Duplication of a Mission statements			
Criticise	Cr 1 relating to lack of agreement on terminology Cr 2 relating to diversity of views Cr.3 the lack of a framework	Cr 1 relating to lack of agreement on terminology Cr 2 relating to diversity of views Cr.3 the lack of a framework	Cr.4 How the Mission statements could help accomplish the aims. They should: express beliefs, have meaning, guide actions, be honest & realistic	Cr.5 The wording to make it reflective of the intention.	Cr.6 The title Cr.7 The lack of campus wide collaboration Cr.8 Mission statements as having little impact			Cr.5 The wording as not strong enough
Explicate		Ex.1 A Mission statement						
Envision			En1 A statement that is phrased in terms of student opportunities. En.2 The specific wording, initial draft	En.2 The specific wording of the statement, development of the options	En.3 An appropriate title. En.4 A collaboratively developed campus wide vision			En.2 The specific wording of the statement, agreeing the final wording.
Commit								Co.1 Committing to commit. Wording to signal commitment
Conseq. Action								
Session No →	1	2	3	4	5	6	7	8

Table 7.1 Concept development and the development of participants' transformative agency mapped against the session timeline in the development of the Sustainability Statement for the Mayo Campus

7.2 Thematic analysis, Concept Development and Transformative Agency

The five themes identified from the thematic analysis are presented here. The text in the following subsections builds on the narrative summarised in Table 7.1, which uses the research intervention sessions as a timeline and maps the stages of the development of the concept against the episodes of transformative agency as discussed and analysed in Chapter 6.

7.2.1 T1 Intense criticising at an early stage led to explicating an original concept

The first theme I present here highlights how episodes of intense criticising in the early stages of the research-intervention led to the concept of a "mission statement" being explicated. Such criticising rendered untenable those ongoing discussions about specific terminology that had been an early focus of the sessions. In response, the concept of a "mission statement" was explicated (see Table 7.1, stage 2), which was thought to provide a framework that could be used as a basis for pursuing a shared goal. This relationship between criticising and concept explication was important in shaping the early direction of the research-intervention - it was how participants came to *start* projecting their own voices as the project got underway, thereby responding to the early agenda put forward by the researcher-interventionist.

As related previously in Chapter 5, the early sessions involved lengthy debates on the participants' various interpretations of sustainability, how it related to their own activities and practices, and what they perceived to be the barriers to sustainability on the campus. That led to a number of manifestations of criticising that I have termed Cr.1: criticising relating to

agreement on terminology, Cr.2: criticising relating to diversity of views and Cr.3: criticising the lack of a framework.

Cr.1 highlighted the fact that sustainability terminology is contentious, and while there were definitions offered, it was hard to get agreement on them, or even to get agreement on their necessity or validity. In terms of concept development, this form of criticising highlighted that any attempt at embedding sustainability, in ways that relate to specific external definitions of the term, will likely struggle to bring together a coalition sufficient for taking action in the organisation. Cr.2 highlighted the diverse range of views that were held about sustainability by the participants, with some participants focusing on the environmental aspects and others more tuned in to the social aspects. With regard to concept development, such criticising emphasised that individuals are passionate about sustainability in different ways and may not engage with definitions that exclude their preferred aspects. Cr.3 drew attention to the fact that there was already a lot of sustainability related activity being carried out individually by the participants in their own practices, but it was in an ad hoc manner, with no framework or policy to provide focus or guidance. This form of criticising thus emphasised that the research-intervention was in danger of similar conceptual fragmentation, which would inevitably fail to produce change at a strategic level.

These types of episode of criticising initially appeared in Session One, but they also appeared again in Session Two, which were arguably the most intense episodes of criticising observed during the research-intervention, as this time the participants were more familiar with the issues and were able to engage more intensely. The discussions resulted in the participants explicating the possibility of a mission statement (there were also three other potential solutions explicated at this stage as outlined in Chapter 5, but they are not the focus of this

analysis) that could provide a framework, which could be used by individuals allowing them the freedom to interpret the mission in terms of their own practices. The idea of such a framework gained a degree of acceptance within the group of participants because it was not easily susceptible to those forms of criticising that I have labelled Cr. 1, Cr. 2 and Cr. 3.

This germ cell idea provided the participants with a framework and thus a way to move forward and address the other criticising issues in relation to the terminology and the diversity of views. The episode of explicating the mission statement thus resulted in the intensity of the criticisms fading away towards the end of the session. This was the origin of the idea for the mission statement.

This theme highlights the importance of acknowledging the influential role that criticising has to play in the creation of new concepts. Criticising can be construed as a display of negativity, but this intervention demonstrates that criticism is an essential element of concept formation and development. In this research-intervention, different forms of criticising played a key role in rejecting the initial concept put forward by the researcher-interventionist which had involved defining the term sustainability in ways that drew on established literature. They also provided a yardstick by which new ideas would be quickly judged by participants, and thereby provided the opportunity for a framework idea to gain acceptance.

7.2.2 T2 Resistance was a pre-requisite for major conceptual shifts, once the intervention was underway

The second theme I present here draws attention to the observation that resistance preceded the two major conceptual shifts in the concept, once the initial conceptual idea had been accepted by the group. Resistance can be observed in Table 7.1 stages 3 and 4 (Session Three

and Five) and in each case, in different ways, the resistance was expressed in relation to the idea of a mission statement. Both of these expressions of resistance prompted a major conceptual shift in the concept. In the first instance, resistance to the idea of a corporate mission statement prompted a new way to look at mission statements, whereby it was proposed that they would offer a choice rather than appearing prescriptive. In the second instance, the title "mission statement" was resisted because of the duplication with an existing Institute mission statement. Again, resisting prompted a major conceptual shift, which resulted in the concept being renamed as a Campus Sustainability Statement.

In Session Three, the notion of a mission statement was resisted initially as being too corporate, conceptually vague and not necessarily meaningful. There were strong concerns expressed about how such a statement could be made that would reflect a genuine deep understanding of the troubling aspects of sustainability (problems with growth economics and the unsustainable status quo, etc) while at the same time, be actually meaningful, rather than just sounding impressive. This form of resisting represented a clear rejection by particular participants of a conceptual direction that other members of the group were clearly happy with. R.1 involved deploying the argument that corporations routinely and publicly acknowledge the importance of sustainability issues while avoiding taking any meaningful action. It was not until it was suggested that a mission statement could take the focus away from definitions, acknowledge different perspectives, and pledge to offer students the opportunity to critically engage with sustainability, that the idea of a mission statement became palatable to the participants (turning point A). This was the first major conceptual shift in thinking about the statement, and it effectively removed the resistance to the concept and replaced it with criticising (see 7.2.4 below).

The next major shift in the development of the concept occurred in Session Five (Stage 4), when the concept again encountered resistance, also due to it being labelled a mission statement. The idea of calling it a mission statement was resisted primarily because it was acknowledged that the Institute already had a mission statement, and it was felt that it would be inappropriate for the group to attempt to develop another one, either for the Institute or the campus. Resistance of form R.2 therefore highlighted that the concept would need to work within the existing infrastructures of the institution—part of which would need to involve avoiding its accidental conflation with other previously established concepts. Also, at this stage, as a result of the development work in the sessions, the statement had been conceptually developed and refined, and it was now felt that it should have a title that was more reflective of what it actually was. A number of terms and options were considered, and the group finally agreed on calling it a Campus Sustainability Statement. This was another major conceptual shift, which was prompted by resistance. The new label avoided the term mission statement and focused the statement clearly on the campus and sustainability, neither of which had been previously explicit. Again, once the shift occurred, the resistance dropped away and was replaced by criticising.

This theme highlights the importance of resistance when developing new concepts. Resistance is often cited as problematic in change interventions; however, this intervention demonstrates that resistance can have a positive impact on a change intervention, when it involves developing a concept over which those involved have influence. Indeed, once the concept development had started and the research-intervention was underway, it seems that forms of resisting were a crucial prerequisite for major conceptual shifts to occur in the group.

7.2.3 T3 Conceptual refinement is driven by criticising

The third theme draws attention to how, once the concept was explicated, it developed in ways that responded to and mediated the episodes of resisting and criticising. As previously observed, episodes of resisting resulted in major conceptual shifts, while episodes of criticising led to the concept being iteratively honed and refined. This was observed in stages 3, 4 and 5 of the research-intervention. As can be seen in Table 7, there were episodes of criticising observed in all stages of the development. However, after the concept of the statement had been explicated (as a result of intense criticism), the episodes of criticising in sessions 3, 4 and 5 had direct impacts on the episodes of envisioning observed in the same sessions. I can say this because each episode of envisioning observed, was a response to an episode of criticising.

Once Session Three had passed turning point A, there was a change in the participants' approach to the development of the concept of the statement. The participants were more positively disposed towards it because they could now see how it could be used as a shared framework that offered the students opportunities and choices, rather than just a corporate goal or a specific view. This new model prompted the participants to engage in a series of criticising episodes which focused on many issues that had been brought up in the previous sessions relating to the existing activities on the campus. The criticising actions demonstrated that the participants wanted the statement to be able to do a lot of things at the same time; express diversity of beliefs, be meaningful enough to guide action, articulate a common purpose and at the same time, remain honest and simple. In Session Three, the first iteration of the statement that was considered, was in the form of a single line, but as the concept developed through the actions of criticising, the participants felt that it should also include a

reference to the operations of the campus. After some discussion, an additional sentence was proposed, and the first draft ended up consisting of two lines. This conceptual fine-tuning is witnessed again in Session Four (stage 3 also) where, after further criticising, a number of wording options (refinements) were developed.

Conceptual refinement as a result of criticising was again witnessed in stage 4, when criticising, in relation to the lack of campus wide collaborations, prompted the proposed statement to be distributed among the campus staff for comment and feedback.
The most explicit example of conceptual refinement being driven by an episode of criticism was witnessed in Session Eight (stage 5), when the statement was fine-tuned through minor adjustments to the wording.

This theme highlights the importance of criticising in the context of concept development. Once the concept has been formed, criticising becomes important as a way to shape and refine its development through the process.

7.2.4 T4 Concept development moderated resistance into criticism

Theme four highlights the observation that once the concept had developed to the stage where the participants overcame the initial episodes of resisting, they then began to engage in episodes of criticising, which, in some cases, responded directly to the root cause of the resistance.

The expressions of criticising observed in stages 3 and 4 appear to be linked directly to the preceding episodes of resisting, because of the development of the concept. Once the main conceptual shifts had occurred, and the reason for the resistance had been dealt with, the

subsequent episodes of criticising were focused more on engagement, which addressed how to work with the concept, rather than against it (resisting).

In table 7.1, stage 3, it can be seen that as the session progresses, the resistance to the concept R.1 is moderated by the development of the concept and replaced by Cr.4, which in many ways, addresses the original issues which prompted the resistance.
This trend can be seen again, in stage 4 (Session Five), as the session progresses. The resistance to the mission statement as a duplicate (R2), is replaced with various forms of criticising, some of which are aimed at addressing the main cause of the resistance (i.e. a mission statement).

The key observation here is that once the concept had gone through a major conceptual shift in response to expressions of resistance, participants, whose ideas would have been incompatible with the original form of the concept, are enabled to engage in criticising the new form of the concept. Thus concept development enables new forms of transformative agency to be expressed by the participants.

This theme highlights the important role that concept development has in relation to the development of different types of participants' transformative agency. In the early stages of the process, the major conceptual shift, prompted by the participants' resistance to the concept of the CSS, enabled the continued development of the participants' transformative agency through the expression of criticising the new concept.

7.2.5 T5 Participants tried to embed particular forms of agency into the concept that they were developing.

The final theme I present here draws attention to how the participants tried to embed committing to action into the concept itself, by including the words 'committed to' in the actual statement. The reason for doing so stems, in large part, from the earlier discussions, which acknowledged that the CSS needed: to deploy terminology that could elicit buy-in from different stakeholders; to be distinguishable from the existing mission statement; and to be oriented to the campus. The specific formulation of the CSS

> *The Mayo Campus is committed to embedding sustainability into the core of its activities and operations. We endeavour to provide a teaching and learning space that promotes critical engagement with sustainability*

thus sought to elicit agency from everyone on campus, and to provide an avenue of accountability to the leadership of the campus.

The concept of the Campus Sustainability Statement was developed in a process where the transformative agency of the participants oscillated between expressions of resisting, criticising, and then envisioning. As previously outlined, these oscillations traced the development of the concept. The expressions of resistance resulted in two major conceptual shifts, firstly towards a mission statement and then towards a CSS. The concepts that resulted from these major shifts were subsequently refined and moderated by the ensuing episodes of criticising that occurred and the associated envisioning that this prompted.

The types of expressions of transformative agency are not bound in any way to be expressed in a linear fashion, i.e. resistance, criticism, explicating, envisioning, committing to and taking action, do not necessarily follow one another, but there is an approximate order or sequential relationship, e.g. taking action could not precede explicating, in relation to a particular concept. In the case of the development of the CSS, committing and taking action are the "next" logical manifestations of expression of TA that could be expressed. Here, perhaps, because of the passive nature of a CSS (i.e. it is an expression of intent rather than an actionable concept such as a module or event), the participants have chosen to embed "committing to action" into the concept itself, by including the words "commits to" in the text of the CSS.

The concept was developed in such a way that the participants included the words "committed to" explicitly in the phraseology of the concept. In doing this, they were trying to express the sense of collective commitment and accountability that had emerged during the intervention. The action of embedding the term "committed to" into the statement, could also indicate that the intention was to foment "consequential action" by those who engaged with the statement, but this was not demonstrated in the findings or alluded to in post intervention semi-structured interviews.

This theme highlights the hierarchical nature of the development of transformative agency in this intervention. By the end of the process, the participants had expressed the "early" forms of transformative agency such as resistance and criticising, and they had also expressed envisioning to further develop the concept. However, as they now wanted to express the sense of collective commitment and accountability that had emerged during the intervention, they again used envisioning, but this time, to embed the intentionality directly into the wording of the statement.

7.3 Relating the themes to the literature

Having identified five thematic areas which characterise the *relationships between* concept development and the development of participants' transformative agency, I now outline the relevance and importance of these findings in the context of the wider SHE literature.

7.3.1 Contribution to the literature on Sustainability Terminology

Referring to the review of literature relating to sustainability terminology, I identified numerous debates on the lack of agreement on the terminology and definitions (Mader et al. 2013; Owens and Legere 2015; Cheeseman *et al.* 2019) . Much of the focus of these debates was on the purely scientific purpose of defining the concepts and identifying boundaries. This lack of agreement, the associated conceptual multiplicity (e. g. Sinakou et al. (2018)), and the issues relating to different disciplinary understandings (disciplinary contestation, e.g. Gale et al. (2015)) are a problematic issue for HE, and can clearly cause difficulties with communications, where clarity and precision are essential (Ryan 2011).

However, in the literature there is no mention of the need to develop new concepts that will drive action in particular ways in HEIs. This study contributes knowledge about how concepts have implications for the kind of actions that can be taken, and how stakeholders can contribute to this and also gain agency developing such concepts.

The issues of terminology are particularly problematic when trying to get people to try to agree on a set of ideas or actions (Evangelinos and Jones 2009; Wright 2010), as my work in this thesis has reinforced. My findings in this study support this view but offer a way for institutions to address and overcome these issues through the collaborative development of

new concepts that guide actions within institutions, rather than remaining mired at the level of constructing more and more precise definitions for specialists.

At the beginning of the development of the Campus Sustainability Statement, there was a lot of time spent discussing issues of terminological precision. The lack of a definition and issues with conceptual clarity were identified early on by the stakeholders themselves as being particularly troublesome, in the context of trying to move forward with the development of a shared vision or framework that all of the participants could support. It was only as successive concepts were collaboratively developed and refined in a structured intervention through a series of episodes of resisting and criticising, that the group was able to overcome the range of arguments and intractable positions that had arisen from focusing on the perceived importance of meanings and definitions. Indeed, it was established early on that it was unlikely that the group would find agreement on definitions, and this underpinned the realization of the need for new concepts to be developed. Once the focus changed from being about the terminology to being about improving what could be provided for the students, all members of the group were able to contribute to the development of the concept, even while maintaining their own views and positions.

The focus was on developing new concepts that could be locally applied, that would drive action and have real implications for how the Institute was going to change. This type of development is underreported in the literature reviewed.

My findings in relation to the difficulties associated with achieving agreement on terminology align with many of the studies reviewed, e.g Moore (2005); Gale et al. (2015). However, the approach of developing new concepts as a way to overcome these issues, is quite different

from the literature, where the focus is on reporting the issues and analysing the underlying causes, such as stakeholder opinions and disciplinary biases.

This is an important contribution to the literature on implementing SHE because it demonstrates how the structured collaborative development of a new concept can offer a way of developing a framework, in this case in the form of a sustainability statement, that can be used to drive actions in relation to embedding SHE. This contribution therefore helps to address the problems associated with the lack of agreement on sustainability related terminology, by offering a collaboratively developed concept which acts as a sustainability framework, rather than terminological interpretations or definitions.

In addition to providing a framework which staff can support, there is also evidence to suggest that the agency of those involved in the development of such a concept, is significantly developed, to the point where the participants express commitment to the concept.

7.3.2 Contribution to the literature on the role of Higher Education

The literature suggests that HEIs have moral and ethical responsibilities in relation to sustainability and must engage with it to create a just and sustainable future for society (Cortese 2003; Baker-Shelley et al. 2017; Findler *et al.* 2019). It is also clear that there are a wide variety of views on the nature of the role that HE should play in achieving a sustainable future (Calder and Clugston 2003; Dentoni and Bitzer 2015). This presents a problem in relation to finding acceptable ways to embed or integrate sustainability into HE.

In Section 2.3.2., I noted how some writers have highlighted the disparity between the principles of ESD and the role of HE, and argue that ESD is value-laden, and consequently risks giving students a pro-sustainability view, rather than an informed unbiased view. This issue appeared in the early stages of the development of the CSS, when it was suggested that a mission statement might present an unbalanced pro-sustainability view. This arose as a result of some of the participants questioning the compatibility of a sustainability statement with running business programmes that were based on growth economics. However, this issue was resolved when the participants acknowledged that their role in this context was not to drive particular views or opinions, but rather to offer choices and allow the students to make up their own minds. In terms of the development of the CSS, this was finally articulated as "providing a teaching and learning space that promotes critical engagement with sustainability".

Thus, the contribution here relates to how the intervention allowed participants to discuss and explore the responsibilities of the institution. Many of the participants had a strong commitment to sustainability issues and a lot of personal passion for the topic, but it was acknowledged that reaching agreement and fostering change would be difficult without

acknowledging the institutional context and the limited likelihood of being able to drive actual change via the existing institutional routes. The result was a CSS that made a statement about a commitment to students and their critical engagement with sustainability issues.

The literature reports a wide variety of views on the exact role of HE in relation to sustainability (Tziganuk and Gliedt 2017), but all agree on the fundamental role of providing knowledge, skills and know- how that promote seeking multiple perspectives and applying critical thinking.

The findings of this study are broadly in line with what is reported in the literature, in that the participants, while passionate about sustainability, were also passionate about providing students with a choice, so that they could make up their own minds.

This study contributes to knowledge by demonstrating that a collaboratively developed concept, such as a CSS, can provide a way for stakeholders to fully engage with SHE, while maintaining their views and academic freedom.

7.3.3 Contribution to the literature on the drivers of SHE

Among the many themes identified in the literature review that were considered to be drivers of SHE, the findings of this project address and make contributions to knowledge on three of these themes. These are: that engagement by the participants and stakeholders is a major driver of SHE (Mader et al. 2013; Godemann *et al.* 2014) the benefits of promoting inter-and multidisciplinary approaches in research and courses (Adams 2013); and the need for a whole university approach (Müller-Christ *et al.* 2014).

While participant and stakeholder engagement are correctly identified as drivers in the literature, there is very little reported on understanding the mechanisms of such stakeholder engagement and how such engagement actually works to drive change. This work confirms that participant engagement is indeed a strong driver. It helps to explain how and why that is, particularly in relation to the development of new SHE related concepts, by tracing in detail an example of the unfolding process which needs to occur if stakeholders are to be actively engaged. In addition, the work provides insights into how the development of new concepts can also influence the development of participants' transformative agency. This study has explored and extracted important knowledge on the dynamics of how these interactions unfold in the development of a Campus Sustainability Statement.

The importance of inter-and multidisciplinary approaches to the implementation of SHE is widely reported on (Pharo *et al.* 2012; Gale *et al.* 2015; Annan-Diab and Molinari 2017), and this study confirms the importance of promoting dialogue between participants from different disciplinary backgrounds. The literature highlights problematic issues in this area such as disciplinary fragmentation and the associated terminological issues (Gale *et al.* 2015), and the consequential lack of interdisciplinary research (Leal Filho 2018). There is a clear need to find

ways to enable dialogue and construct concepts that bridge interdisciplinary discussions and allow different perspectives to be drawn into a common process. This study makes a contribution here, by demonstrating how the CL process can facilitate the creation of such concepts.

During the development of the CSS, the inter-disciplinary debates and discussions fuelled some of the original discussions on terminology and definitions. This led to the generation of the germ cell idea of a mission statement, that would guide action, but was still open to individual interpretation. This was an essential pre-requisite to the subsequent development of the student-oriented Campus Sustainability Statement. The contribution of this study is that it provides valuable insights into how meaningful inter- and multidisciplinary discussions can lead to the formation of new concepts that drive actions that support SHE.

The CL methodology is designed around the inclusion of a wide range of participants and is considered to be a method that combines both top down and bottom up approaches to implementing change (Bligh and Flood, 2015). This study involved participants from management, academic and administrative staff, some of whom were also involved with the Green Campus Programme. While this project was only carried out on a single campus, the benefits of the "whole university approach" were very much evident during the development of the CSS, where the influence of each group played a significant role in its development. Again, the contribution to knowledge is demonstrating that the development of concepts and participants' TA through the implementation of the CL methodology can leverage the benefits of the whole Institute approach when implementing SHE.

A number of authors (e.g. Velazquez *et al.* 2006; Müller-Christ *et al.* 2014) mention the development and use of mission statements and sustainability guidelines derived from the content of HEI declarations as key internal drivers for SHE. However, my findings would question the benefits or efficacy of these, as the participants felt that "mission statements" per se, do not necessarily have much impact or illicit strong responses from staff members.

This project makes a number of important contributions to knowledge, in relation to the drivers of SHE. The study demonstrates the benefits of employing concept development to drive the implementation of SHE, by leveraging the benefits of multi-disciplinary input from a wide range of participants. The study also contributes to the understanding of the mechanisms of participant engagement and the interplay between the development of concepts and participants' TA, which is considered essential when encouraging staff engagement with SHE.

7.3.4 Contribution to the literature on the challenges and barriers to SHE

Resistance is widely positioned as a significant barrier to the implementation of any kind of institutional change (Verhulst and Lambrechts 2015) , and this is frequently mentioned in relation to the implementation of SHE (Dahle and Neumeyer 2001; Djordjevic and Cotton 2011: Brandli *et al.* 2015; Leal Filho *et al.* 2017; Aleixo, Leal and Azeiteiro 2018).

Yet this study suggests that rather than act as a barrier, participants' expression of resistance during the process of concept development in a CL research intervention can give rise to major conceptual shifts, which result in changes that can address the underlying causes that elicited the initial resistance. In this way, the expression of resistance can actually be seen to have a positive influence when driving certain types of change, by causing significant and important development of the concept.

As discussed in 7.3.1 and highlighted in the literature review, issues around terminology, such as lack of definitions, conceptual multiplicity and the ensuing communication issues, are seen as significant challenges in relation to embedding SHE.

In this study, these barriers were encountered at the outset of the intervention in ways that broadly echo what would be expected from the literature. However, in this instance, these barriers were overcome by the collaborative development of the concept of a mission statement, which explicitly responded to and overcame those issues in the early stages. In the case of the CSS, as the concept was developed, it allowed for multiple personal interpretations, yet provided a framework that all staff could use to drive the sustainability agenda on the campus.

Understanding the contribution that the use of concept development can have, in relation to addressing the challenges and barriers of implementing SHE, can perhaps be illustrated by way of an example. Akins *et al.* (2019) proposed that barriers can be grouped into three broad clusters: those related to awareness (of sustainability); HE structures; and the lack of resources. This study involved developing new knowledge in ways that address all three of these.

Firstly, the study demonstrated that once people are aware of barriers, they are prepared to work around them and develop conceptual frameworks (increase awareness of sustainability). Secondly, a framework enables them to respond to institutional impediments, such as the intra-institutional fragmentation associated with disciplinary contestation (HE structure). Thirdly, in relation to the longer-term impacts of the intervention, one of the outcomes was directly responsible for securing resources for the completion of a feasibility study into the creation of a centre for the study of community sustainability on the Mayo Campus.

7.3.5 Contribution to the literature on the approaches and strategies for implementation of SHE

In relation to the implementation of sustainability into HE, there are numerous studies which identify a range of ways of approaching SHE, from the adoption of institutional frameworks (Appleton 2017) to a range of assessment and reporting metrics and templates (Ceulemans, Lozano and Alonso-Almeida 2015). Indeed, many universities employ an approach which involves one or more of these. Recently the engagement of a specialist sustainability officer, and/or the creation of a sustainability office, charged with spearheading and leading the implementation process have become particularly prominent ways of approaching SHE at an institutional level, especially in Ireland. While all of these approaches have varying degrees of success, there is no universally accepted or agreed approach and the majority of HEIs engage one or more of these strategies (Lozano 2018).

As the session reports in Sections 5.2.1 and 5.2.2 illustrate, many of the participants were already engaging in sustainability related work on an ad hoc basis before they took part in the intervention. This piecemeal approach is widely reported, e.g. Dlouhá et al. (2017) and demonstrates one of the fundamental challenges associated with embedding sustainability, i.e. how to bring people together in a structured way, who may be from disparate backgrounds and hold different fundamental beliefs, to implement SHE.

There is a paucity of literature on the use of the collaborative development of new concepts as a way to encourage and implement SHE and I could not find any studies where the CL methodology had been specifically applied to the issue of sustainability in the Higher Education context.

As an approach to embedding SHE, the CL opens up the possibility of collaborative development by offering a structured approach, where participants can work together to develop new concepts to drive actions around SHE. It also offers the opportunity for participants to develop their agency and thereby be transformed by the process of engagement. The significant impact that this development of agency can have on the development of a concept, such as a Campus Sustainability Statement, is clearly demonstrated in this study.

This study contributes to the knowledge on approaches to embedding SHE by successfully demonstrating the potential of the CL. While there are a lot of approaches to implementing SHE which involve varying degrees of consultation, participation, and the development of new tools (e.g. Cebrián Bernat 2016; Besong 2017; León-Fernández et al. 2018), I did not find any that focused specifically on the development of concepts.

.

7.4 Summary of chapter

In the first part of this chapter, I have presented my thematic analysis of the relationships between concept development and the development of participants' transformative agency during the development of the Mayo Campus Sustainability Statement. In the second part, I outline my contributions to knowledge, by discussing those themes in relation to the literature reviewed in Chapter 2.

In the following chapter, I present my conclusion where I reflect on my findings and address the research questions and the overall objectives of the study. I then outline the limitations of the study and the broader implications in terms of policy and practice, as well as the potential for future research.

Chapter 8 Conclusion.

8.1 Introduction

In this chapter, I remind the reader of the research objectives for this study and how I approached it. I then summarise my findings and comment on the limitations of the project, before outlining my contributions to knowledge. I follow this with an overview of the implications that this project has for both policy and practice, and also outline the impacts that the other 'tangible' outcomes from this project have had on my career since completing the intervention. I conclude the chapter with a brief overview of the potential for further research in the area.

8.2 Research objective

In broad terms, this project sets out to explore how stakeholders could come together and develop new concepts of sustainability in their institution. In order to do so, the Change Laboratory was chosen to structure a research-intervention. The research questions were designed to focus on exploring the relationship between two key developmental processes: the development of new concepts and the associated development of participants' transformative agency. Thus, the research questions are:

Main RQ 1

What are the relationships between concept development and participant transformative agency in a research intervention focused on fostering sustainability in higher education?

Sub Question 1

How did the participants develop the concept of the 'Campus Sustainability Statement'?

Sub Question 2

How did the participants express their transformative agency during the process of developing the 'Campus Sustainability Statement'?

8.3 Research findings

In Chapter 6, I answer sub-questions 1 and 2 by providing a detailed analysis of both the development of the Campus Sustainability Statement and how it influenced and was influenced by the associated development of the participants' transformative agency. In Chapter 7, I build on this and answer the main research question by presenting my thematic analysis on the relationships between the two. Below, I briefly summarise my findings to remind the reader of the stages and developmental flow of the process.

The concept of the Campus Sustainability Statement was developed over a five-stage process which spanned the duration of the intervention. The first stage involved identifying the need for such a concept and the second stage involved exploring how these needs could be addressed and resulted in the generation of a germ cell idea. Stage three involved an in-depth examination of the germ cell idea, to explore and determine what it might mean for the participants, how it might work, and ultimately how it would be articulated. By the end of stage three, the germ cell had turned into a well-developed concept. Stage four also saw a major shift in the concept when its title changed to a CSS, to more accurately reflect its purpose. In stage five, the wording was finally revised with a resulting clear expression of commitment to action embedded in the statement. The CSS was subsequently proposed by management for adoption by the campus and adopted at the next full staff meeting.

In terms of transformative agency, the explication that was the genesis of the germ cell idea for the CSS, occurred in Session Two, in response to the need to find or create a definition or concept of sustainability that would allow the participants to develop a shared understanding, provide a common goal, and guide actions that would embed sustainability in

the practices of the staff on the Mayo Campus. As the intervention evolved, expressions of transformative agency in the form of resisting, criticising, and envisioning, influenced and were influenced by the development of the CSS.

In terms of the relationships between concept development and transformative agency, I identify five themes, which provide valuable insight into how this complex relationship works: Intense criticising at an early stage led to explicating an original concept; Resistance was a pre-requisite for major conceptual shifts once the intervention was underway; Conceptual refinement was driven by criticising; Concept development moderated resistance into criticism; Participants tried to embed particular forms of agency into the concepts that they were developing.

In summary, my study suggests that during a CL research intervention, concept development and the development of the participants' transformative agency are intimately and reciprocally linked. The development of the concept of the CSS clearly influenced the types of expression of participants' transformative agency as the intervention proceeded. Conversely, the development of the statement was also influenced by the type of expression of transformative agency expressed by the participants. This was particularly evident in relation to expressions of resisting and criticising, which were both very influential on the way that the statement was developed, and how it was finally articulated.

8.4 Limitations

As with all research projects, there are a number of limitations to this study.

By normal HE standards, the Mayo campus could be considered to be quite a small campus and this impacted on the type of programme and the number of participants who were available to take part in the project. From a mitigation point of view, the CL process is suitable for a variety of scales of operations, and the size of the Mayo Campus made it ideal as a pilot project, where the process is trialled for suitability to be run on a larger scale.

It must also be acknowledged that the Mayo Campus may have been a particularly receptive site in which to explore such an intervention, because of all of the existing sustainability related activities, as mentioned in earlier chapters. (See also Section 8.7)

Being an insider researcher (see Section 4.3.4), knowing and working with the participants undoubtedly had some influence on the way the intervention unfolded. However, in the case of a CL, the role of the researcher is to guide the participants through the process, rather than direct them in particular ways. I was very mindful of this during the process. Where possible, I focused on facilitating the participants' inputs, and only intervened to identify options or point out a need to make a decision.

In terms of the timing of the sessions, it proved difficult to find a time that suited everybody's timetable. In the end, the participants agreed to Wednesday afternoons, which are normally reserved for academic programme board and staff meetings, but this effectively meant that one programme was excluded from the process, as it was a part-time programme that took place weekly, on Wednesday afternoons.

The Change Laboratory approach is usually carried out by a team, but for this project, I was, in effect a sole researcher and this limited the scope of the study to some extent. If there had been a research team involved, there would have been more capacity between sessions

to transcribe the session content and analyse data, which may have influenced the way that the following session tasks were designed. However, to mitigate this a lot of time was spent viewing and reviewing the videos between the sessions to ensure that the key issues and critical moments were noted and appropriate follow-up actions taken.

In relation to using Activity Theory and CHAT with a group of participants from a wide range of backgrounds, many of whom were not familiar with social science theories such as AT or CHAT. I believe that we were not able to take full advantage of the benefits of using these theories as a tool in the CL. While I did introduce the triangular activity systems diagrams in the early sessions and there was some time spent discussing how this model would apply to the project, it did not gain much traction or receive much interest from the participants. I think this is partly because it is quite a complex theory with new terminology and, because it takes time to become familiar with it, which the participants did not have in the context of the CL intervention.

The lack of participant engagement with the AT model diagram did influence the design direction that I took during the sessions. While I do not know what actual impact this had on the overall outcomes of the project, I would in future interventions consider employing the AT model and diagrams more as a second stimulus or developmental tool during the sessions.

In part my ability to do so may be influenced by my own growing confidence as a researcher-interventionist in using the theory and supporting others to do so in-the-moment within Change Laboratory sessions.

Unfortunately, because of events that were entirely outside of the control of this project, several significant structural and management changes took place in the Mayo Campus in 2017

and these had a major impact on the operations of the campus. The implications of these changes make it difficult to ascertain the longer-term impacts of the development of the concepts and participants' transformative agency.

8.5 Contributions to the literature

This study traces the development of a Campus Sustainability Statement and provides insights into how the process of the development of the statement can influence, and also be influenced by, the development of participants' transformative agency. The study has also explored and extracted important knowledge on the dynamics of how these interactions unfold during the development process. Below I summarise the modest contributions to the literature that this study makes, presented in approximated descending order.

1. The main contributions to knowledge that this study makes are to the literature concerning the challenges and barriers to SHE. Firstly, this study demonstrates that the collaborative development of a new concept can be used to overcome the terminological issues that are often seen as barriers in the literature (this claim is akin to point 3 below, but speaks to a slightly different audience). Secondly, this study highlights that during the process of concept development, expressions of resistance can have a positive impact on the development process by triggering a response in the form of major conceptual shift.

2. This study makes two contributions to the literature in relation to the drivers of SHE. The main contribution here relates to expanding the understanding of the mechanisms of stakeholder or participant engagement, which is widely acknowledged as a key driver when implementing sustainability initiatives. This is illustrated by insights into how concept

development and transformative agency are related, both of which are essentially expressions of engagement.

The study also contributes to knowledge by offering new insights into how collaborative concept development can bridge interdisciplinary discussions and allow different perspectives to be drawn into a common process.

3. This study makes a contribution to knowledge in the literature that relates to sustainability and ESD terminology, as it demonstrates how the structured collaborative development of a new concept can be used to overcome communications problems associated with sustainability-related terminology and definitions. There is also evidence to suggest that the agency of those involved in the development of such a concept is significantly enhanced during the process, to the point where the participants are prepared to express commitment.

4. The study also makes a modest contribution to the literature relating to the role and responsibilities of HE in relation to sustainability. This study highlights that stakeholders are very capable of debating and discussing the role of HE and have very specific views. Stakeholders add a voice that is nuanced and context specific reflecting their own roles and experiences. Here, they see the role of HE, as that of providing students with the opportunity to critically engage with sustainability in teaching and learning activities.

5. This study makes a modest contribution to the literature in relation to approaches to implementing SHE. The study clearly demonstrates that the CL is a powerful tool that can be used to develop new concepts, which can be used to support the implementation of SHE through overcoming terminological barriers, bridging interdisciplinary discussions, and the development of participants' transformative agency.

8.6 Implications for policy and practice

This project has had significant implications for the Institute at both practice and policy levels. The subject matter of the project, the CSS can be considered as both a policy instrument, indicating the campus's commitment to sustainability, and also an outcome that is designed to influence practice.

In terms of policy, the launch of the CSS in Feb 2017 publicly acknowledged the commitment of the Mayo Campus to embed sustainability into the core of its activities and operations and its commitment to promoting critical engagement with sustainability in its teaching and learning activities. Subsequently, in the wake of this project, the Institute also funded a feasibility study on the creation of a Centre for the Study of Community Sustainability on the Mayo Campus. The feasibility study was completed in 2017, and it signalled the start of a process that would ultimately lead to the recent establishment of a Centre for Sustainability in GMIT, a new head of which has since been appointed. The creation of the Centre is one of many sustainability related initiatives that are currently on-going in the Institute. Other Campuses in the Institute have also been awarded Green Flags, and the main Campus in Galway City is at an advanced stage with an application for their Green Flag.

One of the tangible outcomes that did not maintain traction after the CL, was the utilisation of the 'programme sustainability paragraphs'. This was mainly due to the structural and management changes alluded to above. However, the Institute is about to undertake a programme review process, and sustainability is to be one of its three key themes. I recently proposed to the registrar's office the idea that each programme in the Institute would generate a sustainability paragraph for inclusion on the Institute website, which would

explicitly highlight the linkages with sustainability. I justified this suggestion with reference to the previous collaborative development of such paragraphs by campus stakeholders in the project described in this thesis. The proposal received a positive response.

In terms of practice, this project has had many implications for me and my colleagues in GMIT. One of the five tangible outcomes listed in 5.16 was development work on new sustainability -related modules. This work was continued after the CL, through the programme development team that was formed at the end of the project and resulted in the development of two new sustainability related programmes that have since been successfully run in the Institute. Currently, and partly as a result of the success of one of these programmes, the Institute is developing a level 9 (M.Sc) programme on sustainability leadership, and I am a member of the assigned developing team.

As a result of carrying out this research project, I was inspired to become involved in other projects, and also to look for funding for research and development projects. I have been successful with this in relation to two projects, for which I have achieved substantial funding under the government sponsored Human Capital Initiative (HCI) Scheme[13] :

The first project has had a huge impact on my career and has effectively resulted in me changing jobs. I am now the GMIT project manager for a multi-Institute project that aims to develop a national Digital Academy for a Sustainable Built Environment (DASBE[14]), which will run until 2024. I continue to lecture, but my role has expanded to include significant project management and budget responsibilities.

[13] https://hea.ie/skills-engagement/human-capital-initiative/
[14] https://dasbe.ie/ (still under construction)

The second project involves the development of a series of micro-credentials and modules around the UN SDGs (Sustainable Development Goals). This project is also a multi-Institute initiative, on which I will be working with colleagues from our future Technological University partners, Sligo IT and Letterkenny IT.

8.7 Implications for future research.

In the wider context, I suggest that this project demonstrates the significant potential that formative interventions, such as the CL, have in relation to exploring how sustainability and ESD can be embedded in HE practices.

One area where there is clear potential for future research is continuing to explore how the CL can be used to develop inter- and cross-disciplinary sustainability focused research projects. The structured nature of the process, and the focus on collaborative reconceptualization was very beneficial when dealing with contentious issues such as terminology, where values and disciplinary biases can be difficult to navigate.

From a methodological point of view, the findings of this study suggest that a more detailed exploration of the relationship between "resisting" and major conceptual shifts (along with the other concept development/transformative agency relationships identified) is an area which requires significant further research. This relationship is somewhat counter intuitive, and it would be very interesting to explore in more detail, how this relationship works and the existence of possible contributory factors or parameters.

As previously discussed, the CL is often run initially as a pilot project, before being run in the larger institutional context. The success of this project demonstrates the potential this approach has for embedding and implementing SHE, and it would be interesting to see such a project being facilitated on the main Campus in Galway. I have suggested this to the President of the Institute and at the time of writing, am hopeful that, as part of the new Institute wide focus on sustainability, this might occur in the next academic year.

References

Adams, C. A. (2013) 'Sustainability reporting and performance management in universities', *Sustainability Accounting, Management and Policy Journal*, 4(13), pp. 384–392.

Agbedahin, A. V. (2019) 'Sustainable development, Education for Sustainable Development, and the 2030 Agenda for Sustainable Development: Emergence, efficacy, eminence, and future', *Sustainable Development*, 27(4), pp. 669-680-. doi: 10.1002/sd.1931.

Akins, E. *et al.* (2019) 'Sustainability Education and Organizational Change: A Critical Case Study of Barriers and Change Drivers at a Higher Education Institution', *Sustainability*, 11(2), p. 501. doi: 10.3390/su11020501.

Al-Haddad, S. and Kotnour, T. (2015) 'Integrating the organizational change literature: A model for successful change', *Journal of Organizational Change Management*, 28(2), pp. 234–262. doi: 10.1108/JOCM-11-2013-0215.

Aleixo, A. M., Leal, S. and Azeiteiro, U. M. de M. (2018) 'Conceptualization of sustainable higher education institutions, roles, barriers, and challenges for sustainability: An exploratory study in Portugal', *Journal of Cleaner Production*, 172, pp. 1664–1673. doi: 10.1016/j.jclepro.2016.11.010.

Amaral, A. R. *et al.* (2020) 'A review of empirical data of sustainability initiatives in university campus operations', *Journal of Cleaner Production*, 250, p. 119558. doi: 10.1016/j.jclepro.2019.119558.

Amaral, L. P., Martins, N. and Gouveia, J. B. (2015) 'Quest for a sustainable University: a review', *International Journal of Sustainability in Higher Education*, 16(2), p. 155 172.

Annan-Diab, F. and Molinari, C. (2017) 'Interdisciplinarity: Practical approach to advancing education for sustainability and for the Sustainable Development Goals', *International Journal of Management Education*, 15(2), pp. 73–83. doi: 10.1016/j.ijme.2017.03.006.

Appleton, E. (2017) *Next Generation Sustainability Strategy and Structure. Whole-institution Approaches to Sustainability in Universities and Colleges*. Environmental Association of Universities and Colleges. PP 1-30. Available at: http://www.sustainabilityexchange.ac.uk/next_generation_sustainability_strategy_and_str.

Avila, L. V. *et al.* (2017) 'Barriers to innovation and sustainability at universities around the world a', 164, pp. 1268–1278. doi: 10.1016/j.jclepro.2017.07.025.

Baker-Shelley, A., van Zeijl-Rozema, A. and Martens, P. (2017) 'A conceptual synthesis of organisational transformation: How to diagnose, and navigate, pathways for sustainability at universities?', *Journal of Cleaner Production*, 145, pp. 262–276. doi: 10.1016/j.jclepro.2017.01.026.

Barrett, C. B. (1996) 'Fairness, stewardship and sustainable development', *Ecological Economics*, 19(1), pp. 11–17.

Behfar, K. J. *et al.* (2008) 'The critical role of conflict resolution in teams: a close look at the links between conflict type, conflict management strategies, and team outcomes.', *The Journal of applied Psychology*, 93(1), pp. 170–188. doi: 10.1037/0021-9010.93.1.170.

Bekessy, S. A., Samson, K. and Clarkson, R. E. (2007) 'The failure of non-binding declarations to achieve university sustainability: A need for accountability', *International Journal of Sustainability in Higher Education*, 8(3), pp. 301–316. doi: 10.1108/14676370710817165.

Berchin, I. I. *et al.* (2018) 'The importance of international conferences on sustainable development as higher education institutions' strategies to promote sustainability: A case study in Brazil', *Journal of Cleaner Production*, 171, pp. 756–772. doi: 10.1016/j.jclepro.2017.10.042.

Besong, F. A. (2017) *Infusing Sustainability in Higher Education in Ireland : The Green Curriculum Model (GCM) and the Dispositions , Abilities and Behaviours (DAB) Competency Framework*. Ph D Thesis, Dublin Cty University.

Blackler, F. (2009) 'Cultural-Historical Activity Theory and Organization Studies.', in Sannino, H. Daniels, & K. D. G. (ed.) *Learning and Expanding with Activity Theory*. Cambridge University Press, pp. 19–39.

Blanco-Portela, N. *et al.* (2017) 'Towards the integration of sustainability in Higher Education Institutions: A review of drivers of and barriers to organisational change and their comparison against those found of companies', *Journal of Cleaner Production*, 166, pp. 563–578. doi: 10.1016/j.jclepro.2017.07.252.

Bligh, B. and Flood, M. (2015) 'The Change Laboratory in Higher Education : research-intervention using activity theory', *Theory and Method in Higher Edcation Research III*, 1, pp. 141–168. doi: 10.1108/S2056-375220150000001007.

Bligh, B. and Flood, M. (2017) 'Activity theory in empirical higher education research: choices, uses and values', *Tertiary Education and Management*, 3883(February), pp. 1–28. doi: 10.1080/13583883.2017.1284258.

Bone, E. and Agombar, J. (2011) *First year attitudes towards, and skills in sustainable development.* York, Higher Education Academy, Pp1-126. Available at: http://www.heacademy.ac.uk/assets/York/documents/ourwork/sustainability/FirstYearAttitiudes_ FinalReport.pdf.

Bonneau, C. (2013) 'Contradictions and their concrete manifestations: An activity-theoretical analysis of the intra-organizational co-configuration of open source software.', in *Proceedings of the 29th EGOS Colloqium*. Montreal: European Group for Organizational Studies., pp. 1–28.

Boote, D. N. and Beile, P. (2015) 'Scholars Before Researchers : On the Centrality of the Dissertation Literature Review in Research Preparation', 34(6), pp. 3–15.

Booth, A., Papaioannou, D. and Sutton, A. (2012) *Systematic approaches to a successful literature review*. Thousand Oaks, California: SAGE.

Brandli, L. *et al.* (2015) 'The Environmental Sustainability of Brazilian Universities: Barriers and Pre-conditions', in Leal Filho, W. (ed.) *World Sustainability Series, Integrating Sustainability Thinking in Science and Engineering Curricula,*. Springer International Publishing Switzerland, pp. 197–213. doi: 10.1007/978-3-319-09474-8_5.

Branzei, O., Vertinsky, I. and Zietsma, C. (2000) 'From Green-Blindness To the Pursuit of Eco-Sustainability: an Empirical Investigation of Leader Cognitions and Corporate Environmental Strategy Choices.', in *Academy of Management Proceedings*, pp. C1–C6. doi:

10.5465/apbpp.2000.5535908.

Breiting, S. (2009) 'Issues for environmental education and ESD research development: looking ahead from WEEC 2007 in Durban', *Environmental Education Research*, 15(2), pp. 281–284.

Brinkhurst, M. *et al.* (2011) 'Achieving campus sustainability: Top-down, bottom-up, or neither?', *International Journal of Sustainability in Higher Education*, 12(4), pp. 338–354. doi: 10.1108/14676371111168269.

Brundtland, G. H. (1987) *Our Common Future (The Brundtland Report)*, *Report of the World Commission on Environment and Development: Our Common Future (The Brundtland Report)*. Available at: https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf.

Buckler, C. and Creech, H. (2014) *Shaping the Future We Want: UN Decade of Education for Sustainable Development (2005-2014) Final Report*. doi: 10.5363/tits.11.4_46.

Calder, W. and Clugston, R. (2003) 'International efforts to promote higher education for sustainable development.', *Planning for Higher Education*, 31(3), pp. 30–44.

Calder, W. and Clugston, R. M. (2003) 'Progress Toward Sustainability in Higher Education', *Environmental Law Reporter: News & Analysis*, 33(1), p. 1. doi: http://www.ulsf.org/pdf/dernbach_chapter_short.pdf.

de Caluwe, L. I. . and Vermaak, H. (2006) *Leren veranderen: een handboek voor de veranderkundige. Compleet herziene versie*. Deventer, Kluwer.

Cebrián Bernat, G. (2014) *An action research approach for embedding education for sustainability in a university undergraduate curriculum*. PhD Thesis, University of Southampton.

Cebrián Bernat, G. (2016) 'The I3E model for embedding education for sustainability within higher education institutions', *Environmental Education Research*, (August), pp. 1–19. doi: 10.1080/13504622.2016.1217395.

Cebrián Bernat, G., Grace, M. and Humphris, D. (2015) 'Academic staff engagement in education for sustainable development', *Journal of Cleaner Production*, 106, pp. 79–86. doi: 10.1016/j.jclepro.2014.12.010.

Ceulemans, K., Lozano, R. and Alonso-Almeida, M. del M. (2015) 'Sustainability reporting in higher education: Interconnecting the reporting process and organisational change management for sustainability', *Sustainability (Switzerland)*, 7(7), pp. 8881–8903. doi: 10.3390/su7078881.

Cheeseman, A. *et al.* (2019) 'Taking stock of sustainability in higher education: a review of the policy literature', *Environmental Education Research*, 0(0), pp. 1–16. doi: 10.1080/13504622.2019.1616164.

Christensen, P. *et al.* (2009) 'Sustainable development', *International Journal of Sustainability in Higher Education*, 10(1), pp. 4–20. doi: 10.1108/14676370910925217.

Christie, B. A. *et al.* (2013) 'Environmental sustainability in higher education : How do academics teach ?', *Enviornmnetal Education Research*, 19(3), pp. 385–414. doi: 10.1080/13504622.2013.879697.

Cohen,L. Manion,L. Morrison, K. (2007) *Research methods in Education*. 6th edn. London: Routledge.

Cortese, A. D. (2003) 'The Critical Role of Higher Education in Creating a sustainable future', *Planning for Higher Education*, (March-May), pp. 15–22.

Cotton, D. R. E. *et al.* (2007) 'Sustainable development, higher education and pedagogy: a study of lecturers' beliefs and attitudes', *Environmental Education Research*, 13(5), pp. 579–597. doi: 10.1080/13504620701659061.

Cotton, D. R. E. *et al.* (2009) 'Revolutions and second-best solutions: Education for sustainable development in higher education', *Studies in Higher Education*, 34(7), pp. 719–733. doi: 10.1080/03075070802641552.

Dabija, D.-C. *et al.* (2017) 'Stakeholders' perception of sustainability orientation within a major Romanian University ",' *International Journal of Sustainability in Higher Education*, 18(4).

Dahle, M. and Neumeyer, E. (2001) 'Overcoming barriers to campus greening', *International Journal of Sustainability in Higher Education*, 2(2), pp. 139–160. doi: 10.1108/14676370110388363.

Daniels, H. (2007) 'Pedagogy', in Daniels, H., Cole, M., and Wertsch, J. V (eds) *The Cambridge companion to Vygotsky.* 1st edn. Cambridge University Press, pp. 307–331.

Daniels, H., Cole, M. and Wertsch, J. V (eds) (2007) *The Cambridge companion to Vygotsky*, *Choice Reviews Online*. Cambridge University Press. doi: 10.5860/choice.45-2312.

Davydov, V. V. (1990) 'Types of generalization in instructionn: Logical and Psychological Problems in the Structuring of School Curricula', *Soviet studies in mathematics education Volume 2*, pp. 1–223. Available at: https://www.marxists.org/archive/davydov/generalization/generalization.pdf.

Delakowitz, B. and Hoffman, A. (2000) 'Education, The Hochschule Zittau/Goerlitz: Germany's first registered environmental management (EMAS) at an institution of higher', *International Journal of Sustainability in Higher Education*, 1(1), pp. 35–47.

Dentoni, D. and Bitzer, V. (2015) 'The role(s) of universities in dealing with global wicked problems through multi-stakeholder initiatives', *Journal of Cleaner Production*, 106, pp. 68–78. doi: 10.1016/j.jclepro.2014.09.050.

Department of Education and Skills (2014) *' Education for Sustainability ' The National Strategy on Education for Sustainable Development in Ireland 2014-2020*. Retrieved 04/03/2018 from www.education.ie/en/The-Education-System/Higher-Education/.

DeSimone, L. and Popoff, F. (1997) *Eco-Efficiency. The Business Link to Sustainable Development:* Masechusetts, USA: MIT Press.

Disterheft, A. *et al.* (2015) 'Sustainable universities - A study of critical success factors for participatory approaches', *Journal of Cleaner Production*, 106, pp. 11–21. doi: 10.1016/j.jclepro.2014.01.030.

Djordjevic, a. and Cotton, D. R. E. (2011) 'Communicating the sustainability message in higher education institutions', *International Journal of Sustainability in Higher Education*, 12(4), pp. 381–394. doi: 10.1108/14676371111168296.

Dlouhá, J., Glavič, P. and Barton, A. (2017) 'Higher education in Central European countries – Critical factors for sustainability transition', *Journal of Cleaner Production*, 151, pp. 670–684. doi: 10.1016/j.jclepro.2016.08.022.

Dobson and Tomkinson (2012) 'Creating sustainable development change agents through problem-based learning', *International Journal of Sustainability in Higher Education*, 13(3), pp. 263–278.

Doppelt, B. (2003) 'Overcoming the seven sustainability blunders', *Systems Thinker*, 14(5), pp. 2–7. Available at: https://thesystemsthinker.com/overcoming-the-seven.

Dunphy, D., Griffiths, A. and Benn, S. (2007) *Organizational Change for Corporate Sustainability.A Guide for Leaders and Change Agents of the Future.* 2nd edn. New York: R.

Dyer, G. and Dyer, M. (2017) 'Strategic leadership for sustainability by higher education: the American College & University Presidents' Climate Commitment', *Journal of Cleaner Production*, 140, pp. 111–116. doi: 10.1016/j.jclepro.2015.08.077.

E.J. Wals, A., Weakland, J. and Blaze Corcoran, P. (2017) 'Preparing for the Ecocene: Envisioning futures for environmental and sustainability education', *Japanese Journal of Environmental Education*, 26(4), pp. 4_71-76. doi: 10.5647/jsoee.26.4_71.

Eco-UNESCO (2007) *Research Project on Education for Sustainable Development in Ireland*. Report commisioned by Comhar Sustainable Development Council.

Elliott, H. and Wright, T. S. A. (2013) 'Barriers to Sustainable Universities and Ways Forward: A Canadian students` Perspective', in *The 3rd World Sustainability Forum*, pp. 1–19. doi: 10.3390/wsf3-f006.

Engeström, Y. (1987) -. 1st edn, *Learning by ExpandingAn Activity Theoretical approach to developmental research*. 1st edn. Helsinki: Orient-Konsultit. doi: 10.1128/jvi.20.1.78-85.1976.

Engeström, Y. (1993) 'Developmental studies of work as a testbench of activity theory: The case of primary care medical practice.', in Chaiklin, S. and Lave, J. (eds) *Understanding practice: Perspectives on activity and context*. New York: Cambridge University Press, pp. 64–103.

Engeström, Y. *et al.* (1996a) 'The Change Laboratory as a Tool for Transforming Work', *Lifelong Learning in Europe*, 1(2), pp. 10–17.

Engeström, Y. *et al.* (1996b) 'The Change Laboratory as a Tool for Transforming Work', *Lifelong Learning in Europe*, 1(2), pp. 10–17.

Engeström, Y. (2001) 'Expansive Learning at Work: Toward an activity theoretical reconceptualization', *Journal of Education and Work*, 14(1), pp. 133–156. doi: 10.1080/13639080020028747.

Engeström, Y. (2008) *From Teams to Knots: Activity-theoretical studies of collaboration and learning at work.* Cambridge: Cambridge University Press. doi: https://doi.org/10.1017/CBO9780511619847.

Engeström, Y. (2009) *Expansive learning: Toward an activity-theoretical reconceptualization (Chapter 4)*. Available at: http://pagi.wikidot.com/engestrom-expansive-learning.

Engeström, Y. (2011) 'From design experiments to formative interventions', *Theory &*

Psychology, 21(5), pp. 598–628. doi: 10.1177/09593543114192 52.

Engeström, Y. (2014) *Learning by Expanding: An Activity-Theoretical Approach to Developmental Research*. 2nd edn. New York: Cambridge University Press. doi: 10.1017/CBO9781139814744.

Engeström, Y. (2016) *Studies in Expansive Learning: Learning What is Not Yet There*. 1st edn. New York: Cambridge University Press.

Engeström, Y. (2020) 'Ascending from the abstract to the concrete as a principle of expansive learning', *Psychological Science and Education*, 25(5), pp. 31–43. doi: 10.17759/pse.2020250503.

Engeström, Y., Miettinen, R. and Punamaki, R. (1999) *Perspectives on Activity Theory*. 1st edn, *Perspectives on Activity Theory*. 1st edn. Edited by Y. Engestrom, R. Miettinen, and R. Punamaki. Cambrigde UK: Cambridge University Press. doi: 10.1017/cbo9780511812774.

Engeström, Y., Nummijoki, J. and Sannino, A. (2012) 'Embodied germ cell at work: Building an expansive concept of physical mobility in home care', *Mind, Culture, and Activity*, 19(3), pp. 287–309. doi: 10.1080/10749039.2012.688177.

Engeström, Y. and Sannino, A. (2010) 'Studies of expansive learning: Foundations, findings and future challenges', *Educational Research Review*, 5(1), pp. 1–24. doi: 10.1016/j.edurev.2009.12.002.

Engeström, Y. and Sannino, A. (2011) 'Discursive manifestations of contradictions in organizational change efforts: A methodological framework', *Journal of organizational change management*, 24(3), pp. 368–387. doi: 10.1108/S1479-3563(2012)000012B005.

Engeström, Y., Sannino, A. and Virkkunen, J. (2014) 'On the Methodological Demands of Formative Interventions', *Mind, Culture, and Activity*, 21(2), pp. 118–128. doi: 10.1080/10749039.2014.891868.

Evangelinos, K. I. and Jones, N. (2009) 'An analysis of social capital and environmental management of higher education institutions', *International Journal of Sustainability in Higher Education*, 10(4), pp. 334–342. doi: 10.1108/14676370910990684.

Fairhurst, G. T. *et al.* (2016) 'Diverging and Converging: Integrative Insights on a Paradox Meta- perspective', *The Academy of Management Annals*, 10(1), pp. 173–182. doi: 10.1080/19416520.2016.1162423.

Ferrer-Balas, D. *et al.* (2008) 'An international comparative analysis of sustainability transformation across seven universities', *International Journal of Sustainability in Higher Education*, 9(3), pp. 295–316. doi: 10.1108/14676370810885907.

Figueiró, P. S. and Raufflet, E. (2015) 'Sustainability in higher education: A systematic review with focus on management education', *Journal of Cleaner Production*, 106, pp. 22–33. doi: 10.1016/j.jclepro.2015.04.118.

Findler, F. *et al.* (2019) 'The impacts of higher education institutions on sustainable development: A review and conceptualization', *International Journal of Sustainability in Higher Education*, 20(1), pp. 23–38. doi: 10.1108/IJSHE-07-2017-0114.

Fisher, P. B. and Mcadams, E. (2015) 'Gaps in sustainability education The impact of higher education coursework on perceptions of sustainability', *International Journal of Sustainability in*

Higher Education, 16(4), pp. 407–423. doi: 10.1108/14676371311312905.

Flavin, C. (2010) 'Preface', in Starke, L. and Mastny, L. (eds) *State of the world Transforming cultures From Consumerism to Sustainability*. First. New York: WW Norton & Company, pp. xvii–xxi.

Gale, F. *et al.* (2015) 'Four Impediments to Embedding Education for Sustaianbility in Higher Education.PDF', *Australian Journal of Environmental Education*, 31(2), pp. 248–263.

Gergen, M. (1995) 'The Social Construction of Grievances: Constructionist Approaches to a Relational Theory.', in Hosking, D. M., Dachler, H. P., and Gergen, K. . (eds) *Management and Organization: Relational Alternatives to Individualism*. Aldershot, England: Ashgate Publishing Limited., pp. 98–103.

Gibson, R. (2001) *Specification of sustainability-based environmental assessment decision criteria and implications for determining 'significance' in environmental assessment*. Ottowa: Canadian Environmental Assessment Agency. Available at: https://publications.gc.ca/site/eng/241764/publication.html.

Godemann, J. *et al.* (2014) 'Higher education and sustainable development', *Accounting, Auditing & Accountability Journal*, (October 2006), pp. 218–233. doi: 10.1108/AAAJ-12-2013-1553.

Gough, A. (2013) 'Historical, contextual and theoretical orientations that have shaped environmental education research', in Wals, A. E. J. et al. (eds) *International Handbook of Research on Environmental Education*. Routledge, pp. 9–12.

Green, T. L. (2015) 'Lecturers' perspectives on how introductory economic courses address sustainability', *International Journal of Sustainability in Higher Education*, 16(1), pp. 44–56. doi: 10.1108/14676371311312905.

Grindsted, T. S. (2011) 'Sustainable universities – from declarations on sustainability in higher education to national law', *Environmental Economics*, 2(2), pp. 29–36.

Grindsted, T. S. and Holm, T. (2012) 'Thematic Development of Declarations on Sustainability in Higher Education', *Environmental Economics*, 3(1), pp. 32–40. doi: 10.2139/ssrn.2697500.

Haapasaari, A., Engeström, Y. and Kerosuo, H. (2014) 'The emergence of learners' transformative agency in a Change Laboratory intervention', *Journal of Education and Work*, 9080(April 2014), pp. 1–31. doi: 10.1080/13639080.2014.900168.

Haapasaari, A., Engeström, Y. and Kerosuo, H. (2016) 'The emergence of learners' transformative agency in a Change Laboratory intervention', *Journal of Education and Work*, 29(2), pp. 232–262. doi: 10.1080/13639080.2014.900168.

Hashim, N. and Jones, M. L. (2007) 'Activity Theory: A framework for qualitative analysis', in *4th International Qualitative Research Convention (QRC)*. PJ Hilton Malaysia.

Hasted, C. (2019) *PhD Thesis, Humanities doctoral education for a relational future : a Change Laboratory research intervention Humanities doctoral education for a relational future : a Change Laboratory research intervention*. University of Lancaster.

HESI (2017) 'Higher education institutions – key drivers of the sustainable development goals", A special event of the 2017 High-level Political Forumon Sustainable Development',

in *Higher Education Sustainbility Initiative*. New York: UNHQ, pp. 1–5. Available at: https://sustainabledevelopment.un.org/hlpf/2017/HESIGlobalEvent.

Hesselink, F., van Kempen, P.P. and Wals, A. E. J. (2000) 'ESDebate: International On-line Debate on Education for Sustainable Development, Education for Sustainable Development'. IUCN, Gland.

Holden, E., Linnerud, K. and Banister, D. (2014) 'Sustainable development: Our Common Future revisited', *Global Environmental Change*, 26(1), pp. 130–139. doi: 10.1016/j.gloenvcha.2014.04.006.

Holm, T. *et al.* (2015) 'Process framework for identifying sustainability aspects in university curricula and integrating education for sustainable development', *Journal of Cleaner Production*, 106, pp. 164–174. doi: 10.1016/j.jclepro.2015.04.059.

Hoover, E. and Harder, M. K. (2015) 'What lies beneath the surface? the hidden complexities of organizational change for sustainability in higher education', *Journal of Cleaner Production*, 106, pp. 175–188. doi: 10.1016/j.jclepro.2014.01.081.

Hopkinson, P. G. (2009) 'Towards the Sustainable University.', *Leadership Foundation for Higher Education*, (19), pp. 1–4. Available at: http://hdl.handle.net/10454/4711.

Horhota, M. *et al.* (2014) 'Identifying behavioral barriers to campus sustainability', *International Journal of Sustainability in Higher Education*, 15(3), pp. 343–358.

Hugé, J., Mac-Lean, C. and Vargas, L. (2018) 'Maturation of sustainability in engineering faculties – From emerging issue to strategy?', *Journal of Cleaner Production*, 172, pp. 4277–4285. doi: 10.1016/j.jclepro.2017.07.143.

Hume, T. Barry, J. (2015) 'Environmental Education and Education for Sustainable Development', *International Encylcopedia of the social and behavioural Sciences.* doi: 10.1016/B978-0-08-097086-8.81041-7.

Johnson, S. (2011) 'Higher education and sustainable development: paradox and possibility', *Environmental Education Research*, 17(2), pp. 281–284.

Johnston, P. *et al.* (2007) 'Reclaiming the definition of sustainability', *Environmental Science and Pollution Research*, 14(1), pp. 60–66.

Jones, P., Trier, C. J. and Richards, J. P. (2008) 'Embedding Education for Sustainable Development in higher education: A case study examining common challenges and opportunities for undergraduate programmes', *International Journal of Educational Research*, 47(6), pp. 341–350. doi: 10.1016/j.ijer.2008.11.001.

Junyent, M. and de Ciurana, A. M. G. (2008) 'Education for sustainability in university studies: a model for reorienting the curriculum', *British Educational Research Journal*, 34(6), pp. 763–782. doi: 10.1080/01411920802041343.

Kaptelinin, V. and Nardi, B. (2012) *Activity Activity Theory Theory in in HCI*. Available at: http://www.morganclaypool.com.elibrary.jcu.edu.au/doi/pdf/10.2200/S00413ED1V01Y201203HCI013.

Karatzoglou, B. (2013) 'An in-depth literature review of the evolving roles and contributions of universities to Education for Sustainable Development', *Journal of Cleaner Production*, 49, pp. 44–53. doi: 10.1016/j.jclepro.2012.07.043.

Kärkkäinen, M. (1999) *PhD Thesis Teams as Breakers of Traditional Work Practices. A Longitudinal Study of Planning and Implementing Curriculum Units in Elementary School Teacher Teams.* Helsinki.

Karpov, Y. V. and Bransford, J. D. (1995) 'L. S. Vygotsky and the Doctrine of Empirical and Theoretical Learning', *Educational Psychologist*, 30(2), pp. 61–66. doi: 10.1207/s15326985ep3002_2.

Kemper, J. A., Ballantine, P. W. and Hall, C. M. (2018) 'Global warming and sustainability: Understanding the beliefs of marketing faculty', *Journal of Public Affairs*, 18(4), pp. 1–8. doi: 10.1002/pa.1664.

Kitamura, Y. (2014) 'The possibility of holistic safety education in Japan: From the perspective of Education for Sustainable Development (ESD)', *IATSS Research*, 38(1), pp. 40–47. doi: 10.1016/j.iatssr.2014.05.004.

Koehn, P. H. and Uitto, J. I. (2014) 'Evaluating sustainability education: Lessons from international development experience', *Higher Education*, 67(5), pp. 621–635. doi: 10.1007/s10734-013-9669-x.

Kopnina, H. (2011) 'Revisiting Education for Sustainable Development (ESD): Examining Anthropocentric Bias Through the Transition of Environmental Education to ESD', *Sustainable Development*. doi: 10.1002/sd.529.

Kopnina, H. (2015) 'Neoliberalism, pluralism and environmental education: The call for radical re-orientation', *Environmental Development*, 15(July), pp. 120–130. doi: 10.1016/j.envdev.2015.03.005.

Kopnina, H. and Meijers, F. (2014) 'Education for sustainable development (ESD): exploring theoretical and practical challenges', *International Journal of Sustainability in Higher Education*, 15(2), pp. 188–207. doi: 10.1108/14676371311312905.

Læssøe, J. *et al.* (2009) *Climate Change and Sustainable Development: the Response from Education: a Cross-national Report from International Alliance of Leading Education Institutes. Danmarks Pædagogiske Universitetsskole*. Aarhus.

Lafferty, W. (2004) *Governance for Sustainable Development. The Challenge of Adapting Form to Function*. Edited by W. . Lafferty. Cheltenham: Elgar.

Lambrechts, W., Van Liedekerke, L. and Van Petegem, P. (2018) 'Higher education for sustainable development in Flanders: balancing between normative and transformative approaches', *Environmental Education Research*, 24(9), pp. 1284–1300. doi: 10.1080/13504622.2017.1378622.

Langemeyer, I. and Roth, W. M. (2006) 'Is Cultural-Historical Activity Theory Threatened to Fall Short of its Own Principles and Possibilities as a Dialectical Social Science?', *Outlines. Critical Practice Studies*, 8(2), pp. 20–42.

Larrán Jorge, M. *et al.* (2015) 'An approach to the implementation of sustainability practices in Spanish universities', *Journal of Cleaner Production*, 106, pp. 34–44. doi: 10.1016/j.jclepro.2014.07.035.

Leal Filho, W. (2011) 'About the Role of Universities and Their Contribution to Sustainable Development', *Higher Education Policy*, 24(4), pp. 427–438. doi: 10.1057/hep.2011.16.

Leal Filho, W. *et al.* (2015) 'Putting sustainable development in practice: Campus greening as a tool for institutional sustainability efforts', *Sustainability in Higher Education*, (October), pp. 1–19. doi: 10.1016/B978-0-08-100367-1.00001-9.

Leal Filho, W. *et al.* (2017) 'Identifying and overcoming obstacles to the implementation of sustainable development at universities', *Journal of Integrative Environmental Sciences*, 14(1), pp. 93–108. doi: 10.1080/1943815X.2017.1362007.

Leal Filho, W. (ed.) (2018) *Handbook of Sustainability Science and Research*. Cham, Switzerland: Springer International Publishing Switzerland. doi: 10.1007/978-3-319-63007-6.

Leal Filho, W. *et al.* (2018) 'Reinvigorating the sustainable development research agenda: the role of the sustainable development goals (SDG)', *International Journal of Sustainable Development and World Ecology*, 25(2), pp. 131–142. doi: 10.1080/13504509.2017.1342103.

Leal Filho, W. and Manolas, E. (2012) 'Contributions to the UN decade of education for sustainable development', in Azeitero, U. M., Leal Filho, W., and Pereira, R. (eds). Peter Lang Scientific Publishers, p. 430.

León-Fernández, Y. *et al.* (2018) 'Enhancing environmental management in universities through participation: the case of the University of Córdoba', *Journal of Cleaner Production*, 172, pp. 4328–4337. doi: 10.1016/j.jclepro.2017.06.103.

Lincoln, Y. S. and Guba, E. (2013) -. 1st edn, *The Constructivist Credo*. 1st edn. Walnut Creek, CA: Left Coast Press. doi: 10.4324/9781315418810.

Lozano-Ros, R. (2003) *Sustainable development in higher education. Incorporation, assessment and reporting of sustainable development in higher education institutions.* Lund University.

Lozano, R. (2006a) 'A tool for a Graphical Assessment of Sustainability in Universities (GASU)', *Journal of Cleaner Production*, 14(9–11), pp. 963–972. doi: 10.1016/j.jclepro.2005.11.041.

Lozano, R. (2006b) 'Incorporation and institutionalization of SD into universities: breaking through barriers to change', *Journal of Cleaner Production*, 14, pp. 787–96.

Lozano, R. (2008) 'Envisioning sustainability three-dimensionally', *Journal of Cleaner Production*, 16(17), pp. 1838–1846. doi: 10.1016/j.jclepro.2008.02.008.

Lozano, R. *et al.* (2015) 'A review of commitment and implementation of sustainable development in higher education: Results from a worldwide survey', *Journal of Cleaner Production*, 108, pp. 1–18. doi: 10.1016/j.jclepro.2014.09.048.

Lozano, R. (2018) 'Proposing a definition and a framework of organisational sustainability: A review of efforts and a survey of approaches to change', *Sustainability (Switzerland)*, 10(4). doi: 10.3390/su10041157.

Lozano, R. and von Haartman, R. (2018) 'Reinforcing the holistic perspective of sustainability: Analysis of the importance of sustainability drivers in organizations', *Corporate Social Responsibility and Environmental Management*, 25(4), pp. 508–522. doi: 10.1002/csr.1475.

Lozano, R. and Peattie, K. (2009) *Developing a Tool to Audit Curricula Contributions to Sustainable Development, Sustainability at Universities—Opportunities, Challenges, and Trends.* Edited by W. Leal Filho. Franfurt am Main: Peter Lang Publishing Group.

LSE Public policy group (2011) *Maximising the impacts of your reserach: A handbook for social scientist.* London: London School of Economics. Available at: http://blogs.lse.ac.uk/impactsof socila sciences/the-handbook/.

Macquarie University (2009) *Sustainability in the Curriculum Project*. Edited by I. Solomonides. Sydney: Macquarie University Learning and Teaching Centre.

Mader, C. (2013) 'Sustainability process assessment on transformative potentials: The Graz Model for Integrative Development', *Journal of Cleaner Production*, 49, pp. 54–63. doi: 10.1016/j.jclepro.2012.08.028.

Mader, C., Scott, G. and Razak, D. A. (2013) 'Effective change management, governance and policy for sustainability transformation in higher education', *Sustainability Accounting, Management and Policy Journal*, 4(3), pp. 264–284. doi: 10.1108/SAMPJ-09-2013-0037.

Martin, S., James, B. and Hall, A. (2005) 'Sustainability, systems thinking and professional practice.', *Journal of GEograohy in Higher Education*, 29(1), pp. 78–89. doi: DOI: 10.1080/03098260500030389.

Maxwell, J. A. and Mittapalli, K. (2008) 'Theory', in Given, L. M. (ed.) *The SAGE Encyclopedia of QUALITATIVE RESEARCH METHODS Volumes 1 and 2*. Thousand Oaks, California: SAGE, p. 1014. Available at: https://books.google.com/books?id=y_0nAQAAMAAJ&pgis=1.

Meadows, Donella, Randers, J. and Meadows, Dennis (2004) *The Limits to Growth: The 30 year update*. 1st edn. White River Junction Vermont: Chelsea Green Publishing Company.

Millar, C., Hind, P. and Magala, S. (2012) 'Sustainability and the need for change: organizational change and transformation vision', *Journal of organizational change management*, 24(4), pp. 489–500.

Moffitt, P. (2018) *PhD Thesis: Transformative agnecy for the collboration and future oriented redesign of activity in in Military Higehr Education: Empowering participants to change.* Lancaster University.

Moon, C. J., Walmsley, A. and Apostolopoulos, N. (2018) 'Governance implications of the UN higher education sustainability initiative', *Corporate Governance (Bingley)*, 18(4), pp. 624–634. doi: 10.1108/CG-01-2018-0020.

Moore, J. (2005) 'Barriers and pathways to creating sustainability education programs: policy, rhetoric and reality', *Environmental Education Research*, 11(5), pp. 537–555. doi: 10.1080/13504620500169692.

Mosier, S. and Ruxton, M. (2018) 'Sustainability university–community partnerships: Lessons for practitioners and scholars from highly sustainable communities', *Environment and Planning C: Politics and Space*, 36(3), pp. 479–495. doi: 10.1177/2399654417749593.

Müller-Christ, G. *et al.* (2014) 'The role of campus, curriculum, and community in higher education for sustainable development - A conference report', *Journal of Cleaner Production*, 62, pp. 134–137. doi: 10.1016/j.jclepro.2013.02.029.

Nasibulina, A. (2015) 'Education for Sustainable Development and Environmental Ethics', in *Procedia:Social & Behavioral Sciences*. Elsevier B.V., pp. 1077–1082. doi: 10.1016/B978-0-08-097086-8.91081-X.

Nejati, M. *et al.* (2011) 'Barriers To Achieving a Sustainable University in the Perspective of

academicians', in *The 9th Asian Academy of Management International Conference*, pp. 402–407.

Nejati, Mostafa and Nejati, Mehran (2013) 'Assessment of sustainable university factors from the perspective of university students', 48, pp. 101–107.

Nicolini, D., Gherardi, S., & Yanow, D. (2003) 'Introduction: Toward a Practice-Based View of Knowing and Learning in Organizations.', in Nicolini, D., Gherardi, S., & Yanow, D. (ed.) *Knowing in Organizations: a Practice-Based Approach*. London: M.E.Sharpe, pp. 3–32.

Omazic, A. (2021) 'Semi-Systematic Literature Review on Sustainability and Sustainable Development in Higher Education Institutions', *Sustainability*, 13(7683), pp. 1–45. doi: 10.3390/ su13147683.

Orr, D. W. (1994) *Earth in Mind: On Education, Environment, and the Human Prospect*. 10th Anniv. Washington DC: Island Press.

Orr, D. W. (2009) *Down to the Wire: Confronting Clmate Change*. 1st edn. New York: Oxford University Press.

Owens, K. A. and Legere, S. (2015) 'What do we say when we talk about sustainability? Analyzing faculty, staff and student definitions of sustainability at one American university ",' *International Journal of Sustainability in Higher Education*, 16(3), pp. 367–384. doi: 10.1108/14676371211211809.

Pattison, E. (2020) *Change Laboratory, IPhD Thesisi: n-service teachers as relational and transformative agents: a study of primary school teachers' professional learning during a Change Laboratory formative intervention*. Lancaster Unversity, UK.

Pharo, E. J. *et al.* (2012) 'Can teacher collaboration overcome barriers to interdisciplinary learning in a disciplinary university? A case study using climate change', *Teaching in Higher Education*, 17(5), pp. 497–507. doi: 10.1080/13562517.2012.658560.

Porter, T. and Cordoba, J. (2009) 'Three Views of Systems Theories and their Implications for Sustainability Education', *Journal of Management Education*, 33(3), pp. 323–347. doi: 10.1177/1052562908323192.

Post, J. and Altman, B. . (1994) 'Managing the environmental change process: barriers and opportunities.', *Journal of organizational change management*, 7(4), pp. 64–81.

Postholm, M. B. (2015) 'Methodologies in Cultural–Historical Activity Theory: The example of school-based development', *Educational Research*, 57(1), pp. 43–58. doi: 10.1080/00131881.2014.983723.

Putnam, L. L. (2013) 'Primary and Secondary Contradictions: A Literature Review and Future Directions', *Management Communication Quarterly*, 27(4), pp. 623–630. doi: 10.1177/0893318913504139.

Putnam, L. L., Fairhurst, G. T. and Banghart, S. (2016) 'Contradictions, Dialectics, and Paradoxes in Organizations: A Constitutive Approach†', *Academy of Management Annals*, 10(1), pp. 65–171. doi: 10.1080/19416520.2016.1162421.

Ragazzi, M. and Ghidini, F. (2017) 'Environmental sustainability of universities: Critical analysis of a green ranking', in *Energy Procedia*, pp. 111–120. doi: 10.1016/j.egypro.2017.07.054.

Ralph, M. and Stubbs, W. (2014) 'Integrating environmental sustainability into universities', *Higher Education*, 67(1), pp. 71–90. doi: 10.1007/s10734-013-9641-9.

Ramos, T. B. *et al.* (2015) 'Experiences from the implementation of sustainable development in higher education institutions: Environmental Management for Sustainable Universities', *Journal of Cleaner Production*, 106, pp. 3–10. doi: 10.1016/j.jclepro.2015.05.110.

Reason, P. and Bradbury, H. (eds) (2008) *The SAGE Handbook of Action Research Participative Inquiry and Practice*. 2nd edn, *The SAGE Handbook of Action Research*. 2nd edn. London: SAGE. doi: 10.4135/9781848607934.n16.

Reeger, B. and Bunders, J. (2009) *Knowledge Co-Creation: Interaction between Science and Society: A Transdisciplinary Approach to Complex Societal Issues*. 1st edn. Den Haag: RMNO/COS.

Reid, D. (1995) *Sustainable development. An introductory guide*. 1st edn. London: Earthscan.

Rieckmann, M. (2012) 'Future-oriented higher education: Which key competencies should be fostered through university teaching and learning?', *Futures*, 44(2), pp. 127–135. doi: 10.1016/j.futures.2011.09.005.

Roorda, N. and Martens, P. (2008) 'Assessment and Certification of Higher Education for Sustainable Development', *Sustainability: The Journal of Record*, 1(1), pp. 41–56. doi: 10.1089/SUS.2008.9990.

Ryan, A. (2011) *Education for Sustainable Development and Holistic Curriculum Change: A Guide for HE Institutions*. York: Higher Education Academy.

Ryan, A. and Tilbury, D. (2013) 'Uncharted waters : voyages for Education for Sustainable Development in the higher education curriculum', *The Curriculum journal*, 24(2), pp. 272–294. doi: 10.1080/09585176.2013.779287.

Sammalisto, K. and Arvidsson, K. (2005) 'Environmental management in Swedish higher education: Directives, driving forces, hindrances, environmental aspects and environmental co-ordinators in Swedish universities', *International Journal of Sustainability in Higher Education*, 6(1), pp. 18–35. doi: 10.1108/14676370510573113.

Sammalisto, K., Sundström, A. and Holm, T. (2015) 'Implementation of sustainability in universities as perceived by faculty and staff - A model from a Swedish university', *Journal of Cleaner Production*, 106, pp. 45–54. doi: 10.1016/j.jclepro.2014.10.015.

Sannino, A. (2011) 'Activity theory as an activist and interventionist theory', *Theory & Psychology*, 21(5), pp. 571–597. doi: 10.1177/0959354311417485.

Sannino, A. (2015a) 'Learning , Culture and Social Interaction The principle of double stimulation : A path to volitional action', *LCSI*, pp. 1–15. doi: 10.1016/j.lcsi.2015.01.001.

Sannino, A. (2015b) 'The emergence of transformative agency and double stimulation: Activity-based studies in the Vygotskian tradition', *Learning, Culture and Social Interaction*, 4, pp. 1–3. doi: 10.1016/j.lcsi.2014.07.001.

Schulz, K.-P. (2008) 'Shared knowledge and understandings in organizations: Its development and impact in organizational learning processes', *Management Learning*, 39, pp. 457–473. doi: 10.1177/1350507608093714.

Seatter, C. S. *et al.* (2014) 'The Paradox of pedagogy: Education for sustainable Development and transformative learning.', 1, pp. 1–20.

Segalàs, J., Mulder, K. F. and Ferrer-Balas, D. (2012) 'What do EESD "experts" think sustainability is? Which pedagogy is suitable to learn it? Results from interviews and Cmaps analysis gathered at EESD 2008 Jordi', *International Journal of Sustainability in Higher Education*, 13(13), pp. 293–304. doi: 10.1108/14676371311312905.

Shephard, K. and Furnari, M. (2013) 'Exploring what university teachers think about education for sustainability', *Studies in Higher Education*, 38(10), pp. 1577–1590. doi: 10.1080/03075079.2011.644784.

Shephard, K., Rieckmann, M. and Barth, M. (2018) 'Seeking sustainability competence and capability in the ESD and HESD literature: an international philosophical hermeneutic analysis', *Environmental Education Research*, (October). doi: 10.1080/13504622.2018.1490947.

Shorrocks, A., Davies, J. and Lluberas, R. (2020) 'The Global wealth report 2020', *Research Institute*, (December), pp. 1–56. Available at: https://www.credit-suisse.com/media/assets/corporate/docs/about-us/research/publications/global-wealth-report-2020-en.pdf.

Shriberg, M. and Harris, K. (2012) 'Building sustainability change management and leadership skills in students: Lessons learned from "Sustainability and the Campus" at the University of Michigan', *Journal of Environmental Studies and Sciences*, 2(2), pp. 154–164. doi: 10.1007/s13412-012-0073-0.

Sibbel, A. (2009) 'Pathways towards sustainability through higher education', *International Journal of Sustainability in Higher Education*, 10(1), pp. 68–82. doi: 10.1108/14676370910925262.

Sidiropoulos, E. (2010) 'The role of HEIs in society ' s transformation to sustainability The case for embedding sustainability concepts in business programs', in *Proceedings of the 10th Australasian Campuses Towards Sustainability Conference, Melbourne 2010*. Melbourne, pp. 45–53. doi: 10.13140/2.1.2698.1768.

Sidiropoulos, E. (2011) 'Navigating the Journey to Sustainability: The Case for Embedding Sustainability Literacy Into All Tertiary Education Business Programs', *THE INTERNATIONAL JOURNALof Environmental, Cultural, Economic & Social SUSTAINABILITY*, pp. 248–273.

Sidiropoulos, E. (2012) 'Synergising sustainability initiatives across a tertiary institution - building momentum for institutional transformation', in *Asia Pacific Association for Inetrnational Education (APAIE) 2012 Conferenc*e. Bangkok, p. Workshop presentation. Available at: https://www.researchgate.net/publication/265251328_Synergising_sustainability_initiatives_across_a_tertiary_institution_-_building_momentum_for_institutional_transformation.

Sinakou, E. *et al.* (2018) 'Academics in the field of Education for Sustainable Development: Their conceptions of sustainable development', *Journal of Cleaner Production*, 184, pp. 321–332. doi: 10.1016/j.jclepro.2018.02.279.

Stapp, W. B. (1969) 'The concept of environmental education', *Environmental Education*, 1(1), pp. 30–31. doi: 10.1080/00139254.1969.10801479.

Steel, B. *et al.* (2004) 'The role scientists in the environmental policy process: A case study from the American west', *Environmental Science and Policy*, 7(1), pp. 1–13. doi:

10.1016/j.envsci.2003.10.004.

Steiner, G. and Posch, A. (2006) 'Higher education for sustainability by means of transdisciplinary case studies: an innovative approach for solving complex, real-world problems', *Journal of Cleaner Production*, 14(9–11), pp. 877–890. doi: 10.1016/j.jclepro.2005.11.054.

Stephens, J. C. *et al.* (2008) 'Higher education as a change agent for sustainability in different cultures and contexts', *International Journal of Sustainability in Higher Education*, 9(3), pp. 317–338. doi: 10.1108/14676370810885916.

Sterling, S. (2012) 'The Future Fit Framework: An introduction guide to teaching and learning for sustainability in HE', pp. 1–76. Available at: http://www.heacademy.ac.uk/assets/documents/esd/Future_Fit_270412_1435.pdf.

Sterling, S., Maxey, L. and Luna, H. (eds) (2013) *The Sustainable University. Progress and prospects.* New York: Routledge.

Stevenson, R. (2006) 'Tensions and transitions in policy discourse: recontextualising a decontextualised EE/ESD debate', *Enviornmnetal Education Research*, 12(3/4), pp. 277–290.

Stone, L. . (2006) 'Limitations of cleaner production programmes as organizational change agents. II Leadership, support, communication, involvement and pro- gramme design', *Journal of Cleaner Production*, 14, pp. 15–30.

Stough, T. *et al.* (2018) 'Assessing sustainability in higher education curricula: A critical reflection on validity issues', *Journal of Cleaner Production*, 172, pp. 4456–4466. doi: 10.1016/j.jclepro.2017.02.017.

Sylvestre, P., Wright, T. S. A. and Sherren, K. (2014) 'A tale of two (or more) sustainabilities: A Q methodology study of university professors' perspectives on sustainable universities', *Sustainability (Switzerland)*, 6(3), pp. 1521–1543. doi: 10.3390/su6031521.

Teixeira, S. R. (2014) 'The Environmental Education as a Path for Global Sustainability', *Procedia - Social and Behavioral Sciences*, 106, pp. 2769–2774. doi: 10.1016/j.sbspro.2013.12.318.

Thogersen, J. and Crompton, T. (2009) 'Simple and Painless; The limitations of Spillover in environmental campaigning', *Journal of Consumer Policy*, 32(2).

Thürer, M. *et al.* (2018) 'A systematic review of the literature on integrating sustainability into engineering curricula', *Journal of Cleaner Production*, 181, pp. 608–617. doi: 10.1016/j.jclepro.2017.12.130.

Tilbury, D. (2002) *Education and sustainability: responding to the global challenge*. Available at: http://www.ibcperu.org/doc/isis/13028.pdf%5Cnhttp://ibcperu.org/doc/isis/13028.pdf.

Tilbury, D. *et al.* (2005) *A national review of environmental education and its contribution to sustainability in Australia: Further and higher education*. Canberra.

Tilbury, D. (2008) 'Higher Education ' s Commitment to Sustainability : From Understanding to Action PART I : THE CONTEXT Higher Education for Sustainability : A Global Overview of Commitment and', pp. 1–21.

Too, L. and Bajracharya, B. (2015) 'Sustainable campus: engaging the community in

sustainability', *International Journal of Sustainability in Higher Education*, 16(1), pp. 57–71. doi: 10.1108/IJSHE-07-2013-0080.

Trencher, G. *et al.* (2014) 'Beyond the third mission: Exploring the emerging university function of co-creation for sustainability', *Science and Public Policy*, 41(2), pp. 151–179. doi: 10.1093/scipol/sct044.

Trencher, G. *et al.* (2016) 'The Role of students in the Co-creation of Transformational Knowledgeand Sustainbility Experiments: Experiences from Sweden, Japan, and the USA.', in Leal Filho, W. and Brandli, L. (eds) *Engaging Stakeholders in Education for Sustainable Development at University Level, World Sustainability Series,*. Springer International Publishing Switzerland, pp. 335–342. doi: 10.1007/978-3-319-26734-0_13.

Trowler, P. R. (2016) *Doing Insider research in Universities (Doctoral research into Higher education Book 1)*. Kindle.

Tummons, J. (2012) 'Theoretical trajectories within communities of practice in higher education research', *Higher Education Research and Development*, 31(3), pp. 299–310. doi: 10.1080/07294360.2011.631516.

Tziganuk, A. and Gliedt, T. (2017) 'Comparing faculty perceptions of sustainability teaching at two US universities', *International Journal of Sustainability in Higher Education*, 18(7), pp. 1191–1211. doi: https://doi.org/10.1108/14676301103802 99.

UE4SD (2014) *University educators 4 sustainable developmen*. Available at: www.ue4sd.eu.

UN (1972) 'United Nations Conference on the Human Environment, Stockholm, 1972', *Archive*. doi: 10.1111/j.1468-0033.1973.tb02054.x.

UN (1975) 'Belgrade Charter 1975; UN Conference on the Human Enviornment.' Available at: https://www.gdrc.org/uem/ee/belgrade.html.

UN (1992) 'Agenda 21', in *UN Conference on Environment and Development Rio 1992*, pp. 1–352. doi: 10.4135/9781412971867.n128.

UNESCO (1977) 'The Tbilisi Declaration (Intergovernamnetl conference on Environmental Education)'. Available at: https://www.gdrc.org/uem/ee/tbilisi.html.

UNESCO (2006) 'Drivers and Barriers for Implememnting Sustainable Development in Higher Education', in Holmberg, J. and Samuelsson, B. E. (eds) *Education for Sustaianble Development in Action Technical Paper No 3*. Paris, pp. 1–130. Available at: http://unesdoc.unesco.org/images/0014/001484/148466E.pdf (accessed 22 April 2017.

UNESCO (2014) *Education for Sustainable Development, Roadmap for Implementing the Global Action Programme on Education for Sustainable Development*. doi: 10.4324/9781315299235.

UNESCO Education Sector (2005) *Framework for the UNDESD International Implementation Scheme.*

Vargas, L., Mac-Lean, C. and Huge, J. (2019) 'The maturation process of incorporating sustainability in universities', *International Journal of Sustainability in Higher Education*, 20(3), pp. 441–451. doi: 10.1108/IJSHE-01-2019-0043.

Velazquez, L. *et al.* (2006) 'Sustainable university: what can be the matter?', *Journal of Cleaner Production*, 14(9–11), pp. 810–819. doi: 10.1016/j.jclepro.2005.12.008.

Verhulst, E. and Boks, C. (2014) 'Employee Empowerment for Sustainable Design', *J. Corp. Citizen*, (55), pp. 73–101.

Verhulst, E. and Lambrechts, W. (2015) 'Fostering the incorporation of sustainable development in higher education. Lessons learned from a change management perspective', *Journal of Cleaner Production*, 106, pp. 189–204. doi: 10.1016/j.jclepro.2014.09.049.

Viegas, C. V. *et al.* (2016) 'Critical attributes of Sustainability in Higher Education: A categorisation from literature review', *Journal of Cleaner Production*, 126, pp. 260–276. doi: 10.1016/j.jclepro.2016.02.106.

Virkkunen, J. & Newnham, D. S. (2013) *The Change Laboratory: A tool for collaborative development of work and education.* Rotterdam: Sense Publishers.

Virkkunen, J. (1995) *Työpaikkatarkastuksen ristiriidat ja niiden ylittämisen mahdollisuudet. Tutkimus keskusteluun perustuvan työn välineistä ja tul- oksellisuudesta [Contradictions in Workplace Inspections and Possibilities of Overcoming Them. A Study of the Tools and Effect*. Helsinki: Työministeriö.

Virkkunen, J. (2006) 'Dilemmas in building shared transformative agency', *Activities*, 3(1), pp. 43–66. doi: 10.4000/activites.1850.

Virkkunen, J. and Newnham, D. S. (2013) *The Change Laboratory: A tool for collaborative development of work and education.*

Vygotsky, L. . (1960) 'The history of development of higher mental functions.', in *The collected works of L. S. Vygotsky. The history of the development ofhigher mental functions*, pp. 27–63.

Vygotsky, L. . (1978) *Mind in Society: the development of higher psychological processes.* Edited by M. Cole et al. Cambridge, MA, USA: Harvard University Press.

Vygotsky, L. . (1987) 'Lectures on psychology, Lecture 6: The problem of will and its development in childhood. A. S. Carton (Eds.), The collected works ofL.S. Vygotsky. Problems ofgeneral psychology, Vol. 1'. New Yorl: Plenum, pp. 351–358.

Vygotsky, L. . (1999) 'Tools and signs in child development', in Rieber, R. W. (ed.) *The collected works of L. S. Vygotsky. vol 6*. New York: Kluwer Academic Publishers.

Wenger, E. (1998) *Communities of practice: Learning, meaning and identity.* Cambridge: Cambridge University Press. doi: https://doi.org/10.1017/CBO9780511803932.

Wesselink, R. and Wals, A. E. J. (2011) 'Developing competence profiles for educators in environmental education organisations in the Netherlands', *Environmental Education Research*, 17(932789702), pp. 69–90. doi: 10.1080/13504621003637037.

Wilson, S. (2012) 'Drivers and blockers: Emmbedding Education for Sustainability (EfS) in Primary teacher education', *Australian Journal of Environmental Education*, 28(1), pp. 42–56.

Wright, T. S. A. (2002) 'Definitions and frameworks for environmental sustainability in higher education', *International Journal of Sustainability in Higher Education*, 3(3), pp. 203–220. doi: 10.1108/14676370210434679.

Wright, T. S. A. (2004) 'The evolution of sustainability declarations in higher education', in Corcoran, P. B. and Wals, A. E. J. (eds) *Higher Education and the Challenge of Sustainability*.

Dordrecht, Netherlands: Kluwer Academic Publishers, pp. 7–14.

Wright, T. S. A. (2010) 'University presidents' conceptualizations of sustainability in higher education', *International Journal of Sustainability in Higher Education*, 11(1), pp. 61–73.

Wright, T. S. A. and Horst, N. (2013) 'Exploring the ambiguity: what faculty leaders really think of sustainability in higher education', *International Journal of Sustainability in Higher Education*, 14(2), pp. 209–227.

Wu, Y. C. J. and Shen, J. P. (2016) 'International Journal of Sustainability in Higher Education Article information ':, 17(5), pp. 633–651. doi: 10.1108/14676371211211809.

Yamagata-Lynch, L. C. (2007) 'Confronting Analytical Dilemmas for Understanding Complex Human Interactions in Design-Based Research From a Cultural—Historical Activity Theory (CHAT) Framework.', *Journal of learning Sciences*, 16(4), pp. 451–484. doi: 10.1080/10508400701524777.

Yamagata-Lynch, L. C. (2010) *Activity Systems Analysis Methods*, *Understanding Complex Learning Environments*. New York: Springer. doi: 10.1007/978-1-4419-6321-5.

Yarime, M. *et al.* (2012) 'Establishing sustainability science in higher education institutions: Towards an integration of academic development, institutionalization, and stakeholder collaborations', *Sustainability Science*, 7(SUPPL. 1), pp. 101–113. doi: 10.1007/s11625-012-0157-5.

Zeegers, Y. and Clark, I. F. (2014) 'Students' perceptions of education for sustainable development', *International Journal of Sustainability in Higher Education*, 15(2), pp. 242–253. doi: 10.1108/IJSHE-09-2012-0079.